Control Shift

European Industrial Heritage Reuse in review

VOLUME 1

Theodora Chatzi Rodopoulou

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A+BE | Architecture and the Built Environment | TU Delft BK

20#13

Design | Sirene Ontwerpers, Rotterdam

Cover photo | Power Station / Lavrion Technological & Cultural Park, Hielkje Zijlstra

Keywords | industrial heritage, reuse, regeneration, stakeholders, participation, European heritage

ISBN 978-94-6366-292-5
ISSN 2212-3202

Digital version freely available at **abe.tudelft.nl**

Control Shift

European Industrial Heritage Reuse in review

Dissertation

for the purpose of obtaining the degree of doctor
at Delft University of Technology
by the authority of the Rector Magnificus, prof.dr.ir. T.H.J.J. van der Hagen
chair of the Board for Doctorates
to be defended publicly on
Friday 4 September 2020 at 10:00 o'clock

by

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The **National Technical University of Athens (NTUA)** made important contributions to the work described in this dissertation.

This research was funded by a full scholarship by the **Onassis Foundation.**

To those who passed and they are greatly missed
To Him who has been always by my side

Preface

The charming complexity of Industrial Heritage, its embedded sociocultural, technical and financial significance as well as the need to impede the progressive degeneration of a vast valuable historic building stock, were the reasons that attracted the author's attention to the subject under investigation while still in her first steps as an assistant researcher in the NTUA in the mid-2000s. Later, during her professional career as an architect in Greece and the Netherlands, new aspects and issues of the field were revealed, nurturing this initial interest. The captivating attractiveness of industrial relics and the recognition of their great potential to fulfil current and future needs when reused on the one hand, and the intricacy and multiple problems of the Reuse process on the other, motivated the author to engage in a preliminary research, forming a PhD proposal on the topic of Industrial Heritage Reuse by 2014.

At the time, the financial crisis was paralysing heritage care in Europe, raising questions and concerns about the future of the abandoned and revitalised former industrial giants. In that climate of depression, the need for enhanced more responsive and sustainable ways of transforming historic buildings had taken a new urgency. This doctoral research' ambition was to respond to this composite topical problem, providing a meaningful contribution on an academic and practical level.

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Summary

The legacy of industrialisation counts only a few decades of being accepted as cultural heritage. The change of perceptions over its connotation and significance, from a menace to historic landscapes to an outstanding historical resource, took place in an era of massive sociocultural and economic upheavals. Those far-reaching developments reshaped both the theory and the practice of heritage conservation.

Since the 1970s, new conservation approaches started emerging and being employed, next to the long established strategies of preservation and restoration. Adaptive reuse was included in the repertoire of conservation and quickly gained ground, as a strategy which allowed both the preservation of heritage values and sustainable development. The incorporation of adaptive reuse as an alternative conservation approach marked a noteworthy shift in heritage care. Contemporary conservation seized aiming at the prevention of change. Instead, it embraced it, following the new axiom: 'Managing change'.

This dissertation, positioned in the crossroads of the heritage conservation, architectural and spatial planning fields, focuses on Industrial Heritage Reuse practice in Europe. Despite widely employed in the last half century, Industrial Heritage Reuse still remains particularly challenging and highly confusing, hiding internal and external risks. Those resonate from the conditions of present times, the ambiguities of the contemporary framework of conservation, the embedded dilemmas of the Reuse practice as well as from the particularities of this special heritage group.

This vastly complex yet fascinating topic has not yet been studied holistically under the circumstances dictated by the contemporary era. A deeper and broader understanding of the practice has assumed greater urgency in the 21st century, as it is the stepping stone for the enhancement of the practice -a demand that is increasingly stressed by academic and professional circles.

The aim of this dissertation is to explore the potential of enhancement of the Industrial Heritage Reuse through the identification and analysis of its influencing Aspects, under the light of the contemporary theoretical conservation concepts, the current demands of the field of practice and the rising challenges of the 21st century context.

This research addresses a topical issue, drawing from the concepts of the contemporary theory of conservation, challenging outdated theoretical notions and conventional practical and methodological applications. Furthermore, it sheds light to a hazy and confusing subject, addressing the tensions and the unresolved issues, highlighted by the existing literature on multiple disciplines. It revisits and reinterprets the standing axiom 'Managing Change', providing the scientific community with missing answers on the way, the Actors and the criteria based on which this can be achieved. Drawing upon both theory and practice on an international level, this inquiry gives a holistic and multileveled view on the subject under investigation, stimulating further thought and debate.

Apart from extending the academic body of knowledge, the intention of this doctoral research is also to become a useful springboard for the practitioners that engage with Industrial Heritage Reuse. In order to achieve that, this dissertation presents an international and retrospective review of Industrial Heritage care, allowing experience drawn from one country to inform approaches on safeguarding via Reuse on other countries. Furthermore, it offers inspiration and raises awareness through the 'ReIH' online knowledge platform (http://reindustrialheritage.eu/projects) and the analysis of twenty cases studies of best practice. Lastly, taking into account the pressing issues of sustainability, equality and multilateralism, it offers guidance, providing a much needed alternative framework for the conservation of Industrial Heritage. This framework is capable of practical implementation and can contribute to an enhanced, more responsive, more sustainable, more inclusive, more value-driven and more holistic practice.

The Main Research Question (M.R.Q.) of this doctoral research is:

How can the European Industrial Heritage Reuse practice be better understood, and possibly enhanced, through the close examination of the Aspects influencing it?

Finding a well-substantiated answer to this question has required the formulation of a mixed-method research design, combining case study research, historical research and qualitative interviews. This research design has been applied to a geographical scope extending in Western Europe. In specific, the research focuses on the developments pertaining to Industrial Heritage care and Reuse in countries forerunners, such as the United Kingdom; countries followers, such as the Netherlands and countries latecomers such as Spain and Greece. In each of those countries 5 Industrial Heritage Reuse cases of best practice have been selected and investigated in detail, out of an extensive list of the 214 case studies reviewed. The full range of cases reviewed is presented in the online knowledge platform 'ReIH', developed by the author.

Due to the wide scope of the research, this dissertation is divided in two Volumes. Volume 1 introduces the research problem and explains the rationale of the thesis; it provides the theoretical framework of the subject under investigation; it presents the research methodology; it develops the academic analysis and it finally offers the products of the research. Volume 2 presents the analysis and evaluation of the 20 selected case studies of best practice, serving also as a basis of information for the academic analysis presented in Volume 1.

The results of this doctoral research highlight the current stage and the standing challenges pertaining to Industrial Heritage care and Reuse. Furthermore, they shed light to the Aspects affecting Industrial Heritage Reuse practice. Those include the Net^2 of Factors comprising the intertwined Nets of Endogenous Attributes and Exogenous Conditions, the Net of influencing Actors and the Components of Industrial Heritage Reuse.

The main finding of this thesis is that the enhancement of Industrial Heritage Reuse practice relies on the identification of the dependencies and tensions between the influencing Aspects of the practice and on the establishment of a balance among them. A framework that can guide this perplexing yet exciting venture is offered as the main result of the thesis.

Reflecting on the concept of 'Control shift' -the reinterpretation of the axiom 'Managing change'- it is suggested that the contemporary Reuse practice is about interpreting and accepting constants, grasping dynamic variables and based on the comprehension of their combined effect, taking informed decisions for the formulation of the Reuse Components, setting boundaries and maintaining a balance between them.

Samenvatting

De nalatenschap van de industrialisatie is pas sinds enkele decennia geaccepteerd als cultureel erfgoed. De verandering in de perceptie van de connotatie en betekenis – [verschuivend] van een bedreiging van historische landschappen tot een uitzonderlijke bron van historische kennis – vond plaats in een periode van enorme sociaal-culturele en economische omwentelingen. Deze verstrekkende ontwikkelingen hebben zowel de theorie als de praktijk van de monumentenzorg ingrijpend veranderd.

Sinds de jaren zeventig van de twintigste eeuw ontwikkelden zich, naast de reeds bestaande strategieën voor behoud en herstel, nieuwe benaderingen van instandhouding. Aangepast hergebruik (adaptive reuse) werd opgenomen in het repertoire van erfgoedbehoud en won al snel terrein als strategie die zowel het behoud van erfgoedwaarden als duurzame ontwikkelingen mogelijk maakte. De opname van herbestemming als een alternatieve benadering van instandhouding markeerde een opmerkelijke verschuiving (shift) in de monumentenzorg. De eigentijds instandhouding legde zich niet langer toe op het voorkomen van veranderingen. In plaats daarvan werden veranderingen omarmd, onder het nieuwe motto: managing change (beheer de verandering).

Dit proefschrift, gepositioneerd op het kruispunt van monumentenzorg, architectuur en ruimtelijke ordening, richt zich in het bijzonder op het hergebruik van industrieel erfgoed in Europa. Hoewel het herbestemmen van industrieel erfgoed wijd verbreid is in de afgelopen halve eeuw, blijft het nog steeds een bijzondere uitdaging. Het proces is moeilijk te doorgronden omdat het gepaard gaat met grote interne en externe risico's. Die weerspiegelen zowel de huidige omstandigheden, de dubbelzinnigheden van het hedendaagse instandhoudingskader en de ingebedde dilemma's van de herbestemmingspraktijk als de specifieke kenmerken van deze bijzondere erfgoedcategorie.

Dit enorm complexe maar fascinerende onderwerp is nog niet holistisch bestudeerd onder de omstandigheden die door het huidige tijdperk worden voorgeschreven. Een diepgaander en breder begrip van de praktijk heeft een grotere urgentie gekregen in de 21ste eeuw, omdat dit de springplank is naar verbetering van de praktijk – een vraag die steeds meer benadrukt wordt in academische en professionele kringen.

Het doel van dit proefschrift is om het potentieel van verbetering van het hergebruik van industrieel erfgoed te verkennen door de aspecten die hierop van invloed zijn te identificeren en te analyseren. Dit gebeurt in het licht van de hedendaagse theoretische conserveringsconcepten, de huidige eisen vanuit het werkveld (de praktijk) en de toenemende uitdagingen van de 21e-eeuwse context.

Dit onderzoek richt zich op een actueel vraagstuk, gebaseerd op de huidige opvattingen in de theorievorming over instandhouding van erfgoed. Het neemt een kritische houding aan ten aanzien van de verouderde theoretische begripsvorming en de conventionele praktische en methodologische toepassingen. Bovendien werpt het licht op een mistig en verwarrend onderwerp en behandelt het de spanningen en de onopgeloste problemen die in de bestaande literatuur voor meerdere disciplines aan de orde worden gesteld. Het bestaande axioma 'Managing Change' wordt herzien en geherinterpreteerd. De wetenschappelijke gemeenschap krijgt ontbrekende antwoorden over de manier, de actoren en de criteria op basis waarvan deze verandering (shift) kan worden

bereikt. Gebaseerd op zowel theorie als praktijk op internationaal niveau, geeft dit onderzoek een holistische en gelaagde kijk op het betreffende onderwerp en stimuleert het tot verder nadenken en debat. Naast het uitbreiden van de academische kennis, is het doel van deze dissertatie om bruikbare handvaten te bieden aan instanties en personen die zich in de praktijk bezighouden met het hergebruik van industrieel erfgoed.

Om dit te bereiken, presenteert dit proefschrift een internationale en retrospectieve beoordeling van de zorg voor industrieel erfgoed, waardoor de ervaring die in een land is opgedaan, informatie kan verschaffen over benaderingen voor veiligstelling via hergebruik in andere landen. Bovendien biedt het inspiratie en creëert het bewustwording door middel van het 'ReIH' online kennisplatform (http://reindustrialheritage.eu/projects) en door de analyse van twintig casestudy's van best practice. Ten slotte biedt het, rekening houdend met de urgente kwesties als duurzaamheid, gelijkheid en multilateralisme, houvast en biedt het een broodnodig alternatief kader voor het behoud van industrieel erfgoed. Dit raamwerk is praktisch toepasbaar en kan bijdragen aan een verbeterde, responsievere, duurzamere, inclusievere, meer waardegedreven en een meer holistische praktijk.

De hoofdonderzoeksvraag van deze dissertatie is:

Hoe kan de Europese praktijk van herbestemming van industrieel erfgoed beter worden begrepen en mogelijkerwijs worden verbeterd, door het nauwkeurig onderzoeken en in beeld brengen van de aspecten die hierop van invloed zijn?

Het vinden van een goed onderbouwd antwoord op deze vraag, vereiste de formulering van een gemengde onderzoeksmethodiek, waarbij de case study-onderzoek, historisch onderzoek en kwalitative interviews zijn gecombineerd. Deze onderzoeksaanpak is toegepast op een geografisch gebied dat zich binnen West-Europa bevindt. Specifiek richt het onderzoek zich op de ontwikkelingen met betrekking tot de industriële erfgoedzorg en herbestemming in vooroplopende landen zoals het Verenigd Koninkrijk; landen die als volgers worden gezien zoals Nederland, en landen die daar achteraan lopen, zoals Spanje en Griekenland. In elk van deze landen zijn vijf voorbeeldprojecten (best practice) van industrieel hergebruik geselecteerd en in detail onderzocht, nadat ze zijn geselecteerd uit een uitgebreide lijst van 214 geïnventariseerde casestudy's. Het volledige scala van beoordeelde cases wordt gepresenteerd en ontsloten in het door de auteur ontwikkelde online kennisplatform 'ReIH'.

Vanwege de brede reikwijdte van het onderzoek is dit proefschrift verdeeld in twee delen. Deel 1 introduceert de probleemstelling van het onderzoek en legt de beweegredenen van het proefschrift uit. Het behandelt het theoretische kader van het te onderzoeken onderwerp; het presenteert de onderzoeksmethodologie; het ontwikkelt de academische analyse en biedt tenslotte de resultaten en de conclusies van het onderzoek.

Deel 2 presenteert de analyse en de evaluatie van de twintig geselecteerde voorbeeldprojecten van 'best practice', die ook dienen als een basis van informatie voor de academische analyse die in Deel 1 wordt gepresenteerd.

De resultaten van dit promotieonderzoek belichten de huidige situatie en de aanhoudende uitdagingen die zich voordoen bij de zorg voor en het hergebruik van industrieel erfgoed. Bovendien werpen ze licht op de aspecten die van invloed zijn op de praktijk van herbestemming van industrieel erfgoed. Deze omvatten het Net^2 van Factoren die de met elkaar verweven Netten van Endogene Attributen en Exogene Voorwaarden, alsook het Net van beïnvloedende Actoren en de Componenten van hergebruik van industrieel erfgoed.

De belangrijkste conclusie van dit proefschrift is het inzicht dat de verbetering van de herbestemmingspraktijk van industrieel erfgoed afhankelijk is van de identificatie van de onderlinge afhankelijkheden en spanningen tussen de beïnvloedende aspecten in de praktijk en van de totstandbrenging van een evenwicht daartussen. Als voornaamste resultaat van dit proefschrift wordt een raamwerk aangeboden, dat richting kan geven aan deze ingewikkelde maar uitdagende onderneming.

Reflecterend op het concept van 'Control Shift' – de herinterpretatie van het motto 'Managing Change' – wordt gesuggereerd dat de hedendaagse herbestemmingpraktijk gaat over het interpreteren en accepteren van constanten, het begrijpen van de dynamische variabelen en, gebaseerd op het begrip van hun gecombineerde effect, het nemen van weloverwogen beslissingen voor de formulering van de Herbestemmings Componenten, het stellen van grenzen en het bewaren van een evenwicht daartussen.

Περίληψη

Η ενσωμάτωση των ιστορικών καταλοίπων της βιομηχανίας στην πολιτιστική κληρονομιά αποτελεί ζήτημα μόλις μερικών δεκαετιών. Η αλλαγή αντίληψης για το συμβολισμό και τη σημασία της βιομηχανικής κληρονομιάς, από απειλή στο ιστορικό τοπίο, σε ένα ιστορικό αγαθό εξαιρετικής σημασίας, συντελέστηκε σε μια εποχή μαζικών κοινωνικών, πολιτιστικών και οικονομικών ανακατατάξεων. Οι εκτεταμένες αυτές εξελίξεις αναδιαμόρφωσαν τόσο τη θεωρία όσο και την πρακτική της διατήρησης της πολιτιστικής κληρονομιάς.

Από τη δεκαετία του 1970, άρχισαν να αναπτύσσονται και να υιοθετούνται σταδιακά νέες προσεγγίσεις διατήρησης οι οποίες εφαρμόστηκαν παράλληλα με τις υπάρχουσες στρατηγικές προστασίας και αποκατάστασης. Η επανάχρηση εντάχθηκε στη θεματολογία της διατήρησης μνημείων και κέρδισε γρήγορα έδαφος ως στρατηγική που επιτρέπει τόσο τη διατήρηση των αξιών της πολιτιστικής κληρονομιάς όσο και την αειφόρο ανάπτυξη. Η ενσωμάτωση της επανάχρησης, ως εναλλακτικής προσέγγισης διατήρησης, σηματοδότησε μια αξιοσημείωτη μεταλλαγή στη φροντίδα της πολιτιστικής κληρονομιάς. Η σύγχρονη αντίληψη διατήρησης έπαψε να επικεντρώνεται στην αποτροπή αλλαγών. Αντ ‘αυτού, τις ασπάστηκε, ακολουθώντας το νέο αξίωμα: «Διαχείριση αλλαγών».

Το αντικείμενο της έρευνας της παρούσας διατριβής, η οποία εμπίπτει στο επιστημονικό πεδίο της διατήρησης της πολιτιστικής κληρονομιάς αλλά και στα πεδία του αρχιτεκτονικού και πολεοδομικού σχεδιασμού, είναι η επανάχρηση βιομηχανικής κληρονομιάς σε ευρωπαϊκό επίπεδο. Παρά την ευρεία εφαρμογή της πρακτικής κατά τον τελευταίο μισό αιώνα, η επανάχρηση της βιομηχανικής κληρονομιάς παραμένει ένα αντικείμενο ιδιαίτερα προκλητικό και εξαιρετικά συγκεχυμένο, αντιμετωπίζοντας εσωτερικούς και εξωτερικούς κινδύνους. Οι κίνδυνοι αυτοί πηγάζουν από τις συνθήκες της σύγχρονης εποχής, από την υποκειμενικότητα του σύγχρονου πλαισίου διατήρησης, τα εσωτερικά διλήμματα της πρακτικής επανάχρησης καθώς και από τις ιδιαιτερότητες αυτής της ειδικής ομάδας πολιτιστικής κληρονομιάς.

Αυτό το εξαιρετικά πολύπλοκο αλλά συναρπαστικό θέμα δεν έχει μελετηθεί συνολικά υπό τις συνθήκες που υπαγορεύει η σύγχρονη εποχή. Μια βαθύτερη και ευρύτερη κατανόηση του θέματος έχει αποκτήσει αυξανόμενη σημασία στον 21ο αιώνα, καθώς αποτελεί το εφαλτήριο για τη βελτίωση της πρακτικής στον συγκεκριμένο τομέα -ένα αίτημα που τονίζεται όλο και περισσότερο από ακαδημαϊκούς και επαγγελματικούς κύκλους.

Σκοπός της παρούσας διατριβής είναι η διερεύνηση των δυνατοτήτων βελτίωσης της επανάχρησης βιομηχανικής κληρονομιάς μέσω του εντοπισμού και της ανάλυσης των στοιχείων που την απαρτίζουν και εκείνων που την επηρεάζουν, υπό το φως του σύγχρονου θεωρητικού πλαισίου διατήρησης, των σημερινών απαιτήσεων σε επίπεδο πρακτικής και των αυξανόμενων προκλήσεων του 21ου αιώνα.

Η έρευνα αυτή εξετάζει ένα επίκαιρο ζήτημα, στηριζόμενη στο σύγχρονο θεωρητικό πλαίσιο διατήρησης, αντικρούοντας ξεπερασμένες θεωρητικές έννοιες αλλά και συμβατικές πρακτικές και μεθοδολογικές εφαρμογές. Επιπλέον, επιχειρεί να ρίξει φως σε ένα περίπλοκο θέμα, αντιμετωπίζοντας τα προβλήματα και τα ανεπίλυτα ζητήματα που επισημαίνονται από την

υπάρχουσα βιβλιογραφία πολλαπλών γνωστικών πεδίων. Επανεξετάζει και επαναπροσδιορίζει το υπάρχον αξίωμα «Διαχείριση Αλλαγών», παρέχοντας στην επιστημονική κοινότητα τις ελλείπουσες απαντήσεις για τον τρόπο, τους συντελεστές και τα κριτήρια βάσει των οποίων μπορεί να επιτευχθεί αυτό. Βασιζόμενη τόσο στη θεωρία όσο και στην πρακτική σε διεθνές επίπεδο, η έρευνα αυτή δίνει μια συνολική και πολυεπίπεδη άποψη για το υπό έρευνα θέμα, προωθώντας περαιτέρω τον επιστημονικό διάλογο.

Πέρα από μια ουσιαστική συνεισφορά στο ακαδημαϊκό γνωστικό πεδίο, πρόθεση αυτής της διδακτορικής έρευνας είναι επίσης να αποτελέσει μία χρήσιμη ερευνητική αναφορά για τα εμπλεκόμενα μέρη που ασχολούνται με την επανάχρηση της βιομηχανικής κληρονομιάς. Για την επίτευξη του στόχου αυτού, η παρούσα διατριβή παρουσιάζει μια διεθνή ανασκόπηση της φροντίδας της βιομηχανικής κληρονομιάς, επιτρέποντας την μεταφορά γνώσης και εμπειρίας στο αντικείμενο της επανάχρησης από τη μια χώρα στην άλλη. Επιπλέον, προσφέρει έμπνευση και ευαισθητοποίηση μέσω της δημιουργημένης για αυτό το σκοπό ηλεκτρονικής πλατφόρμας «ReIH» (http://reindustrialheritage.eu/projects) και της λεπτομερούς ανάλυσης είκοσι μελετών περίπτωσης καλής πρακτικής στο πεδίο. Τέλος, λαμβάνοντας υπόψη τα επείγοντα ζητήματα της βιωσιμότητας, των ίσων ευκαιριών και του πολυπαραγοντισμού, προσφέρει καθοδήγηση, αναπτύσσοντας ένα αναγκαίο εναλλακτικό πλαίσιο για τη διατήρηση της βιομηχανικής κληρονομιάς. Αυτό το πλαίσιο έχει δυνατότητες πρακτικής εφαρμογής και μπορεί να συμβάλει σε μια βελτιωμένη, πιο δυναμική, πιο βιώσιμη και πιο δημοκρατική πρακτική, με σεβασμό στις πολύπλευρες αξίες της πολιτιστικής κληρονομιάς.

Το κύριο ερευνητικό ερώτημα της διδακτορικής διατριβής είναι το παρακάτω:

Πώς μπορεί να κατανοηθεί καλύτερα και, ενδεχομένως, να βελτιωθεί η πρακτική της επανάχρησης της βιομηχανικής κληρονομιάς σε ευρωπαϊκό επίπεδο, μέσω της εις βάθους εξέτασης των στοιχείων που την επηρεάζουν;

Προκειμένου να απαντηθεί το παραπάνω ερώτημα με τεκμηριωμένο τρόπο, απαιτήθηκε η διαμόρφωση μίας συνδυασμένης μεθοδολογικής προσέγγισης, η οποία περιλαμβάνει την έρευνα περιπτώσεων, την ιστορική έρευνα και την ποιοτική έρευνα. Το πεδίο εφαρμογής της προσέγγισης αυτής περιλαμβάνει τέσσερις χαρακτηριστικές περιπτώσεις του πρώην «Δυτικού» μπλοκ. Ειδικότερα, η έρευνα επικεντρώνεται στις εξελίξεις που αφορούν τη φροντίδα της βιομηχανικής κληρονομιάς και την επανάχρησή της σε χώρες-πρωτοπόρους, όπως το Ηνωμένο Βασίλειο, σε χώρες-ακόλουθους όπως η Ολλανδία και σε περιφερειακές με υστέρηση στη συγκεκριμένη περίπτωση χώρες όπως η Ισπανία και η Ελλάδα. Σε καθεμία από τις χώρες αυτές επιλέχθηκαν και διερευνήθηκαν ενδελεχώς 5 περιπτώσεις μελέτης καλής πρακτικής επανάχρησης βιομηχανικής κληρονομιάς, από έναν εκτεταμένο κατάλογο 214 περιπτώσεων. Το πλήρες φάσμα των περιπτώσεων που εξετάστηκαν παρουσιάζεται στην ηλεκτρονική πλατφόρμα «ReIH», που αναπτύχθηκε από τη συγγραφέα της διατριβής.

Δεδομένου του ευρέος πεδίου της έρευνας και του μεγάλου όγκου πληροφορίας, η διατριβή αυτή δομείται σε δύο ενότητες με τους αντίστοιχους τόμους. Ο Τόμος 1 εισάγει το ερευνητικό θέμα και περιγράφει την προβληματική της διατριβής, αναλύει το θεωρητικό πλαίσιο του εξεταζόμενου θέματος, παρουσιάζει τη μεθοδολογία της έρευνας, αναπτύσσει την ακαδημαϊκή ανάλυση και προσφέρει τελικά τα αποτελέσματα της έρευνας. Ο Τόμος 2 παρουσιάζει την ανάλυση και αξιολόγηση των 20 επιλεγμένων περιπτώσεων μελέτης καλής πρακτικής, αποτελώντας επίσης το υπόβαθρο για την ακαδημαϊκή ανάλυση που αναπτύσσεται στον Τόμο 1.

Τα αποτελέσματα αυτής της διδακτορικής έρευνας δίνουν μια σαφή εικόνα της σημερινής κατάστασης και των προκλήσεων που αφορούν τη φροντίδα και επανάχρηση της βιομηχανικής

κληρονομιάς. Επιπλέον, αποκαλύπτουν τα στοιχεία που επηρεάζουν την πρακτική επανάχρησης της βιομηχανικής κληρονομιάς. Αυτά συγκροτούν το Δίκτυο[2] των Παραγόντων, αποτελούμενο από τα αλληλοσχετιζόμενα Δίκτυα Ενδογενών Χαρακτηριστικών και Εξωγενών Συνθηκών, το Δίκτυο των Εμπλεκόμενων Μερών αλλά και το Δίκτυο των Συνιστωσών της επανάχρησης της βιομηχανικής κληρονομιάς.

Το κύριο εύρημα της διατριβής είναι ότι η βελτίωση της πρακτικής της επανάχρησης της βιομηχανικής κληρονομιάς εξαρτάται από τον εντοπισμό των εξαρτήσεων και των τριβών μεταξύ των στοιχείων επιρροής της και από την εξισορρόπηση τους. Κύριο αποτέλεσμα της διατριβής αποτελεί η ανάπτυξη ενός πλαισίου που μπορεί να καθοδηγήσει αυτό το περίπλοκο αλλά συναρπαστικό εγχείρημα.

Εξετάζοντας εις βάθος την έννοια της Διαχείρισης Μεταλλαγών (Control Shift) -μια επανερμηνεία του σύγχρονου αξιώματος της διατήρησης- υποστηρίζεται ότι η σύγχρονη πρακτική επανάχρησης οφείλει να ερμηνεύει και να αποδέχεται σταθερές, να αντιλαμβάνεται τις δυναμικές μεταβλητές και να βασίζεται στην κατανόηση των συνδυασμένων αποτελεσμάτων τους, παίρνοντας τεκμηριωμένες αποφάσεις για τη διαμόρφωση των συνιστωσών επανάχρησης, θέτοντας όρια και διατηρώντας την κατάλληλη ισορροπία μεταξύ τους.

1 Introduction

1.1 Research' field: European Industrial Heritage Reuse

This thesis examines the Reuse of Industrial Heritage in Europe, through the concept of 'Control Shift'. This is a reinterpretation of the contemporary conservation axiom 'Managing Change', which on the one hand places emphasis on the practice's shifting Components and on the other, on the Actors and Factors that exercise influence and control.

This opening Chapter provides background information on the research field and introduces briefly the key theoretical debates that will guide the academic analysis of the subject under investigation. Next, the research problem and research questions are defined. The aim of the research is explained along with the relevance of this study. A short description of the research methodology follows, while an analytical discussion of the subject is provided in Chapter 3. Finally, this Chapter closes with an outline of the dissertation.

1.1.1 Industrial Heritage in Europe

In the last quarter of the 20th century, Europe entered the era of deindustrialization. Vast Industries -once the 'motor' of progress- fell prey to obsolescence. This transitionary process, which culminated in the 1970s and 1980s in Western Europe, had a profound impact in financial, societal and spatial terms. The UK, France, Germany saw whole regions depopulate, suffering from high unemployment and poverty rates. The rest of the European nations one after the other started facing the same issues with less intensity. The dreadful socio-economic situation was unfolding against an urban background of progressive deterioration. The scale of the crumbling factories and their location, often in the heart of urban nuclei, led to the degradation of countless cities and districts. As time was taking its toll, vandalism was striking another blow to the legacy of industrialization.

Governments at the time, determined to turn a page in their countries' economy, condemned or ignored the industrial carcasses. As a result, vast manufacturing, mining and transport landscapes were left to rust and rot or vanished under the wrecking ball. This levelling tendency was dressed in many cases with the attractive veil of urban renewal. Regrettably, in many countries, the bulldozers were unleashed prior to an objective evaluation of the importance and uniqueness of the historic industrial stock, resulting in major losses.

This climate of destruction and arbitrariness provoked strong reactions. Starting in the UK, archaeologists and conservationists, leading concerned groups of people, opposed to this detrimental process, a reaction that spread with different speed across Europe. At the same time,

a new discipline called 'industrial archaeology',[1] aiming at understanding and interpreting the evidence created for or by industrial processes, was gaining ground. Under the initiative of voluntary associations and national heritage services, the fragments of the past industrial activity started to be recorded. This early action resulted in the safeguarding of many historic industries as well as in the rise of interest in the significance of the industrial legacy.

The official recognition of historic industrial sites as valuable cultural heritage and its appreciation took considerable time and in some European countries was not achieved until the turn of the new Millennium. Despite the developing theoretical base of knowledge for the study and interpretation of industrial relics, the first widely recognised international guidelines for their conservation was issued only in 2003 (TICCIH, 2003). The most comprehensive and internationally accepted definition for Industrial Heritage was given in 2011, by the Joint ICOMOS-TICCIH 'Principles for the conservation of Industrial Heritage Sites, Structures Areas and Landscapes', known as the 'Dublin Principles'(ICOMOS – TICCIH, 2011, 2-3). According to the Dublin Principles:

"The Industrial Heritage consists of sites, structures, complexes, areas and landscapes as well as the related machinery, objects or documents that provide evidence of past or ongoing industrial processes of production, the extraction of raw materials, their transformation into goods, and the related energy and transport infrastructures. Industrial Heritage reflects the profound connection between the cultural and natural environment, as industrial processes – whether ancient or modern – depend on natural sources of raw materials, energy and transportation networks to produce and distribute products to broader markets. It includes both material assets – immovable and movable –, and intangible dimensions such as technical know-how, the organization of work and workers, and the complex social and cultural legacy that shaped the life of communities and brought major organizational changes to entire societies and the world in general."

When discussing Industrial Heritage, this dissertation refers to the interpretation given by the above definition with the delimitations presented in the Sub-Section 1.5.1.

1.1.2 Industrial Heritage conservation and Reuse

Early attempts to conserve Industrial Heritage in Europe mainly involved its transformation into museums. Very soon though, it became obvious that alternative ways were required in order to respond to the scale and particularities of this new heritage group. Since the late 1970s, adaptive reuse, -a process of altering a site so that it is suitable to house a new function- was employed for prolonging the life of industrial relics.

The notion of adaptive reuse gathered momentum, infiltrated and finally dominated the conservation discourse (especially in relation to Industrial Heritage) in the postmodern era. Its emergence is linked to the influence of new concepts, such as the idea of sustainability (World Commission on Environment and Development, 1987) and the impact of new conditions, including the growing market competition, globalisation and postmodernity to the urban development and the conservation field (Wilkinson et al., 2014, Viñas, 2005, Janssen et al., 2017, Glendinning, 2013).

1 The term was first used by Michael Rix in his article for the "Amateur Historian" in 1955. In 1967 Rix wrote a longer piece about industrial archaeology, stressing the importance of an archaeological approach to industrial sites (Palmer et al. 2012).

Due to that, from a heretic and scarce form of conservation during the 1980s, Industrial Heritage Reuse became common practice in most western European countries during the 1990s and flourished in the first years of the 21st century.

Despite saving existing historic structures from obsolescence, adaptive reuse paid little attention to their cultural significance, especially in its first applications. It was therefore applied widely in sites that were perceived of having little or no value, like the industrial ones. As a result, in too many occasions of Reuse, industrial buildings were treated just as flexible shells allowing uninformed architectural experimentations, destructive speculative schemes or a combination of the two.

As perceptions changed, both over the significance of Industrial Heritage and the nature of the conservation practice, Industrial Heritage Reuse remained topical yet it rose as a challenge to the conservation, architectural and spatial planning field.

1.2 General literature overview and key debates/issues

1.2.1 Industrial Heritage: An unconventional heritage group at risk

Studies over the past five decades have offered important information in regard to the legacy of industrialisation, its special characteristics as well as the threats it currently faces.[2] Special emphasis should be given the work of Cossons (2008, 2012) that provides an extensive analysis of the values of Industrial Heritage. According to Cossons, Industrial Heritage embodies a wide array of values that escape the typical monument aesthetic and historic significance, extending also to social, cultural, technological and scientific values. Those values are ascribed in the content and setting as well as in human memories rather than solely in the carcass of the industrial sites, complicating their conservation.

Besides the values that create complexities, there is a wide convergence between scholars that Industrial Heritage is exceptionally challenging to handle in comparison with other heritage groups (Orbasli, 2008, 29,30,196, Prudon, 2008, 445-472, Douet, 2012, 1, Oglethorpe and McDonald, 2012, 55-56, Binney et al., 1990, 10). Its scale, dimensions and morphology; its technical

2 The list of reference works that offer such information on a national basis is extensive. Indicatively the work of Cossons (1975), Falconer (1980) and Palmer and Neaverson (1994) in the UK; the work of Pieter Nijhof (1978) and Karel Loeff (2013) in the Netherlands; the publication of Ibáñez and Alons (2011) in Spain; and the studies of Polizos et al. (1998) and the Ministry of Culture of Greece - Directorate of Folk Culture (1999) in Greece are mentioned as important contributions that provide an overview of the Industrial Heritage of each country. Many more significant studies focus on selected industrial sectors (TICCIH, 2019) or on particular cases. Methodological issues related with industrial archaeology are analysed in the work of Palmer and Neaverson (1998), Casella and Symonds (2005) and Palmer et al. (2012).
The reference works with an international scope on the subject are fewer. Important contributions include the Blackwell Encyclopedia (Trinder, 1992) and the recent publication of TICCIH (2012) 'Industrial Heritage Retooled'. Significant sources of knowledge on the field are the journals: 'TICCIH bulletin', the 'Journal of the Society for Industrial Archeology', The 'Industrial Archaeology review', The journal 'Technologia' (no longer issued), 'Ojos de la memoria', 'Erfgoed van industrie en techniek', 'Industria' (no longer issued) and the journal 'Patrimonio Industriale'.

complexity, the machinery and installations it contains; the negative perceptions that hamper its appreciation; its controversial symbolism as an icon of both progress and innovation and hardship and suffering; its inherent dynamic yet messy character; its unkempt context; the contamination issues it presents; the social consequences it entails as well as its economic weight, are presented as key factors that render its recording, protection and conservation difficult.

According to numerous studies (Stratton, 2000, Agriantoni, 2003, TICCIH-Municipal Centre for Historical Research and Documentation of Volos, 2007, Cossons, 2008), this unconventional group, despite the progress achieved in the last five decades, still faces major threats due to its unconventional nature. Abandonment -most common in countries that have only recently started investing in the safeguarding of their industrial legacy-; mis-use and over-commercialisation; outdated programmes and old-fashioned operational models -common in the countries forerunners of Industrial Heritage care- are only part of the threats that the European legacy of industrialisation faces.

The financial crisis of the late 2000s aggravated the situation further (English Heritage, 2011, Gould, 2015, Areces, 2011, Schlanger, 2011, Merrifield, 2014). In the name of the crisis, cultural heritage services experienced severe budget cuts, heritage experts and conservators got laid off, research funding was cut while both private and public investments for the conservation and conversion of heritage assets were dramatically reduced. As a result, new redevelopment projects ceased; ongoing schemes were paused, many conversions of heritage buildings were abandoned while several converted sites started facing viability issues. Even after the first shock, when the economy started to show signs of recovery in the most affluent European countries, the crisis was used as an excuse to legitimize decisions or delay actions for prioritizing financial goals over the restoration of the deeply wounded cultural heritage sector (Chatzi Rodopoulou, 2019).

In short, the existing body of literature highlights on the one hand the wide spectrum of values of Industrial Heritage and on the other its eccentricity. Previous research findings have pinpointed that those features render Industrial Heritage care challenging. According to multiple published studies, the challenges and risks of the new Millennium to the legacy of industrialisation are numerous and they have been seriously aggravated by the financial crisis of the late 2000s, the repercussions of which are still traceable in the heritage sector.

1.2.2 Reuse: A hazy and complex strategy

Since the 1970s, a growing amount of literature has been published on the strategy of adaptive reuse (e.g. Cantacuzino, 1975, Latham, 2000, Ball, 2002, Mansfield, 2002, Brooker and Stone, 2004, Douglas, 2006, Bullen, 2007, Giebeler, 2009). A categorisation of the different approaches on its theory is attempted by Plevoets and van Cleempoel (2013). The latter argue that at present there are four discernible schools of thought on the subject, including typological, technical, programmatic and strategic interpretations. The existing body of literature indeed presents a wide differentiation in scope and interpretation of the strategy. Each analysis emphasises a different key Component or a set of Components. Therefore, it has been demonstrated that adaptive reuse has a multilateral character (Latham, 2000, 37).

The review of more sources on the subject, including the work of Wilkinson et al.(2014), Schmidt and Austin (2016) and Wong (2017), shows that Reuse is not only multilateral but also a particularly complex and hazy strategy, too. From its definition to its evaluation, there is much vagueness and controversy. That seems to stem from the inherent dilemmas of the strategy and

from the tensions between its Components. More and more scholars (Fragner, 2012, Janssen et al., 2017, Mason, 2008) argue that there are no universally accepted answers to what constitutes a 'proper way' of reusing heritage sites, prompting for tailored made thinking and decision-making.

The studies on Industrial Heritage Reuse, that Plevoets and van Cleempoel (2013) would categorise as typological, support the above observations, providing also a significant source of information on the strategy, drawing mainly from a national, sectorial or case study scope.[3] Exceptions to that rule are a few publications with a wider international scope such as those of Berens (2011), Baum and Christiaanse (2012) as well as studies such as the Shift X project (City of Bydgoszcz et al., 2014).

Taken together, the evidence reviewed support the notion of Industrial Heritage Reuse as a multidimensional strategy that merits further examination as it still remains perplexing. Such an examination can be based on the available growing body of literature, yet have a broader international scope; an approach that it is currently scarce.

1.2.3 A conservation theoretical framework in transition

There is a growing body of literature that recognises that contemporary conservation has become a volatile and highly complex discipline (Avrami et al., 2000, Avrami, 2009, Glendinning, 2013, Howard, 2003, Kuipers and Quist, 2013, Mason, 2008, Orbasli, 2008, Pendlebury, 2009, Viñas, 2005). This state is often contrasted with the serenity and clear structure of the period of 'classical conservation', starting in the 19th century and extending until the third quarter of the 20th century (Viñas, 2002, Glendinning, 2013). Since the 1980s, the conservation theoretical framework has been subjected to major shifts. The transitions encompass the scope, scale and nature of the conservation object, the key guiding principles and values, the conservation approach, the focus, the involved Actors and finally the preferred strategies of conservation.

From this catholic transformation three transitions need to be stressed, as they facilitate the understanding of this dissertation's rationale. Firstly, the widening of the values from a narrow aesthetic and historic understanding to social, economic and cultural components. This influenced both the range of objects to conserve and the underlying reasons for conservation. In relation to the historic industrial stock, the shift of values on the one hand served as its entry ticket to the heritage field, providing also solid arguments for its conservation; on the other, it made it liable to invasive interventions.

Secondly, the transfer of control of the conservation process from the experts to the stakeholders. This influenced the evaluation process and decision-making of conservation. For the Industrial Heritage field that meant that a wide range of Actors could be involved and exert influence over conservation decisions. This on the one hand, provided a potential for the democratisation of the process and on the other, led to a procedure liable to delays and possible dead-ends.

Thirdly, the shift of approach in conservation strategies, from a set of tactics that condemned change, into an array of approaches where change is to be managed. 'Managing change' has become an axiom of the contemporary theory of conservation (Orbasli, 2008, Roders and Velpaus, 2013, English Heritage, 2013a, Strolenberg, 2017). That altered profoundly the way of heritage care.

3 Reference works on the subject in question include the publications of Stratton (2000), English Heritage (2013), Mettetal (2011), Real (2015), TICCIH Greece and KAM (2015), de Boer (1995), Bayer et al. (2015) and Llordès, T. and Pont (2014).

Adaptive reuse gained acceptance in the conservation field. In respect to Industrial Heritage, this shift of approach provided a sustainable solution to the problem of obsolescence yet it gave rise to multiple risks of cultural, social and financial nature.

From the evidence presented, it is shown that the departure from the classical theoretical framework of conservation to the contemporary one has given rise to new opportunities for heritage care. At the same time, it appears that the subjectivism of the new era of conservation hides also unresolved issues and underlying tensions, which can place heritage at risk. With no clear answers to the questions:

- How should heritage be conserved and managed?
- Who should be in control of heritage conservation and management?
- Based on what grounds should heritage be conserved and managed?

concerns and confusion rise.

1.2.4 A dynamic reality and a demanding context

Besides the challenges in relation to the object and strategy under investigation as well as its supporting theoretical framework, there is a need to indicate key issues defined by the context of conservation.

According to Avrami et al.(2000, 3), "*Conservation is an integral part of civic society. […] it shapes the society in which it is situated, and in turn, it is shaped by the needs and dynamics of that society*."

The 21st century society, as reflected in the UN annual reports (United Nations Secretary-General, 2019) is a dynamic, complex and highly demanding one. Topical challenges that need to be taken into account include the claims for sustainability, equality and multilateralism (United Nations, 2019).

1.3 Problem definition & Aim of the research

The brief introduction to the field of research underlined a composite problem in relation to Industrial Heritage Reuse. Despite widely employed in the last half century, Industrial Heritage Reuse still remains particularly challenging and highly confusing, facing internal and external risks. Those resonate from the conditions of present times, the ambiguities of the contemporary framework of conservation, the embedded dilemmas of the Reuse practice as well as from the particularities of this special heritage group.

This vastly complex yet fascinating topic has not been studied holistically under the circumstances dictated by the contemporary era. More and more, heritage conservation needs to conform to a growing set of ideals emphasised by academic and professional circles. Industrial Heritage Reuse in the 21st century is required to be more responsive, more sustainable, more inclusive, more value-driven and more holistic. In short, there is a need for an enhanced approach for the transformation of the legacy of industrialisation.

The aim of this dissertation is to explore the potential of enhancement of the Industrial Heritage Reuse through the identification and analysis of its influencing Aspects, under the light of the contemporary theoretical conservation concepts, the current demands of the field of practice and the rising challenges of the 21st century context.

Based on the notion of 'Control Shift', this dissertation aspires to redefine and clarify the concept of Reuse, arguing that it can be an effective and sustainable solution for the conservation of Industrial Heritage in the 21st century. Furthermore, exploring the subjects and influencing Aspects of Reuse, it aspires to provide missing answers to the theory of conservation on who is and who should be in control of Reuse as well as on what grounds can Industrial Heritage be transformed. Apart from extending the academic body of knowledge, the intention of this doctoral research is also to become a useful springboard for the practitioners that engage with Industrial Heritage Reuse.

To better establish and sharpen the focus of this dissertation, a main research question has been formulated after a thorough literature study of the problem field and background information involving the field of research.

The Main Research Question (M.R.Q.) of this doctoral research is:

How can the European Industrial Heritage Reuse practice be better understood, and possibly enhanced, through the close examination of the Aspects influencing it?

1.4 Relevance

1.4.1 Scientific relevance

This thesis is positioned in the heritage conservation field having also architectural and spatial planning ramifications. Its scope is channelled by field-specific key issues and challenges, pinpointed by the scientific community examining heritage as well as by the wider pressing socio-economical concerns that influence the scientific discourse.

This research focuses on a relatively new and under-investigated heritage group with great potential and a widely employed strategy with an elevated level of complexity. It addresses a topical problem, drawing from the concepts of the contemporary theory of conservation, challenging outdated theoretical notions and conventional practical and methodological applications. Furthermore, it sheds light to a hazy and confusing subject, addressing the tensions and the unresolved issues, highlighted by the existing literature on multiple disciplines. It revisits and reinterprets the standing axiom 'Managing Change', providing the scientific community with missing answers on the way, the Actors and the criteria based on which this can be achieved. Drawing upon both theory and practice on an international level, this inquiry gives a holistic and multileveled view on the subject under investigation, stimulating further thought and debate. Lastly, taking into account the pressing issues of sustainability, equality and multilateralism, it provides a much needed alternative framework for the conservation of Industrial Heritage, capable of practical implementation.

This doctoral research also relates to the scientific focus of the two academic groups it formed part, their research activity and the expertise of their academic staff. In detail, the subject under investigation is in line with the research work of the Section Heritage and Architecture of TUDelft, which is concerned with the existing architecture preservation and renewal and places special emphasis on its cultural significance. It also fits well in the scope of the Urban Environment Laboratory of the NTUA, which involves, among other issues, the analysis and study of the historical environment as well as the possibilities for its protection and promotion. The relevance with the two groups' academic fields, facilitated greatly the doctoral research that drew from their research output and built on it, while making the most out of the interaction with colleague group members.

1.4.2 Social relevance

As mentioned above, the goal of this doctoral research, besides offering a meaningful contribution to the scientific discourse, is also to become a useful springboard for the practitioners that engage with Industrial Heritage Reuse. Addressing the issues that usually cause frustration, confusion and delays in the redevelopment process, it aspires to become a source of evidence for the full range of involved stakeholders. In order to achieve that, this dissertation presents an international and retrospective review of Industrial Heritage care, allowing experience drawn from one country to inform approaches on safeguarding via Reuse on other countries. Furthermore, it offers inspiration and raises awareness through the website ReIH and the analysis of twenty cases studies of best practice (see Vol. 2). Lastly, it offers guidance providing a framework capable of practical implementation that leads to an enhanced more responsive, more sustainable, more inclusive, more value-driven and more holistic practice.

1.5 Methodology overview

1.5.1 Research Delimitation

At the beginning of this doctoral research, the aim was to offer a retrospective analysis of Industrial Heritage Reuse and its influencing Aspects, drawing both from theory and practice on an international level. However, when performing the initial literature review and surveying the geography of relevant practical applications, it became clear that the research scope was too broad. Such broadness was endangering the aspired depth of the study and was also precluded from the available financial means and timeframe of the PhD programme.

Subsequently, some delimitations were deemed necessary. A detailed analysis of them is offered in in Chapter 3 of this Volume, while a summary is presented below:

Geographical scope: This dissertation focuses on the study of Industrial Heritage Reuse in Western Europe. Based on a set of three criteria, four European countries were selected and will serve as case studies, based on a multiple, embedded case study research design. Those comprise the United Kingdom, The Netherlands, Spain and Greece. The criteria include firstly, the level of

contribution of each country to the practice; secondly, the economic and sociocultural situation of each country and thirdly, considerations about data access.

Typological and chronological scope: The research will focus on the review of industrial sites originally related with production, extraction, processing and refining, built during the first and second industrial revolution (late 18th to early 20th century) and reused from the 1970s to the 2010s.

Selected case studies: In each selected country five cases of best practice were selected based on a two-level screening process. The screening criteria of the first level included the location of the case; its construction and intervention timeframe; its former function as well as the quality and quantity of existing information over it. This level resulted in an extended list of potential cases. In order to narrow down that list and reach the final selection, the Delphi technique was used.

1.5.2 Methodology and research design overview

This dissertation employs a mixed method research design for responding to the research question presented above. The methods used involve:

1. Case study research
2. Historical research
3. Qualitative Interviews

An outline of the research design is offered in Figure 1.1.

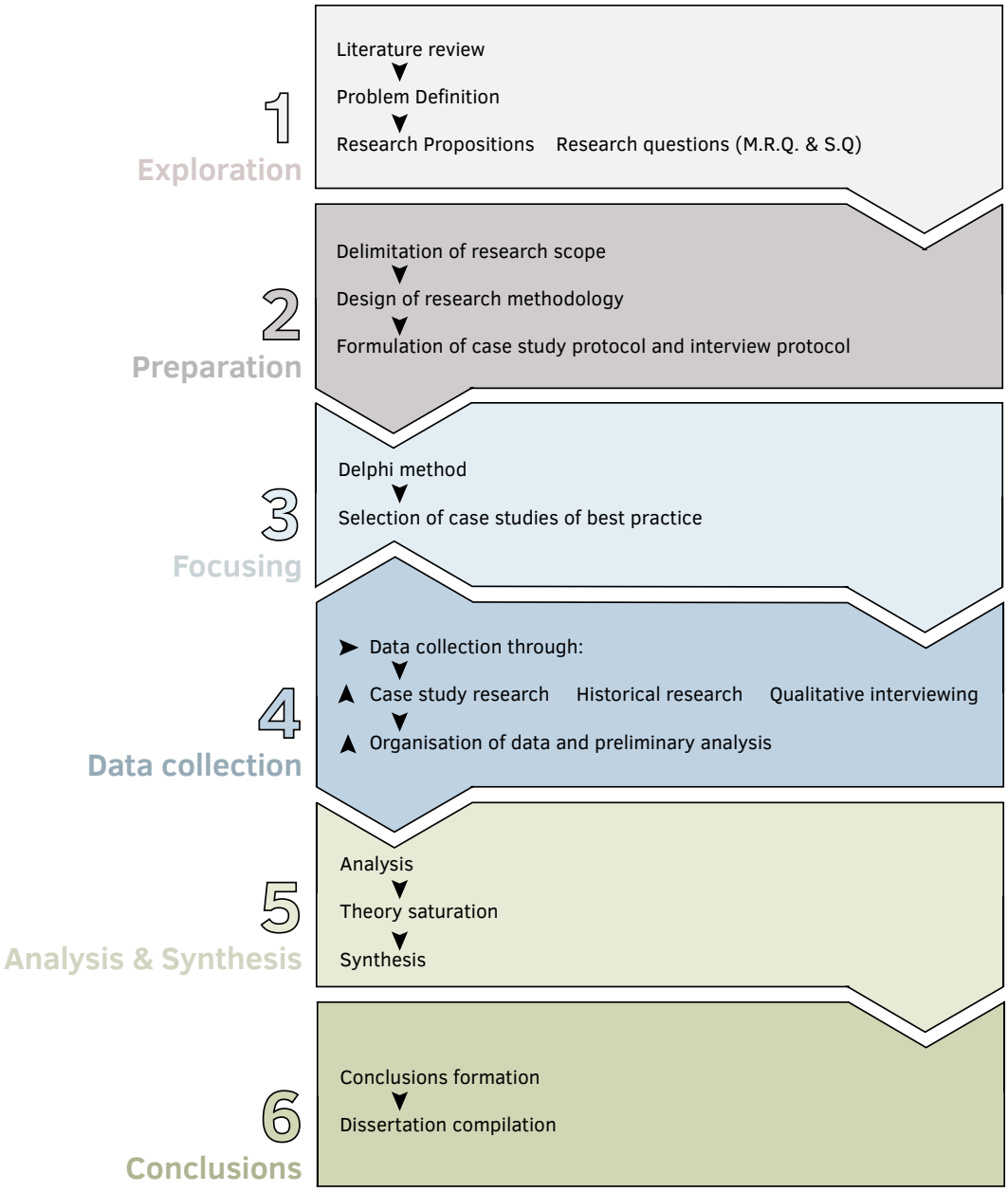

FIG. 1.1 Research design outline

The structure of the methodology and the employment of case study research in multiple countries necessitated the formulation of a circular process and the repetition of stages 3-4 for each country under investigation (FIG. 1.2).

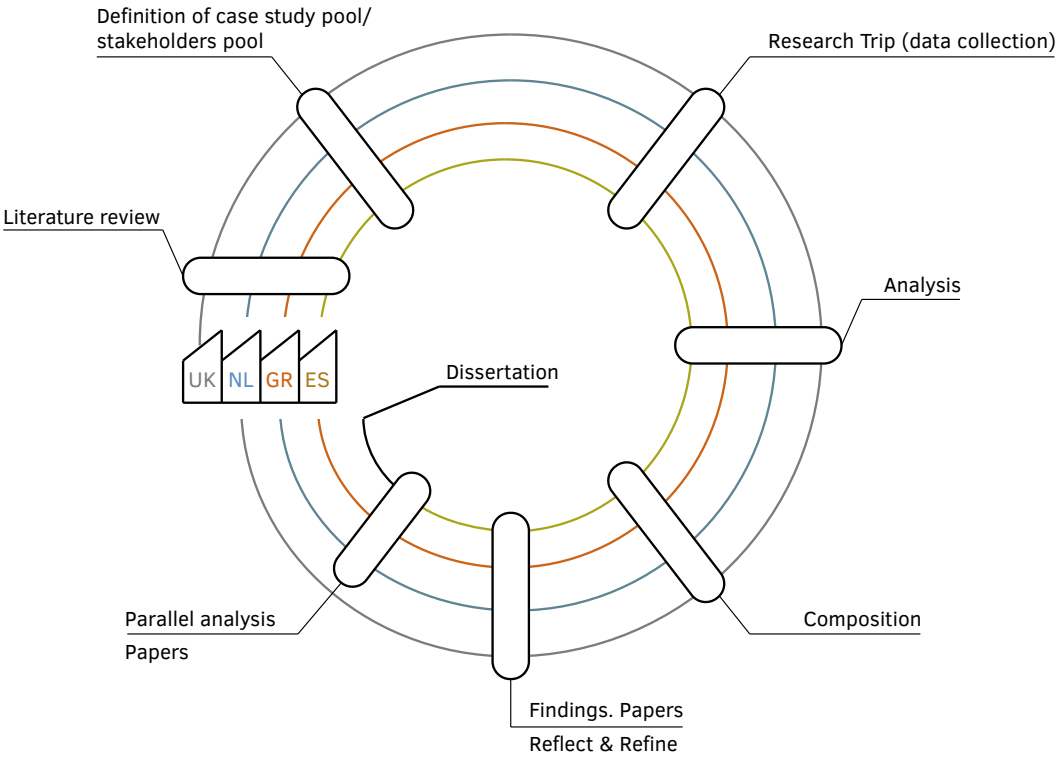

FIG. 1.2 Analysis of Methodology stages for the case study research as envisaged in the beginning of the research

It is worth emphasising that the research methodology is not merely an adaptation from similar types of investigation but an actual product of this dissertation. Its originality lies mainly in the combination of methods and techniques of research and analysis as well as in its application in a vast field of inquiry. The research methodology presents multiple merits. Firstly, it allows the investigation of a complex and multileveled subject of research, meeting the research quality standards of internal and external validity, reliability and objectivity. Secondly, it brings to light a vast volume of original evidence while presenting evidence in the English language that were previously only available to a restricted audience due to language barriers. Thirdly, the methodological approach takes into account all the contemporary demands of the conservation field providing the scientific discourse with topical missing answers.

Fourthly, besides the generation of the main research products of this dissertation, the methodology in question has offered important 'by-products' including the "ReIH online knowledge platform" and the Register of best practice case studies of Industrial Heritage Reuse (Volume 2 of the dissertation). Those have a threefold contribution. They raise awareness over the subject of the research amongst interested parties; they inform future initiatives, being a useful point of reference for practitioners and serve as a solid basis for future research.

Lastly, the methodology is transferable to similar lines of investigation. It can be a valuable strategy for the research of complex phenomena taking place in the present and recent past in a multinational setting.

1.6 Outline of the thesis

Due to the wide scope of the present doctoral research, this dissertation is composed of two Volumes. Volume 1 introduces the research problem and explains the rationale of the thesis (Ch.1); it provides the theoretical framework of the subject under investigation (Ch.2); it presents the research methodology (Ch.3); it develops the academic analysis (Ch.4 – Ch.7) and it finally offers the products of the research (Ch.8).

Volume 2 presents the analysis and evaluation of the 20 selected case studies of best practice examined in detail during the course of this doctoral research. This Volume serves as a basis of information for the academic analysis presented in Volume 1. Besides that, it is intended to serve as an insightful and 'user friendly' point of reference for academics and practitioners interested in the European Industrial Heritage Reuse as well as a solid basis for future research.

2 Theoretical framework

2.1 Introduction

This Chapter presents the theoretical framework for this dissertation's academic analysis. It aspires to provide an understanding of the predominant conservation concepts and their evolution, during the last two centuries that have influenced this doctoral research as well as the contemporary ideas and current demands on the field. It also seeks to highlight the theoretical base of Industrial Heritage Reuse, developed mainly in the last three decades. This is an essential precondition firstly for positioning Industrial Heritage Reuse in the wider heritage conservation field, secondly, for understanding the development of the practice, which will be analysed in the following Chapters and thirdly, for defining the scope of this dissertation.

Section 2.2 will discuss the development of the conservation theory from the 19th century to the establishment of the contemporary theoretical base with special emphasis on the issues of heritage values, adaptive reuse, intrinsic and contextual influence as well as the issue of stakeholders. Section 2.3 will provide the sociocultural context in which Industrial Heritage was recognised. Section 2.4 will present the integration of the legacy of industrialisation into the field of cultural heritage. Section 2.5 will summarise the key shifts that have taken place in the theoretical framework of conservation and will trace their impact on the international framework guiding Industrial Heritage Reuse. Section 2.6 will focus on the challenges of Industrial Heritage Reuse as an accepted form of conservation. Section 2.7 will highlight current demands of the conservation field within the contemporary context. Finally, Section 2.8 will provide definitions of key terms used in the manuscript, it will clarify the objectives of this dissertation and it will close with the formulation of the theoretical propositions[4] that will guide the data collection and analysis of this research.

2.2 The conservation theory framework

The legacy of industrialisation counts only a few decades of being accepted as cultural heritage. The change of perception from a menace to historic landscapes to an outstanding historical resource took considerable time and effort and can be only understood in relation to the wider developments in the conservation theory framework as well as against the large socioeconomic transitions of the society at large.

4 According to the writings of Yin (1994, 2009) on case study research, that have largely influenced the research methodology of this dissertation, the development of theoretical propositions at the outset of an inquiry is highly recommendable. Those propositions have a tripartite role. Firstly, they reflect an important theoretical issue; secondly, they direct attention to something that should be examined within the scope of the study and thirdly, they are valuable instruments that lead to theory building (Yin, 1994, 21).

This Section will firstly provide this essential background. Special emphasis will be given on key issues of conservation, including heritage values, conservation strategies, the issue of intrinsic and contextual influence and finally the issue of stakeholders. This brief analysis will show that the theoretical framework of conservation is being the subject of transitions over the last decades and in extent that the answers to key questions like: why heritage is valued, how is it conserved, on what grounds and by whom, keep shifting.

2.2.1 The development of Conservation theory

"Conservation is a constantly changing modern phenomenon, a future-oriented 'Movement' drawing on the past." Glendinning, 2013.

The evolution of Conservation has been discussed and analysed in detail by a number of scholars including Erder (1986), Murtagh (1988), Choay (2001), Jokilehto (1999/2004), Viñas (2005), Glendinning (2013) and many others. Complementing those reference works, a wealth of publications provides insights about particular developments either within a specific national framework, e.g. for the British context (Orbasli, 2008; Pendlebury, 2009); for the Dutch context (Kuipers, 1998) or pertaining to a specific architectural Movement, e.g. the Modern Movement (Prudon, 2008). The following brief review, drawing mainly from the former works, aims to present key developments in the Conservation theory. This will place in context the recognition of industrial relics as a new heritage group and its Reuse as a preferred strategy for ensuring its conservation.

The Conservation Movement, despite its long roots that extend to classical antiquity, was established in the late 18th century. As a *'stepchild of progress'* (Glendinning, 2013, 1), it emerged from the deep ruptures of the turbulent post-Enlightenment era, when rationalism, nationalism and industrialisation were abruptly transforming all aspects of the traditional order in Europe and the US. In this climate of sweeping upheavals, historic monuments assumed a heightened significance as cultural anchors in a world in transition.

In the first period of its evolution, that spans until the early 20th century, the Movement was characterised by distinct and often contrasting strands of thought and action expressed in different countries, under the influence of geopolitical factors and pressures specific to architecture. At the forefront of the 19th century discourse in Europe were the key figures of Eugène Emmanuel Viollet-le-Duc, John Ruskin and William Morris with their contrasting theories of stylistic restoration and preservation with minimal to no intervention respectively (Prudon, 2008, 53-57, Viñas, 2005, 14-16). Much of the principles guiding conservation thereafter, have their origin in this 19th century theoretical base. The same period also saw the beginning of the institutionalisation of conservation[5] characterised by the establishment of national heritage agencies staffed with professional experts, official bureaucracy, and the creation of the first legislative framework (Choay, 2001, 82-108).

According to Glendinning (2013, 140), the paradoxical condition of the Conservation Movement by 1900 was that despite its growing conflicts fuelled by nationalism, it was sharing a single set of underlying values. The 20th century saw the Movement gaining real momentum and consolidating (Wong, 2017, 72-79). An important milestone in its development took place in 1903 with the issuing of a conservation text authored by Alois Riegl titled "the Modern Cult of Monuments".

5 France was the first European country that established a government heritage service in the 19th century. The institutionalization of conservation in Europe however is largely a 20th century phenomenon.

The text, on the one hand was aiming to define the key values of conservation, paving the way for an evolving debate thereafter and on the other, it was conveying the universal meaning of monuments, as opposed to the previous appropriations of the concept by nations. Riegl can be therefore seen as the harbinger of conservation internationalisation, a development which took place mainly between 1945 and 1989 (Glendinning, 2013, 141-144).

In response to the devastation caused by World War I, the interwar period saw growing attempts for systematic internationalisation of conservation and the establishment of a strategic vision for the definition and protection of the 'common heritage'. The Athens Conference in 1931, organised by the International Museums Office, issued the first international document forming basic principles for a code of practice for conservation, known as the Athens Charter (ICOMOS, 1931). For the first time thoroughness, consensus, consolidation and homogenisation were valued as opposed to the autonomous intellectual debates of the earlier times.

In the aftermath of World War II, the attempts for the internationalisation of conservation were intensified. In 1964, the Second International Congress of Architects and Technicians of Historic Documents was organised, issuing the Venice Charter (1964). This key document re-examined the principles defined in the Athens Charter, echoing the Ruskin and Anti-Scrape tradition of material authenticity. Furthermore, it enhanced its scope, incorporating new ideas shaped by the Modern Movement preference for a contrast of old and new and strengthened by the concept of reversibility (Glendinning, 2013, 398-399). The distinction between conservation and restoration as well as the legibility of any new intervention were significant contributions of the document. The Venice Charter, in the words of Wong (2017, 98-99) has been broadly interpreted and is considered "*the raison d'être for distinctive modern design interventions and additions.*"

The Venice congress, along with the highly influential set of principles, gave way to the establishment of the International Council on Monuments and Sites (ICOMOS), the professional association that works for the conservation and protection of cultural heritage around the world. Since then, several international charters, conventions and recommendations have been formed for the safeguarding of the historic built environment, initiatives which were openly interconnected.

The culmination of the heritage internationalisation however was clearly manifested in two instances: the organisation of the UNESCO World heritage Convention in Paris in 1972 (UNESCO, 1972) and the launch of the European Architectural Heritage Year 1975. The former gave way to the designation system of the World Heritage List of UNESCO, a platform that forms and unites the common views for the safeguarding of Cultural heritage (UNESCO, n.d.). According to Orbasli (2008, 28): "*The World Heritage List […] might be seen as a kind of measure of heritage understanding, reflecting changes in the international community's view on what constitutes heritage and how inclusive it is.*"

From the late 1970s the Western-dominated organisational structure of the Conservation Movement was infiltrated with concepts and concerns of other cultures. On the one hand, this paved the way for the transition from the internationalisation of heritage to its universality. On the other though it was the first sign of the far-reaching shifts that would shatter the Movement's 'grand narrative' in the decades that followed. The Burra Charter (Australia ICOMOS, 1979) marked the beginning of this shift, introducing the principles of cultural diversity and advocating intangible heritage values (Glendinning, 2013, 414).

Postmodern subjectivism had a decisive impact on the conservation field. Glendinning (2013) describes the last three decades as an era of 'destabilisation' for the Conservation Movement. In his study on Contemporary Theory of Conservation, Viñas (2005) elaborates on this period, shedding

light to the shifts that have taken place on the field of conservation. In detail, he makes a distinction between "*'classical' theories of conservation' and 'contemporary' conservation thinking*" (Viñas, 2005, xi-xii), which he also situates as developing since the 1980s. According to Viñas (2002, 2005) and Kuipers and Quist (2013), the classical principles (authenticity, reversibility, minimal intervention) guiding conservation up to the 1980s and characterised by their close adherence to Truth are still dominant. Yet criticism and new alternatives have been developed and have been gaining momentum. *"The emerging contemporary theory of conservation has substituted the notion of function, use or value of the conservation object for that of Truth. The idea is that conservation decisions should bear in mind not truth, but intangible (as well as tangible) efficiency and functionality"* (Viñas, 2002, 25, 30).

The destabilisation period saw the boundaries of heritage being progressively challenged both by external and internal forces. The former ones related to conditions such as the growing market competition and the general political and economic processes of globalisation and postmodernity. From the 1990s, commercialisation began to infiltrate the values of conservation. This facilitated economic growth yet led to progressive commodification and homogenisation of cities under the same tactics of branding (Glendinning, 2013, 420-423).

The latter ones pertained to a number of transitions of the conservation object itself, including a continuous expansion in its the scope, scale and nature. In detail, the cultural heritage concept was broadened, encompassing both tangible and intangible heritage; moving away from an individual building (monument) logic to an all-inclusive landscape-based approach (heritage) and considering not only the extraordinary but also vernacular architecture, too (Roders and Velpaus, 2013, Howard, 2003, 74).

This brief review of the Conservation theory development provided the basis for understanding how and why conservation was progressively driven away from objectivism and into 'subjectivism'. In what follows, this multifaceted shift will be further analysed, discussing four main issues.

2.2.2 The issue of heritage values (why conserve?)

The very essence of conservation is the maintenance and shaping of the set of values embodied in heritage, often referred to as cultural significance (Avrami et al., 2000, 7). The articulation and assessment of values is a reference point for the decision-making of any conservation action, providing answers to what and why to conserve (Mason, 2008, 99). Thus, this matter merits further analysis and attention. Values, like every other dimension of conservation, are not static nor objective. On the contrary, being embedded in culture and social relations, they have been the subject of multiple interpretations overtime. Furthermore, values are not common for all heritage objects neither is there a common conception between stakeholders about them. This discourse is particularly important for the present study as it will facilitate the understanding of special challenges regarding the recognition and Reuse of Industrial Heritage.

As discussed in Sub-Section 2.2.1, the issue of the monument values was first raised by Alois Riegl in 1903. Riegl subdivided values in two large categories. On the one hand, there was a group of 'present day values' that corresponded to Vitruvius's criteria of architecture (i.e. use value, artistic value) along with another, more complex concept of 'newness-value'. On the other hand, there was a grouping of 'recollection values' focused solely on the past. Those included the age value, the historical value, the intentional commemorative and non-intended commemorative value (Glendinning, 2013, 141).

Since Riegl, a large number of studies have intended to identify, order and categorise values, composed by scholars such as Ashworth (1996), Lipp (1984), de la Torre (1997) and Hutter (2007) as well as national organisations such as ICOMOS-Australia (1979/1999/2013) and English Heritage (1997). The appendix of the Getty research report "Values and Heritage" (Avrami et al., 2000) provides a broad spectrum of contributions to the issue as well as full reference details for the above works.

Despite the varied interpretations of heritage values, until the 1970s Riegl' s ideas were largely used as a yardstick, guiding conservation decisions in the Western World. The era of postmodernity however and the sweeping economic and sociocultural changes it entailed brought forward new concepts of heritage valuation. The rising influence of the market logic into every sphere of social life, emphasised the economic potential of heritage. According to Glendinning (2013, 346):

"In the mid-'70s, a new phase of libertarian radicalism got underway, helping adapt this corporate structure to new values of capitalist competition in the built environment. In country after country, the decline of the welfare state and its grand narratives of progress allowed new values of market modernity to pervade the world of architecture, with heritage increasingly taking its place as an element of tourism and city branding."

The issue of heritage values, due to its heightened significance, has been the subject of much discussion in the contemporary conservation theoretical discourse (Avrami et al., 2000, Howard, 2003, Orbasli, 2008, Avrami, 2009, Wilkinson et al., 2014). An important contribution which provides an updated view of heritage values is that of Mason (2008). Building on existing value schemas (Riegl, 1903, Lipp,1984, Burra Charter, 1998, Frey, 1997 and English Heritage, 1997), Mason defines a broad typology of values, which aspires to serve as a vehicle to inform policies and planning decisions being also relevant to all disciplines and stakeholders. The two categories defined in his work, are the Sociocultural and the Economic values. The former includes the traditional core of conservation values (Historical, Cultural/symbolic, Social, Spiritual/Religious, Aesthetic) while the latter, values that can be measured by economic analysis (Use/Market value, Nonuse/nonmarket value, Existence, Option, Bequest).

Summing up, it is evident that heritage values have been subjected to shifts in the last four decades. The cultural significance of historic sites is no longer restricted to a narrow aesthetic and historic understanding but it also includes social, economic and cultural components.

2.2.3 The issue of conservation strategies: the rise of adaptive reuse (how?)

The shifting understanding of heritage values was reflected in changing approaches of dealing with the past. As a result, the practice of conservation (in its broad sense)(Viñas, 2005, 23) was extended, covering both long established strategies such as preservation and restoration and new approaches, too. Adaptive reuse was one of the latter. As will be discussed in this Sub-Section, this strategy was entrenched within the Environmental Movement and was quickly embraced by the architectural, urban planning and conservation practice.

There are numerous studies that have broadly interpreted and defined adaptive reuse in the context of buildings (e.g. Ball, 2002; Mansfield, 2002; Douglas, 2006; Bullen, 2007; Wong, 2017). Adaptation is derived from the Latin 'ad' (to) 'aptare'(fit) while reuse implies a functional change. Similarly to the vast majority of the conservation terminology, adaptive reuse is not conditioned upon a single understanding defined at a single moment in time (Viñas, 2005, 18). In contrast,

adaptation activities have been frequently defined with a number of terms including renovation, refurbishment, remodelling, reinstatement, retrofitting, conversion, transformation, rehabilitation, modernisation, re-lifting, restoration and recycling of buildings (Douglas, 2006, 1-2, Wilkinson et al., 2014, 4). Those terms in turn, have been subjects of different interpretations from scholars and organisations. A sample of the expanding 'babylonian' list of terms which present small differentiation and significant overlaps in meaning, is offered in the work of Wong (2017, 13-20), Douglas (2006, glossary) and Giebeler et al. (2009, 10-15).

It is no coincidence that the terms adaptation or reuse, despite describing a practice that has its roots in ancient history, were nowhere to be found in the international conservation charters or the theory of conservation until the 1970s (Wong, 2017, 30). The notion of adaptive reuse gathered momentum, infiltrated and finally dominated the conservation discourse (especially in relation to Industrial Heritage) in the postmodern era that entailed, according to Wilkinson, Remøy and Langston (2014, xiii) a generalised transition from the 'industrial age' to the 'ecological age'.

In specific, the term Adaptive reuse, was firstly used in the early 1970s during the global oil crisis, which triggered a rising concern for the natural resources (Wilkinson et al., 2014, 5, Wong, 2017, 30). It emerged as a response to those concerns and the need to rejuvenate the environment and cities (Fragner, 2012, 112) within the broader discourse of sustainability.[6] With the rise in consensus for sustainability it was recognised that demolishing and building anew was no longer a viable option.

The environmental arguments supporting the establishment of adaptive reuse as a sustainable practice were based on the considerable gains of the preservation of the building stock's embodied energy, as opposed to the high material use, transport energy, energy consumption and pollution resulting by new construction. Those arguments were complemented with many others, namely the need to enhance the energy performance and comfort of buildings using innovations in the building technology, to adjust them to contemporary building standards and make them responsive to exogenous changes such as the general economic climate and the market influence (Douglas, 2006, 9-11). Increasingly, adaptive reuse of buildings was employed, providing a sustainable solution to the problem of economic, functional, physical, social, legal and aesthetic obsolescence. All types of buildings including offices, residential and retail units as well as industrial sites started to be converted for satisfying the aforementioned exogenous and endogenous needs (Douglas, 2006, 9-10, 30, Wilkinson et al., 2014, 5-9).

The rise of the adaptive reuse practice coincided with the era of destabilisation of the grand narrative of conservation, discussed in the Sub-Section 2.2.1. Being highly susceptible to new ideas at the time, from the 1980s, the Conservation Movement embraced the concept of adaptation and inducted it in its repertoire, as a tool with which to preserve threatened values while allowing sustainable development. This is clearly reflected in the subsequent conservation charters e.g. the Burra Charter (Australia ICOMOS, 1979) and its revisions, the ICOMOS New Zealand Charter (2010), as well as in the national conservation policy and guidance of various European countries e.g. the British Standard (1998) and the Dutch 'Belvedere' Programme (1999). The new strategy found wide resonance as it provided a sensible answer to the dynamism of the extending cultural landscape and the multivalence of cultural significance of the new era.

6 The definition of Sustainability differs depending upon the context in which it is used. It is most commonly defined as 'meeting the needs of the present without compromising the ability of future generations to meet their own needs' (WCED. 1987, Our common future, Oxford: Oxford University Press, 2).

The embracing of adaptive reuse by the Conservation Movement marked a noteworthy shift in heritage care. Preservation seized to be the main objective. Instead, the 'management of change' became more and more relevant for conservation. In the words of Roders and Velpaus (2013, 25): *"From an approach where change was at all costs to be avoided, the protection of the built environment has evolved into an approach where change is to be managed. Rather than being opposites, protection is transformation; a special form of transformation with the aim to maintain and restore cultural significance, even when the built environment is changing."*

The expansion of conservation strategies, created once more new tensions and scepticism. The adaptive reuse of heritage was relying on a process of delicate balance between preservation and change. Yet, this process was once again highly subjective, relying mainly in the assessment of the values attached to heritage by the stakeholders involved in the practice. As conservation gradually left the confines of experts and engaged an increasing number of Actors with different or no expertise, the challenges and risks of adaptive reuse started emerging.

Adaptive reuse made relevant the old buildings, including heritage, to the fields of architecture and urban planning. From the 1980s hitherto, a large number of buildings has been transformed, in diverse and fascinating manners. Starchitects have also increasingly engaged with the transformation of existing historic buildings, receiving massive amounts of coverage in the media (Wong, 2017, 6). Celebrated examples of adaptive reuse, like the Tate Modern in London, the Reichstag in Berlin and the Park de la Villette in Paris redesigned by Herzog and de Meuron, Renzo Piano and Bernard Tschumi respectively, have increased the public interest in old buildings, facilitating investment in other obsolete buildings in their area. The attractiveness of those projects however took often a heavy toll on the preservation of their sociocultural values, raising concerns with the most important being heritage commodification. This manifests that overtime, more inherent dilemmas in the practice of adaptive reuse were revealed (Brooker and Stone, 2004, 12, Fragner, 2012, 114).

As the renewed appreciation of the historic urban landscape grew and the emphasis of conservation shifted, it became clearer and clearer that cultural heritage had the potential to be a vehicle rather than a hindrance to urban regeneration (Orbasli, 2008, 29). Starting in the 1980s and gaining further momentum in the following decades, heritage conservation was integrated in spatial planning while adaptive reuse was used as a key instrument of area regeneration (Janssen et al., 2017, 1662).

Janssen et al. (2017) offer an important contribution to the conceptualisation of the shifting relationship between heritage management and spatial planning. Drawing from the case of the Netherlands, they define three successively evolving approaches to heritage conservation in the Dutch spatial planning: heritage as sector, as factor and as vector. The first approach reflects the sectorial preservation and protection of objects only; the second, the spatial development of larger heritage landscapes and the third, the tension of providing meaning in all kinds of social, economic as well as spatial processes. It is stressed that despite the consecutive evolution of those approaches, one did not replace the other but they rather gained ground amongst different Actors. This conceptualisation emphasises the rising complexity of the study of adaptive reuse practice from an isolated strategy to an integrated approach as well as the wide scope of conflicts it entails.

Since the 1970s, when adaptive reuse came to establish itself as an instrument of sustainability, a growing body of literature have attended to analyse and theorise it. Plevoets and van Cleempoel (2013) argue that at present there are four discernible schools of thought on the theory of Reuse, each one emphasizing a different key issue. Those include the typological (represented by the seminal works of Cantacuzino, 1975; Latham, 2000 and Douglas, 2006), the technical

(including the works of Highfield and Gorse, 2009, Giebeler, 2009, Gelfand and Duncan, 2011), the programmatic (Paredes, 2006) and the strategic approach (including the works of Machado, 1976, Brooker and Stone, 2004, Cramer and Breitling, 2007, Wong, 2017). The typological approach also encompasses numerous studies which investigate the Reuse possibilities and appropriate approaches for specific building types including religious buildings (Alavedra and Marin, 2007, Rijksdienst voor het Cultureel Erfgoed, 2011), office space (e.g. Remøy, 2000) and industrial buildings (e.g. Stratton, 2000). The extensive range of publications and their difference in scope and interpretation reveals the multilateral character of the adaptive reuse practice and in turn the nuanced challenges it entails.

Summing up, this Sub-Section discussed the transition of conservation approach, from a set of established strategies that prevented change to the historic environment to a rediscovered concept that embraces it. 'Managing change' has become the axiom of contemporary conservation. It should be stressed that the strategy of adaptive reuse, more than four decades after its 'official' establishment, still remains highly relevant as a sustainable way of heritage conservation and as a valuable instrument of redevelopment of our built environment. Despite its wide application and the rising body of literature devoted to its analysis, it still remains perplexing. From its definition to its evaluation, there is much vagueness and controversial approaches. More and more scholars (Fragner, 2012, Janssen et al., 2017, Mason, 2008) argue that there are no universally accepted answers to what constitutes a proper way of reusing heritage sites, prompting for tailored made thinking and decision-making. Who is involved in this process however and based on what grounds can decisions be made?

2.2.4 The issue of intrinsic and contextual influence (on what grounds?)

As explained in the Sub-Section 2.2.2, the attachment of values to heritage is subject of contextual conditions. Historically the shifts in the cultural, social, economic structure of society have caused an expansion and a continuous restructuring of heritage values; a process that is ever evolving.

With no concrete standards for preserving the expanded set of heritage values and multiple strategies available for conservation, deciding what and how to conserve has become more and more complex. The intrinsic characteristics of heritage, that entail physical parameters (e.g. damage and deterioration) as well as historical narratives and aesthetic canons ware used traditionally as an effective yardstick, driving conservation decisions. Nowadays however, assessing only those characteristics seems inadequate for addressing the redefined cultural significance of heritage. New approaches for a broader and more multidisciplinary heritage value assessment have become necessary. The works of Mason (2008) and van Emstede (2015) offer valuable insights for the organization of a value assessment process with the aforementioned characteristics.

The understanding of the heritage object and its values are the basis for an 'au courant' decision-making, both in the evaluation stage but also during the implementation and management of a Reuse project. In the words of Mason (2008, 108): *"Heritage sites and objects must be understood in relation to their context –in other words holistically. One cannot fully understand a site without understanding its contexts, which perforce, extend beyond the site itself both literally and conceptually."*

In other words, the expansion of the heritage scope, scale and values calls for a better understanding of a broader net of Factors involving both the intrinsic characteristics of heritage and a wider net of Conditions (e.g. economic, cultural, social and political) that influence it. This net merits further analysis as it can provide informed and topical directions for the conservation decision-making, throughout the transformation process.

2.2.5 The issue of stakeholders (who?)

The shift in the conservation field from objectivism to new, more subjective ways of thinking and the integration of heritage conservation to spatial planning severely shook the pool of Actors involved in the field. Avrami et al. (2000), Viñas (2002, 2005), Pendlebury (2009) and many other scholars describe an important transition, pertaining to the infiltration of a large number of stakeholders in the expert's zone of professional conservators. This transition in turn, has fuelled discussions around central questions, such as: Who participates in heritage value assessment nowadays? Whose values are counted? and Who is in control of conservation?

Traditionally, conservation was conducted by trained experts. A closed, strictly defined circle of cultural elite that based their action on the classical principles of Truth, Objectivity and Scientific processes (Viñas, 2005, 67-90). The conservation of the built environment in specific, was controlled by experts employed by the national heritage agencies. The questioning of the classical principles and the rising consensus for the socially constructed nature of heritage brought serious upheavals on the field.

On the one hand, conservation ethics were influenced. The need to conserve for the sake of the people rather that for the sake of conservation itself was emphasised. This in turn prompted a shift of the conservation focus from the objects (historic built environment) to its subjects (stakeholders) (Viñas, 2005, 222, Avrami et al. 2000, 3).

On the other hand, from the 1990s, the role of experts was largely doubted while their power of controlling conservation lost its general acceptance. Within a short period of time, the off-limits expert's zone became highly populated by various stakeholders including the State, property owners, commercial developers, other experts and practitioners, the market, local communities as well as other cultural groups. Progressively heritage authorities saw their power waning while other Actors surfaced as powerful decision-makers (Glendinning, 2013, 417).

The emphasis of conservation until the recent decades on the object rather than the subject of conservation is reflected in the notably narrower scholar base for the latter issue. In the 21st century, however the topic of stakeholders study has been gaining attention. A number of scholars have suggested alternative categorisations of the rising number of involved Actors, based on different criteria (e.g. Viñas, 2005, 67-90, Orbasli, 2008, 67-74). Special interest show the works that have intended to classify stakeholders while linking them with other aspects of conservation in the post-modern era (e.g. the objects of conservation and the levels of identity or the value assessment process).

Mason (2008, 112-113) suggests a categorisation based on the amount of power and authority of conservation Actors. He divides stakeholders into three categories namely: Insiders (who take the decisions), outsiders (who have little or no leverage in the process) and constituencies (who may exercise some interest in the future). He also notes that more and more frequently efforts are made to shift outsiders to the inside. Mason supports that more participation is essential and suggests a variety of tools for eliciting heritage values from every defined group during the decision-making.

Howard (2003, 103-146) takes a different approach, considering heritage as a product or a service in the marketplace and forms a categorisation based on the heritage markets, consumers as well as its producers. This classification comprises Mason's categories of insiders and outsiders along with four others, including owners, governments, academics and the media. Howard highlights the conflicting agendas between stakeholders and the distinct power and significance each of those have.

The ideas presented in the reviewed works do not allow for definite answers to the questions posed at the begging of this Sub-Section. Nevertheless, they do reveal that stakeholders' identification and analysis is a highly important task for the study of heritage conservation in the contemporary era, emphasizing also topical challenges and issues that can guide future research. One of them is the need for the definition of new roles of stakeholders, a topic which is widely underscored (Stratton, 2000, Baum and Christiaanse, 2012, English Heritage, 2013b, van Hees et al., 2014).

Finally, a key challenge which is highlighted with more and more intensity by a broad spectrum of scholars (Avrami et al., 2000, Viñas, 2002, Avrami, 2009, Roders and Velpaus, 2013) is that conservation should not be imposed but agreed upon between affected subjects. This is what Staniforth (2000) has defined as 'negotiative conservation', Sörlin (2001) as a 'Trading Zone', Avrami et al. (2000) as a 'social process' and many others as 'concensus' (Viñas, 2002, Roders and Velpaus, 2013). Despite the wide advocacy for the transition from the established top-down expert-centred approach to a more inclusive stakeholder participatory process, an alternative framework capable of practical implementation is still missing.

2.3 The post - industrial era (when?)

The rise of appreciation of the vestiges of industry, must be examined against the wider developments of the post-industrial era, besides the evolution of the conservation and the Environmental Movement. Since 1980, the term 'post-industrial society' was widely spread, implying transitions both in the economy and in the built environment. The former, regarded the shift of employment from the primary and secondary economic sector to the tertiary and quaternary sector (at least in the Western world).

The latter involved two key developments. On the one hand, the advanced abandonment, dereliction and in some cases destruction of the symbols of the Industrial Revolution and the 'First Machine Age' and on the other, a shift of perceptions for the possibilities of cities' transformation and urban renewal. Based on the new concepts of the international conservation debate and against the rising concerns for the natural environment and the devastating effects of Modernist transformations of city centres, a pro-conservation reaction throughout Europe was born (Veldpaus et al., 2013).

2.4 From the 'heritagisation' of industries to the industrialisation of heritage (what?)

The rise of industrial archaeology and the recognition of 19th -and later 20th- century industrial sites as valuable cultural heritage, took place against the backdrop of upheavals presented in the previous Sections. Until the 1970s, and even later in many European countries, the aesthetic and age values were paramount for the recognition and protection of most heritage typologies. That played a decisive role in the process of appreciation and acceptance of industrial relics as part of heritage. Factories, power plants, mining sites and every other facet of industry were perceived by the early architectural conservationists as threats to the beauty of the natural scenery, cultural

landscape or historical townscape. Those rusted carcases, with their atypical values, took longer to be recognised as heritage and receive protection and care. From the late 1970s however, the conditions changed and perceptions started to shift.

The safeguarding of the historic industrial buildings and the acknowledgement of their heritage value came in focus of the conservationists' discourse at different times in each European nation, in the second part of the 20th century.[7] Palmer and Neaverson (1998, 9), tracing the first steps of institutional interest and protection on the subject, discuss the creation of early inventories of monuments including the industrial ones in the US and Europe. They note that "*In Europe, the value of the physical remains of industry took rather longer to be appreciated*".[8] Since the early 1960s, the new discipline of Industrial Archaeology started influencing the theoretical discourse towards the scientific examination and the protection of the industrial cultural landscape, that was facing the first signs of threat at the time (Glendinning, 2013, 317).

A key development which generated significant momentum was the organisation of the first international Congress on the Conservation of Industrial Monuments in Ironbridge in 1973. The congress reflected the growing international concern of practitioners for this new 'endangered' part of the built environment and their interest in protecting it. The most important outcome of the congress was the establishment of TICCIH, the worldwide organisation for the study, interpretation and preservation of our Industrial Heritage (see § 6.2.3.).

The 1980s, as posed above, saw significant fluctuations in the Conservation Movement. In the words of Glendinning (2013, 413):

"Already, by 1983, the newly established grand narrative was breaking up. Partly, this resulted from the sub-division of heritage into specialist discourses, a trend pioneered by the boom in industrial archaeology, and celebrated in a succession of highly specific international conventions."

The 'heritagisation' of the industrial legacy and the propagation of its potential at an international level started at this period. The Council of Europe took the initiative, organising four colloquies on the subject in the late 1980s.[9] The Recommendation No. R (90) 20 issued in 1990 acknowledged Industrial Heritage as: "[…] an *integral part of the historic heritage of Europe" and* emphasised the need to secure its protection and conservation (Council of Europe. Committee of Ministers, 1990). Despite this important step, Industrial Heritage remained comparatively underappreciated throughout the 20th century. This is confirmed by the ICOMOS study (1999): 'Proposals for achieving a more representative sample of the cultural heritage on the World Heritage List', noting that *"[…]the Industrial Heritage is poorly represented as well as the 20th century heritage."*

The systematisation of the Industrial Heritage protection was only achieved in the 21st century. 'The Nizhny Tagil Charter for the Industrial Heritage' (TICCIH, 2003), signed in 2003 as well as the Joint ICOMOS-TICCIH 'Principles for the conservation of Industrial Heritage Sites, Structures Areas and Landscapes', referred to as the 'Dublin Principles' (ICOMOS – TICCIH, 2011), constitute the international guidelines for the conservation of industrial monuments.

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7 The issue will be further discussed in Chapter 4.

8 This is explicable considering the political, financial and sociocultural conditions of Europe until the mid-20th century dictated by two World Wars and later the reconstruction period.

9 Lyon, 1985, Industrial Heritage: What politics?; Madrid,1986, Engineering and Public Works. A New Dimension of Heritage; Bochum, 1988, Mining Engineering Monuments as a Cultural Heritage; London and Durham, 1989, Recording the Industrial Heritage. (Council of Europe. Committee of Ministers, 1990).

Those doctrinal documents, defined Industrial Heritage and its values, offering also a basic orientation for its protection. In specific, they emphasised that the legacy of industrialisation embodies a large set of unique values, some of which are not common in other heritage typologies. The issue of values was briefly presented in the Nizhny Tagil Charter (2003), while an extensive analysis was provided by Cossons (2012, 7-12, 2008, 5-9). According to him, Industrial Heritage embodies evidential, historic, social, cultural, aesthetic, technological and scientific values.

In regard to the guidelines offered by the doctrinal documents, the idea of industrial buildings' constant use was promoted as the best method of ensuring their ongoing maintenance. According to the Dublin Principles, *"Appropriate original or alternative and adaptive use is the most sustainable way of ensuring the conservation of Industrial Heritage sites or structures."* (ICOMOS – TICCIH, 2011, Article III.10, 5). A basic framework of change restrictions and recommendations, based on the Venice Charter, was also introduced. Documentation of changes, reversibility, respect of the age value, conservation of significant material components and patterns of circulation and activity as well functional integrity and machinery conservation were highlighted as the most important principles guiding industrial buildings' conversion.

The acceptance of Reuse as a conservation approach in the Nizny Tagil Charter and the Dublin Principles and the shift of wording introducing it in the relevant articles of the two documents, from a possible alternative to 'the most sustainable way', appears to be in line what Glendinning describes as the globalising shift in the world of heritage in the turn of the 21st century. In detail he states:

"*In general, heritage was now expected to 'do' rather more than before, especially in an urban context […]. It was expected not just to act as an architectural, social or cultural catalyst but to play its part as an element in managed strategies of economic regeneration, aimed at reinventing deindustrialised cities through wide-ranging strategies of reconceptualisation and reconfiguring, implemented by a range* of governmental and private agencies." (Glendinning, 2013, 422).

This shift has been described by Choay as the 'industrialisation' of heritage (Glendinning, 2013, 422).

The Reuse of Industrial Heritage gathered momentum and gained credibility as a preferred way of conservation against the big fluctuations brought by the postmodern era. As society changed, more and more emphasis was given to economic values rather the traditional conservation values (Mason, 2008, 118, 123). This tendency on the one hand, provided justification for the Reuse rather than the demolition or preservation of industrial relics as ruins or as 'walkable monument factories'. On the other hand though, it overshadowed their wider range of values. In too many occasions of Reuse, industrial sites were treated just as flexible shells allowing uninformed architectural experimentations, destructive speculative schemes or a combination of the two. That is not to say however, that there were no respectful conversions or schemes that combined masterfully preservation and adaptation. Characteristic examples of those are celebrated in the reference work of Stratton (2000) "Industrial Buildings: Conservation and Regeneration".

TEXTBOX 2.1: INDUSTRIAL HERITAGE CONSERVATION AND THE BROAD SCOPE OF REUSE

Despite the delayed appreciation of the former industrial relics from conservationists, other groups showed intense interest in them. As a result, beginning in the late 1960s from the UK, multiple ways of conservation were employed across Europe from volunteer groups, commercial developers, entrepreneurs, local authorities and many other Actors. According to Kierdorf and Hassler (2000, 7), who draw primarily from the German context, no less than twelve strategies can be distinguished for the conservation of the 'technical culture':

– the classical technological museum (e.g. in Munich)
– the open air museum (e.g. Ironbridge)
– the museum in the monument (e.g. Rammelsberg)
– the continuation of historical forms of production as 'Museumindustrie' (e.g. Solingen)
– the 'walkable' monument factory (e.g. Oldisleben)
– the usage of built parts of the Industrial Heritage as shell for new activities (e.g. Zollverein, Essen)
– the adaptation of the built Industrial Heritage to new uses
– industrial relics as archaeological reserves
– controlled conservation of contaminated sites as monuments
– deterioration without demolition, ruins
– quarry for other application of materials
– moratoria, in-between uses, temporary conservation.

The former classification is useful for understanding the different possibilities available for the conservation of Industrial Heritage or parts of it; yet it merits further discussion and clarification. It is worth highlighting that the conservation of Industrial Heritage includes multiple strategies that involve its change of use, with adaptation being just one of them. Furthermore, it should be noted that the boundaries between the above categories are not clear, allowing projects to be placed in more than one category (e.g. the Ruhr Museum in Zollverein).

Keeping in mind firstly, that in practice, conserving Industrial Heritage (especially as a landscape approach) is based on the employment and combination of multiple strategies with the change of the site's former function being usually the common denominator; and secondly, that there are no commonly accepted terms for describing such a composite practice, it is deemed essential to introduce a term that reflects this variety of diverse tactics.

'Reuse' is therefore defined here provisionally, as a broad conservation approach, which involves the alteration of the former use of the conservation object (in part or in its full extent) and it is capable of incorporating a variety of diverse strategies simultaneously. A more comprehensive definition of reuse will be given at the end of this Chapter (see § 2.8.2).

Summing up, the above analysis demonstrates that Industrial Heritage has been consolidated as a recognized part of cultural heritage, gaining international gravitas in the early 21st century. Furthermore, Reuse has been established as the most appropriate approach for conserving Industrial Heritage. The acceptance of change, which is at the core of the Reuse practice, has been embraced as a key conservation concept of the new era.

2.5 Shifts, shifts, shifts: Industrial Heritage against a conservation theory in transition

The overview of the Section 2.2 established that nowadays the conservation theory is in flux. The theoretical framework and in extent the practical implications of heritage conservation have been subjected to profound changes over the last decades (Avrami et al., 2000, Viñas, 2002, Orbasli, 2008, Glendinning, 2013, Kuipers and Quist, 2013). In turn, the answers to key questions like: "What is heritage?", "How should it be conserved and managed?", "Who should be in charge of conservation/management?", "Why and based on what grounds should we conserve/manage it?" keep shifting. The transitions pinpointed are multiple. They encompass the scope, scale and nature of the object of conservation, the key guiding principles and values, the conservation approach, the focus, the involved Actors and finally the preferred strategies of conservation.

Aiming to clarify whether those shifts apply to the object of this dissertation, namely Industrial Heritage, a comparative analysis of the international principles guiding its conservation will follow.

Table 2.1 summarises key definitions and recommendations of the two international doctrinal documents that guide the protection of Industrial Heritage. Their comparison reveals a number of transitions in line with the changing framework of the conservation theory. In detail, the object of conservation has been indeed broadened in terms of scale (encompassing landscapes instead of items) and scope (including intangible aspects). Classical conservation principles (such as authenticity and reversibility) are still dominant. However, there is a shift to the intensity of the directions offered in the two Charters, from a strict necessity ("*interventions should…*") to an optional choice ("*whenever is possible…*"). Both charters plea for a participatory process of conservation, placing the expert among an array of stakeholders.

What is largely important and highly relevant for this dissertation is the shift in the recommended strategies for protection. The Nizhny Tagil Charter introduces preservation in situ as the most preferable way of conservation and secondary adaptation. Dismantling and relocation as well as reconstruction are given as alternatives in extreme situations. In contrast, the Dublin Principles appear to embrace change. Reuse ('Appropriate original or alternative and adaptive use') is given far more emphasis and it is suggested as the most sustainable way of conservation. This comparative analysis therefore confirms that a great part of the shifts mentioned in Section 2.2 has influenced Industrial Heritage conservation theory.

TABLE 2.1 Comparative analysis between the Nizhny Tagil Charter and the Dublin Principles

	Nizhny Tagil Charter (2003)	'The Dublin Principles' (2011)
Industrial Heritage definition	1. Industrial Heritage consists of the remains of industrial culture which are of historical, technological, social, architectural or scientific value. These remains consist of buildings and machinery, workshops, mills and factories, mines and sites for processing and refining, warehouses and stores, places where energy is generated, transmitted and used, transport and all its infrastructure, as well as places used for social activities related to industry such as housing, religious worship or education.	1. The Industrial Heritage consists of sites, structures, complexes, areas and landscapes as well as the related machinery, objects or documents that provide evidence of past or ongoing industrial processes of production, the extraction of raw materials, their transformation into goods, and the related energy and transport infrastructures. Industrial Heritage reflects the profound connection between the cultural and natural environment, as industrial processes–whether ancient or modern – depend on natural sources of raw materials, energy and transportation networks to produce and distribute products to broader markets. It includes both material assets – immovable and movable –, and intangible dimensions such as technical know-how, the organisation of work and workers, and the complex social and cultural legacy that shaped the life of communities and brought major organizational changes to entire societies and the world in general.
Recommended strategies	5.I. **Conservation** of the Industrial Heritage depends on preserving functional integrity, and interventions to an industrial site should therefore aim to maintain this as far as possible. The value and authenticity of an industrial site may be greatly reduced if machinery or components are removed, or if subsidiary elements which form part of a whole site are destroyed. 5.III. **Preservation in situ** should always be given priority consideration. **Dismantling and relocating** a building or structure are only acceptable when the destruction of the site is required by overwhelming economic or social needs. 5.IV. **The adaptation of an industrial site** to a new use to ensure its conservation is usually acceptable except in the case of sites of special historical significance. New uses should respect the significant material and maintain original patterns of circulation and activity, and should be compatible as much as possible with the original or principal use. An area that interprets the former use is recommended. 5.VII. **Reconstruction**, or returning to a previous known state, should be considered an exceptional intervention and one which is only appropriate if it benefits the integrity of the whole site, or in the case of the destruction of a major site by violence.	III.10. **Appropriate original or alternative and adaptive use** is the most frequent way and often the most sustainable way of ensuring the conservation of Industrial Heritage sites or structures. New uses should respect significant material, components and patterns of circulation and activity. III.11. **Reverting to a previous known state** may be acceptable under exceptional circumstances for educational purposes, and must be based on thorough research and documentation. **Dismantling and relocating** are only acceptable in extraordinary cases when the destruction of the site is required by objectively proved overwhelming economic or social needs.
Principles	5.VI. Interventions should be **reversible** and have a **minimal impact**. Any **unavoidable changes** should be documented and significant elements that are removed should be recorded and stored safely. Many industrial processes confer a patina that is integral to the integrity and interest of the site.	III.11. **Wherever possible**, physical interventions should be **reversible**, and respect the age value and significant traces or marks. Changes should be documented.

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TABLE 2.1 Comparative analysis between the Nizhny Tagil Charter and the Dublin Principles

	Nizhny Tagil Charter (2003)	'The Dublin Principles' (2011)
Actors	3.X. **International co-operation** is a particularly appropriate approach to the conservation of the Industrial Heritage through co-ordinated initiatives and sharing resources. 4.V. **The competent authorities** should have statutory powers to intervene when necessary to protect important threatened sites. 4.VI. Government should have **specialist advisory bodies** that can give independent advice on questions relating to the protection and conservation of Industrial Heritage, and their opinions should be sought on all important cases. 4.VII. Every effort should be made to **ensure the consultation and participation of local communities** in the protection and conservation of their local Industrial Heritage. 4.VIII. **Associations and societies of volunteers** have an important role in identifying sites, promoting public participation in industrial conservation and disseminating information and research, and as such are indispensable actors in the theatre of Industrial Heritage. 7.I. **Public authorities** should actively explain the meaning and value of industrial sites through publications, exhibitions, television, the Internet and other media, by providing sustainable access to important sites and by promoting tourism in industrial areas.	I. 4. Researching and documenting requires an interdisciplinary approach supported by **interdisciplinary research** and educational programmes to identify the significance of Industrial Heritage sites or structures. […] The evaluation and assessment of documents should be undertaken by an **appropriate specialist in the industry** to which they relate to determine their heritage significance. **The participation of communities and other stakeholders is also an integral part of this exercise.** III.10. **Specialist skills** are necessary to ensure that the heritage significance is taken into account and respected in managing the sustainable use of these Industrial Heritage sites and structures. […]

2.6 The challenge of Industrial Heritage Reuse

"Unfortunately, successful re-use can give the misleading impression that the adaptation process is easy, resulting in an apparently simple and obvious conclusion. This is far from true, as the effort taken to achieve the end result is hidden, going unseen - and perhaps unvalued - in the eye of the beholder." Dereck Latham, 2000

The shifts highlighted in the previous Sections gave rise to new possibilities and risks, confounding heritage conservation. The growing complexity has led to confusion over the most suitable and effective ways of dealing with the historic built environment. Reusing heritage therefore, and in specific the vestiges of industry, under the circumstances has become more and more perplexing. What complicates further the task, making it practically synonymous with challenge, are the intrinsic characteristics and exclusive values of this heritage group.

Aiming at highlighting how the subjectivism governing heritage conservation nowadays creates ambiguities and complicates Industrial Heritage Reuse, three examples of shifts will be discussed: the expansion of the heritage scope, the departure from the classical principles of conservation and the tendency for a more democratic decision-making process.

Firstly, the expansion of the heritage scope provides opportunities for the integration of qualitative aspects to its care. On the one hand, taking into consideration the intangible dimensions of Industrial Heritage, such as the technical know-how and the organisation of work and workers,

helps in better understanding the complexity of our inherited past. On the other hand, an uncontrolled reversing of the focus on tangible heritage to the intangible one can put historic industrial structures in danger. If intangible heritage aspects are promoted at the cost of tangible characteristics, many historic industrial sites may be considered irrelevant and may be either demolished or transformed arbitrarily.

Secondly, the departure from the classical principles of conservation according to its adepts, disengages heritage protection from obsolete practice and paves the way to development, generating real economic and social benefits. In absence of new widely accepted efficient principles however, destructive Reuse practice or loss of historic industrial urban fabric appear as likely possibilities.

Finally, a bottom-up decision-making process and the active participation of several stakeholders contribute to the democratisation of conservation. The plurality of views in the process can lead to the eradication of the excesses committed by cultural or economic elites. Such a process hides however dangers of decision-making dead-ends, delays as well as possibilities of heritage banalisation.

Moving from the ambiguities of the contemporary framework of conservation to other challenges, the particularities of the Reuse strategy should be considered. The analysis of the Sub-Section 2.2.3 highlighted the multiplicity of the Reuse strategy. Against the described climate of subjectivism and ambiguity, this feature is another component of complexity presenting challenges. The number of Reuse Components that should be considered such as: the process of the Reuse, the new programme, the architectural (re)design, the preservation of the cultural significance of heritage, financial, social and functional (including technological) considerations, form the base of multiple dilemmas.

In other words, the strategy of reuse appears as challenging by nature as it is characterised by tensions between its Components. Change versus cultural significance preservation; financial viability against social, cultural and environmental sustainability, revitalization against commodification, respect versus comfort, present-day expectations versus future usability, reverse of obsolescence versus gentrification are only some of the multiple dilemmas embedded in the strategy.

The challenge of Industrial Heritage Reuse is related, besides the haziness of the contemporary conservation framework and the nature of the Reuse strategy, to the particularity of the heritage group. There is a wide convergence between scholars that Industrial Heritage is exceptionally challenging to handle in comparison with other heritage groups (Binney et al., 1990, 10, Orbasli, 2008, 29,30,196, Prudon, 2008, 445-472, Douet, 2012, 1, Oglethorpe and McDonald, 2012, 55-56). Its scale, dimensions and morphology; its technical complexity, the machinery and installations it contains; its questionable aesthetic value and the negative perceptions that hamper its appreciation; its controversial symbolism as an icon of both progress and innovation and hardship and suffering; its inherent dynamic yet messy character; its unkempt context; the contamination issues it presents; the social consequences it entails as well as its economic weight are presented as key factors that render its recording, protection, conservation and Reuse difficult.

Lastly, it is worth emphasising the challenges stemming from the peculiarities of Industrial Heritage values. Along with the dilemmas emerging from the tension between the economic and sociocultural values, common for all heritage groups, reusing Industrial Heritage requires the consideration of some special, sensitive values, such as the technological, scientific and cultural ones. The issue is rather perplexing, as those values are often ascribed in the content and setting as well as in human

memories rather than solely in the carcass of the industrial sites. As a result, a comprehensive value-driven Reuse of Industrial Heritage requires special attention not only to its fabric but also to its components, machinery and setting as well as to the intangible records of industry.

The above discussion revealed with clarity that Industrial Heritage Reuse is an exceptionally multi-composite and challenging assignment. One that cannot be understood fully without a holistic examination. So far, a very restricted body of literature has attempted to take such an approach (e.g. Berens, 2011, Douet, 2012). Most studies on the field present limitations. Some important contributions have become outdated (e.g. Nelissen et al., 1999, Stratton, 2000); others are too generic, failing either to address the particularities of Industrial Heritage (Schmidt and Austin, 2016, Wong, 2017) or to acknowledge the industrial relics as part of cultural heritage (Douglas, 2006, Baum and Christiaanse, 2012). Furthermore, a number of contributions have quite a narrow scope, discussing only one Component of Reuse, as for example the economics of Reuse (Strolenberg and Gelinck, 2014) or just one single dilemma. For example a growing body of knowledge, including (Brooker and Stone, 2004, Jäger, 2010, Wong, 2017) focuses on the balance between architectural intervention and cultural values preservation. Lastly, much of the existing accounts despite offering evidence on the result of Industrial Heritage Reuse have a character of anthology, failing to address the critical and underlying issues of Industrial Heritage Reuse strategy (e.g. Paredes, 2006, Llordès and Pont, 2014).

Summing up, this Section underlined the challenges of Industrial Heritage Reuse. It was supported that they stem from the ambiguities in the contemporary framework of conservation, the embedded dilemmas in the Reuse strategy as well as from the particularities of this special heritage group. This highly complex task can be visualised as a yarn ball (FIG. 2.1), comprising different Aspects and multiple yarns of various colours, all knotted and tangled with each other. To this day, unravelling this vastly perplexing yet fascinating yarn ball has not been achieved. Industrial Heritage Reuse has not been holistically studied under the circumstances dictated by the contemporary postmodern age.

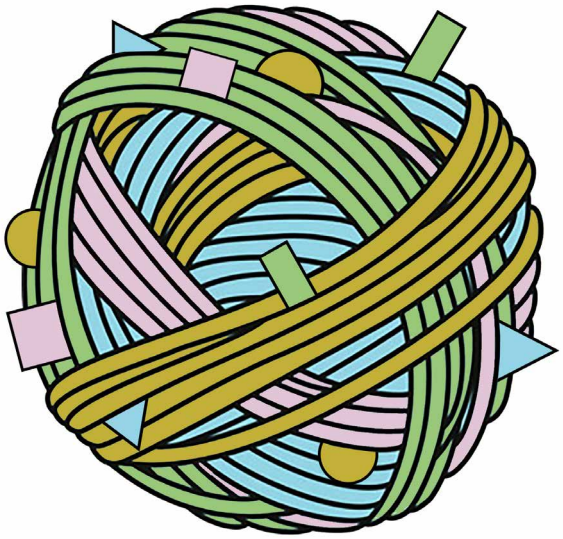

FIG. 2.1 The mutli-composite and perplexing assignment of Industrial Heritage Reuse visualised as a multi-coloured yarn ball, comprising different Aspects.

2.7 Current demands against the contemporary context

Zooming out from the challenges of Industrial Heritage Reuse practice to the wider discourse of heritage conservation, it is necessary to highlight key current demands in the field. Those demands placed against the contemporary context of the 21st century globalised world will refine the scope of this dissertation to topical issues that merit attention with high scientific and social relevance.

Firstly, as mentioned in the Sub-Section 2.2.3, on a global scale increasing emphasis is placed upon the issue of sustainability, a concept that has greatly influenced the conservation field. Since the late 1990s, a demand for making heritage both profitable and "green" has gained significant momentum. Against a climate of continuous, concealed or prominent, financial crisis and a growing empowerment of capitalism, this assertion keeps finding great resonance across theorists and practitioners today. Furthermore, with environmental concerns dominating the scientific discourse, the ecological angle of heritage conversion still remains highly topical.

This quite restricted conception of the dimensions of sustainability and the fixation on the goals of low embodied energy and small carbon footprint has been challenged in the 21st century and a more holistic approach has been called for. In 2002, the European Commission (2002) emphasised the importance of establishing a tripartite pattern for the sustainable development based on economic, environmental and social pillars, too.

Since then a number of studies have addressed the issue of socially, cultural or symbolic sustainability of heritage (Avrami, 2009, 181, Viñas, 2005, 183). This appeal seems to be more and more relevant against the pressures of changing demographics, widespread urbanisation, urban sprawl, migration and growing inequality in the globalised world of the 21st century (United Nations Development Programme, 2016). In light of the latter demand, there are scholars stressing the role of the process of heritage conservation for the creation of social and political capital. A second demand therefore arises, advocating more emphasis in the process, rather than the product of conservation (Avrami, 2009).

Lastly, product of the dialectic within the conservation field between the local and the global is the recognition of the importance of transnational research. In the field of Industrial Heritage, TICCIH is the main facilitator of international cooperation, encouraging cross-cultural networking and research. Following the example of the creation of regional groups such as the Asian Network of Industrial Heritage and TICCIH Latin America, the current decade has seen a vivid interest in the establishment of a subgroup within TICCIH with a European scope.[10] It is noteworthy that one of the six Europe-wide proposed focal points of the said group is the issue of adaptive reuse. Hence, a European scope on the subject can be added to the former list of current demands in the field.

10 This initiative, which is still at its infancy, was born in a special session in the TICCIH International Conference in 2015. The issue was revisited at the National Representatives Meeting during the TICCIH International Conference of 2018 in Chile and finally started taking shape in the special session titled "Building a network for the European Industrial Heritage: TICCIH Europe - participatory session" organized in December 2018 in Paris within the framework of the conference 'The European Industrial Heritage of the First World War'. The author was present in the last two congresses, contributing to the formation of the group.

2.8 Conclusions: Control shift, the search for an enhanced approach of Industrial Heritage Reuse

2.8.1 Losing control?

"All progress is precarious, and the solution of one problem brings us face to face with another problem." Martin Luther King, Jr.

Since the 19th century, when the first ideas about conservation emerged, a lot has changed in the field. The achievements are undoubtedly numerous with the most important being the establishment of conservation as a key consideration in the management of the built environment (Pendlebury, 2009, 222). Yet progress is never free of problems. The aftermath of the postmodern era shifts has led to a growing sense of instability. There are currently too many strategies, too many objects to conserve, too many values to stand for, too many conditions to consider and too many professionals involved in the process (Viñas, 2005, 18-22). The large bulk of international doctrinal documents with their contrasting content seems to fuel instead of clearing up the rising confusion.

At the same time, the demand for more flexible, more topical and more applicable solutions for the conservation of our historic built environment is rising. The existing body of research stresses the need for a more holistic, responsive and sustainable approach. One that entails an extended repertoire of strategies which can protect a wide and differentiated spectrum of cultural values while considering the heterogeneous nature of heritage. Democratic and inclusive and at the same time cost effective and visually pleasing, this envisioned new approach hides underlying tensions and ambiguities, strengthening further the confusion.

Will this highly subjective context lead finally to randomness and loss? Is it still possible to systematically conserve the fragments of our inherited past or is the control of heritage conservation an obsolete notion? If control is still relevant and an enhanced, more flexible conservation practice is desirable, who should be in control; what is there to control and how can it be achieved?

This dissertation will rearticulate those very critical and topical questions, applying them to the challenging field of Industrial Heritage Reuse. Drawing from key concepts and demands of the contemporary theory of conservation, its aim is to explore the potential of enhancement of the Industrial Heritage Reuse practice, through the close examination of its Components and the Factors and Actors that exercise influence and control.

2.8.2 Cutting through the confusion and embracing clarity: Terminology definitions

Aspiring to contribute to the dissolution of the cloud of confusion which currently surrounds the academic discourse on conservation issues, it is deemed essential to provide further clarification on the terminology of this dissertation. In what follows, the key terms used in this study will be defined.

Industrial Heritage

The term will be used as defined by the Dublin Principles (ICOMOS – TICCIH, 2011) with the chronological and typological limitations presented in the Sub-Sections 3.4.1.1 and 3.4.1.2.

Reuse

In Section 2.4, TEXTBOX 2.1, the term Reuse was defined, as: a broad conservation strategy, which involves the alteration of the former use of the conservation object (in part or in its full extent) and it is capable of reflecting a variety of diverse approaches simultaneously. In light of the concepts presented in the totality of this Chapter, this provisional definition needs to be extended.

Reuse is therefore defined as a broad conservation approach, which is capable of reflecting a variety of diverse strategies simultaneously. It implies the balancing of change and preservation of cultural significance within the wider scope of sustainability and it involves the modification of the conservation object (in part or in its full extent) for a compatible use.[11]

Managing change

The term refers to the shift of approach in conservation strategies, from a set of tactics that condemned change, into an array of approaches where change is to be managed. According to Orbasli, 2008; Roders and Velpaus, 2013; English Heritage, 2013a and Strolenberg, 2017, 'Managing change' [12] has become an underlying axiom of the contemporary theory of conservation.

Specifically, Orbasli (2008, 36) defines this approach as: *"A process that enables historic places to be maintained and changed if necessary but always recognising the values that these heritage assets stand for."*

English Heritage (2013a, 4) defines it as: *"positive and collaborative, based upon a shared understanding of the qualities which make a place or building special. Its aim is to achieve a balance which ensures that those qualities are reinforced rather than diminished by change, whilst achieving a solution which is architecturally and commercially deliverable."*

Roders and Velpaus (2013, 25) describe it as "*a special form of transformation with the aim to maintain and restore cultural significance, even when the built environment is changing."*

Finally, Strolenberg, (2017, 14-18) describes it as an '*open approach to heritage'* […] that can even include, '*at times radical solutions'*. […] "*This approach requires monument care to choose an appropriate strategy, depending on the situation."*

In short, the alternative definitions of the term 'managing change' imply the acceptance of change under conditions and the actions of selecting strategies and balancing parameters.

11 In order to avoid repetitiveness of the term reuse in this manuscript, it will be substituted interchangeably by the terms conversion and transformation in parts of the text. The use of those terms does not imply a differentiation in meaning or approach.

12 This approach in certain publications (e.g. Roders and Velpaus) is referred to explicitly as 'managing change' and in others implicitly (e.g. Orbasli, 2008, website of Rijksdienst voor het Cultureel Erfgoed, 2020). The English Heritage Agency refers to it using the term 'Constructive Conservation' while and Meurs and Steenhuis (2017) use the term 'Preservation through development'.

Control

According to the Cambridge dictionary (n.a., 2019) the term control can be defined as follows:

Control, *vi*: *"to decide or strongly influence the particular way in which something will happen or someone will behave",* alternatively:

Control, vi: "*to limit the amount by which something is allowed to change, develop, or increase."*

Those two definitions highlight that control entails the concepts of influence and limitation. **The term can be therefore better understood as the action of affecting, guiding or shaping** (Thesaurus.com, 2019) **while placing boundaries on forthcoming shifts.**

Control shift

The title of this dissertation is a reinterpretation of the key underlying axiom of contemporary conservation: 'Managing change'. It implies a receptive and creative attitude to change combined with the intention to determine certain boundaries to the phenomenon ultimately aiming at an envisioned enhanced status. **Control shift in Industrial Heritage Reuse can be therefore understood as: influencing (in the sense of affecting, guiding or shaping) the direction of the changes inherent in the Reuse of the legacy of industrialisation while searching for boundaries in order to achieve an enhanced, more balanced approach.**

2.8.3 Re-examining control: In search for an enhanced approach of Industrial Heritage Reuse

The analysis of this Chapter, drawing from a brief review of key contributions in the relevant academic literature, established the context of this research and identified important problems and controversies in the field. Furthermore, it offered a basis for understanding the relevance of this study, providing also the underlying conceptual norms that will be used for guiding its objectives and research design. Finally, it clarified the terminology used in this manuscript. This final Sub-Section of Chapter 2, will clarify the dual objective of this dissertation and the theoretical propositions that will direct the scope of the study, reflecting some important theoretical issues discussed.

The latent objective of this research is the exploration of the concept of 'Control shift' – a reinterpretation of the topical and highly perplexing axiom 'Managing change'. The field of application of the axiom is a comparatively new heritage group. Through the review and analysis of Industrial Heritage Reuse -a redefined broad approach that is synonymous with challenge- key questions stemming from the contemporary theoretical discourse will be answered. In specific, **who**, if any, controls the inherent shifts of the approach under investigation and **how**, will be discussed as well as **what is and what is not controllable**.

Under the light of the contemporary conservation theory which prompts the shift of focus from the object to the subject, this dissertation will examine the evolution of the practice of Industrial Heritage Reuse, with emphasis on the Actors controlling the approach and the Factors influencing it, rather than merely its outcome.

Taking into account the demands and challenges of the contemporary context, the present research will adopt a holistic, international and multileveled approach. Expanding the scope of research on a European level; placing equal emphasis both on the process and the result of Reuse through a multileveled study; considering both Endogenous and Exogenous Aspects of influence and finally examining the practice through the multifaceted prism of sustainability, resonate from the abovementioned intention.

Lastly, the salient objective of this dissertation is to respond to the need for an enhanced, richer and more varied approach of Industrial Heritage Reuse, providing a framework that will enable it to meet the 21st century aspirations, summarised in FIG. 2.2. That is expected to greatly facilitate the application of contemporary theoretical concepts in practice, casting away -at least to an extent- the veil of confusion covering the field.

FIG. 2.2 21st century aspirations about an enhanced Industrial Heritage Reuse practice

In short, this doctoral research will attempt to unravel and analyse the 'yarn ball' of Industrial Heritage Reuse, considering the norms of the contemporary theoretical framework, and will provide the scientific discourse with the missing answers identified in this Chapter. The results of the research are intended to serve as a compass for guiding theorists and practitioners in the highly perplexing context of the 21st century.

TOC

3 Methodology

3.1 Introduction

Building on the theoretical concepts and findings described in Chapter 2, this Chapter will present the research design and the methods applied for conducting this study on European Industrial Heritage Reuse. Special attention is given to the methodology as it is not merely an adaptation from similar types of investigation but an actual product of this dissertation, allowing for the investigation of a vast and multileveled research field.

Section 3.2 will present the main research question of the dissertation and its related sub-questions, based on the theoretical propositions developed in the previous Chapter. This analysis is considered essential, as it will provide the foundation for the selection of the research methods, a topic that will be analysed in Section 3.3. Section 3.4 will present in detail the key methods and techniques used for the data collection and the analysis. The synthesis of the selected methods into an effective research design will be presented in Section 3.5. The last Section of the Chapter (§ 3.6) will discuss the usefulness of this new methodology, the potential for its application in future research, as well as its limitations.

3.2 Research question formulation and theoretical propositions

3.2.1 Theoretical propositions

In order to contribute to the theoretical academic corpus on a systematic way, a firm research design should be formulated. As it will be discussed in the Sub-Section 3.4.1, the research design created for this dissertation is largely based on a case study rationale, inspired by the work of Yin (1994 & 2009). According to Yin, the most preferred general analytic strategy of case study research is to rely on theoretical propositions outlined at the beginning of the research. Those propositions have a tripartite role. Firstly, they reflect an important theoretical issue; secondly, they direct attention to something that should be examined within the scope of the study and thirdly they are valuable instruments that lead to theory building (Yin, 1994, 21).

The theoretical proposition guiding this dissertation are presented in the TEXTBOX 3.1.

TEXTBOX 3.1: THEORETICAL PROPOSITIONS

The analysis of the existing research base offers valuable starting points for the present study, allowing the conception of the following theoretical propositions.

1 Industrial Heritage Reuse is influenced both by its intrinsic characteristics and by contextual conditions (see § 2.2.4).
2 The stakeholders of Industrial Heritage Reuse are Actors who exercise influence in the practice (see § 2.2.5).
3 The stakeholders of Industrial Heritage Reuse control a number of components, the composition of which affects the practice (see § 2.2.3).
4 The interplay of all the above Aspects can determine the outcome of Industrial Heritage Reuse. The comprehension of this interplay in turn can provide lessons for the 'control shift' concept.

The four theoretical propositions presented will guide the objectives of this doctoral research and the research design, described in the present Chapter.

3.2.2 Research question formulation and analysis

The first condition that should be satisfied for the delimitation of a research field and the development of a focused investigation is the formulation of research questions (Groat and Wang, 2002). The literature review on the issue of the Industrial Heritage Reuse practice led to the identification of a research gap in the topic under investigation and to the development of a sharp research question for addressing it.

The Main Research Question (M.R.Q.) of this doctoral research is:

How can the European Industrial Heritage Reuse practice be better understood, and possibly enhanced, through the close examination of the Aspects influencing it?

Sub-questions

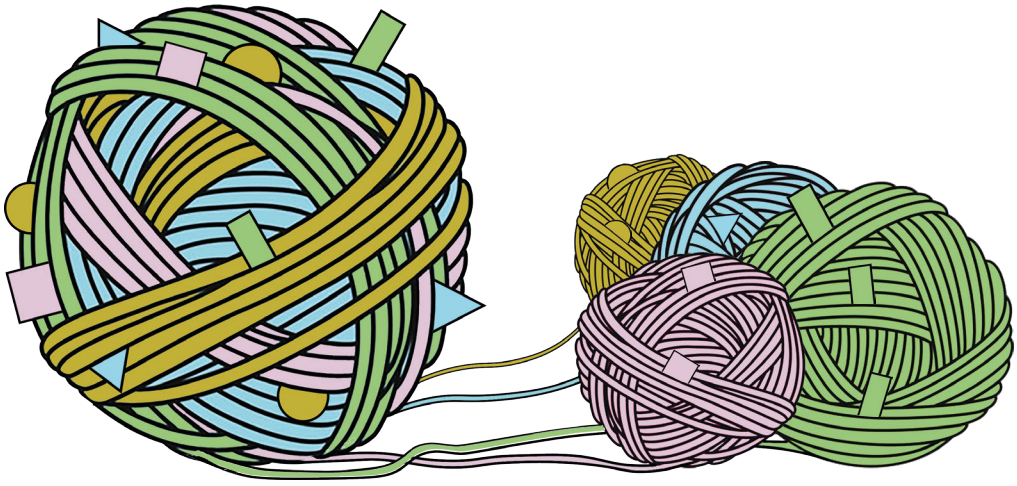

FIG. 3.1 The theoretical propositions provide a starting point for the unravelling of the Industrial Heritage Reuse 'yarn ball' into its distinctive constituents.

The results of the theoretical framework analysis, summarised in the theoretical propositions (TEXTBOX 3.1) serve as a solid basis for the anatomy of the Aspects influencing Industrial Heritage Reuse, into distinctive constituents (FIG. 3.1). Based on those, the main research question is analysed to the five sub-questions presented below, which address each constituent separately.

- S.Q.1. How has the current state of Industrial Heritage Reuse practice been formed as an accepted form of heritage conservation during the last fifty years in Europe?
- S.Q.2. Which Factors, if any, influence decisively Industrial Heritage Reuse practice and how?
- S.Q.3. Which Actors, if any, influence the Industrial Heritage Reuse practice, when, where and how?
- S.Q.4. Which are the key Components of Industrial Heritage Reuse and how does their composition influence the practice?
- S.Q.5. How do those Aspects influence each other and how does this impact Industrial Heritage Reuse?

TABLE 3.1 Analysis of main research question

Current state							**Enhanced state**
					Shift		
Industrial Heritage Reuse practice	**Control**		*How?*				
	Influencing Factors	*Which?*	Reuse Components *(which?)*	IN	Time	Period	*When?*
	Influencing Actors	*Who?*			Place	Area	*Where?*

3.3 Selection of research methods

The selection of an appropriate research methodology and the formulation of a well-defined research design are critical for the outcome of the research. The formulation of this doctoral research methodology involved the refinement of the main research question and its analysis in sub- questions; the study of selected literature focused on research methodology, techniques and research design (Groat and Wang, 2002, Patton, 2002, Given, 2008, Yin, 2009, Turner III, 2010, Swanborn, 2010, Lune and Berg, 2012,); the consultation of the methodological approaches of relevant dissertations (Pereira Roders, 2007, Remøy, 2010) and the attendance of relevant courses, given by the Graduate School of TUDelft in the framework of the Doctoral Education Programme.[13]

The methodological approach of this research is guided by the Sub-Questions (S.Q) posed above. Thus, the methodological choice is based on the aim of the researcher to study in depth a real life phenomenon (*S.Q.1.)* which takes place in the present and recent past, while achieving a clear understanding of experiential and other phenomena interwoven with its context. (*S.Q.2., S.Q.3., S.Q.4., S.Q.5)*.

13 Course title: How to manage your research information (C11.M1), 20 & 27/1/2015, Organiser: Graduate School TUDelft, Course title: How to make a questionnaire and conduct an interview (C4.M1), 6 & 26/3/2015, Organiser: Graduate School TUDelft.

Yin (2009, 8-14) discusses three conditions that should be taken into account when choosing research methods, namely:

A the form of research question
B the control of the behavioural events and
C the focus on contemporary events

The link between various research methods and these conditions are presented in Table 3.2.

TABLE 3.2 Relevant Situations for Different Research Methods, (Yin, 2009, 8)

Method	Form of research question	Control of the behavioural events	Focus on contemporary events
Experiment	How, why?	yes	yes
Survey	Who, what, were, how many, how much?	no	yes
Archival analysis	Who, what, were, how many, how much?	no	yes/no
History	How, why?	no	no
Case study	How, why?	no	yes

The research questions of this study are mainly a combination of “what” “how” and “who” questions. The author has no control over the behavioural events since the objects and phenomena under investigation are not examined in a controlled environment such as a laboratory setting. Moreover, the focus is cast on buildings and phenomena of the recent past involving Actors who are, in their vast majority, alive and serve as valuable sources of information for the study. These conditions provide an orientation for a methodological formulation.

Groat and Wang (2002) as well as Lune and Berg (2012) analyse different research methods, stating their strengths and limitations. Drawing from those studies and the analysis of Yin (2009) presented briefly above, a mixed method research (Groat and Wang, 2002, 368-370) was developed, securing methodological, theory and data triangulation (Patton, 2002, 247-248) while complementing the strengths and minimizing the weaknesses of each research method.

3.4 Analysis of selected research methods and techniques

The methods used for responding to the main research question involve:

1 Case study research
2 Historical research
3 Qualitative Interviews

Table 3.3 presents the methods used for answering each Sub-Question.

TABLE 3.3 Research methods used per sub-question

Method	S.Q.1	S.Q.2	S.Q.3	S.Q.4	S.Q.5
Case study	x	x	x	x	x
Historical research	x	x	x		
Interviews	x		x		

In what follows an analysis of each method will be presented, discussing the structure of the methodological approach, tools and techniques used. Special emphasis is given to the strategies of data collection and data analysis.

3.4.1 Case study research

The research design is largely based on a case study rationale. In detail, a multiple embedded case study research design is employed, given that each case study involves more than one levels of analysis (TEXTBOX 3.2) (Groat and Wang, 2002, 356-357). Based on the theoretical propositions presented above, cases were selected with the aim of reaching analytic generalisation (Yin, 2002,38) through a combination of literal and theoretical replications[14] (Yin, 2009, 54-55).

In detail, the evolution of Industrial Heritage Reuse practice is analysed in four selected European countries serving as case studies (B. Intermediate Level) for illustrating the state of Industrial Heritage Reuse in Europe during the last fifty years (A. Total structure). Those cases predict contrasting results for anticipated reasons (see proposition 1), following a theoretical replication logic (see also § 3.4.1.1).

TEXTBOX 3.2: LEVELS OF ANALYSIS

A. Total structure: Industrial Heritage Reuse practice in Europe

B. Intermediate level: Selected cases of countries

- State and development of Industrial Heritage care and Reuse (per country)
- Actors' influence (per country)

C. Individual units: Selected cases of best practice (per country)

D. Individual unit parts/Individual Sub-units: Influencing Factors, Actors and Components per case

In the next level of analysis the replication logic changes. Aiming at testing the theoretical propositions 2-4, five cases of Industrial Heritage Reuse per country have been selected illustrating best practice (C. Individual units), thus serving a literal replication logic. Within those however

14 "Yin describes the distinction between literal and theoretical replication. A literal replication is a case study (or studies) that tests precisely the same outcomes, principles or predictions established by the initial cases study. In contrast a theoretical replication is a case study that produces contrasting results but for predictable reasons" (Yin in Groat & Wang,2002, 357).

there is a tripartite distinction between early, later and recent cases. The replication logic between the three parts is theoretical. In contrast, a literal replication is achieved across the distinctive groups of the four countries (see also § 3.4.1.2).

3.4.1.1 Selection of countries (B. Intermediate level)

The selection of the particular cases, serving to shed light into the subject under investigation (responding mainly to the S.Q.1. and S.Q.3.) was based on three criteria. Firstly, on the level of contribution of each country to the field of Industrial Heritage protection and Reuse. Secondly, on economic and sociocultural factors and thirdly, on considerations of data access and research feasibility.

A **Level of contribution**

Many European countries have a rich historic industrial stock and a variety of Reuse and conservation examples to show. Yet, the beginning and development of the systematic care for the historic industrial stock for each one of them took place at different times (see FIG. 4.5). As a result, the length and level of contribution of each country to the field differs. In order to grasp the nuances in the formation of the practice during the last half century, there was a need to analyse the state of the European Industrial Heritage Reuse though the examination of countries forerunners, followers and latecomers in respect to their contribution to the field. The cases selected fall into these three categories.

B **Economic and sociocultural situation**

Economic and sociocultural considerations also played a role in the selection of countries. Securing some common ground across cases was considered important. That is why all the selected countries share a common economic system, belonging to Western Europe.[15] The European countries formerly ruled by communist regimes, that followed a completely different model of growth, were not addressed in the study.

Despite that, in order to explore the influence of the Exogenous Conditions to Reuse as well as the role and influence of the involved Actors it was critical to aim for a theoretical replication logic between the selected countries. As a result, a diversity of economic position, social and cultural Conditions was sought for. The four selected countries present the required diversity.

C **Data access**

Direct access to relevant literature, communication with implicated stakeholders as well as accessibility to archives and the reused historic fabric was paramount for this research. For the first two issues, proficiency in multiple language is an essential tool. Thus, a key criterion for the countries' selection was the author's language skills.

Furthermore, a basic condition for the archival and field research was the flexibility to visit all selected countries and invest time in each one of them. As a consequence, the country selection

15 According to Pediaa (https://pediaa.com/difference-between-western-and-eastern-europe/#Western Europe) Western Europe is the western region of Europe. However, this term has no precise definition; the usage of this term has changed over the years. During the Cold War, this term referred to the developed and rich countries of the Western world. There was a marked difference between Western and Eastern Europe in terms of economics, politics, and religion until the fall of the Berlin Wall (1989) and the collapse of the Soviet Union (1991).

took also into account the feasibility of the required travelling implications and the support from educational institutions. In specific, this transnational inquiry was facilitated by the collaboration of TUDelft in the Netherlands and the NTUA in Greece that allowed the researcher to spend a significant amount of time for the archival and field research in both countries while taking advantage of the resources and networks of each university.

The application of the three analysed criteria into the prospective pool of European nations resulted in the selection of four European countries including the United Kingdom, the Netherlands, Spain and Greece. Those will serve as the cases of the Intermediate level of analysis (B).

3.4.1.2 Selection of projects of best practice (C. Individual units)

Given the complexity of the research questions and the abundance of best practice examples of Industrial Heritage Reuse in Europe, a two-level screening process was conducted for the identification of suitable information-rich cases for the level of analysis C (Individual units). The set of operational criteria defined, is presented below.

Screening criteria. Level 1

A **Location of the case**. All projects should be located in the selected countries of Level B. (United Kingdom, the Netherlands, Spain and Greece.)

B **Construction and intervention time-frame.** The research will be focused on the review of industrial sites built during the first and second Industrial Revolution (Loeff, 2013) (late 18th to early 20th century) and reused from the 1970s to the 2010s.

C **Former function**. This research will focus on the industrial complexes originally related with production, extraction, processing and refining.

D **Quality and quantity of existing information** regarding the site, the decision-making and the intervention process. A comprehensive set of multiple data sources, including archival material, documentation etc. reported by different sources are an essential condition for an unbiased and in-depth inquiry. Along with that, this doctoral research required the collection of oral testimonies from implicated Actors for gaining insight to sides of the practice that are usually under-investigated (e.g. decision-making process, occupation and management phase). Projects that did not allow theoretical and data triangulation were excluded from the research.

A wide literature review on the subject of the European Industrial Heritage Reuse practice (see Ch. 4) resulted in the identification of 214 cases that satisfy the analysed criteria. Those were listed in a matrix including their key characteristics (Project Name, Location, Former and New Use, Construction and Reuse year, Architect/Engineer and Reuse architect, Source, Date of survey, Remarks). The matrix was used as the base for the final selection.

Aiming at raising awareness over the topic under investigation, this extended database of information was refined, complemented and turned into an online research platform fully accessible, launched in 2018 (Chatzi Rodopoulou and Floros, 2018).

Final selection. Level 2

The restricted timeframe and resources of this doctoral research called for a highly efficient way of narrowing down the extended list of cases to a number that could be investigated within the allocated time schedule while providing accurate answers to the questions asked. **The Delphi technique**[16] was chosen as the most appropriate and efficient way to tackle this problem. In each country a group of 3-4 local experts[17] with a proven and long experience in the field of Industrial Heritage was consulted for aiding in the selection of the most appropriate and information-rich cases of best practice. The experts were provided with an explanation of the criteria analysed above as well as with the replication logic of the case study research design and were shown the matrix produced by the author. The technique resulted in the selection of 5 case studies per country that would be analysed in depth. The investigation of twenty cases within a time schedule of c. two and a half years was deemed feasible.

Before proceeding to the data collection phase a case study protocol (Yin, 2009, 80-90) was designed for securing the methodological rigor of the case study data collection and analysis, keeping the process targeted and preventing possible mismatches in the long run. The case study protocol can be found in the Appendix 1.

3.4.1.3 Techniques for data collection

Within the case study research design an extended array of techniques were used for the data collection including historical and archival research of primary and secondary sources; direct observation; interviews with stakeholders and online surveys. That allowed the data triangulation which led to well substantiated results.

In detail, for the Intermediate level B, historical and archival research was conducted, collecting data on the development of Industrial Heritage protection and Reuse from books, scientific journals, newspapers, photographic archives, corporate and organisation documents and websites. This technique was combined with the interviews of key experts in each country (see § 3.4.3).

For the Individual units C, more techniques were combined including historical and archival research of primary and secondary sources; direct observation; interviews with stakeholders and online surveys. The first technique offered illuminating data on the historic use of the sites under investigation, their conversion and delivery and on occasion on the role and influence of the involved stakeholders. Only in the early cases was there evidence available for the occupation and management phase of the converted sites.

The technique of direct observation was employed in all cases presented in this dissertation. The aim of the technique was to assess the converted sites first-hand within their context and gain insight into their occupation and management stage. During the field visits, interviews with stakeholders were conducted and the photographic material presented in this study was collected.

16 Patton (2002, 200) defines the Delphi technique as: "Interviewing key knowledgeables in a field to solicit the latest and best thinking about a proposal".

17 See Appendix 3.

Lastly, interviews were conducted as part of the cases belonging to level C, to shed light into the decision-making process, the occupation and management phase, the evaluation of the Reuse outcome as well as into the role and influence of the involved stakeholders. Those interviews can be categorised into two types. Firstly, interviews with decision-makers and secondly interviews with users of the converted sites. The questionnaire used for the latter group was customised and turned into an online survey based on the Google Forms platform, maximising efficiency in terms of time and resources. An analytic account of the generation of the interview protocol is given in the Sub-Section 3.4.3.

3.4.1.4 Analysis of case study research data

The analysis of the diverse range of data collected for the level of analysis C through the case study research followed the 'pattern matching strategy' (Yin, 2002,106-7). After the data organisation and classification and the compilation of the case study reports, a special type of pattern matching, described by Yin (1994, 110) as 'Explanation-building' was adopted.

Based on the theoretical propositions, the aim of the analysis of the level C cases was to reveal the causal links between the influencing Factors, Actors and Reuse Components and the process and outcome of Reuse. For achieving so, a 'monster matrix' was generated (Miles and Huberman in Swanborn, 2010, 122-123). The matrix included all influencing Aspects (Asp), namely the influencing Factors, Actors and Components and for each one of them Statements (Stat) grounded on the case study evidence about the influence they exercise on the process and outcome of the Reuse. Using a colour scheme the matrix also revealed the links between the influencing Aspects.

CASE STUDY 1: SHEET 1		
ASPECT 1	ASPECT 2	ASPECT 3
STAT.1.1	**STAT.2.1**	STAT.3.1
STAT.1.2	STAT.2.2	**STAT.3.2**
STAT.1.3	STAT.2.3	STAT.3.3
STAT.1.4	**STAT.2.4**	**STAT.3.4**

CASE STUDY 2: SHEET 2		
ASPECT 1	ASPECT 2	ASPECT 3
STAT.1.1	**STAT.2.1**	
STAT.1.2		**STAT.3.2**
		STAT.3.3
STAT.1.4	**STAT.2.4**	**STAT.3.4**
STAT.1.5	STAT.2.5	
STAT.1.6		

CASE STUDY 3: SHEET 3		
ASPECT 1	ASPECT 2	ASPECT 3
	STAT.2.1	STAT.3.1
STAT.1.2	STAT.2.2	**STAT.3.2**
STAT.1.3	STAT.2.3	
STAT.1.4	**STAT.2.4**	**STAT.3.4**
STAT.1.5	STAT.2.5	STAT.3.5
	STAT.2.6	

ALL STATEMENTS: SHEET 21		
ASPECT 1	ASPECT 2	ASPECT 3
STAT.1.1	STAT.2.1	STAT.3.1
STAT.1.2	STAT.2.2	STAT.3.2
STAT.1.3	STAT.2.3	STAT.3.3
STAT.1.4	STAT.2.4	STAT.3.4
STAT.1.5	STAT.2.5	STAT.3.5
STAT.1.6	STAT.2.6	

FINAL STATEMENTS: SHEET 22		
ASPECT 1	ASPECT 2	ASPECT 3
	STAT.2.1	
STAT.1.2		**STAT.3.2**
STAT.1.4	**STAT.2.4**	**STAT.3.4**

FIG. 3.2 Simplified presentation of the 'monster matrix' used in the case study analysis. The colours facilitate the identification of links between Aspects (Factors, Actors and Components). The interpretation of the Final statements colour scheme for example reveals that Aspect 1 and Aspect 3 are linked, and so is Aspect 2 and Aspect 1.

The process of analysis started with the coding of the first case study and the creation of initial statements that were organised in the first sheet of the aforementioned matrix (FIG.3.2, Sheet1).

The coding and statements' organisation of the second case study in the next sheet of the matrix followed (FIG.3.2, Sheet2). Comparing the two sets of statements, led to the need to complement and refine the initial ones as case no.2. brought in light new statements, or additional evidence for the existing ones. As the number of statements increased after the analysis of each case, a sheet containing the total account of statements was deemed necessary (FIG.3.2, Sheet 21).

Upon the completion of the compilation of the 'monster matrix' with the evidence of the 20 cases, the replication of statements across case studies was explored. Statements that replicated across more than three cases were considered a pattern and were used as a base for the results of the case study research. This process ended with the definition of the final statements (FIG.3.2, Sheet 22). Before presenting those as the results of the case study research, the theoretical framework of this research was revisited, examining them again through new perspectives. The elaborated final statements are presented in the Chapter 7 of this Volume, excluding the statements pertaining to the Exogenous Conditions which are discussed in Sub-Section 5.2.1, the Endogenous Attributes which are discussed in Sub-Section 5.3.2 and the statements regarding the Actors discussed in Section 6.5.

3.4.1.5 Stages of case study research method

- **Stage 1.** Definition of the levels of analysis, identification of case study design (multiple and embedded). Formulation and application of screening process for selecting case studies.
- **Stage 2.** Selection of case studies (Levels B, C). Identification of techniques required for the data collection. Development of case study protocol.
- **Stage 3.** Data collection using multiple techniques. Organisation of data.
- **Stage 4.** Compilation of case studies reports composing evidence with data collected from other methods. Repetition of step 3, when there was a lack of sufficient data.
- **Stage 5.** Analysis of case studies reports using the 'explanation building' analytic strategy. Theory saturation.
- **Stage 6.** Extraction of conclusions, enriching the theoretical propositions.

3.4.2 Historical research

Historical research is used in the methodology of this doctoral research both as a technique and as a method. The Sub-Section 3.4.1.3 illustrated the use of historical research as a technique within the case study design for the data collection. The present Sub-Section will focus on the use of historical research as a method for responding to the S.Q.1., S.Q.2. and S.Q.3.

Defining historiography which is the term most associated historical research, Lundy (2008, 396) states: *"Historiography goes beyond data gathering to analyse and develop theoretical and holistic conclusions about historical events and periods. It includes a critical examination of sources, interpretation of data, and analysis that focuses on the narrative, interpretation, and use of valid and reliable evidence that supports the study conclusions."*

Examining a practice which is bound intrinsically with the sociocultural and historical milieu of the past, historiography is considered the most appropriate method for providing a contextual link of the past to the present and exploring the issue under investigation. As such it was used as a principal method for exploring the state of Industrial Heritage Reuse practice in Europe during the past fifty years (S.Q.1.) the Factors influencing the outcome of Industrial Heritage Reuse practice (S.Q.2.) and the shifting role and influence of the involved Actors (S.Q.3.). Drawing from a combination of primary and secondary sources and joining this data with evidence collected by the case study research, data and theory triangulation was secured. The analysis of the collected data involved their assessment and the verification of the soundness of interpretations created from that evidence via triangulation. Finally, through the interpretation of the evidence a holistic, well investigated and well documented narrative was constructed in the form of a report (Groat and Wang, 2002, 137, 165-167).

3.4.2.1 Stages of historical research method

The stages followed for the historical research design were the following:

- **Stage 1.** Literature review on the development of the theoretical and practical framework of Industrial Heritage Reuse in Europe, the role and influence of the involved Actors and the influencing Factors on the practice.
- **Stage 2.** Development of a set of propositions based on the conclusions of the literature review (see TEXTBOX 3.1), serving as a guide for the data collection process and the interpretation of results.
- **Stage 3.** Data exploration and collection. Data sources included various documents including books, scientific journals, organisation documents, exhibition catalogues and newspapers. Also, the reports produced by the case studies of best practice served as secondary sources of data.
- **Stage 4.** Evaluation of data, analysis, formation of generalisations and consultation of multiple lines of theory for structuring results and arriving to conclusions.
- **Stage 5.** Report compilation describing the findings along with their interpretation, providing detailed supportive evidence in defence of the conclusions.

3.4.3 Qualitative research Interviews

Interviews are used as a pivotal instrument of this research, both as a method for soliciting information about S.Q.3 and as a technique within the case study method. The choice of interviews as a method and technique stems from the very nature of the research questions and the purpose of the study. S.Q.3 reflects the author's intention to explore certain stakeholders' perceptions as well as the way that they make sense of their own circumstances. Interviews are thus the most appropriate method for acquiring this type of qualitative information.
Aiming at a holistic exploration of the involved Actors' views, the author interviewed the whole array of stakeholders, ranging from specialists to the public. Engaging with such a diverse spectrum of people required a well organised yet flexible approach.

In what follows the formulated structured strategy used during the interviews for the development of the data collection instrument, is presented.

— **Interview protocol**
The first step was to formulate a basic interview protocol (see Appendix 2) which specified the intended interviewee groups [Who?], the rationale for the interviews [Why?] and the instruments used for each interviewee group [How?].

— **Formulation of broad themes of the questions**
The second step was the formulation of the broad themes of questions, namely:
  — the role and influence of key stakeholders in the practice of Industrial Heritage Reuse in the countries under investigation;
  — the achievements, problems, shifts and the specific developments taking place in the selected countries related with the care and Reuse of Industrial Heritage;
  — The preparation, decision-making process and the occupation and management phase of best practice cases, the stakeholders' responsibilities, contributions and aspirations and the stakeholders' rate of (dis)satisfaction over the outcome of the Reuse.

— **Formulation of specific questions that address key issues under investigation**
The aforementioned categories were analysed into specific questions, forming broad pilot questionnaires.

— **Customisation of the questions and formation of various types of questionnaires**
A reflection on the pilot questionnaires showed that some of them were comprehensive yet too extensive and too complicated, especially for some stakeholders unfamiliar with heritage and architecture terminology. The need to customise the pilot questionnaire according to the level and background of the respondents (Lune and Berg, 2012, 123) led to the formation of four different types of questionnaires. At that point it became clear that it was not feasible nor necessary to conduct face to face interviews with all the groups of stakeholders. Thus, the questionnaire Type 4 was designed as an instrument of online survey or fill-in questionnaire.

— **Testing and Amendments**
Before using the questionnaires for interviewing stakeholders a double stage testing was performed. Firstly, the questionnaires were reviewed by the researcher's supervisors, a specialised methodology academic (Dr. Maartje van den Bogaard) as well as fellow PhD students of TUDelft following the course "*How to make a questionnaire and conduct an interview (C4.M1)"*. Their comments helped to identify double-barrelled questions (Lune and Berg, 2012, 126) enhancing the structure and making the questionnaires more concise as well as clarifying vague questions. After these amendments a pilot interview was conducted in order to identify possible problems that might arise.

— **Final interview protocol**
The last step that preceded the interviewing and surveying of the stakeholders was the refinement of the interview protocol. The draft protocol formulated in the first step of this process was complemented with additional information and enriched with the formatted version of the questionnaires. The final interview protocol and the questionnaires used are presented in the Appendix 2.

3.4.3.1 Types of interviews and use of the data collection instrument

It is worth highlighting that all interviews conducted face to face were semi standardised (Lune and Berg, 2012, 109-115). That left the freedom to digress from the predetermined questions acquiring more information where possible and necessary, perusing areas spontaneously initiated by the interviewees. Furthermore, some key respondents who had a long involvement in the subject of research and at the same time were stakeholders in one of the cases of best practice were asked to respond to more than a single questionnaire.

Special attention was given to language issues for soliciting the most complete and accurate account of information. The vast majority of the interviews were taken in the language of the interviewees. The only exception to that were the interviews taken in the Netherlands due to the lack of fluency of the author in Dutch. Nevertheless, in the cases of Dutch interviewees unable to respond in English, a fill-in questionnaire was used translated in Dutch. In this manuscript all non-English quotes have been translated by the author (T. Chatzi Rodopoulou) unless otherwise stated.

For the needs of this research 226 face to face and 8 telephone interviews were taken in three languages while 82 people answered the on-line survey in four languages (Table 3.4). A detailed list of all the individuals interviewed during this doctoral research is presented in the Appendix 4.

TABLE 3.4 Analysis of interviews types per country conducted during this doctoral research

Country	Face to face interviews	Telephone interviews	Online survey	SUM
UK	57	7	16	80
The Netherlands	57		47	104
Greece	66		8	74
Spain	45		11	56
Germany		1		1
France	1			1
SUM	**226**	**8**	**82**	**316**

3.4.3.2 Analysis of qualitative interviewing data

After the data collection process, the preparation of interview transcripts and their review by the respondents, the analysis of the data acquired by qualitative interviewing followed. The theory of content analysis[18] (Lune and Berg, 2012, 153-157, 353-380) was applied for the latter. Firstly, categories were developed for ordering the data. In most cases, those stemmed from the design of the interviews, which was already structured. Nevertheless, in the cases of interviews of specialists or stakeholders with multiple roles, the category building presented challenges. In such cases category development stemmed from theory building.

The next step was the close examination of the transcripts, their annotation and reduction to short answer excerpts which were in turn ordered in the aforementioned categories. That facilitated on the one hand the counting of elements in the case of quantitative content analysis (e.g. positive/ negative features of the outcome of the Reuse) and on the other, the formation of patterns.

18 Content analysis is a careful detailed, systematic examination and interpretation of a particular body of material in an effort to identify patterns, biases and meanings (Lune and Berg, 2012, 349).

3.4.3.3 Stages of qualitative interviewing method

The stages followed for the application of the qualitative interviewing method were the following:

- **Stage 1.** Preparation of interview protocol
- **Stage 2.** Interviewing subjects in the UK (Summer 2015), the Netherlands (Summer-Autumn 2016), Greece (Spring-Summer 2017) and Spain (Autumn 2017)
- **Stage 3.** Preparation of interview transcripts and reviewing by the respondents (excluding the anonymous respondents)
- **Stage 4.** Content analysis
- **Stage 5.** Report compilation, describing the findings along with their interpretation, providing detailed supportive evidence in defence of the conclusions

3.5 Research design

As mentioned in the previous Sections, the complex array of research sub-questions calls for a mixed method research design. In what follows the research design formulated for this doctoral research is analysed, presenting all stages from the preliminary steps of exploratory literature review to the production of the research results.

STAGE 1_Exploration

The first stage of the research involved an extensive literature review on the theoretical (international conservation charters, conservation and Reuse concepts)(see Ch.2) and practical framework of Industrial Heritage protection and Reuse (anthologies of cases studies)(see Ch. 4). That exploratory step served as a basis for the problem definition and the formation of the preliminary research question presented below:

"What does the current spectrum of Industrial Heritage Reuse in Europe cover, how has it been formed during the last fifty years and how can it be evaluated?"

The second step of Stage 1 involved a more focused literature review on the subjects of:

A heritage conservation theory (contemporary framework, shifts and current demands)
B theoretical approaches and practical application of Industrial Heritage Reuse in Europe and the USA
C the Factors and Components influencing the outcome of Industrial Heritage Reuse
D the role of the Actors involved in Industrial Heritage Reuse

The objective of this stage was to gain a deeper understanding of the shifts and the evolution of the theoretical and practical approaches related with Industrial Heritage Reuse as well as the delineation of the role of main stakeholders. The findings of this study also suggested the need for an in-depth research into the influencing Factors and Components of Industrial Heritage Reuse.

That step allowed to narrow down the problem, leading to the formation of the theoretical propositions presented in TEXTBOX 3.1.

In turn, the former preliminary research question was fine-tuned giving way to the main research question and its analysis in sub-questions (see § 3.2.2).

STAGE 2_Preparation

The second stage of the research involved the delimitation of its scope, the design of the research methodology and the formulation of the instruments of data collection.

In detail, through the replication logic and the criteria analysed in the Sub-Section 3.4.1.1, the research was focused into the analysis of specific countries. Moreover, the screening process presented in the Sub-Section 3.4.1.2 guided a focused literature review on examples of Industrial Heritage Reuse in Europe, resulting in the matrix of Industrial Heritage cases.

Before exploring any case study or interview any subject, a case study and an interview protocol were formulated.

STAGE 3_Focusing

The third stage of the research involved the identification of the most suitable case studies of best practice. As explained in the Sub-Section 3.4.1.2, that was achieved with the application of the Delphi technique. The same technique was used to enrich the author's understanding on the synthesis of the stakeholders' team in each country.

STAGE 4_Data collection

The fourth stage involved the data exploration and collection for the historical research and the field research, including the selected case study inquiry and the qualitative interviewing.

The organisation of the data collection followed a four-partite structure, starting from the UK (Summer 2015) and continuing to the Netherlands (Summer-Autumn 2016), Greece (Spring-Summer 2017) and finally Spain (Autumn 2017). The process required a period of more than two years.

The research on the UK, the first country under investigation, served as a testing ground for the efficiency of the methodology and the instruments of data collection, highlighting at the same time limitations and difficulties of the field research and archival research. The lessons learned from this first field trip were used for refining methodology details and optimising the data collection in the following areas of investigation.

Upon the closure of the data collection in each country, the collected information was organised per case study or theme and transcripts of the interviews were prepared. Furthermore, part of the collected data was analysed leading to preliminary interpretations which further informed the data collection of the following countries.

STAGE 5_Analysis & Synthesis

The data collected in the previous phase of the research was analysed in stage 5. Firstly, the information collected during qualitative interviews was examined through content analysis. The data was organised in matrixes according to a set of categories. The qualitative information was coded and interpreted, while the quantitative data was visualised in the form of graphs (see introductory and closing graphs in each case study in Volume 2).

Secondly, the data collected during case study research were examined. Before the actual analysis of the case study evidence, a process of data organisation and classification was performed. The information was organised in chronological order, a set of categories was defined; the evidence was placed into those categories while data displays were created, too (Yin, 2009, 103).

The following step involved the production of case study reports of the selected countries and the selected cases of best practice. That required the analysis of the embedded historic research. Also, insights from the content analysis of qualitative interviews informed the case study reports. Upon the completion of the case study reports (see Volume 2), the case study analysis began, using the strategy of explanation building (Yin, 1994, 110). Following that, the historical data which were not embedded to the case studies were analysed and interpreted.

Lastly, when required by the methodology, the results stemming from the analysis of the various methods used were synthesised. At that stage revisiting theory for cross-referencing findings was considered essential.

STAGE 6_Conclusion and dissertation compilation

The final stage of the research design involved the generation of conclusions, responding to the main research question and the compilation of the dissertation.

Dissemination

Given that generating awareness on the Industrial Heritage protection and Reuse practice was among the goals of this research, special attention was given to the communication of its products. The dissemination of the research' output started well ahead its completion. The output was structured in multiple forms accessible to all stakeholders involved with Industrial Heritage care and part of the future practitioners, too (Table 3.5). The Table below presents the communication of the interim research products in various events in relation to the attending stakeholders.

TABLE 3.5 Dissemination of interim research output

Stakeholder	Interim public research output			
	Conference & Seminar presentation	Article publication	Online knowledge platform	Course
Specialist/ Scholar	x	x	x	(x)
Practitioner	(x)	x	x	
Public			x	
Student	(x)	x	x	x

3.5.1 Methodology scheme: from a ladder to a spiral approach

The structure of the methodology and the employment of case study research necessitated the formulation of a circular process and the repetition of stages 2-4 for each case study of the level B (TEXTBOX 3.2). As shown in the Figure 1.2, the goal was to implement all stages (2-5) for every case before proceeding to the next one. This was attempted in the first case under investigation and proved to be inefficient. That is why the analysis of all the cases investigated finally took place after the completion of the data collection, in the sixth semester of the PhD programme (FIG. 3.3). In order to disseminate the output of the research during the second and third year of the programme, selected parts of the collected data were analysed leading to preliminary conclusions.

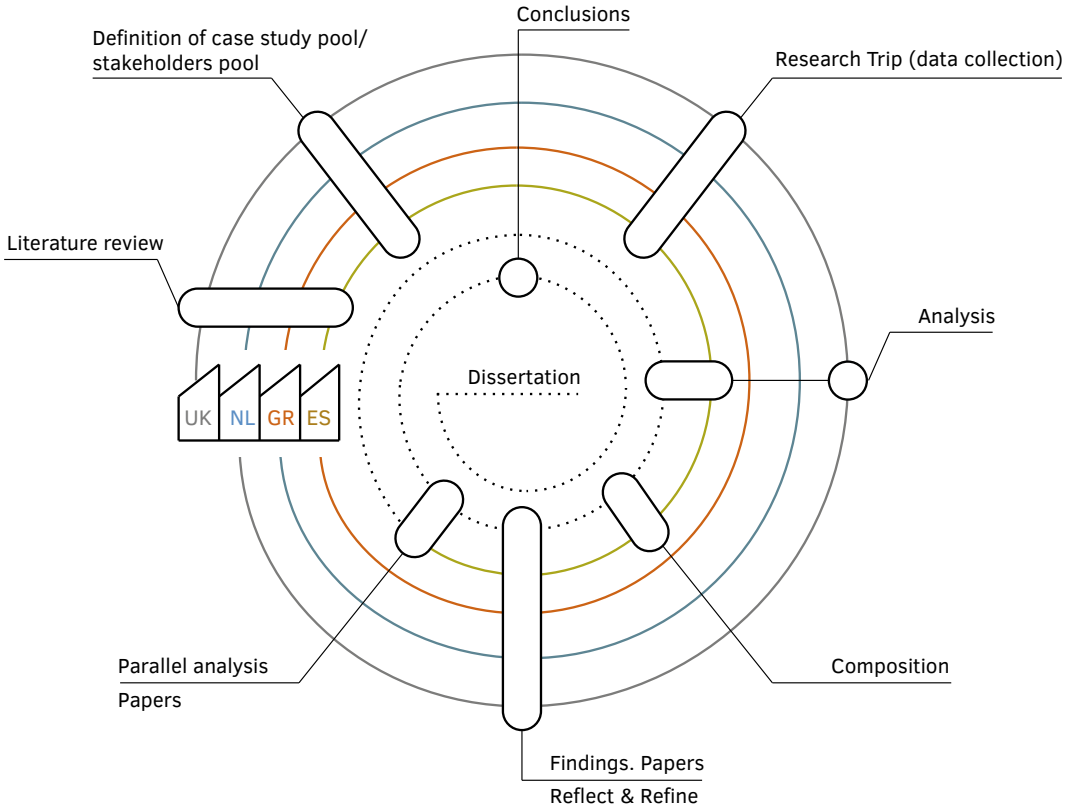

FIG. 3.3 Analysis of Methodology stages for the case study research as implemented.

3.6 Usefulness, potential and limitations of methodology

The research methodology analysed in this Chapter is not merely an adaptation from similar types of investigation but an actual product of this dissertation. Its originality lies mainly in the combination of methods and techniques of research and analysis as well as in its application in a vast field of inquiry. The research methodology presents multiple merits. Firstly, it allows the investigation of a complex and multileveled subject of research, meeting the research quality standards of internal and external validity, reliability and objectivity (Groat and Wang, 2002, 34-40). The mixed method research design on the one hand secures methodological, theory and data triangulation, which strengthens the findings of the research. On the other hand, it complements the strengths of each method while reducing biases or deficiencies caused by using only a single method of inquiry (Given, 2008, 892).

Secondly, through field research, including case study field trips and interviewing, the designed methodology offers much more than a collection and reinterpretation of existing literature, bringing to light a vast volume of original evidence. That -among other information- includes the views and perspectives of the full array of Industrial Heritage Reuse involved Actors, many of which are rarely brought forward. Furthermore, extending in four countries, the methodology design permits the presentation of evidence in the English language that were previously only available to a narrow audience (e.g. Greek speaking and Dutch speaking population) due to language restrictions.

Thirdly, the methodological approach takes into account all the demands analysed in Section 2.7. The subject under investigation is examined through the prism of latter, aiming at providing the scientific discourse with topical missing answers.

Fourthly, besides the generation of the research products, presented in Chapter 8 of this dissertation, the methodology in question offered important 'by-products' including the "ReIH online knowledge platform" and the Register of best practice case studies of Industrial Heritage Reuse (Volume 2 of the dissertation). Those have a threefold contribution. They raise awareness over the subject of the research amongst interested parties; they inform future initiatives being a useful point of reference for practitioners and serve as a solid basis for future research.

Lastly, the methodology is transferable to similar lines of investigation. It can be a valuable strategy for the research of complex phenomena taking place in the present and recent past in a multinational setting.

Apart from its merits however this methodology was also subject to limitations. The PhD programme timeframe and the available resources imposed certain restrictions to various stages of the research design. Initially, in respect to the level of analysis B. the research was not possible to analyse in depth key countries forerunners, such as Germany and France, that along with the UK have contributed great deal to the care and Reuse of their Industrial Heritage. It is strongly recommended that future studies employed a similar analytic approach on those countries as they are indisputably important sources of information for the subject in question.

Moving from the preparation to the data collection phase, it should be stressed that it was not possible to examine all countries simultaneously. The field research required more than two years for its completion. This is seen as a weakness given that the reused buildings under investigation are 'living organisms', frequently subjected to change. Therefore, it is worth mentioning that the

analysis of the cases of the first countries extends to the developments taking place until the year they were examined. Therefore, any possible shifts that might have taken place after the field research hitherto have not been included in the case study reports.

In respect to the analysis phase, the lack of resources did not allow the use of professional software for the production of interview transcripts. As a result, the transcription of 234 interviews consumed considerable time causing delays. Finally, it was impossible within the timeframe and the scope of this dissertation to find precise financial details for all twenty case studies. The figures that were identified however are presented within the case studies reports.

Despite the above, the merits of this methodology largely outweigh its limitations, making it both a valuable action plan for answering the research questions of this doctoral study and a useful strategy for future research.

TOC

4 Industrial Heritage Reuse practice in Europe

4.1 Introduction

In the previous Chapters the evolving theoretical framework of conservation and the position of Industrial Heritage (Ch. 2) as well as the research design and methodology of this dissertation (Ch.3) were discussed. This Chapter will analyse the evolution of Industrial Heritage in Europe, both in its recognition and its Reuse practice. This analysis will cover all the three groups of countries identified in relation to the chronological evolution of Industrial Heritage care practice, namely 'pioneers', 'followers' and 'latecomers'. This Chapter aspires to answer the S.Q.1 of this dissertation:

'How has the current state of Industrial Heritage Reuse practice been formed as an accepted form of heritage conservation during the last fifty years in Europe?'

Section 4.2 will provide some essential background of the eras of industrialization and deindustrialization, setting the scene for future developments. Section 4.3 will offer a rough picture of the action taken in countries-forerunners in the field of Industrial Heritage Reuse with special emphasis in Germany and France. Section 4.4 will analyse in detail the development and current state of the reused Industrial Heritage in the four selected countries, ranging from pioneers to latecomers in the practice. Section 4.5 will present the results of the cross examination of the selected countries' analysis, identifying the main shifts that have occurred in the European Industrial Heritage care and Reuse practice overtime as well as the related challenges each country is facing at present. Finally, Section 4.6 will summarise the main findings of the Chapter.

4.2 Industrialization and deindustrialization in Europe

Before diving into a detailed analysis of the evolution of the care and Reuse practice in Europe, some background information for the eras of industrialisation and deindustrialisation in the continent and beyond will be offered. This is deemed essential as it will facilitate the understanding of the developments occurring in the following period, that falls in the scope of this dissertation.

Industrialisation, which involved the transformation of agricultural societies into industrial ones, has been defined as a revolutionary process that changed radically the face of the world. The industrial revolution began in the 1760s in Britain with the introduction of the steam-powered machine for mass production and new infrastructure. In the 19th century it spread at different speeds across Europe, the US and Japan (Allen, 2017). Industrialisation was marked by the passing from muscle, wind power and hand tool technology to machine-based technology, for which large scale use of new energy resources and huge capital investment were required. It was also marked by the birth of the factory system which constituted a new organisation of work, based on the division of labour. The industrialisation process involved far reaching shifts in the social, political and economic realms, too. The emergence of new social classes, new political and economic systems redefined every facet of society (Albrecht, 2012, 17-23).

Along with the above, industrialisation deeply affected the built and natural environment as well as the development of cities, as the new factories attracted thousands of workers, who needed a home. The unprecedented migration from the countryside to the cities rose new challenges in city planning and policy (Berens, 2011, 18). Large-scale landscape changes took place as a result of industrial activity which included the establishment of new settlements around new industrial cores, the opening of new transportation routes, the massive exploitation of natural resources for energy production and the extraction of raw materials. New industrial towns, canals, dams, railroads, harbours, mines, mills and factory complexes left visible marks on the natural and manmade landscape of the industrialising world. Those developments were often accompanied by pollution and demolition of traditional farmsteads. New building and installation typologies emerged, altering or defining the structure, form and aesthetics of the old and new cities respectively (Bergeron, 2012, 31-37).

The radical and profound transformations brought in society and the environment by the industrial revolution, caused a counter reaction in the mid-19th century, that praised the traditional arts and crafts and sought to protect the historic buildings and scenic landscapes as collective heritage: the Arts & Crafts movement and the Conservation Movement (Glendinning 2013, 123). In this context, the buildings and sites that were associated with the first phase of industrialisation and its negative side-effects, were detested if not demonized as intruders of the assumed harmonious pre-industrial environment.

Nevertheless, industrialisation, urbanisation and radical renewal in technology and production went on during the 20th century. This process also spread –partly in the aftermath of decolonisation since the 1960s and 1970s– to the so-called developing countries in Asia. As labour was relatively cheap there, many West European industries began to outsource their production activities and to abandon their previous premises.

The consequences of industry's mass exodus from the industrialised world to the developing countries in the late 20th century, had an analogous gravity to the repercussions of industrialisation.

Deindustrialisation caused a severe economic shock that took decades to overcome, involving deep restructurings of national economies and shifts in employment following prolonged periods of decline and unemployment. Furthermore, deindustrialisation had a serious and prolonged social, political and cultural impact principally on the lives of the workers and the communities dependent on the industrial sector and secondarily on the society of the industrialised world as a whole. The abrupt closure of industries, that were the common denominator of industrial communities, resulted in the loss of their shared identity and in turn in the shattering of social networks. Feelings of loss of confidence and pride, betrayal and mistrust in institutions led the former industrial communities into a downward spiral. Unemployment, dislocation and alienation had a ripple effect causing elevated rates of poverty and crime (Moller, 2008, McLachlan, 2018).

The radical shifts provoked by the deindustrialisation process affected profoundly once again the built and natural environment. Massive areas in the inner cities were turned into black holes of the urban fabric, industrial cities lost their raison d'être while whole industrial regions were surrendered to abandonment and decay. The structures and equipment, that were once the motors of progress and wealth, were left as sad carcasses to rot and rust (Berens, 2011, 19).

The road from the demonization and loathing of those industrial relics to their appreciation, transformation and reintegration in the built and social fabric was long and bumpy. As demonstrated in the following Sections, every country followed its own way, taking its first step at different times.

4.3 Historic development of Industrial Heritage protection and Reuse in Europe

Europe, as described above, has been established as the birthplace of industrialisation. However, it cannot claim the title of the vanguard of Industrial Heritage transformation, too. The practice of Industrial Heritage Reuse and regeneration is employed for the first time in the US in the late 1950s. Early notable examples include the regeneration of historic harbours in Boston, Baltimore, New York, San Francisco and Lowell, Massachusetts (Stratton, 2000, 13). While local politicians and developers were transforming waterfront areas, using federal and city funds, an informal wave of squatters, alternative artists and other social groups, with or without political agendas, started reusing abandoned industrial sites in city centres, shifting gradually the perception of the public opinion for the value of these enclaves. Noteworthy examples of early Industrial Reuse projects include the Ghiradelli chocolate factory in San Francisco and the Andy Warhol's Factory in Soho, NY in the 1960s (Baum and Christiaanse, 2012, 14, Cossons, 1993, 4). The emerging trend of Industrial Heritage Reuse practice quickly crossed the ocean, influencing developments in Europe.

The 'Old World' at the time was facing the dramatic repercussions of deindustrialisation that had started in the 1960s, reaching its crescendo in the 1970s and 1980s. The most frequent reaction of the European governments to the mounting industrial wastelands in the first period of deindustrialisation was their levelling. The destruction wave though that devoured or threatened to engulf important symbols of industrialisation raised concerns and was met with opposition. Starting from the big industrial nations that had received the largest blow during deindustrialisation, the opposition was transformed into a fierce movement that fought for the safeguarding, protection and conservation of

the legacy of industrialisation. Gradually, from the 1970s on most western European governments, influenced by the movement and the US experience, started changing their course of action.

The transition from the demolition to the valuation, protection and Reuse of Industrial Heritage required decades and took place at different times in each European country. The UK, Germany, France and Belgium were among the pioneers of Industrial Heritage care in Europe. Countries such as the Netherlands quickly followed the steps of the precursors while others needed more time to adjust. The developments in the former countries have been widely discussed in a vast number of publications. In contrast, relatively little is known for the action of the latter. For painting a comprehensive picture of the shift of industrial remains from a menace to an asset in a European level, the action of the whole range including pioneer, follower and latecomer-countries will be analysed. The retrospective review of the selected European countries' action will provide an insight to the influence of broader contextual developments in the practice of Industrial Heritage Reuse.

4.3.1 Countries pioneers

In a quest to recover from the trauma of deindustrialisation, the large European industrial nations were the first where the value of the vestiges of industry was recognised and actions were taken for its care, setting an example that influenced a change of perception across the continent and beyond. The pioneering country of Industrial Heritage conservation and Reuse is the UK; its evolution will be discussed in detail in the Sub-Section 4.4.1. For a general backdrop of the UK's forerunner's position, the evolution in two other large industrial countries, Germany and France, will be briefly sketched below, despite not being in the focus of this research.

4.3.1.1 Germany

Germany, was – and still is – an industrial nation of international importance and so is its related Industrial Heritage. Yet, the evolution in, firstly, the recognition of the heritage values of industrial sites and, next, the practices of Reuse shows a great heterogeneity. This is partly caused by the nation's complex history – marked by two World Wars, the following division during the Cold War and reunification in 1989 – and partly by the current decentralised legislation on heritage conservation.

During the interwar period, the first nationwide survey on technical monuments was initiated by the national Association of German Engineers. Its 1927 Annual meeting was devoted to technical history and contained numerous examples of *'Technische Kulturdenkmale'* (cultural monuments) from the most heavily industrialised regions of the country, as a counterpart of the already inventoried '*Kulturdenkmale'*. The following year a working group was formed, in which also the Deutsches Museum von Meisterwerken der Naturwissenschaft und Technik (German Museum of Masterpieces of Sciences and Technology) and the Deutsche Bund Heimatschutz took part. However, the resulting publication in 1932 did not receive a great resonance at the time, although incidentally some technical monuments and machines were preserved mainly dating from the pre-industrial period (Kierdorf and Hassler, 2000, 34-57).

After WWII, which had brought enormous destructions and victims, not only the demarcation of the territory of Germany was changed, but also its geopolitical situation. The nation was subdivided into an eastern bloc where the German Democratic Republic (GDR) was established under the

influence of the Soviet Union, and a western bloc where the Federal Republic of Germany (FRG) was formed, with west Berlin as a 'free foothold' in the east. Already from 1951 on, systematic records of technical and industrial sites were set up in the GDR under the State's initiative, aiming at a new socialist narrative. Since 1952, the category of 'technical monument' became part of the GDR's Regulation for the preservation and conservation of cultural monuments. In the following decades the recorded assets were classified and listed as Industrial Heritage. In 1979, the GDR counted thirty-seven listed industrial monuments and ten years later a few hundred (Steiner, 2011, 106-107).

The FRG, following the conservation tradition of Western Europe that was largely scorning industrial structures as an inferior building stock, only started to shift its perception by the late 1960s. Influenced by the developments in the GDR and reacting to the wave of demolitions that were engulfing historic industrial landscapes, public resistance grew, giving rise to the movement of 'Industriekultur'.[19] Pioneers of this movement were artists, journalists and scientists such as the photographers Hilla and Bernd Becher and the social scientist Hermann Glaser (Kierdorf and Hassler, 2000, 120-121).

The local communities' struggles found resonance in the State of North Rhine-Westphalia (NRW) that achieved the first breakthrough. In 1970, it published a political agenda for the period 1970-1975 with the intention to record industrial monuments and finance preservation measures. This example was followed by all West German federal states in the following years. Another important contribution of the NRW programme was the transformation of a number of Industrial Heritage sites, such as the Zollern colliery in Dortmund, into the first industrial museums of the country (Steiner, 2011, 108).

After the re-unification of Germany in 1989 Industrial Heritage care became an intrinsic part of the sixteen federal states' duties. This has resulted in a wide differentiation in conservation laws and assignment rates from state to state. To this day, fourteen States Ministries serve as Upper Conservation Authorities, whereas North Rhine-Westphalia and Schleswig-Holstein (with Hanseatic city of Lübeck) are each governed by two lower conservation authorities. A specialist partner of all federal conservation organizations with a national scope is the Association of State Conservationists (VdL). VdL established the working group on Industrial Heritage in 1983, that serves as a nationwide information exchange platform on Industrial Heritage (VDL Vereinigung der Landesdenkmalpfleger, n.d.).

According to A. Föhl, Industrial Heritage specialist since 1974 and editor of the Technische Denkmale im Rheinland publication in the Arbeitshefte series,

"It can be said that Germany over the last 50 years has become a leading nation concerning the preservation of the Industrial Heritage. The positive economic situation allowed for the spending of generous sums for this activity, mainly in the 1970s and 80s. The scale of the objects was steadily increased […]. A broad variety of reuse concepts has been developed ranging from water towers, textile factories, slaughterhouses or industrial halls to sites measuring hundreds of hectares like coal mines and iron works." (Resp. no 315, interview, 21/11/2017).

19 " 'Industriekultur' understood as a concern for all aspects of the cultural history of the industrial era, combines the history of technology, culture and social life and encompasses everyone in the industrial society, their daily lives as well as their living and working conditions." (Grossewinkelmann, 2012, 189).

Undoubtedly the most important and influential contribution of the country worldwide in the practice of Industrial Heritage Reuse, is the case of the Ruhr region regeneration. From 1989 to 1999, in the framework of the International Building Exhibition IBA Emscher Park urban restructuring programme, more than 100 projects were realized in 19 cities and towns in the former coal and steel production zone of the Ruhr region. The regeneration project of 570 acres was funded by the state with a budget of 2.3 billion EUR. Through a process of participation of the municipal governments, industrial corporations, civic associations and the local community, the formerly derelict wasteland was incrementally transformed into an attractive destination within a decade. The Ruhr region strengthened its economy while retaining its identity and the industrial landscapes conveying it. Flagship projects such as the Zeche Zollverein (World Heritage site since 2001) and the Duisburg-Nord Landscape Park serve as references combining surprising programmes and a range of conservation approaches. The heritage tourism model of the *'Route der Industriekultur'* developed in the Ruhr region, inspired the concept of European Route of Industrial Heritage (ERIH), launched in 1999 and further recognised by its designation as a Cultural Route by the Council of Europe in 2019.

Between the wide array of Industrial Heritage Reuse examples in Germany the projects of Speicherstadt in the HafenCity district in Hamburg (World Heritage site since 2015), Electropolis in Berlin and (IBA) Fürst-Pückler-Land in Brandenburg stand out. It is worth stressing that the German contribution to the Industrial Heritage Reuse practice features landscape scales and the conversion of both 19th and 20th century industrial sites.

The German industrial legacy has a recognised worldwide importance and it is represented in the World Heritage List with six inscriptions including, apart from the two aforementioned sites: the transnational Erzgebirge/Krušnohoří Mining Region, the Fagus Factory in Alfeld, the Völklingen Ironworks as well as the Mines of Rammelsberg and the Historic Town of Goslar and Upper Harz Water Management System (UNESCO World Heritage Centre, 2019b).

4.3.1.2 France

France, another industrial giant of Europe, was also among the first European countries to care and reuse its Industrial Heritage. Until the 1970s the perceptions of the cultural value of industry in the country were divergent. *"Between rejection and fascination, pride of work for some, evocation of the suffering it causes for others, wastelands unleashed passions."* (Real, 2015). The levelling of Baltard's 19th century 'Les Halles' complex though in 1971, a historic wholesale market in the heart of Paris that fell prey to the populistic modernist and hygienist arguments of the era, changed mentalities abruptly (Berens, 2011, 54-55). Within a climate of destruction, owed to the progressive deindustrialisation, a fierce advocacy movement in favour of Industrial Heritage was born in France.

In contrast to the British situation that will be analysed in Sub-Section 4.4.1, in France the key Actors who recognised the value of abandoned former industrial buildings and their capacity to accommodate new uses, were mainly academic researchers, historians and architects. Since the 1970s, historians, such as Maurice Daumas and Luis Bergeron, Serge Chassagne and Denis Woronoff, largely contributed to the research of industrial relics, to the introduction of industrial archaeology studies in the higher education curriculum and to the establishment of advocacy associations in France. At the same time, the architects Bernard Reichen and Philippe Robert, who are portrayed as the forerunners of the movement, engaged in influential Reuse projects (Smith, 2012, 86-87).

In detail, the conversions of Le Blan spinning mill in Lille (1977) and the Blin and Blin factory in Elbeuf (1979) into residential-led mixed use developments, played a decisive role in the propagation of the Reuse practice, that was unknown at the time in France. The phenomenon of creative factories also affected France in the 1970s and found wide application until the turn of the century.[20] Furthermore, the rescue of buildings of monumental scale, such as the Orsay train station and the halls of La Villette in the French capital in the early 1980s, highlighted the potential of industrial relics and sanctified the Reuse practice, giving the impetus for its proliferation (Real, 2015).

The 1970s saw the establishment and multiplication of advocacy associations, too. Their endeavours were focused around the safeguarding of buildings in danger and the creation of Ecomuseums. The first Ecomuseum was founded in 1973. Since its establishment, 'Le Creusot', has inspired a number of industrial museums and open-air museums in France and abroad. By the end of the decade the voices of the outcry against the destruction of Industrial Heritage were united under CILAC (the French National Association for Industrial Archaeology). The organisation remains active to this day (CILAC, n.d.)

The French State remained indifferent and in some cases opposed the rising safeguarding and Reuse movement of industrial relics during the 1970s. A political change in the beginning of the following decade though led to a notable change of attitude. With the creation of the 'Industrial Heritage' team in the sub-directorate of the General Inventory of Monuments and Artistic Wealth of France (Sous-direction de l'Inventaire général des monuments et des richesses artistiques de la France) in 1983 and the provision of large sums of money, the new government actively encouraged the study and protection of the French Industrial Heritage. The team coordinated the first thematic studies and compiled a rapid and exhaustive inventory of the industrial, movable and immovable heritage (Smith, 2012, 89).

The knowledge gained from this field survey enabled the selection of buildings for listing. From the mid-1980s until the financial crisis of the late 2000s, the number of inscriptions of industrial sites increased. The 1980s and 1990s was a militant period when it was necessary to convince authorities that Industrial Heritage was worth keeping. Those attempts led to a relatively early awareness and appreciation.

In regard to the practice of Industrial Heritage Reuse, it proliferated after the establishment of the first creative factories and the first experiments of Reichen and Robert with collective housing. Textile mills, food processing complexes and warehouses were the typologies that became objects of conversion in large numbers. The prevailing new functions of the converted industrial sites were primarily cultural[21] (with museums and cultural centres being the most typical uses), economic,[22] residential[23] and

20 Characteristic examples of conversions to creative factories include 'La Cartoucherie de Vincenne's (1970) and the 'Frigos' in Paris (1980), 'La Friche la Belle de Mai' in Marseille (1992) and the 'Main d'œuvre' in Saint-Ouen (1998).

21 A characteristic example of conversion to cultural functions is 'Le tissage Roussel' in Roubaix (1999) while important examples of industrial museums include 'Le centre historique minier de Lewarde' (1984), 'Le musée de la Corderie Vallois'in Notre-Dame-de-Bondeville (1994) and 'La Cité internationale de la dentelle et de la mode' in Calais (2009).

22 Characteristic examples of conversions to office and business uses include the offices of BNP-Paribas Securities Services in the Grands moulins de Pantin (2009), the headquarters of Nestlé France in the Noisiel factory (1996) and the Cité du Cinéma in the power plant Centrale Saint-Denis II (2012).

23 A number of mills have been converted to different types of residential complexes including collective housing (e.g. Prouvost factory in 1984); social housing (e.g. the Berger and Cie spinning mill in Rouen), lofts (e.g. Hellemmes lofts programnes in 2003 and 2010) and retirement homes, such as the 'Trie-Château' spinning mills in Oise and the 'Mozac' in Puy-de-Dôme (Mettetal, 2011).

educational.[24] Industrial Heritage Reuse projects were largely developed by local authorities, companies, owners, public institutions of inter-municipal cooperation and associations (Mettetal, 2011).

The magnitude of the French preserved Industrial Heritage is represented in the Wold Heritage List with five inscriptions (From the Great Saltworks of Salins-les-Bains to the Royal Saltworks of Arc-et-Senans, the Production of Open-pan Salt, 1982, 2009; Canal du Midi, 1996; Bordeaux, Port of the Moon, 2007; Champagne Hillsides and Houses and Cellars, 2015) with the most important and vast being the Nord-Pas de Calais Mining Basin (2012) (UNESCO World Heritage Centre, 2019a). The latter is of special interest as, apart from preserved industrial sites, it includes a landscape approach of regeneration with numerous converted structures and reclaimed countryside (Mission Bassin Minier Nord - Pas de Calais et al., 2015).

4.4 Evolution of Industrial Heritage protection and Reuse in the selected countries

After the short introduction to the actions in pioneer countries, a more detailed overview of the developments pertaining to Industrial Heritage care and Reuse in the four countries selected will follow. Starting with the UK, the cradle of industrial archaeology and forerunner of Industrial Heritage care and Reuse practice in Europe, the evolution of the practice in the continent will unravel, through the detailed review of countries followers and latecomers. The process in each country is presented according to the same phases, spanning from the first signs of interest in the legacy of industrialisation (recognition), to the initiatives for Reuse (adaptation) and the current situation (post-adaptation). A short presentation of each country's industrialisation and deindustrialisation characteristics precedes the analysis for providing context. Across the Section 4.4. reference is made to the online knowledge platform 'ReIH' and to the selected case studies of Industrial Heritage Reuse, presented in the TEXTBOX 4.1 and analysed in detail in Volume 2 of this dissertation. The reader is advised to consult the platform: http://reindustrialheritage.eu/projects while reading the analysis, as it complements its findings with multiple examples of Industrial Heritage Reuse.

24 Noteworthy conversion to Universities and educational facilities include L'école d'architecture de Normandie (1984), the Université Jean Moulin Lyon III (1993), the Universite Paris VII (2007) and the École d'Architecture Paris-Val-de-Seine (2007).

TEXTBOX 4.1: OVERVIEW OF SELECTED CASE STUDIES

	United Kingdom	The Netherlands	Spain	Greece
Early cases	Ironbridge Gorge Museums (IGM)	Het Jannink	National Museum of Science and Technique of Catalonia (mNACTEC)	Centre of Technical Culture (CTC)
	Great Western Railway's Works (GWRW)	TextielMuseum Tilburg	Bodegas de Jerez de la Frontera (BJF)	Technopolis Athens
Later cases	Stanley Mills	Westergasfabriek	22@, Ca L' Aranyó	Lavrion Technological & Cultural Park (LTCP)
	Ancoats District	DRU Industriepark	La Tabacalera of Madrid	Tsalapatas Complex
Recent cases	King's Cross	Energiehuis	Bombas Gens	Mill of Pappas

4.4.1 United Kingdom

4.4.1.1 The industrialisation and the deindustrialisation of the UK

The UK holds a special interest when studying Industrial Heritage as it is a forerunner country -firstly with regard to the Industrial Revolution and its legacy and next to the initiatives aiming at Industrial Heritage Reuse. At the mid-18th century, a set of conditions converged, opening the way for the birth of the Industrial Revolution in Britain. Those were related with its technological, political, economic and social background and are analysed in detail in numerous works (Albrecht, 2012, 20, Trinder, n.d., Hudson, 1992). The pre-existing agricultural revolution and its outcomes as well as the possibilities offered by the British Empire had formed ripe conditions for the upcoming era of Industrialisation in the country.

A number of inventions of British engineers, such as the Spinning Jenny (1756), the piston steam engine (1712) and its improved versions (1720, 1763) offered another essential precondition for the development of industry and its diffusion. Those innovations combined with the managerial skills and the forward-looking attitude of British entrepreneurs who were backed by willing bankers and a stable and favourable political environment, triggered the revolution, propelling the UK at the wheel of industrialisation (Trinder, n.d., 3).

Britain entered the multileveled transformation in the mid-18th century and remained in the lead of the advancements of industrialisation up until the mid-19th century. Important developments that marked this first phase included the transfer from a charcoal-base to a coal-base manufacturing technology, the adaptation of the steam engine as the principal means of powering industries, the transformation of the ironmaking technology, the organisation of textile production in factories and the creation of new transport infrastructure (Trinder and Stratton, 1993).

The iron, cotton and coal industries were the main pillars of the British industrialisation in the 18th and early 19th century. The inventions of coke smelted cast iron production and forging by Abraham Darby I and Abraham Darby II in Shropshire, led to the manufacturing of key elements among which machines, structural parts of the new factories and rails. The first iron bridge in the world was built in the gorge of the river Severn in 1777-1781, giving its name to the area and serving as a reminder of Britain's industrial primacy (see Vol.2, Ch.1).

The first water powered cotton spinning mill was built in 1771, at Cromford, Derbyshire by Richard Arkwright. This multi-storey building typology that soon dominated the country, became the symbol of the Industrial Revolution. According to Trinder (1993, 754) *"The Textile Mill or factory set a pattern for the application of mechanical power and for the concentration and specialisation of work."*

The application of steam power in the cotton industry exploded the productivity of textile mills. By 1800, the number of steam engines was reaching 3000 in England alone (Trinder and Stratton, 1993, 236). The fuel of industrial revolution, which enabled the mass production of iron and the function of steam engines, was coal. This mineral resource could be found in abundance in the British subsoil. Areas in close proximity to the coalfields, such as the Midlands, the West Riding of Yorkshire, the North - East, southern Scotland and southern Wales turned rapidly into the industrial heartlands of the country (Binney et al., 1990, 16).

The invention of the steam locomotive in 1802 by Richard Trevithick and the construction of the first railway system a few decades later, accelerated the pace of industrialisation and boosted further the productivity of the country. The new symbol of progress besides its impact on the industrial sector catalysed a set of sweeping changes *"carrying the Industrial Revolution to almost every town in Europe"* (Trinder, n.d., 11).

In the late 19th century, the UK lost its supremacy as the world's industrial leader. This role was taken over by other countries such as Germany and the United States that developed new chemical and electro-technical industries. Nevertheless, UK remained until the 1980s among the great industrial powers of Europe. In the 20th century many of the old industries started declining while new emphasis was given to the South East county and the periphery of London, where motorcar factories, aircraft production, consumer goods and food processing plants were being developed (Trinder and Stratton, 1993, 238).

From the 1950s until the 1970s, industry in the UK entered the period of transition and withering that finally led to the decline of the following era. Deindustrialisation, that has been attributed to a number of reasons including the overseas competition, political choices, the loss of the British Empire and the lack of innovation, reached its rock-bottom in the 1970s. Struck by the worldwide energy crisis and high stagflation and shaken down by a rigid shift towards free market policies, the UK saw its coal mining industry collapsing. The other industrial sectors followed this downward spiral, leading to high unemployment rates, communities in despair and a massive landscape of disused brownfields (Kitson and Michie, 2014, Laybourn, 1999).

4.4.1.2 Evolution of Industrial Heritage protection and Reuse in the UK.

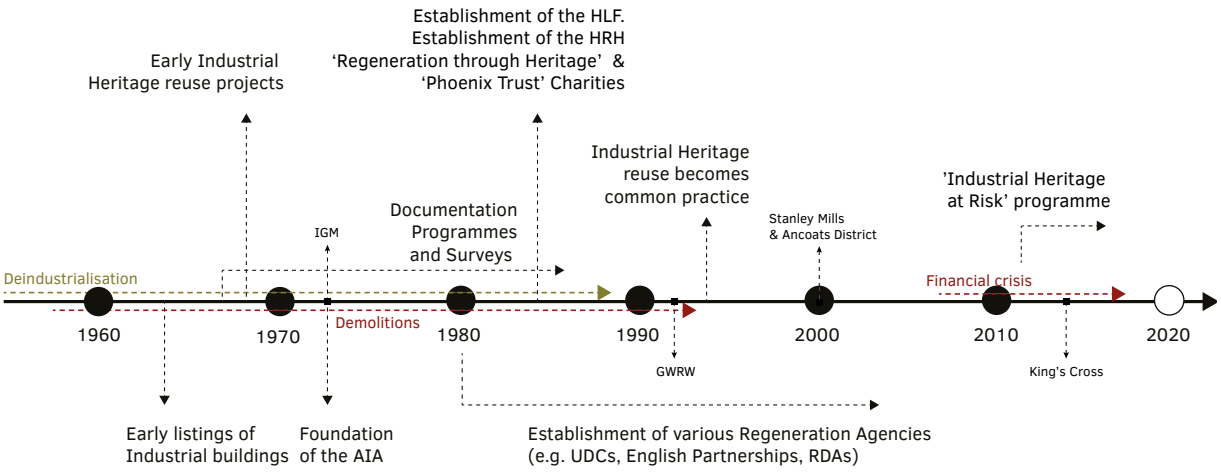

FIG. 4.1 Timeline of the evolution of Industrial Heritage protection and Reuse in the U.K.

The UK is of particular importance to this research not only due to its industrialisation vanguard but also due to its leading role in the evolution of Industrial Heritage protection. Interest for the Industrial Heritage building stock was expressed for the first time in the UK much earlier than most of the European countries. In the late 1950's, with the development of the research field of "industrial archaeology",[25] a new approach towards the remains of the past industrial activity was introduced. The discipline was formed as a reaction to the large-scale demolition and redevelopment of historic industrial sites that was part of the Post war industrial and urban renewal agenda (Palmer et al., 2012, 2).

One of the early adopters of the discipline was the Council for British Archaeology (CBA), founded in 1944. The CBA played a decisive role in bringing the need for Industrial Heritage protection in the government's attention. Even though some industrial sites, such as the Richard Arkwright's Cromford Mill, had been listed, the government had not taken any systematic initiative for the safeguarding of the country's industrial legacy (English Heritage, 2011, 18).

From 1959 to the mid-1960s, the CBA, through its newly established Industrial Archaeology Research Committee, took the first steps for the promotion of the protection of the threatened heritage group (English Heritage, 2011, 41). The Committee devised a basic record card of Industrial monuments and initiated a survey of industrial sites based entirely on volunteers. The venture took a more formal form in 1963 with the launch of the National Survey of Industrial Monuments, following the great loss of the Euston Arch. Its aim was the identification of potential industrial sites for preservation.

In the 1965, a central, classified record based on the CBA's cards was created, forming the National Record of Industrial Monuments (NRIM)(English Heritage, 2011, 9). The survey of

25 The term was introduced by Michael Rix, a Staff Tutor in Architectural history in the University of Birmingham.

industrial sites continued in the following decade, with the appointment of Keith Falconer as the first full time Survey officer by the Ministry of Public Buildings and Works and was formally given the name Industrial Monuments Survey (IMS). Between 1963 and 1981, the IMS looked at more than 4.000 sites and proposed almost half of them for consideration for designation, recording or museum preservation. At the same period a similar survey was taking place in Scotland, with Miles Oglethorpe as Survey officer. In 1981, the IMS was transferred to the Royal Commission on the Historic Monuments of England while the NRIM, which by then contained c. 8000 entries, was absorbed into the National Monuments Record (Falconer, 2012, 32).

In this early formative period for the protection of Industrial Heritage in Britain, the growing public interest, which had been awakened both by the endeavours of the CBA and the repercussions of the country's progressive deindustrialisation, was manifested with the establishment of multiple local and national based groups of specialists and enthusiasts (Palmer et al., 2012, 4). The most important of those was the Association for Industrial Archaeology (AIA) formed in 1973 by industrial archaeologists, volunteer-led local groups and preservation societies (see § 6.2.3). In 1976, the establishment of the Architectural Heritage Fund (AHF), which offered financial aid through loans, facilitated the creation of numerous Building Preservation Trusts (BPTs). As will be discussed in the Sub-Section 6.2.4 of this dissertation, the BPTs, as charities focused on the restoration of historic buildings, played a decisive role in the conservation and Reuse of the British Industrial Heritage in the decades that followed.

The 1960s and 1970s, besides the first attempts for surveying and protecting Industrial Heritage, saw the birth of the first projects of Industrial Heritage transformation mainly into industrial museums. The Ironbridge Gorge Museum (see Vol.2, Ch.1) launched and managed by the Ironbridge Museum Trust, was a pioneer case that marked the beginning of Industrial Heritage Reuse practice in the country. The project -among other contributions- highlighted the merits of in-situ preservation and the positive socioeconomic impact of Industrial Heritage preservation and Reuse. Furthermore, it underlined the ability of voluntary and locally based groups to instigate and manage such processes, becoming a reference for a large number of volunteer-run conversions to open air and industrial museums across Europe. The Ironbridge Gorge Museum also influenced key developments that shaped the care and study of Industrial Heritage on a global level. Among them the most important were the First International Congress on the Conservation of Industrial Monuments in 1973 which led to the establishment of TICCIH (see § 6.2.3) and the foundation of the Institute of Industrial Archaeology in 1978.

The first steps of Industrial Heritage protection in Britain clearly show a particularity in the role of key stakeholders. On the one hand, a burgeoning voluntary sector that proved willing and able to take action in favour of the legacy of industrialisation and on the other, a government with its institutional services that despite enthusiastic about designation, chose a secondary position to the care of this new heritage group. According to Neil Cossons (2008, 10-11):

"In the case of industrial sites, Government policy endorsed and encouraged designation by Scheduling and Listing but -implicitly or explicitly- favoured management and operational responsibility resting with locally based organisations, notably voluntary bodies […], local authorities or combinations of the two."

The deep crisis of the industrial sector of Britain during the 1980s rendered impossible for the voluntary associations to keep pace with the growing volume of the 18th and 19th redundant industrial stock. This led to a shift towards thematic rather than regional studies, led by the restructured Heritage Agencies in England, Scotland and Wales (Palmer et al., 2012, 5-6). Significant designation programmes were the Monument Protection Programme (1986-2004)

and the Thematic Listing Review. The decades that followed saw further restructurings of the UK's Heritage Agencies. Despite those, the work on industrial surveys continued and was expanded (English Heritage, 2011, 18-19, Falconer, 2012, 33).

A major shift in the political scene of the county and the policies promoted by the newly elected conservative government largely influenced the fate of urban industrial brownfields across the UK in the 1980s. Notable transformations in urban dockland areas, industrial zones and city centres took place as a result of the establishment of the Urban Development Corporations (UDCs). Their aim was *"to secure the regeneration of their areas…by bringing land and buildings into effective use"* (Stratton, 2000, 20).

UDCs were driven mainly by economic concerns, failing in their early steps to properly address conservation issues and community concerns (Stratton, 2000, 20). Despite their pitfalls however in a small number of cases they laid the foundations for the regeneration of beleaguered industrial zones and the preservation and conversion of their historic industrial building stock. The examples of the Albert Dock at Liverpool (Stratton, 2000, 126-127, Falconer, 2009, 85) and the docks just downstream of the Tower bridge of London (Berens, 2011, 206-213, Stratton, 2000, 14-15, 195) stand out as positive testaments of their action. Both cases, served as early references for Industrial Heritage regeneration across the UK and attracted considerable private interest and investment.

The 1980s, along with the action of the UDCs and the continuous efforts of the voluntary sector that was mainly focused on conversions to industrial museums, saw early examples of Industrial Heritage Reuse by entrepreneurs and City Councils. Among them the cases of Dean Clough Mills in Halifax and Salts Mill in Saltaire converted into multifunctional complexes by Sir Ernest Hall and Jonathan Silver respectively, stand out (Stratton, 2000, 202, Binney et al., 1990, 35). The transformation of the Liverpool Road Station to the Museum of Science and Industry by the Manchester City Council is also a reference case of the era (Stratton, 2000, 25-26, Falconer, 2009, 85).

In general, within the 1980s British scope, Industrial Heritage attracted the attention of a wider range of stakeholders originating both from the public and the private sector. It became increasingly the subject of imaginative conversions, with the new uses including residential, leisure, office, visitor attractions and mixed use schemes. This undeniable progress however was not free of problems. In many cases speculative pharaonic projects were launched in brownfield land. Many of those were led to a dead end by the property crash of the early 1990s, resulting either in further decay of the Industrial Heritage stock (see King's Cross case, Vol. 2, Ch.5) or to its destruction (see GWRW case, Vol. 2, Ch.2). By the end of the decade the merits of incremental development projects with a financially sustainable programme in the long run became evident (Falconer, 2009, 84-85).

By the 1990s Industrial Heritage Reuse had become common practice in the UK. Two important developments however boosted it further. On the one hand, the establishment of the Heritage Lottery Fund (HLF) in 1994 (see § 6.2.9) facilitated Industrial Heritage Reuse by providing financial support to Actors with restricted economic means, such as BPTs, City Councils and volunteer groups. On the other hand, the creation of the charities 'Regeneration through Heritage' (RTH) and the 'Phoenix Trust' by HRH The Prince of Wales in 1996 (see § 6.2.4) offered both practical support and a hands-on approach, leading to the safeguarding and conversion of many industrial sites. In detail, the first charity helped community groups to restore a number of redundant listed buildings, focusing mainly on industrial relics while the Phoenix Trust acquired, restored and converted large derelict landmark industrial buildings (English Heritage, 2011, 28, Stratton, 2000, 74-88).

The same period saw the National Heritage Agencies taking an active role in the Reuse of industrial buildings. The case of the Great Western Railway's Works, Swindon (see Vol.2, Ch.2) underlines the role of the Royal Commission on the Historical Monuments of England as an instigator of the regeneration of the vast complex, that influenced a series of other conversions across the UK in the years that followed. A case, which best reflects the output of all three developments mentioned above is that of Stanley Mills in Scotland (see Vol.2, Ch.3). The project showcases the catalytic impact of the formation of the HLF and the Phoenix Trust and the merits of the Historic Scotland in the role of developing partner.

In the late 1990s, along with the action of the aforementioned stakeholders, special developers emerged in the UK, becoming synonymous with conversions of industrial sites into exciting mixed use and residential developments. Urban Splash' work, including single site conversions in Manchester and Liverpool epitomises this new development approach (Falconer, 2009, 86).

In the 1990s a number of public regeneration agencies was established as a result of the State's policy, with most important the 'English Partnerships' (1994) that was absorbed in 1998 by the 'Regional Development Agencies'(RDAs). Their role in the Reuse of the British Industrial Heritage stock is analysed by Falconer (2009, 84) and by Stratton in his seminal work: *Industrial Buildings: Conservation and Regeneration* (2000, 23-25).Their positive impact is also evident in the analysis of the cases of the Ancoats district (see Vol.2, Ch.4) and the Newcastle waterfront (Falconer, 2009, 84).

The turn of the century found the UK's economy booming, characterised by low inflation, stable growth, rising asset prices as well as the end of uncertainty and greater risk taking (Pettinger, 2019a). This development along with the repercussions of globalisation in cities' development (Sassen, 2006), largely influenced Industrial Heritage Reuse practice, predominantly in the large city centres. The conversion of the Bankside Power Station into the Tate Modern in London, which attracted massive attention, embodies a series of shifts related with the practice. The most important of those is the engagement of starchitecture and its aftermath in Industrial Heritage Reuse.

In the period 2000-2007 many industrial sites were converted across the UK including the legendary Lister mills in Bradford (Falconer, 2009, 86). At the same time many already reused sites were upgraded, such as the Ironbridge Gorge Museum in Shropshire and the Custard factory in Birmingham. The project however that best reflects the effects of the transition from the period of growth of the 1990s to the boom of the early 2000s and the successive bust of 2008, is the case of the Ancoats district (see Vol.2, Ch.4).

In 2008, after 15 years of economic growth, the British economy collapsed as a result of the global credit crush (Pettinger, 2019b). The following years of the recession saw a dramatic squeeze of the public sector's stakeholders budget, a considerable reduction of front line staff and a notable retraction of commercial developers, who turned to safer projects. This situation resulted in great losses of industrial sites and the decrease of relevant regeneration schemes, posing threats at the same time at the future of the converted sites owned or managed by the public or voluntary sector (Gould, 2015). The situation is discussed in detail in Falconer (2009), Oglethorpe (2014) and Gould (2015).

In the early 2010s, the British Heritage Agencies and the HLF took noteworthy initiatives, responding to the great challenges posed by the financial crisis to Industrial Heritage. In detail, in 2011 Historic Scotland created a dedicated Industrial Heritage team. Its main goals, which were both met with great success, were to prepare the nomination of the Forth Bridge for World Heritage listing and to provide the Ministers with an Industrial Heritage Strategy (Historic Scotland, 2015).

In the same year the management of the Industrial Heritage in England was taken forward as part of the National Heritage Protection Plan (NHPP)(English Heritage, 2013c). The 'Industrial Heritage at Risk' project (Gould, 2015) launched also in 2011 was a significant contribution of the Agency. Through targeted research and surveys in the general public and the developers, it highlighted the challenges of the stewardship and Reuse of Industrial Heritage. Furthermore, through various publications, events and actions (listed in detail in Gould, 2015), the programme provided direction and support to the full array of stakeholders involved with Industrial Heritage Reuse. Lastly, since 2013 the HLF along with the continuous support on people and communities launched the Programme "Heritage Enterprise" funding social enterprise-led projects (Heritage Lottery Fund, 2012).

After 2013, when the British economy showed the first signs of recovery, a growing number of Industrial Heritage Reuse projects was delivered. Among those the cases of the Grade I Ditherington Flax Mill in Shrewsbury, Middleport pottery and CoRE in Stoke on Trent stand out. The bigger and most important project of the decade however was the case of King's Cross, that is analysed in detail in Volume 2 (see Vol.2, Ch.5).

4.4.1.3 Shifts and challenges

Since the first steps of industrial archaeology in the 1950s a great deal of shifts have occurred in the field. D. de Haan, AIA secretary, discussing the issue states:

"Industrial Heritage is no longer considered to be marginal. 'Normal' archaeology is no longer focusing only in the ancient and medieval era." (Resp no 4, interview, 8/6/2015).

Indeed there is no doubt that Industrial Heritage is held in high regard in the UK by the institutional public bodies, the voluntary sector and the general public. This is reflected in the great advances of the Heritage Agencies in recording, surveying, listing and advising involved stakeholders. It is also echoed in the continuous action of voluntary associations and its far-reaching positive results. Lastly, it is clearly demonstrated in the immense appreciation rate by the general public, revealed in 2011 by the 'bdrc continental Industrial Heritage at Risk: Public Attitudes Survey' (Gould, 2015).

Besides the change of perceptions and the advances on the care of Industrial Heritage that will be further discussed in Chapter 6, the progress made in the UK in the previous six decades also involves a notable evolution in the practice of Industrial Heritage Reuse. The former eyesores of the built environment, embodiments of the decline and suffering of the nation's deindustrialisation, have been largely turned to harbingers of development. The massive number of converted reused sites ranges today from complexes that have retained their former industrial function combining it with other uses, to exciting multifunctional schemes. Along with those, a vast number of industrial museums and visitor attractions across the UK, narrate historic industrial processes, present the social context of industrialisation while preserving and sometimes operating historic machinery. It is worth underlining that the UK has provided multiple reference cases (e.g. IGM, 1973; Dean Clough Mills, 1983; Albert Dock in Liverpool, 1980s; Tate Modern, 2000) that have been influencing the evolution of the practice worldwide.

Among the relevant achievements of the reviewed period it is worth mentioning the rise of inscriptions of British Industrial Heritage sites into the World Heritage List. From one inscribed site in 1986, the UK reached nine World Heritage industrial inscriptions including the Ironbridge Gorge, the Blaenavon Industrial Landscape, the Derwent Valley Mills, the New Lanark and Saltaire Textile

Mills and settlements, the Liverpool Maritime City, the Cornwall and West Devon Mining Landscape, the Pontcysyllte Aqueduct and Canal and the Forth Bridge. It is worth mentioning that the majority of those are reused or contain reused parts (English Heritage, 2011, 47).

So far, reference has been made to the positive shifts in the evolution of the British Industrial Heritage care including its recognition, protection and adaptation. The shifts identified however are not only limited to achievements. The consequences of the recent financial crisis, the shrinkage of the Public Sector support and intervention and finally the expected repercussions of the anticipated leave of the European Union (Brexit) (National Assembly for Wales Culture Welsh Language and Communications Committe, 2018), pose serious threats to the former industrial stock of the UK.

Against those developments a general sense of unease is expressed, influencing the Industrial Heritage discourse and practice, too. The fragmentation of the UK in four countries complicates even further the situation. Concerns have been raised for a number of issues with most important the lack of a United-Kingdom-wide approach for securing the future of Industrial Heritage (Cossons,2008, 26, Nevell,[26] Resp. no 12, interview, 17/6/2015) and the loss of the leading role of Britain in the field over other countries in the 21st century (Oglethorpe, 2014, 88).

In this challenging climate UK is called to tackle a twofold problem. On the one hand, keep finding viable, durable and respectful solutions for the remaining derelict industrial stock with less financial means; and on the other, managing to upkeep the large volume of the converted sites that have been placed at risk under the volatile socioeconomic conditions of the last decade.

4.4.2 The Netherlands

4.4.2.1 The Industrialisation and deindustrialisation of the Netherlands

The Netherlands' mechanical industrialisation came with a relative delay compared to its neighbouring countries. Until the late 19th century, the economy of the country was largely based on international trade and agriculture rather than industrial production. In contrast to the large-scale industrial development of Germany, France, Belgium and the UK, the Dutch industry remained traditional, adopting relatively late steam-powered production methods. One reason was that it had to import costly coal for fuel at the time, whereas wind and water were abundantly – though not regularly – available as a natural power resource to drive a variety of wind or water mills.

A typical example of the sophisticated hydraulic engineering system, used for preventing floods and for reclaiming land from the sea, is the series of 18th century 'polder' windmills at Kinderdijk. The first steam-powered pumping installations ('stoomgemalen') were used for reclaiming land from the Haarlemmermeer (peat) lake in the mid-19th century (and included the famous 'Cruquius') (Griffiths, 1979). Alongside the thousands of polder mills for the water management, hundreds of industrial windmills were in use for grinding grain, oil bearing seeds, sawing wood and other traditional production methods. These industrial mills were usually located on the bastions of the fortified cities, at the edge of villages, or in clusters along important water ways, like the river Zaan.

26 M. Nevell is head of archaeology at Salford University, specialising in industrial, buildings and community archaeology, historic landscapes and archaeological theory.

Due to new political, international and economic developments after the separation of Belgium in 1830 as well as the construction of new infrastructure (canals and railways), a gradual transition took place towards steam-powered mechanisation (Atzema and Wever, 1999, Kaptein, 2017).

The early 19th century industrialisation in the Netherlands was influenced by British and Belgian achievements and entrepreneurs (van Dalen J and Trinder, 1993, 492-494). Yet, the major start of the mechanisation of the Dutch industry is placed in 1870 while rapid industrial growth is only achieved by the 1890s (de Jonge, 1976). The main strains of industry included textiles, shipbuilding, ceramics as well as agriculture-based manufactures (Griffiths, 1979).

The industrial development had an impact on the social and urban framework of the country. Large groups of people moved from the countryside to the factories in search of employment, experiencing in turn poor living and working conditions. Clusters of factories, dominating the whole cityscape were quite rare in the Netherlands. Exceptions to that rule were the industrial food-based landscape along the Zaan, the textile manufacturing in Twente and Tilburg, the potteries of Regout in Maastricht and in the 20th century the shipping industry in Amsterdam and Rotterdam as well as the electric light bulbs manufacturing of Philips in Eindhoven (Cerutti, 2011, 9).

The 20th century saw industrial production in the Netherlands in bloom, partly based on other types of machinery fueled by oil products. Dutch industrialists like Stork at Hengelo pioneered the manufacture of the Diesel engines. After the discovery of oil in the Dutch East Indies in 1890 the Rotterdam port was turned into the centre of European oil storage and trade. The State however also engaged in coal mining in Limburg from 1899 to 1975. Other important industrial innovations included electronics, chemicals and bicycle manufacturing (van Dalen J and Trinder, 1993, 495).

After WWII, which caused enormous destructions of infrastructure and industries, the Dutch government actively advanced a rapid reconstruction of the Dutch industry, partly supported by the Marshall Aid (1948-1952). Since the 1960s foreign workers were brought to the Netherlands, initially as 'guest labourers', for covering the needs of the coal mines and mass production oriented factories, as a result of labour shortages. After a short-lived post-war recovery of two to three decades the Dutch industry started to shrink due to practices of outsourcing and other international market changes. In the 1980s the symptoms of deindustrialisation were evident with high unemployment rates, redundancy and vacancy in the former industrial areas. Nowadays, massive industrial production of common goods is no longer a major factor in the Dutch economy. Dutch companies increasingly focus on high-value, knowledge-intensive and creative industry (Cerutti, 2011, 9).

4.4.2.2 Evolution of Industrial Heritage protection and Reuse in the Netherlands

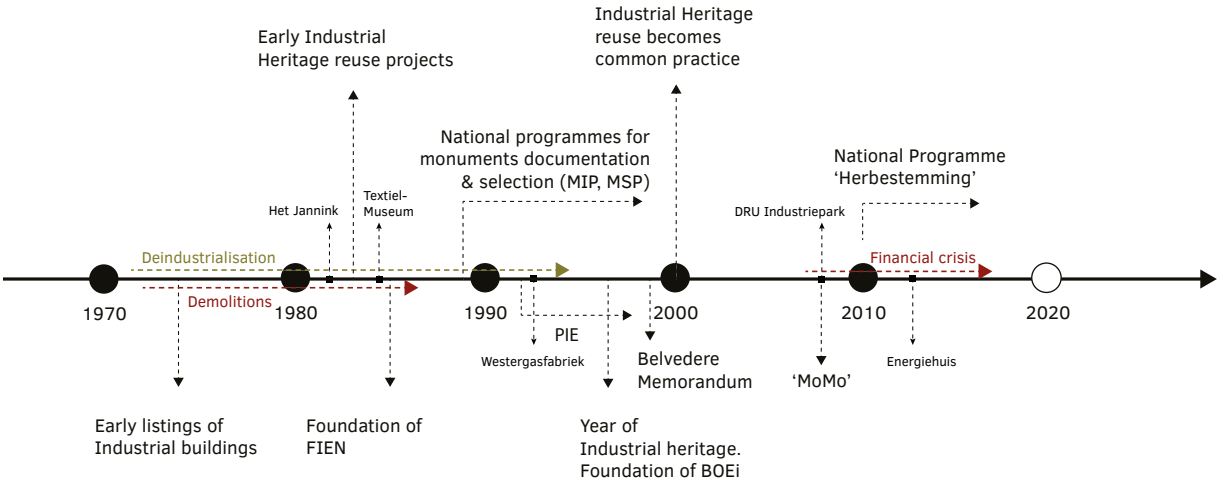

FIG. 4.2 Timeline of the evolution of Industrial Heritage protection and Reuse in the Netherlands

Interest for the Industrial Heritage was expressed for the first time in the Netherlands in the 1970's (Loeff, 2013, 23). The first symposium the Industrial Archaeology was organized by the Royal Institute of Engineers and the Technical College of Delft (Technische Hogeschool Delft) in 1974. Surveys of the steam-powered pumping stations and train stations of the country were conducted by the Netherlands Department for Conservation (Rijksdienst voor de Monumentenzorg, RDMZ) in 1970, followed by the listing of eighteen buildings of each category between 1969 and 1978.

However, until the late 1980's Industrial Heritage was perceived as an inferior group by the official governmental bodies due to its aesthetics and the lack of understanding and appreciation of the historical industrial production. In this period, the government played a subordinate role in the protection of former industrial sites while signs of appreciation were shown at a local and regional level (Loeff, 2013, 28). P. Nijhof, formerly Head of Inventory in the Department of Conservation (Rijksdienst voor de Monumentenzorg) corroborating these claims, states that until the early 1990's the bigger part of the Dutch Industrial Heritage was only listed by exception due to the lack of appreciation of this building category (Nijhof, 1992). It should also be stressed that legal protection of Industrial Heritage items had, for long, been hindered by a lack of available staff and the statutory required minimum limit of 50 years, since the acceptance of the first legislation for statutory protection in the Netherlands in 1961 (Kuipers, 1994).

The attitude of the public towards Industrial Heritage protection in the 1970s and 1980s, was in general in line with the government's, showing either indifference or negativism. The social groups that diverged from this position were the squatters and some volunteer organisations. Squatters, opposing to speculative large-scale urban demolitions, occupied many industrial buildings and managed to save them. Notable examples of squatting in former factories in the 1980s, that resulted in the sites' preservation and Reuse, are the Amsterdam Tetterode complex and the Hooghiemstra in Utrecht (Cerutti, 2011, 10).

In the same era, besides the squatters, a small number of local and regional organisations was formed, expressing enthusiasm and appreciation over the local Industrial Heritage. Their action and voice became more prominent in 1984 with the establishment of the Federation of Industrial Heritage Netherlands (FIEN) (see § 6.2.3). FIEN started as a platform of 20 local and regional volunteer organisations, advocating the conservation of the Dutch Industrial Heritage. A tangible result of the endeavours of the voluntary sector at the time was the establishment of the first industrial museums (e.g. the Techniek Museum HEIM in Hengerlo) (Loeff, 2013, 32).

The passing from the 1970s to the 1980s saw also the first attempts to reuse redundant industrial sites by enlightened individuals and groups. The examples of the Jannink Mill in Enschede (see Vol.2, Ch.6) and the DWL (Drinking Water production) ensemble in Rotterdam converted into residential-led mixed use developments, paved the way for the Reuse practice in the following decades.

The first systematic attempt to document and list industrial monuments, among other buildings and sites dating from the period 1850-1940, took place from 1986 until 1995. The National Monuments Inventory Project (MIP) was a co-operation venture between the national, provincial and municipal departments for conservation of historic buildings and areas and resulted in the creation of a national database accessible to the public. In this programme for the first time attention was explicitly given to cultural historic characteristics, apart from stylistic-architectural and socio-economic historic aspects (Kuipers, 1992).

MIP was followed by the Monuments Selection Project (MSP), aiming at the selection of the sites and buildings of national value which would be protected by the Dutch Monuments Act. MSP was conducted by architectural historians who focused mainly on the exterior of the buildings, paying little attention to the movable heritage and the business technology of the sites. It is worth mentioning that those initiatives testify for an early shift in the government's attitude towards Industrial Heritage. However, the under-representation of Industrial Heritage in the National heritage list showed that industrial buildings were still not held in great regard in comparison to other heritage groups, such as the residential, religious and public buildings.

During the 1990s, a set of developments, including the foundation of key organisations, initiatives like the 'Year of Industrial Heritage' and the appeal of reference projects, led the Dutch Industrial Heritage from the margin to the forefront of attention in the country. In regard to the organisations mentioned, the action of the Netherlands Institute of Industrial Heritage (Projectbureau Industrieel Erfgoed, PIE),[27] should be stressed. The aim of this Institute that was founded in 1991, was the close examination of the industrial building stock and the promotion of Industrial Heritage as a cultural asset. According to P. Nijhof (1992, 113-114):

27 PIE was a private foundation funded by the Ministry of Culture. It was established under the recommendation of the official Advisory Commission Industrial Heritage, who advised the Minister of Culture in 1989 (Nijhof, 1992, 113).

"PIE developed initiatives in the field of inventory, selection, conservation, rehabilitation, education, information, tourism and recreation, related with Industrial Heritage. It also assisted the Monuments Selection Project by creating documentation methods and selection criteria for the c. 40 main industrial branches, categories of industrial monuments and regions as a whole."

PIE offered an insight based on which choices could be made between the demolition and the preservation of several industrial sites. The ideal form of heritage conservation for PIE was the continued existence of the building in its original function. In 1997, when the PIE programme was completed, the issue of the protection and redevelopment of the Dutch Industrial Heritage became duty of the RDMZ[28] (de Boer et al., 1995).

Another important initiative related to the Dutch Industrial Heritage conservation was the Centre for the Industrial and Movable Heritage (CIME) which was founded in 1997 and was closed in 2006. The focus of the Centre was the mapping of the movable and mobile heritage by means of a register (e.g. historic vessels, trams and even aircrafts). In 2004, when the CIME presented its final report however, it did not raise the desired awareness and special attention about this fragile part of the Industrial Heritage (Loeff, 2013, 35).

Along with the work of PIE and CIME what gave a considerable boost to the awareness and appreciation of Industrial Heritage in the Netherlands was the organisation of the 'Year of Industrial Heritage' in 1996 by the Dutch Government. Through a series of actions, congresses, seminars, TV shows, exhibitions and guided tours, it promoted the significance of the heritage group to the general public and the private sector, too.

A tangible reflection of the rising interest generated by the aforementioned developments during the 1990s, was the establishment of BOEi, the National Society for the Conservation, Development and Exploitation of the Industrial Heritage (Nationale Maatschappij tot Behoud, Ontwikkeling en Exploitatie van Industrieel erfgoed). As will be described in detail in Chapter 6 (see § 6.2.6), the organisation played a key role in the Reuse of the country's Industrial Heritage thereafter. Among its most important and sizable conversions are the cases of DRU in Ulft (see Vol.2, Ch.9) and the Cereolfabriek in Utrecht. BOEi remains active to this day, focusing on the acquisition of heritage sites, their restoration and their letting out (BOEi, n.d.-c).

Industrial Heritage Reuse that was a rare practice in the Netherlands during the 1970s and an exception in the 1980s, gained considerable momentum in the 1990s. The case of the Westergasfabriek in Amsterdam (see Vol 2, Ch.8), converted into a cultural hotspot in the Dutch capital, is seen as the turning point for the practice (Chatzi Rodopoulou, 2017). The project, with its unconventional flexible process, its attractive programme and its socioeconomic impact, proved that industrial brownfields could play a crucial role to the cities' physical, social and financial transformation.

28 The Dutch heritage organisation working for the protection and conservation of National Heritage Sites is called 'Cultural Heritage Agency of the Netherlands' (Rijksdienst voor het Cultureel Erfgoed) (RCE) since 2009. It is the successor of the 'National Department of Archaeology, Cultural Landscape and Built Heritage' (Rijksdienst voor Archeologie, Cultuurlandschap en Monumenten) known as RACM. RACM was founded in 2006 and originated from the merge of the 'Netherlands Department for Conservation' (RDMZ) and the Netherlands Department of Archaeology (Rijksdienst voor het Oudheidkundig Bodemonderzoek, ROB), both founded in 1947.

In the turn of the millennium, the value of industrial relics was finally widely recognized in the Netherlands. Many sites acquired a protected monument status while Industrial Heritage Reuse practice became commonplace. A review of the Dutch case studies of Industrial Heritage Reuse presented in the ReIH website reveals a wealth of conversions to every possible use. Prominent projects of the era include the Villa Augustus in Dordrecht and the 20th century Van Nelle factory in Rotterdam.

Those developments will be better understood if examined against the fundamental political, legislation and administrative shifts that took place in the country in the first decade of the 21st century. The consolidation of neoliberalism in the political scene of the Netherlands shook deeply the heritage sector, causing shifts on multiple levels (Kuipers, in press).

Firstly, new policy was launched, promoting firmly the application of a different heritage approach model. The 'Belvedere memorandum' in particular, established the concept of 'preservation through development' by means of an incentives programme. This favoured the turn from single building conservation to large-scale revitalisation projects that required partnerships between public and private stakeholders. The policy boosted the change of societal perspectives over the importance of Industrial Heritage and stressed its potential for conversion. On the other hand though, it encouraged a much more financially driven approach, placing at risk the cultural values of the heritage assets (Strolenberg, 2017, 16, Janssen et al., 2017, 1662-1663).

Secondly, a restructuring and decentralisation policy was promoted. Aiming at a smaller State involvement to all sorts of social and cultural activities, the Dutch Government merged in 2009 the administrative bodies responsible for distinctive sectors of heritage into one: the Netherlands Cultural Heritage Agency. That, among other changes, involved the reduction of its power and budget and the transfer of part of its responsibilities to the local authorities (Kuipers, in press).

The financial crisis of the late 2000s came as another shock to the county's heritage care, influencing deeply Industrial Heritage Reuse practice. The public sector support in the form of subsidies, was reduced or cut, resulting in operation problems of many converted sites (e.g. DRU, Vol 2, Ch.9 and Energiehuis, Vol 2, Ch.10). Moreover, large-scale redevelopment schemes following a linear process logic collapsed. Lastly, there was a reduction in new converted Industrial Heritage Reuse projects.

In response to this climate of decline, the Dutch government established new policies that favoured and encouraged the Reuse of the country's heritage, including its historic industrial stock. This approach was illustrated by the issuing of the inventory project's report, titled 'De Oude Kaart van Nederland. Leegstand en herbestemming' by the State councillor on Cultural Heritage (Harmsen and van der Wall, 2008), the policy document 'Modenisering Monumentenzorg' (MoMo) launched in 2009 and the establishment of the National Programme 'Herbestemming'. MoMo proclaimed mainly three major changes in the practice of monuments care. It emphasized the importance of cultural significance in heritage conservation, complementing them nevertheless with economic ones; it promoted the reinforcement and the simplification of the rules and it fostered the practise of Reuse (Kuipers, in press).

The National Programme 'Herbestemming' (meaning Reuse in Dutch) ran from 2010 until 2015. It took a multileveled action for the promotion of heritage Reuse in the country, through the collaboration of 30 parties including the RCE, municipal and provincial authorities and some contractors. Within the framework of the programme a number of subsidies was given for Reuse projects and urgent works, educational programmes addressed to a wide range of stakeholders were organised and awareness was generated, through the publication of books and articles

(F. Strolenberg,[29] Resp. no 92, interview, 13/7/2016). Lastly, a website was created, presenting, among other information, cases of Industrial Heritage Reuse in the Netherlands in the form of a registry[30] (Restauratiefonds, 2018).

A fundamental change in the Industrial Heritage Reuse practice in the years of the recession was the abolishment of Pharaonic tactics. Instead more flexible and bottom-up approaches were widely employed by stakeholders who were traditionally fulfilling other roles such as entrepreneurs and architects (van t' Kooster, 2013). The examples of the former Philips' Strijp S and Strijp R complexes in Eindhoven as well as the case of de Hallen in Amsterdam (Meurs and Steenhuis, 2017, 56-59, 62-71) are reflections of this new approach. The recovery of the Dutch economy in recent years has opened new possibilities that allow once again mega-development. The direction of the Industrial Reuse practice in this new situation is yet dubious.

4.4.2.3 Shifts and challenges

As revealed from the previous analysis, the practice of Industrial Heritage care and Reuse in the Netherlands has been through key shifts in the past fifty years. Firstly, the former industrial sites have been recognised as an integral part of the country's cultural heritage in the collective memory. This is reflected in the rise of their designation by the National Heritage Agency, in the continuous action of special developer firms dealing with Industrial Heritage Reuse (e.g. BOEi) and most of all in the great resonance that the converted industries have received with in the general public.

Secondly, Industrial Heritage Reuse is nowadays a widely employed practice. The Netherlands have developed since the late 1970s a rich portfolio of Industrial Heritage Reuse projects with a vastly nuanced repertoire of approaches. It is worth mentioning that the Dutch, who experienced a delayed industrialisation, have also championed the 20th century Industrial Heritage protection and Reuse. Indicative of that are the two inscriptions in the World Heritage List, including the Ir. D.F. Woudagemaal (D.F. Wouda Steam Pumping Station) and the converted coffee, tea and tobacco factory Van Nelle at Rotterdam. Thirdly, Industrial Heritage Reuse practice is employed by a large range of stakeholders including among others, local authorities, commercial developers, entrepreneurs and architects.

Despite the noteworthy achievements, there are also key challenges in relation to the practice resulting from some of the shifts analysed in the present Section. In detail, the decentralisation of heritage care, the reduction of the State's intervention and control in the Reuse process and the strong favouring of more market-oriented approaches, place the most vulnerable facets of Industrial Heritage at risk. In practice the most common victims of this new set of conditions are the intangible cultural values and the historic machinery of the former industries. The balance between financial sustainability and cultural values preservation is seen as a major challenge for the case of the Netherlands.

29 Frank Strolenberg is Programme Manager in the 'Herbestemming & Agenda Toekomst Religieus Erfgoed' at the RCE.

30 The originality of that registry was its focus in the new use of the historic sites. Its search filters were facilitating the review of important data concerning the reuse of the sites while the interactive map used was allowing an overview of the practice in the Netherlands. In 2017 the hosting of the website passed to the Nationaal Restauratiefonds (NRF, National Fund for Restoration). The background information on the registered cases of reuse is still accessible, however the interactive map is no longer available.

4.4.3 Spain

4.4.3.1 The Industrialisation and deindustrialisation of Spain

The Industrialisation of Spain lagged behind in relation to the north-western European countries. Traces of industrial activity, including ironworks, steelworks and textile production, appeared in the late 17th and the 18th century. However, they declined rapidly against a climate of high competition and economic instability originating from developments such as the Peninsular War and the dissolution of the country's colonial Empire (Vicens Vives, 1960, 139-140).

The Spanish industrial awakening was only achieved in the second quarter of the 19th century presenting geographical asymmetries. The pioneering regions were the Basque Country, home of iron industry; Asturias, which was a coal production region and Catalonia that specialised in the textile industry (Casanelles and Areces, 2013). A significant push was given to the latter by the introduction of the steam and power loom machinery in 1832. The textile industry stimulated other industrial branches, too, making Catalonia the economic leader of Spain at the time (Aracil, 1993, 704).

The second half of the 19th century saw Spain taking decisive steps towards the transformation of its economy and the consolidation of its industrial sector. Large injections of foreign capital stimulated growth. That was rendered in the development of a railway network and the boom of the mining sector. The production of iron that had started in Andalusia by the 1830s was taken over by Asturias, due to its production modernisation and its competitive prices. The Basque Country, which presented also significant comparative advantages, became by 1870 the leading steel producer of the Spain. It is important to stress that, with the exception of the Basque Country, other extraction sites such as the copper mines of South Spain, were largely controlled by English and French companies (Aracil, 1993, 705).

Despite the great efforts of the previous period, Spain remained a mostly agricultural country in the first decade of the 20th century, with an industrial peripheral zone formed by the Catalonia-Basque Country axis (Vicens Vives, 1960, 114). The neutrality of the country in the World War I influenced positively its economy and favoured its industrial activity. The existing industry was strengthened and the production was enriched with new sectors. The benefits however were experienced mostly in the established industrial cores of the country and in the cementation of Madrid as an important economic centre, without fuelling further industrial expansion in new territories.

Between 1936 and 1959 the destructions of the Civil War and the post-war authoritarian policy of Franco resulted in the country's industrial regression. Administrative changes and significant reforms by the end of the 1950s as well as the application of the 'Stabilization Plan' of the 1959 resulted in the dawn of a period of unpreceded growth. Between 1959 and 1974, the size of the Spanish companies increased and the export of manufactures grew, remaining however still technologically dependent from other countries. A substantial transfer of focus took place from the traditional industries to the most dynamic industrial sectors including chemicals, machinery and transport material production. Industries concentrated in the major cities and their metropolitan areas and, at a regional level, in the previous nuclei. This period also saw new industrial areas rising as for example in Valladolid and Zaragoza (Velasco and Plaza, 2003).

In the last two decades of the 20th century the Spanish industrial sector, in contrast to the large industrial powers of Europe, followed a roller coaster course with periods of profound crisis and others of great prosperity (Velasco and Plaza, 2003, 157-158). Despite the fluctuations however the Spanish economy finally followed the European pattern of outsourcing becoming largely dependent on the tertiary sector. This process resulted in the closure of many firms, mass layoffs and the abandonment of large industrial areas (del Pozo and González, 2012, 449-450).

4.4.3.2 Evolution of Industrial Heritage protection and Reuse in Spain

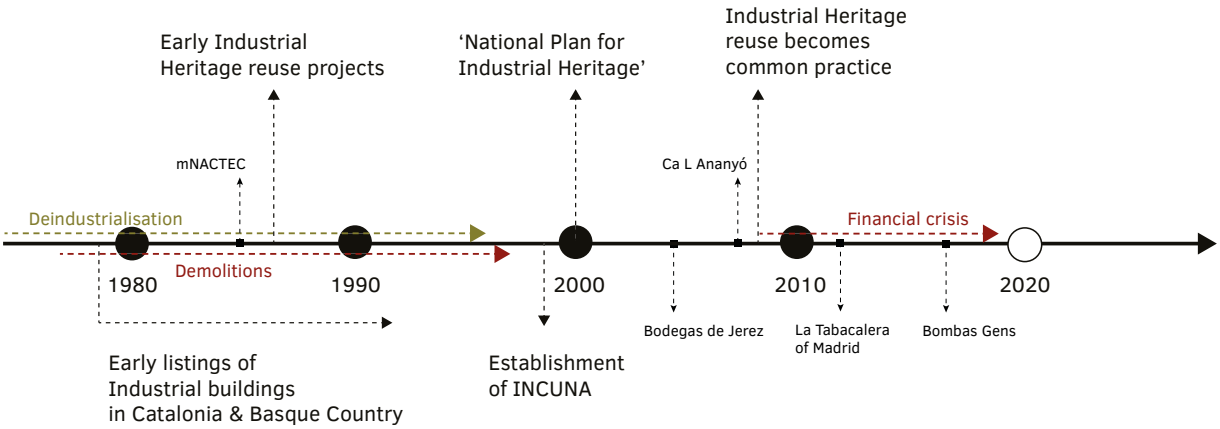

FIG. 4.3 Timeline of the evolution of Industrial Heritage protection and Reuse in Spain

The action for the protection of Industrial Heritage in Spain started in the early 1980s, during the dramatic conditions imposed by its progressing deindustrialisation. The influence of the Northern European countries' initiatives and of certain projects of the EU to protect and enhance Industrial Heritage from the 1984s onward as well as the danger of demolition of historic industrial complexes triggered a dynamic reaction in scientific circles and the local community (del Pozo and González, 2012, 450-452).

The first step was taken with the establishment of the Association of the National Museum of Science and Technology and Industrial Archaeology of Catalonia (mNACTEC) in 1979 (see Vol.2, Ch.11). That was followed by the organisation of the first meeting for the protection and revaluation of Industrial Heritage (*Jornadas sobre la protección y revalorización del patrimonio industrial*), which took place in 1982 at Bilbao, with the participation of academics, professionals and members of the local community. Its objective was to introduce studies of industrial archaeology in Spain and initiate the process of establishing the Science and Technology Museums of the Basque Country and Terrassa (Biel Ibáñez and Cueto Alonso, 2011, 11-13). In the years that followed, an increasing number of meetings and congresses were organised across Spain with a relevant scope (Abad, 2016, 215).

In the first stages towards the protection of the Spanish Industrial Heritage, significant contributions were made by multidisciplinary groups of volunteers. Apart from the establishment of the Spanish Association of Industrial Heritage and Public Works (Asociación Española de Patrimonio Industrial y Obra Publica) in 1986, which had a national scope yet a very brief life span, the last decades of the 20th century saw the creation of various associations focused on regional

Industrial Heritage. The most important of those were the Basque Association of Industrial Heritage (AVPIOP) founded in 1989 and the Association Industry, Culture and Nature (INCUNA) founded in 1997 in Asturias (Biel Ibáñez and Cueto Alonso, 2011, 13).

An important point, which differentiates Spain from the other countries under investigation is that from the outset, the protection and conservation of its Industrial Heritage was largely determined by the regional organisation of the country.[31] *"The interest on Industrial Heritage coincides with decentralised Spain, after Francismo."* comments J. Sobrino Simal, Vice president of TICCIH Spain (Resp. no 186, interview, 26/10/2017). It is notable that the vast majority of the activities for the defence, inventory, conservation and conversion of the vestiges of industry were confined within the limits of the autonomous regions. As a result, the approach, development and current state of Industrial Heritage in Spain present a great differentiation from one autonomous region to the other.

Several lines of evidence (AADIPA Agrupació d'Arquitectes per a la Defensa i la Intervenció en el Patrimoni Arquitectònic, 1998, Llordès and Pont, 2014, 7, Resp. 185-192, interviews, Autumn 2017) suggest that Catalonia and the Basque Country were the pioneers in the process of Industrial Heritage recognition and adaptation and as such they will be further discussed. In Catalonia, the early years following the restoration of democracy were a period of heritage survey and assessing. Under the initiative of the Catalan Government, provincial councils and local authorities, a number of inventories and catalogues of buildings with architectural and artistic merit were generated while many complexes were listed. The 1990s saw the intensification of the Industrial Heritage cataloguing initiatives in Catalonia and their extension in terms of scale (territorial level) and content (cataloguing of machinery and movable heritage) (Llordès and Pont, 2014, 364-365).

In the same period, in the Basque Country an inventory of industrial elements titled "Inventario provisional de patrimonio industrial y de la obra pública" was created by the AVPIOP. That pioneer action that took place between 1990 and 1993, involved the cataloguing of 1227 elements, dating from 1841-1940. Three years later, the same association conducted a second inventory, cataloguing the ironworks and mills of the region (AADIPA Agrupació d'Arquitectes per a la Defensa i la Intervenció en el Patrimoni Arquitectònic, 1998).

The transformation of the industrial stock started in the late 1980s from the aforementioned two regions. It is worth highlighting that the high architectural value of many industrial structures, built in the Art Nouveau style, facilitated profoundly their conservation and Reuse. The first uses to be housed in the former temples of production were cultural and educational ones. An important example of these very first steps was the foundation of mNACTEC in Terrassa (see Vol.2, Ch.11).

In the 1990s, a number of former industrial areas became the field of large scale urban regeneration projects. Two of the most renowned cases were the creation of the Olympic Village in the industrial district PobleNou of Barcelona (see Vol.2, Ch.13) and the transformation of the city centre of Bilbao (Llordès and Pont, 2014, 364-369). Even though those projects have been widely celebrated as model-cases for urban revitalisation, they can only serve as an antipodal reference in terms of Industrial Heritage preservation, as they were both based on the catholic erasure of the existing historic industrial stock and their replacement with new-built structures. In the same period, more modest approaches were developed in other Spanish regions that prioritised heritage conservation over speculation (e.g. the case of the Bodegas of Jerez de la Frontera, see Vol.2, Ch.12).

31 In that respect, an analogy can be drawn between Spain and the UK, which also presents differences in the handling of its Industrial Heritage due to its administrative division in England, Wales, Scotland and Northern Ireland. Nevertheless, Spain is far more fragmented presenting bigger asymmetries in the handling of Industrial Heritage in comparison to the UK.

Throughout the 20th century, the central State appeared indifferent to the safeguarding of the legacy of industrialisation. In terms of legislation, the Heritage Law 16/1985 as well as the first generation of the regional laws did not explicitly cite Industrial Heritage. Nevertheless, this first general heritage legal framework contributed to the listings of a small number of industries on a national and regional level.

With very limited exceptions (Heritage Laws of Castilla-La Mancha in 1990 and Catalonia in 1993), former industrial sites would not be recognised as part of the regional cultural heritage legal framework until the turn of the 21st century. In the late 1990s and early 2000s a second generation of regional laws was created, referring explicitly to Industrial Heritage (Heritage laws of Cantabria and Baleares in 1998, Asturias in 2001 and Andalucía in 2007). The posed laws defined Industrial Heritage and discussed its categorisation, illustrating a shift in the appreciation of this heritage typology from the public administration (Abad, 2016, 12, 215).

The first decade of the new millennium was a period of prosperity for the handling of the Spanish Industrial Heritage. New advocative structures were created and considerable advances were made on a theoretical, strategic and legislative level. At the same time, the Reuse practice proliferated in a rapid way, favoured by the blooming economy and the social awareness of this new heritage group's values. It is worth highlighting two developments of that period which diverged from the past regional-centred practice. Firstly, the establishment of TICCIH Spain in 2002, an NGO which acts as an advocate of Industrial Heritage on a national scale. Secondly, the activation of the State for the formulation a national planning framework for the historic industrial stock of the country.

In 2001, the Commission of the Spanish Cultural heritage Institute (IPCE) drew "The National Plan for Industrial Heritage". Its objective was to promote knowledge, protection, conservation and Reuse of the old industrial spaces based on a coordinated strategy between the State, the Autonomous Regions and the Municipalities, with the participation of citizen associations and private agents. The plan was revised in 2011 (Ministerio de Educación Cultura y Deporte, n.d., Biel Ibáñez and Cueto Alonso, 2011, 14).

Since its creation, a series of actions have taken place in favour of Industrial Heritage. An early project realised in 2002 was the selection of 50 elements, groups and landscapes of industrialisation across Spain that would become subject of the first protection, conservation and reactivation actions. Almost a decade after that, a milestone project created by TICCIH Spain, was also realised within the framework of the Plan. The exhibition and the homonymous publication '*100 elements of Industrial Heritage in Spain'* addressed key aspects of the Spanish Industrial Heritage while presenting in detail 100 inscriptions of the country's most characteristic industrial sites, covering diverse chronological eras, different scales, basic typologies and representative productive sectors and grade of conservation. A more comprehensive project realised in 2012, is the "Study of the situation of Industrial Heritage in Spain" which includes the inventories of all autonomous regions. L. Cruz, Vice-coordinator of the National Plan for Industrial Heritage stressing the positive impact of the Plan states:

"I think that we have achieved a lot since the creation of the Plan. It is an international point of reference. It is raising awareness and also works as an instrument of defence on several occasions. Even though the industrial elements included in the Plan's list do not all have legal protection and the subsequent advantages (such as the BICs), they are acknowledged in a way and accepted by all." (Resp. no 192, interview, 30/11/2017).

Despite its merits, the Plan has been subject of an intense criticism over its shortcomings (Biel Ibáñez and Cueto Alonso, 2011, 88-95, Resp. no 185-192, interviews Autumn 2017). The basic points of criticism are the delay of the project to deliver key actions, such as the compilation of a comprehensive national inventory and its inability to secure in practice the future of selected heritage elements.

As stated above, the first decade of the 21st century also saw the culmination of the transformation of the vestiges of industry in Spain. As shown in the ReIH website, industries were converted in every possible use (housing, education, cultural spaces, museums and interpretation centres/ visitor attractions, service sector activities and restaurants). Important schemes of the era were the cases of Matadero in Madrid and Caixa Forum in Barcelona. Many of the projects developed were signed by starchitects (e.g. Caixa Forum in Madrid, by Herzog and de Meuron). Moreover, more stakeholders entered the field of Industrial Heritage Reuse, introducing new uses to the obsolete structures. Significant projects of urban scale which mark a distinct departure from past destructive practices were the modification of the metropolitan plan in Barcelona's 22@ district (see Vol.2, Ch.13) and the Terrassa Plan for Municipal Urban Planning.

Despite the progress of the country in respect to Industrial Heritage adaptation, it is worth highlighting the noteworthy asymmetries in the practice between the different regions of Spain. These are essentially caused both by the means and attitude of the regional administration towards heritage and from the nature of industry in each region. In regard with the latter point, it has been noted that facilities with higher complexity and bigger size e.g. the mining and ironworks landscapes, common in Asturias and the Basque Country, rarely became subject of transformation. In contrast, structures with more contained aspects such as the textile mills of Catalonia, were easier to convert to other uses.

The recognition of the Spanish Industrial Heritage as a cultural asset of global character is achieved in the 21st century. In 2007 the hanging Bridge of Bilbao entered UNESCO's World Heritage List to be followed by the Mining park of Almadén entry, five years later. According to the experts interviewed in the framework of this research, the turn of the millennium also saw an important shift in the public's appreciation over Industrial Heritage. E. Casanelles, founder and director of mNACTEC (1996-2013) and President of TICCIH (1997-2009), explains:

"The perception of the people towards Industrial Heritage has changed a lot in comparison to the past. This is evident as every year there are protests against the destruction of such site and also more and more buildings are preserved." (Resp. no 185, interview, 25/9/2017).

The recession of the late 2000s put a halt in the marching conversion activity of Industrial Heritage, presenting at the same time some positive effects, too. The latter include the interception of the rising gentrification of former industrial districts and the reconsideration of past intervention approaches. This is illustrated clearly in the case of the Tabacalera in Madrid (see Vol.2, Ch.14). In recent years, the economic situation of Spain has started recovering, allowing paused regeneration projects to continue (e.g. 22@, see Vol.2,, Ch.13) and new projects to appear (e.g. Bombas Gens, see Vol.2, Ch.15).

4.4.3.3 Shifts and challenges

After the course of almost forty years, historic industrial buildings have become an intrinsic part of the Spanish cultural heritage. As analysed above, a lot of progress has been made on a theoretical, legislative and practical level. Spain has formed a rich collection of Reuse cases, including a number of strong reference-projects of a landscape scale.

Nevertheless, the above achievements are not expressed equally in every part of the country. The fragmentation of Spain and the organisation of heritage care on a regional level[32] has resulted in the lack of an overview of historic former industrial sites, necessary for their effective protection and management. Furthermore, it has caused great asymmetries between regions, with some of them being still delayed in terms of Industrial Heritage recognition, protection and adaptation. The establishment of the 'National Plan for Industrial Heritage' is undoubtedly the first step in the right direction. Yet, a lot more should be done. The challenge for Spain appears to be to bring up to speed the 'delayed' regions while getting disentangled -at least in the field of heritage- from the predicaments of the introvert regionalism.

4.4.4 Greece

4.4.4.1 The industrialisation and the deindustrialisation of Greece

Greece's industrialisation took place with a considerable delay and at a far lesser extent and intensity, in comparison to the north-western European countries.[33] It was characterised by a labour intensive pattern, great asymmetries in its spatial sprawl, sensitivity to the fluctuations of international markets and a relatively small scale (Agriantoni, 2018). It was based to an extent on foreign capital, machinery and know how (Agriantoni, 1986, 348). The process of the Greek industrialisation was accelerated in three phases (Chatziiosif, 1986). The first industries in Greece appeared in the 1850s, yet the first period of industrial acceleration is placed between 1870 and 1880. The first Greek industries (flour mills, breweries, cotton and silk mills, tanneries, soap and olive oil mills and machine shops) were of small scale and they were mainly focused on the production of commercial goods for the domestic market.

The main poles of industrialisation of that period were Hermoupolis in Syros, Piraeus and to a smaller extent Patras. In parallel with the production sector, Greece developed from the 1860s on a rich network of industrial extraction sites, spread in the Aegean Sea and the mainland. The most important mining town of the 19th and early 20th century was Lavrion (Belavilas and Papastefanaki, 2009, Mavroidi and Papastefanaki, 2003, 6).

32 The issue will be further analysed in § 6.2.1.2.

33 A comprehensive analysis of this asymmetry's reasons is presented in the article:
Chatziiosif, C. 1986. Greece: Industrialisation without revolution. Archaeology and Arts, 18, 54-59.

The second phase of the country's industrialisation is placed in the Interwar period. With the annexation of regions such as Thessaly (1881); Macedonia, Epirus and the northern Aegean Sea islands (1913) and Thrace (1920) and the extension of the county's borders, important cities with a significant industrial stock (Thessaloniki, Kavala, Veria, Mitilini and Naousa) were incorporated to the Greek territory (Clogg, 1992, Hellenic Military Geographical Service, 1999). New industrial units and new sectors (chemical industry, tobacco and electrical plants) were created, benefited from the expansion of the local market and the financial implications of the consecutive wars. Along with the development of the existing industrial poles, new industrial accumulations appeared in Athens, Volos, and Elefsina (Kalogri et al., 1986).

The third and final phase of the Greek industrialisation took place between 1962 and 1973, boosted by state intervention and a consistent industrial policy. Big industrial plants (aluminium and steel works, refineries and chemical industry) were established while certain products started being exported (Agriantoni and Stoyiannidis, 2018). Nevertheless, the Greek industry never managed to overcome its limitations, *"releasing the necessary dynamics that would make possible the channelling of the entire economy towards a consistent and self-feeding growth"* (Chatziiosif, 1986). Influenced by the global trends, Greece entered into a phase of progressive deindustrialisation in the late 1970s (Agriantoni, 2003, 44).

4.4.4.2 Evolution of Industrial Heritage protection and Reuse in Greece

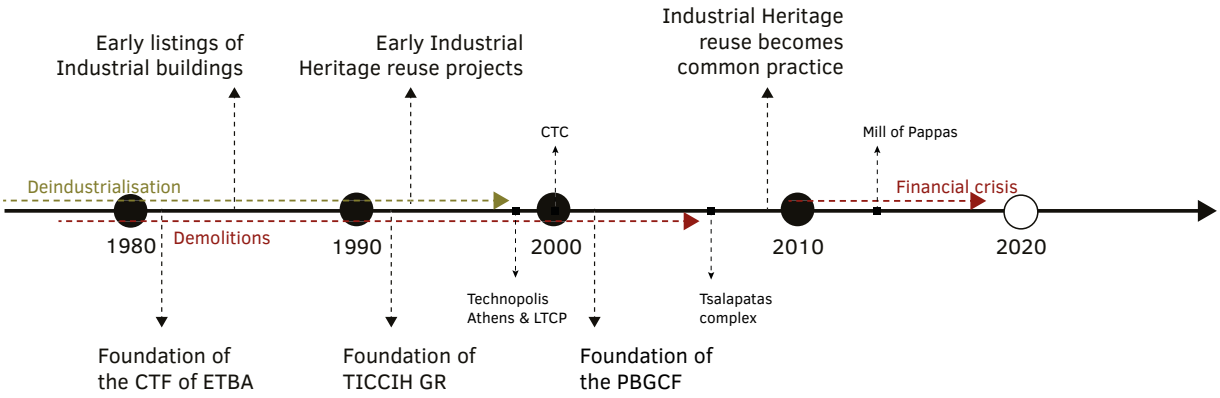

FIG. 4.4 Timeline of the evolution of Industrial Heritage protection and Reuse in Greece

Greece is no stranger to the issue of heritage preservation and its complexities. On the contrary, the country has a long tradition in monuments' preservation with special attention to the relics of the Classical, Hellenistic and Byzantine period. The deep influence of the established practices however and the fostered perception on the 'limits' of heritage by the Greek scientific community and the general public made the incorporation, protection and Reuse of historic industries a challenging venture in the country.

The first efforts for the protection of Industrial Heritage in Greece started in the 1980s with the action of public administration services, research and cultural organisations. The first conference on industrial archaeology in the country was organised in 1986 (Agriantoni, 2003, 46-47, Louvi, 1999, 3). The bodies that played an important role, taking some critical early initiatives in favour of the Greek Industrial Heritage were the Institute of Neohellenic Research (INR) of the National

Hellenic Research Foundation, the Cultural Technical Foundation of ETBA and the Ministry of Culture[34] (TICCIH Greece and KAM, 2015).

From the mid-1980s, the Institute of Neohellenic Research (INR) of the National Hellenic Research Foundation started conducting studies and research projects focused on the history of Greece's industrialisation in the framework of the programme "History of Industry and Industrial Archaeology". The protection of Hermoupolis industrial machinery that paved the way for the establishment of the Centre of Technical Culture of Hermoupolis (see Vol.2, Ch.16) stands out as a key initiative of the INR (Mavroidi and Papastefanaki, 2003, 4).

In parallel with the work of the INR, the Cultural Technical Foundation of ETBA, established in 1981, was setting in motion a dynamic ground-breaking action for the documentation, preservation and safeguarding of the Greek preindustrial and Industrial Heritage and the dissemination of its value. This involved the organisation of related research programmes, publications and conferences, the creation of a network of technical museums and the instigation of safeguarding motions (Papadopoulos, 1987).

At the same time, the State was assuming an active role in the protection of the Greek historic industrial stock. In 1989, the group of Industrial Archaeology was established in the Directorate of Folk Culture, aiming to introduce and coordinate the documentation, safeguarding, exploitation and conduct of Reuse studies of industrial complexes and elements.

The group in collaboration with the Regional Ephorates (offices) of Modern Monuments, launched the first systematic documentation programme of industrial buildings that led to a series of listings. Furthermore, it compiled a specialised archive of Industrial Heritage assets including listed preindustrial and industrial buildings. The publication "Industrial Archaeology" (Group of industrial Archaeology-Directorate of Folk Culture- Ministry of Culture of Greece, 1989), which also formed part of the group's activity, served as an early handbook of the discipline, introducing briefly, along with the action of the group, the main related terms and concepts while presenting a set of proposals for future action. Despite its impressive work, this initiative was restricted to its very first steps as the group was dissolved a year later without finding a successor. As a result, industrial monuments were incorporated in the general scope of the Directorate of Modern Monuments (Deliyanni, 1999, 5).

The 1990s saw the systematisation of the initiatives for the documentation and protection of Industrial Heritage in Greece. The most important development of that era was the establishment of the Greek Section of TICCIH in 1992 (see § 6.2.3.), which engaged and mobilised a large group of people and foundations advocating for the safeguarding of the Greek industrial legacy. Since its establishment the Greek Section of TICCIH, in collaboration with State and scientific bodies has promoted important projects for the safeguarding and projection of the country's industrial stock.

The growing interest in the relics of industrialisation was manifested in the same decade with the emergence of multiple targeted recordings by academic, scientific and research institutions, private bodies and individual researchers, either through research programmes or during the creation process of local thematic museums and other Reuse projects (e.g. Open air water power museum of Dimitsana, Lavrion Technological and Cultural Park).

34 The action of those bodies is presented in detail in Chapter 6.

A key contribution, providing an overview of the Greek industrial listed monuments was published in 1999 by the Ministry of Culture (Ministry of Culture of Greece - Directorate of Folk Culture, 1999). A comprehensive account of the Greek Industrial Heritage documentation initiatives, from their early steps to 1999, is presented in the special issue of the *Journal Technologia* (1999, 3-38) dedicated to the subject (Mavroidi and Papastefanaki, 2003, 4).

The 1990s is also the decade of the preparation and launch of the first large scale Reuse projects in Greece. The only noteworthy implemented project taking a precedence, is the conversion of olive oil mills into cultural centres in Lesvos island. The pioneer programme, executed in the mid-1980s, safeguarded an important number of preindustrial and industrial small-scale oil mills. The lack of experience however led to invasive interventions that undermined the value of the historic sites. The Reuse in most of the cases involved only a shell preservation, resulting in the destruction of the mills' mechanical equipment and interior set-up. Nevertheless, the merits of the programme outweighed its weakness. As A. Louvi (1999, 4) puts it:

"The case of Lesvos was convincing, safeguarding significant shells of industrial buildings, but most importantly paving the way for their protection and altering the position of the Greek community which until then was remaining indifferent, if not negative to the industrial buildings."

As shown from the filtering of the Greek case studies of Reuse in the ReIH platform, the first new uses housed in the former industrial buildings included mainly recreation and cultural activities (music venues, cultural centres etc.), industrial museums and educational facilities. Important transformation projects were set in motion or inaugurated mainly in major cities (Thessaloniki, Athens and Volos) and in the country's key industrial poles (Hermoupolis, Lavrion). At the same time, the first two thematic museums of CTF of ETBA Bank opened their doors in the periphery (Open air water power museum of Dimitsana, Silk Museum at Soufli).

The conversion of the flour mill Chatzigiannakis (1924-1987) in Thessaloniki, was one of the earliest Reuse projects in the country. Awarded by Europa Nostra (1993), it was regarded a reference case of industrial conservation at a complex level, characterised by a respectful approach to the authenticity of the original structure and its machinery. The mill was converted in 1991 into a mixed use function by a group of local entrepreneurs. It housed a cultural and recreation centre in the production and warehouse halls of the factory and an industrial museum in the centrepiece of the mill, preserving all its machinery (Deliyanni, 1992, 48-49). In 2004, a fire destroyed the interior of the historic centrepiece along with its wooden mechanical equipment depriving the complex from its most important dimension (Deliyanni, 2006).

Apart from that project, a series of initiatives was taken for the Reuse and protection of multiple industrial complexes (Gasworks factory, textile mill IFANET, FIX brewery, and tileworks Alatini) in Thessaloniki in the 1990s. The 4th Ephorate of Modern Monuments of the Ministry of Culture and the Local Section of Hellenic Society for the Protection of the Environment and the Cultural Heritage were the most active stakeholders in respect to the city's Industrial Heritage protection. Despite the promising created dynamics, the momentum was eventually lost due to the State indifference and the reaction of the local real estate market. As a result, most of the aforementioned sites remained underused.

Following the lead of Thessaloniki, Athens inaugurated in 1999 the first phase of Technopolis (see Vol.2, Ch.17). The converted gasworks complex, catalysed the regeneration of its context while creating a wave of Industrial Heritage conversions in the area in the years that followed.

At this point it is important to stress the combined contribution of two Academic Institutions with local authorities for the safeguarding and Reuse of the Greek Industrial Heritage since the 1990s. The National Technical University of Athens (NTUA) and the University of Thessaly in collaboration with the Municipalities of Lavrion and Volos respectively, were the instigators of key Reuse projects. From 1994 to 1999 the NTUA implemented the most extensive and complex case of Industrial Heritage Reuse in Greece to this day. The transformation of the French Mining Company of Lavrion to the Lavrion Technological and Cultural Park is analysed in detail in Volume 2 (see Vol.2, Ch.18).

Since the early 1990s, a plan for the safeguarding and Reuse of the abandoned industries of Volos was devised and executed, under the initiative of the local authority and the newly established University of Thessaly (TICCIH Greece and KAM, 2015). The University, in order to be incorporated into the city and enhance its function, restored and reused a number of industrial premises for the needs of its administration and educational functions (e.g. the Papastratos tobacco warehouse, the tobacco factory and the tobacco warehouses Matsaggos and the machine shop Papariga). At the same time, the Municipality of Volos purchased several abandoned industries (e.g. the Rooftile and Brickworks factory of N. & S. Tsalapatas, the Tobacco warehouse Spierer and the Cotton mill Adamopoulos). Using funds of the EU programme URBAN, it managed to reuse those complexes for cultural, sports, administration and other functions (Adamakis, 2006).

It is noteworthy that the local authority assumed the full responsibility of the project, establishing the Municipal Research Company (ΔΕΜΕΚΑΒ). ΔΕΜΕΚΑΒ implemented the studies and designs resulting in the Reuse of the aforementioned buildings, in collaboration with the municipal technical services. Despite the dissolution of that team, the City Council elected in the following decade adopted a similar line of action, enriching the city's portfolio with more reused industries (e.g. Tobacco warehouse Papantos, Electrical company) (Adamakis, 2007, 190-191). The case of Volos is considered to this day, the most comprehensive example of Industrial Heritage regeneration at a city level in Greece.

In spite of the undeniable progress in the field of Industrial Heritage documentation, safeguarding and Reuse, the 1990s also saw extensive losses of iconic industrial buildings in Greece. Indicatively, the FIX brewery in Athens, one of the most significant modern industrial plants of the country, was mutilated, while the warehouse of the Austrian Hellenic company in Thessaloniki was reduced to two facades (Deliyanni and Kotsovili, 1997, 59-60). Furthermore, the analysis of the early case studies of Reuse (e.g. the Katsimantis Dyeworks conversion, see Vol.2, Ch.16; Technopolis, see Vol.2, Ch.17 and the Tsalapatas complex, see Vol.2, Ch.19) reveals an immature approach and multiple weaknesses in regard to the architectural interventions and the extent of cultural heritage preservation.

As expressed in key publications (Deliyanni and Kotsovili, 1997, Agriantoni, 2003), the turn of the millenium finds Industrial Heritage in Greece in a precarious position. Gaps in legislation, discoordination or indifference of the State and lack of a common approach between the Ministries responsible for the listing of industrial monuments as well as lack of compatibility of the new functions with the character of the historic industrial buildings in numerous cases of Reuse (especially into recreational facilities) and radical architectural interventions are highlighted as key issues of the era.

In contrast, the first decade of the 21st century finds Greece in a blooming economic conjuncture. The favourable economic conditions coupled with the growing momentum of industrial archaeology, the accumulated experience of the previous decades and the growing interest in the relics of industrialisation, gave rise to impressive advances in the field as well as a quantitative and qualitative upgrade of Reuse projects across the Greek territory.

In regard to the research and documentation of the Greek industries, the 2000s saw significant developments. A wealth of relevant publications was produced focusing on different industrial sectors, specific industries were thoroughly documented (e.g. Drapetsona Fertilizers Factory, Agro-industrial complex of Aliartos in Viotia) while attention was paid to the documentation of industrial machinery, too. An overview of the documentation initiatives of the 2000s is given by Belavilas (2006) and a more analytical one, ranging from the early documentation attempts to the most recent ones, is provided by the catalogue of the exhibition "Industrial Heritage in Greece, 1980-2015. Safeguarding-Research-Education" (TICCIH Greece and KAM, 2015).

A novelty of the era was the launch and dissemination of Industrial Heritage digital records. The most significant initiatives in that respect were taken by the public sector. In detail, the Ministry of Culture updated its digital record Odysseus[35] with a richer and more analytical content including a thematic catalogue of industrial, technical monuments and workshops (Charatzopoulou, 2003, Charatzopoulou and Gika, 2007). Furthermore, in 2007 the Ministry of Environment launched a digital archive of traditional settlements and protected buildings.[36] The archive despite being generic includes various cases of protected industries (Lialios, 2007). In the same period the National Hellenic Research Foundation launched the thematic record: Industrial establishments and workshops in the Aegean.[37] In parallel with those initiatives, the Greek Section TICCIH developed the "Registry of the Greek Industrial Heritage", attempting to collect and index the existing records, the bibliography, various research programmes while combining them with field research.

The aforementioned registries made a broad range of information on Industrial Heritage accessible. Nevertheless, all of the above present limitations in terms of completeness and validity of certain fields, which have been altered overtime. This gap has not been filled to this day. There is therefore still a need for an updated, comprehensive digital national registry of Industrial Heritage in the country.

Along with the progress in the documentation and research on Industrial Heritage, the new century saw the practice of Industrial Heritage Reuse blooming in Greece. The most diffused new use was that of industrial museums. Seminal projects were launched such as the Centre of Technical Culture in Hermoupolis (CTC) (see Vol.2, Ch.16) and the Museum of water supply in Thessaloniki. The newly established Piraeus Bank Group Cultural Foundation (PBGCF) (see § 6.2.6.) in collaboration with the Laboratory of historic machinery conservation of the CTC created a series of high quality industrial and technical museums across the Greek territory. At the same time, industrial buildings were converted to various other uses both in the major cities and in the periphery with the most diffused being the cultural use.

Despite the encouraging developments in the field in the 2000s, industrial relics kept facing issues. The influx of the funds for the enhancement of the urban tissue of Athens and other major cities, which characterised the preparation of the Olympic Games of 2004, was hardly used to preserve or convert existing historic industrial stock. Priority was given to the creation of infrastructure, new sports venues and the promotion of ancient and neoclassical monuments. At the same time, a number of complexes in Athens and Piraeus were demolished (e.g. Klonaridis brewery, 2000; Drapetsona Fertilizers Factory, 2003; Columbia factory in Perissos, 2006).

35 Odysseus <http://odysseus.culture.gr/h/2/gh220.jsp?era=4&group=15> is a national information system for the museums and archaeological sites of Greece, created in 1996.

36 Archive of traditional settlements and protected buildings <http://estia.minenv.gr/.

37 Industrial establishments and workshops in the Aegean: <http://pandektis.ekt.gr/dspace/handle/10442/428?locale=el>

The financial crisis, starting in the late 2000s and culminating in the following decade, had a profoundly negative effect on the safeguarding and Reuse of Industrial Heritage in Greece. The analysis of certain case studies (LCTP, Tsalapatas, CTC in Hermoupolis) along with the data given by the ReIH knowledge platform illustrate a threefold problem. Firstly, there was a pause in conversion projects from the late 2000s to the early 2010s. That was closely related to the lack of available funds from the EU, that had been used in the previous decades to bankroll large-scale projects and the climate of austerity that made both the public and the private sector unable or unwilling to invest in construction. Secondly, there were major delays in the programmed projects funded by the Greek State (e.g. Implementation of the Mining and Metallurgy museum of the LCTP; see Vol.2, § 18.1.5). Lastly, the realised projects faced considerable problems due to the unfavourable economic situation, which made their viability dubious.

In the current decade, despite the continuous insecurity and the fragility of the economic situation in the country, Industrial Heritage has been given considerable attention. Progressively, from the mid-2010s a number of initiatives have taken place, illustrating the growing interest in the Greek Industrial Heritage.

In 2015, in the framework of the European Industrial Heritage Year, the Greek Section TICCIH in collaboration with the Centre of Mediterranean Architecture, organised the conference and the retrospective exhibition "Industrial Heritage in Greece, 1980-2015. Safeguarding-Research-Education". The exhibition illustrated for the first time a comprehensive picture of the handling of the Greek Industrial Heritage since the early steps of industrial archaeology in the country.

Another noteworthy development was the creation of the volunteers' group 'Greek Industrial Records' (GIR) (Greek Industrial Records, n.d.). The group, established in 2017, has launched a website providing information about the Greek Industrial Heritage. An important novelty of the website is the creation of a new database of Greek industries. The ongoing project realised with the contribution of multiple volunteers, has a double value both engaging the public in the process of documentation while collecting and digitizing scattered or unknown information on various industrial sites.[38]

Lastly, since the mid-2010s industrial buildings have started being reused once again. A number of industrial complexes has been converted to various functions including, museums, cultural clusters, hotels and administration offices. At this point it is worth highlighting the notable absence of conversions into residential functions. This can be attributed to the special conditions of residential production in Greece and the stakeholders involved with it.[39]

38 Besides the GIR group, there are also collectives which advocate in favour of the safeguarding, documentation and care of the Greek legacy of industrialisation having however a wider scope. Among them the group MONUMENTA (http://www.monumenta.org/index.php) has presented over the years an important action.

39 In contrast with the situation in the three other analysed countries, residential production in Greece is hardly in the scope of large corporations (e.g. commercial developers) while there are no public nor private housing corporations in the country. Private individuals, small investors and constructors have assumed the task of residential production implementing for the most part small scale projects. Subsequently, there is a scarcity of experienced players interested and financially able to deal with the elevated costs, the complexity and the extensive scale of Industrial Heritage conversion into a residential use.

4.4.4.3 Shifts and challenges

Since the first applications of industrial archaeology in Greece a lot has changed. The historic industrial relics are no longer treated as the 'outsider' of the Greek cultural heritage. The preceding analysis shows that the Greek Industrial Heritage, after almost four decades has finally found its place in the collective consciousness of the Greek people and most of the stakeholders. The raising designation numbers by the Public Heritage Services, the documentation and research work of the Greek scientific community, the vigorous campaigning action of the various bodies mentioned in the analysis and the large appeal of the implemented reused industrial sites, have contributed greatly to this significant development.

Despite the acceptance of historic industries as a cultural resource however, the focus of Greece's cultural heritage is still on the antiquities as they form the core of the country's cultural identity. The remnants of the Ancient Greek civilisation that testify for the country's historic, scientific and cultural contribution are without any doubt a unique national resource and a global cultural asset that merits protection and projection. This is evident from the representation of the country in the World Heritage List with nine sites dating from the ancient times (UNESCO World Heritage Centre, 2020). On the contrary, it should be noted that Greece has no Industrial Heritage inscriptions on the List, except for the Lavreotiki area (mining centre in the antiquity and modern times) which forms part the Tentative List.

The 'justified fixation' to the heritage of the Antiquity does not pose a threat for the future of the industrial relics under one condition: the adoption of a different methodology for the conservation of Industrial Heritage as opposed to the monuments of the Antiquity and the abolishment of obsolete practices that are unsuitable for Industrial Heritage. A. Androulidaki, Head of Protection and Restoration of Newer and Modern Monuments, elaborating on the issue, states:

"In relation to abroad, in Greece there is formalism. There is a difference in the mindset. We are very much influenced by the ancient monuments and we are transferring this experience to the newer ones as well. To be honest, I do not think that is wrong. I would not want to fall back on authenticity as I consider it a very important feature. The problem is that sometimes we overdo it. We have to find the best of both worlds and stop being so inflexible." (Resp. no 248, interview, 8/5/2017).

O. Deliyanni, Founding member of the Greek Section TICCIH, architect and retired clerk of the Ministry of Culture, summarising the aforementioned shifts while presenting an additional issue claims:

"The late 1980s was marked by the action of a generation that brought experiences from abroad. As a result, a base was created in Greece. Now we know how to approach Industrial Heritage. In the previous decades, funds from European programmes were used while the (heritage) services were conducting the studies. Now there is knowledge but there is no economic potential, which does not allow conservation and reuse applications." (Resp. no 247, interview, 15/8/2018).

The ongoing financial crisis poses indeed the most critical challenge for the future of Greece's cultural heritage. Other challenges the country faces involve the completion of its Industrial Heritage documentation and the employment of an evaluation of the recorded sites. This will allow to pinpoint priorities for safeguarding and Reuse in order to make the best use of the existing limited funds. Flexibility and disentanglement from obsolete practices is an additional step that needs to be taken. Lastly, it is important to stress that along with the continuation of the Reuse of abandoned industries, the new century also presents a new challenge. The viability and upkeep of existing reused sites in the current situation is an equally challenging task.

4.5 Shifts and challenges

As revealed in the analysis of Section 4.4, the evolution of Industrial Heritage care in Europe over the past fifty years was marked by important shifts. A comparison of them in the four countries under investigation, despite their differences, reflects a broad common direction. In other words, all countries analysed went through similar transitions, passing through the same stages of development, namely recognition, protection, adaptation and post adaptation. Nevertheless, as shown in the Figure 4.5, this occurred at different times in each country and in some cases following a different order.

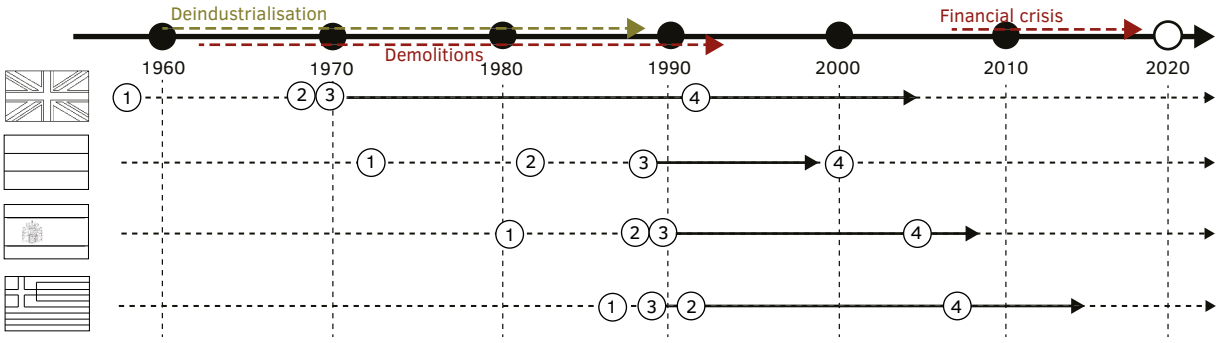

FIG. 4.5 Comparison of selected countries' evolution of Industrial Heritage protection and Reuse. The Figure emphasises the stages of development across Europe overtime and reveals a common direction of the practice.

Recognition & protection

Progressively since the 1960s, the former industrial sites have been attracting civic and institutional attention. Furthermore, systematic research, survey and documentation initiatives of historic industrial sites over the years have given a better view of this heritage group, contributing overall in its better protection and management as well as in its recognition and acceptance as part of Cultural Heritage across Europe.

Adaptation

Industrial Heritage Reuse, beginning from the late 1970s, has become a widely employed practice, which has allowed European countries to turn a problem into a solution.

The shifts noted overtime in Europe in the stage of Adaptation regard multiple facets of the Reuse practice, including the scale of intervention, the range of new functions, the selected building typologies, the intervention approaches and the attitude against the various heritage dimensions. The spectrum of Industrial Heritage Reuse schemes has moved overtime from mono-functional to multifunctional projects; from single building interventions to landscape approaches; from conversions of mills and factories to the transformation of more intricate complexes, such as extraction sites and installations; from adaptations of modest preindustrial sites to 20th century

industrial relics and industries in operation; from restoration approaches to compatible or radical interventions and from the focus on tangible assets to a wider emphasis on intangible values too. Those shifts are in line with the conservation theory transitions discussed in Chapter 2 of this dissertation.

Post adaptation, current challenges and future perspectives

In the 21st century all European nations have reached, organically or violently, the stage of post adaptation. This stage is characterised by two common challenges. The first one is both to continue using industrial brownfields as valuable vectors of progress and to sustain the bulk of sites, converted in the previous years. The countries pioneers and followers have been facing this challenge since the early 2000s, when their early converted Industrial Heritage sites (such as the IGM, the Jannink and the TextielMuseum Tilburg) started reaching the point of obsolescence (including physical, social, functional, legal and economic obsolescence) once again.[40] The countries followers and latecomers were presented with the problem of mainly economic obsolescence from the late 2000s, due to the repercussions of the global financial crisis (see for example the cases of DRU Industriepark, Energiehuis, The Tabacalera, the 22@ and the LTCP).

The second challenge, which relates to the financial crisis as well, is that since the late 2000s all European countries are expected to do more with less. This influences not only the practice of adaptation, but also the protection of the heritage stock.

In spite of the common direction of Industrial Heritage care on a European level, it would be erroneous to infer that nowadays the same maturity levels have been achieved across Europe. As shown in Section 4.4, each nation presents different strengths and weaknesses and has to respond to challenges of a distinct nature, along with the common issues mentioned above.

Special emphasis needs to be given to those challenges as they are deemed a critical issue. In respect to them three key points were identified. Firstly, fragmentation appears to be an important obstacle to the evolution of care of Industrial Heritage particularly in Spain and secondarily in the UK, too. Secondly, the contraction of the State interventionism, evident in the UK and the Netherlands, and the decentralisation of heritage care- a phenomenon more prominent in the UK, the Netherlands and Spain-, leave open a worrying range of possibilities for the loss of the vulnerable aspects of Industrial Heritage both before and during its Reuse. Lastly, the lack of a comprehensive record of Industrial Heritage assets and the absence of a systematic selection process, which still characterise mainly Greece and secondarily Spain as a whole, do not allow an overview of the available heritage stock. As shown from the pioneer countries, the latter is necessary as it can lead to proper protection and well-substantiated Reuse schemes, through informed evaluation.

40 The lessons learned from the experience of the early case studies in countries pioneers, which have managed to tackle effectively this problem will be discussed in Chapter7.

4.6 Conclusions

The aim of the Chapter was to answer the Sub-Question 1 of this dissertation: '*How has the current state of Industrial Heritage Reuse practice been formed as an accepted form of heritage conservation during the last fifty years in Europe?*'

In order to do so, a cross-country retrospective analysis was executed, providing answers to **which** developments took place, **when** and **where** and **how** did they influence the practice.

Through the close examination of four selected countries, the evolution of Industrial Heritage care in Europe was presented from its first steps to the late-2010s. A brief presentation of the process of industrialisation and deindustrialisation in Europe and a short analysis of two European countries pioneers of the practice of Industrial Heritage Reuse, provided context for the aforementioned discussion.

The analysis gave a topical and detailed image of the stages of recognition, protection, adaptation and post adaptation in each country. Lastly, patterns, conversions and diversions in relation to the practice were identified across the continent as well as common and distinct challenges among the countries under investigation.

The most important pattern identified was that all countries have reached now the stage of post adaptation, having gone through the rest of the stages at different times and in some cases following a different order. As for the common challenges, three important points were made. Firstly, the continuation of employing Reuse for the conservation of the remaining obsolete Industrial Heritage sites; secondly, the reinvention of the early reused sites that have been flirting with a new circle of obsolesce and thirdly and most importantly the financial depression which causes multiple side-effects.

In regard to the distinct challenges three significant issues were identified, namely the repercussions of the fragmentation of certain nations and the lack of collaboration between the administrational fragments; the contraction of the State interventionism and the decentralisation of heritage care; the lack of a comprehensive record of Industrial Heritage assets and the absence of a systematic selection process for their listing and educated management.

5 Influencing Factors

FIG. 5.1 The complex mix of Conditions and Attributes influencing the Industrial Heritage Reuse practice, visualized as a yarn ball to be unraveled in Chapter 5.

5.1 Introduction

The previous Chapter (Ch.4) offered a cross-country retrospective analysis of Industrial Heritage Reuse, identifying the key developments and shifts that took place in the last fifty years across Europe while illustrating roughly how they influenced the practice, responding to the S.Q.1. This Chapter will focus on the contextual and intrinsic influencing Factors of Industrial Heritage Reuse. The analysis will facilitate on the one hand the understanding of the reasons that triggered the identified far-reaching shifts and on the other hand, it will start clarifying the complexity of the interrelations between the Conditions and Attributes influencing the Industrial Heritage Reuse practice (FIG. 5.1). The aim of the Chapter is to answer the S.Q.2. of this dissertation:

'Which Factors, if any, influence decisively Industrial Heritage Reuse practice and how?'

Section 5.1 will briefly introduce the particular complexity of Industrial Heritage Reuse in relation to other practices of building adaptation. Section 5.2 will discuss the Net of Exogenous Conditions influencing Industrial Heritage Reuse, drawing mainly from the case studies' analysis of this research. Section 5.3 will discuss the Net of Endogenous Attributes influencing Industrial Heritage Reuse, drawing both from the existing literature base and from the case studies' analysis. The conclusions of the Chapter (§ 5.4) will present a comprehensive overview of the Factors influencing decisively Industrial Heritage Reuse.

The practice of Industrial Heritage Reuse has a lot in common with the adaptive reuse of valorised buildings (listed monuments) as well as with building adaptation in general. Yet, as described in Section 2.6, there are specific challenges that justify a critical examination of the Reuse practice of Industrial Heritage as a special form of adaptation. Those regard mainly the particularities of this special heritage group that often features huge sizes, complex machinery and special values – among other characteristics. The following analysis, drawing from the theory of adaptation and the case studies' analysis will unravel the multi-layered 'Nets' influencing this challenging practice.

5.2 Net of Exogenous Conditions

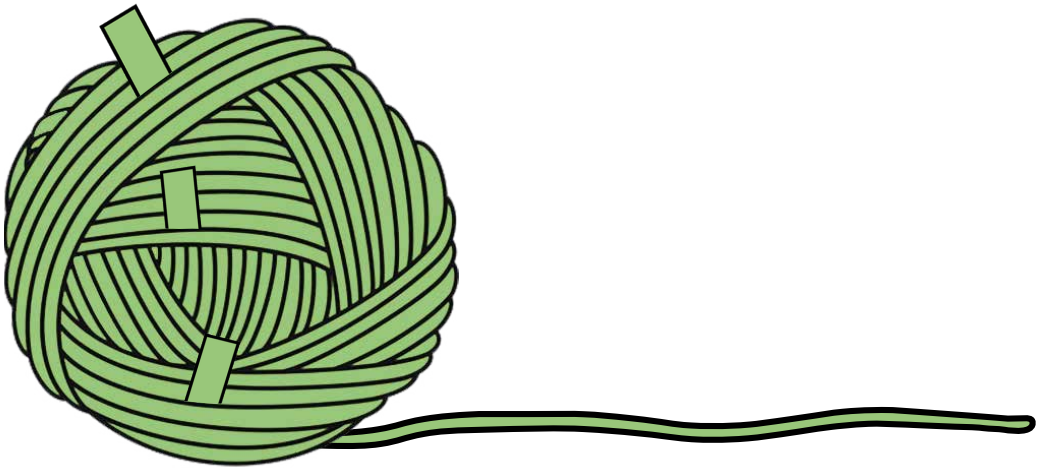

FIG. 5.2 The complex mix of Exogenous Conditions influencing the Industrial Heritage Reuse practice, visualized as a yarn ball to be unraveled in Section 5.2.

The theoretical framework presented in Chapter 2, briefly discussed the issue of influence on conservation decisions. In detail, in the Sub-Section 2.2.4 it was highlighted that informed and topical directions for the conservation decision-making can only be given upon a broader understanding of the Factors influencing it. These Factors involve not only the intrinsic characteristics of heritage that were used in the previous decades as a yardstick for decision-making but also a wider net of influencing Conditions. Those Exogenous Conditions, their interrelations and their impact are still a largely underexplored field (FIG. 5.2). Aiming to identify them and clarify their influence, the following Sub-Section will mainly draw from the selected cases of best practice, analysed in Volume 2 of this dissertation.

5.2.1 Lessons from case studies

Chapter 4 clearly revealed that successive shifts have taken place in each selected country along the evolution of the Industrial Heritage care in Europe. Can the identified far-reaching developments be traced on a case to case basis? And if so, what lessons can be drawn? A close analysis of the case studies of best practice, presented in the Volume 2 of this dissertation, reveals that the following external developments had a decisive influence on the decision-making with regard to Industrial Heritage Reuse.

Designation and National Policy

The Statutory protection of industrial relics, that followed the recording and selection initiatives of each country, or its absence, played a nodal role in the trajectory of each case under investigation. A number of cases confirms that unlisted industrial sites suffered great losses either in their interior (e.g. Energiehuis) or in part of their extent (GWRW, 22@) as they had no statutory protection. It is worth mentioning that the unlisted historic industrial relics were more prone to destruction in times of little appreciation or financial pressure.

On the other hand, it also became evident from multiple cases, that designation created positive conditions for their Reuse. In a few cases (e.g. IGM and Het Jannink), it made the site eligible for grant-aid while in others (e.g. Stanley Mills, DRU Industriepark, Tsalapatas complex, BJF) it facilitated the project's conversion due to its recognised architectural and technical value. In other words, the site was preferred over others for Reuse due to its acknowledged significance.

Besides the statutory protection, national urban planning policies have also widely influenced the cases under investigation. This is particularly evident in the UK examples. In detail, the various redevelopment bodies established as part of the British Government policy (e.g. UDCs, English Partnerships, RDAs) and QUANGOs such as the HLF, boosted significantly the Reuse practice of Industrial Heritage.[41] It is worth stressing that all five British cases had benefited from the effects of the aforementioned policies. The cases Energiehuis, BJF, 22@ and Tsalapatas complex (in its early phase) on the other hand, reveal the catalytic impact of local authorities urban planning policy for their creation and development.

Lastly, the cases' analysis shows that specific economic and cultural actions stemming from national and international policy boosted Industrial Heritage Reuse. The economic actions are discussed in the following Sub-Section while the cultural ones mainly involve the awareness campaigns organised over the past fifty years, to be further analysed in Sub-Section 6.4.1.

National and European economy

A thriving number of case studies highlighted the importance of their financial context and its massive impact on their development. The financial crisis and recession periods (e.g. early 1990s and late 2000s) resulted in significant complications in the large majority of case studies of Industrial Heritage Reuse. Planned projects of unsuitable scale and weak viability were cancelled (e.g. Tarmac plans in GWRW, LRC's masterplan for King's Cross, initial plans for the redevelopment of Bombas Gens); on-going Reuse projects were abandoned (e.g. Murray's Mills in Ancoats District) or delayed (Mining and Metallurgy Museum in LTCP, 22@ in Barcelona); completed schemes started facing serious viability, personnel and maintenance issues (e.g. DRU Industriepark, Energiehuis, mNACTEC, CTC) while underdeveloped parts of Reuse projects were left to dereliction (e.g. underused part of Stanley Mills).

In contrast, in times of financial prosperity, great advances were noted in the cases analysed. In periods of economic affluence the public sector bodies of all four countries vastly supported -in a direct or indirect manner- the thriving majority of the selected cases. At the same time, the implicated private sector stakeholders, benefiting from the positive characteristics of the flourishing economy (including stable growth, rising asset prices, minimum uncertainty) and the incentives

41 The case of IGM, that was developed before the posed policies, illustrates the impact of the New Towns Act through the presentation of the influence of the Dawley New Town Development Corporation.

given by the public sector, took up Industrial Heritage Reuse projects despite their risk (e.g. in the cases of Westergasfabriek and Tsalapatas complex).[42]

The European policy and its resulting financial instruments also influenced profoundly the examined cases. It is noteworthy that almost half of the cases analysed (including, IGM, LTCP, DRU and mNACTEC) were made possible by programmes like Urban, Feder and the Regional development fund. Those programmes allowed various actions that were otherwise impossible to fund such as the regeneration of vast areas, the extension of complex projects and the decontamination of various schemes. Larger contributions of these international funding programmes are noted to be particularly implemented in countries with weaker economies, like Greece.

Political context

The national policies and economic developments influencing the examined cases were closely linked to the political scene of each country. As a result, national politics are also viewed as part of the Exogenous influencing Conditions to the cases. A tangible expression of the political impact on the Industrial Heritage Reuse cases pertains to the repercussions of the shrinking of the State support and intervention in heritage care and management. In detail, verious cases (such as GWRW, Stanley Mills, Jannink, DRU Industriepark and the CTC) show that the political choice of conservative European governments to support the idea of a 'Smaller State' has caused great problems in their operation.

Socio-Cultural context

The case studies' analysis also showed that all the examined examples of Reuse were influenced by their sociocultural context. Firstly, they were all largely shaped by their stakeholders' action, a subject which will be discussed in great detail in Chapter 6. Secondly, they were largely affected by the fluctuating level of Industrial Heritage appreciation and awareness at the time of their development. In detail, as noted above, the restricted appreciation for the legacy of industrialisation rendered demolition or the loss of cultural values and machinery easier in the large majority of the early cases of Reuse examined (e.g. demolition of great part of the GWRW, loss of machinery in part of the Technopolis).

Thirdly, the later and recent cases of Reuse (e.g. DRU Industriepark, Energiehuis, LTCP and Tsalapatas) illustrated a high level of influence from previous reference projects (e.g. IGM, mNACTEC web and Ruhr). Based on the case study analysis, it can be reported that the programme, process, architectural and conservation approach of certain early cases created a positive precedent, which influenced the sociocultural context of each country, facilitating in turn the diffusion of the practice and its enhancement.

Fourthly, the tradition in heritage care in each country also influenced a great deal the Reuse practice of Industrial Heritage. This is more evident in the comparison of the cases of the two extremes in terms of intervention: the Netherlands and Greece.

On the one hand, the examples of intervention in the Netherlands, based on the protection infrastructure established in the late 20th century under the influence of private initiatives (Strolenberg, 2017, 14), are far more expressive (e.g. DRU Industriepark and Energiehuis) with

42 Further analysis of the impact of national and international economic fluctuations on the public and private sector is given in Chapter 6.

some of them even reaching the limit of boldness (e.g. TextielMuseum Tilburg). In regard to the content of the former industrial buildings, the Dutch cases present only very occasionally models of machinery preservation *in situ*, although some historic pump installations can be found still in place and even functioning. There are also a few examples of partial preservation or relocation of historic machinery. In the large majority of the cases, however, the machinery is scraped or sold before the Reuse of the complex, for efficiency or economic reasons.

In contrast, in the Greek context, based on a long-established tradition of conservation of ancient era monuments, there is a tendency to restore rather than to intervene into the shells of the industrial buildings. The transformation approach is far less expressive in terms of new architectural additions. Whenever there is a need for a new structure, reconstruction is preferred over addition (e.g. Kornilakis tannery in CTC, Mill of Pappas). This 'restrained' approach is also applied to the content of the former industrial sites. All Greek case studies analysed have conserved partly or fully their mechanical equipment regardless of their new use. The interior of the industrial buildings is treated with far more freedom. This evident distinction between the approaches towards the shell and the interior, is a common issue for all cases across the analysed countries.

Lastly, focusing only on the cases of visitor attractions and industrial museums, it is evident that they are also influenced by shifts to their national or local socio-cultural context. For example, the growing competition, resulted from the rising number of similar sites, has largely influenced their operation and financial viability, challenging them to reinvest for the reorganisation of their programme and the reinterpretation of their content as well as for redesigning their facilities (e.g. IGM and TextielMuseum Tilburg). The same tension is also underlined by another sociocultural development regarding the redefinition of the role of museums in the 21st century (Cerrah, 2019).

Factor X: Unforeseen and Sporadic Events

Alongside with the abovementioned developments, Industrial Heritage Reuse appears to be influenced by Unforeseen and Sporadic Events. More than a quarter of the cases examined showed that their Reuse process as well as their occupation and management was altered due to unforeseen natural disasters including floods, landslips and fires (e.g. IGM, Energiehuis, Mill of Pappas, mNACTEC). The Mega events can also be viewed as influential sporadic developments. The preparation or even the bid for the organisation of Mega events, like the Olympics, had a decisive effect on a number of cases including Technopolis, 22@ and Ancoats.

The above discussion confirms that the shifts identified in Chapter 4 were not only evident in the individual cases under investigation but also had a decisive impact on them. Patterns were found across early cases located in different countries and recent cases, too (TEXTBOX 4.1). Different patterns and commonalities were also traced across cases located in the same country (TEXTBOX 4.1). What is yet to be answered however is **why** did those shifts take place.

Taking into account the theoretical concepts and in particular the analysis of contextual influence presented in Sub-Section 2.2.4 and drawing from the analysis of the Section 4.4 and the above discussion, it is supported that a number of wider Conditions instigated those shifts, influencing -mainly in an indirect manner- the Reuse practice on a case to case basis. Those external Conditions which have a local, national and international magnitude, form together the "Net of Exogenous Conditions" (NEC) and can be subdivided as follows:

- Social Conditions
- Regulatory framework and Policy
- Political Conditions
- Cultural Conditions
- Financial Conditions
- Conditions X (stemming from Unforeseen and Sporadic Events)

The complex interrelations between those Conditions are graphically represented in Figure 5.3.

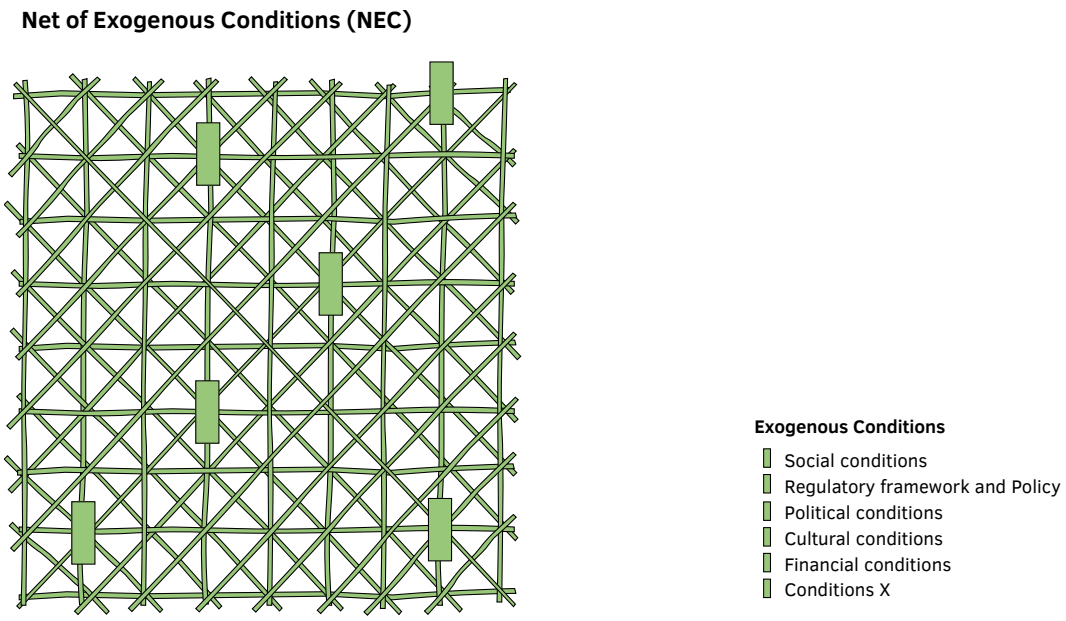

FIG. 5.3 The "Net of Exogenous Conditions" influencing Industrial Heritage Reuse practice.

The case studies' analysis shows that in certain cases the NEC also influences the synthesis of the Actors involved in Industrial Heritage Reuse. For example, as part of the national expression of the condition 'Regulatory framework and Policy', Actors, such as the HLF, have entered dynamically the pool of Industrial Heritage Reuse stakeholders. Furthermore, due to international financial Conditions, the European Commission through its grants (including URBAN, Feder and the Regional development fund) has also played the role of an important stakeholder in numerous cases.

Lastly, what is evident in the Section *'Evolution of Industrial Heritage protection and Reuse in the selected countries'* (see § 4.4) and is important to be highlighted, is that the defined Exogenous Conditions are subject to change over time. The political Conditions influencing the early Industrial Heritage protection and Reuse action in Europe (c.1970s-1980s) for example, were fundamentally different from those of the early 21st century. Time can therefore be defined as an important yet latent Aspect that influences the NEC, and in turn Industrial Heritage Reuse.

5.3 Net of Endogenous Attributes

As discussed in the Sub-Section 2.2.4, complementary to the Exogenous Conditions, are the Endogenous Attributes,[43] or intrinsic characteristics, which form part of the wider Net of Factors that influences the Industrial Heritage Reuse practice. Those Attributes are discussed in the present Section, drawing from the existing body of knowledge on adaptation of (heritage) buildings.

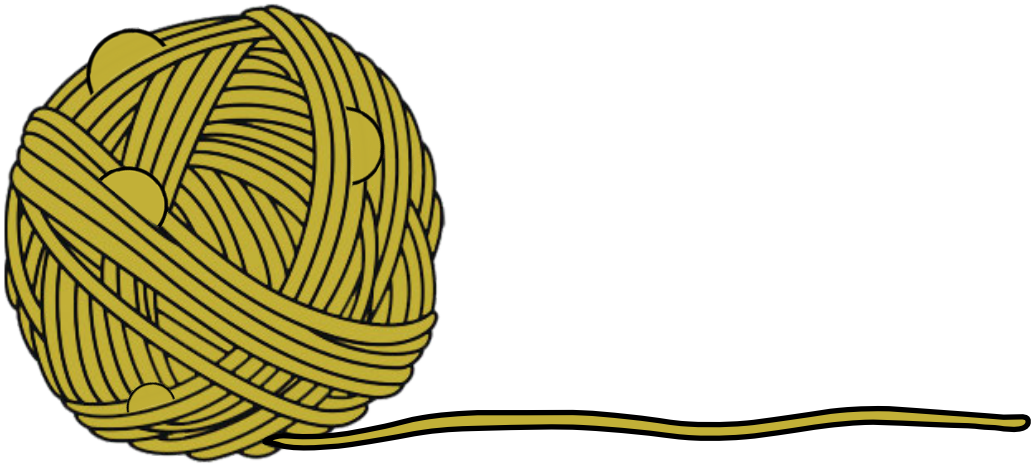

FIG. 5.4 The complex mix of Endogenous Attributes influencing the Industrial Heritage Reuse practice, visualized as a yarn ball to be unraveled in Section 5.3.

5.3.1 Lessons from literature

The complex 'yarn ball' of Endogenous Attributes influencing the decision-making of Heritage Reuse (Fig.5.4) has been unravelled and analysed by various scholars over time. Three significant contributions in literature with a distinctive approach and noteworthy overlaps will be discussed. Their selection was based on the criterion of comprehensiveness. Their composition will result in the definition of the 'Net of Endogenous Attributes' (NEA) that influences Industrial Heritage Reuse practice.

The first contribution pertains to the work of Stratton (2000). Despite rather dated, his publication is considered fundamental as it focuses on Industrial Heritage regeneration in specific, providing insights about the practice through multiple implemented examples. As part of the discussion on feasibility studies and conservation plans, Stratton identifies key principles concerning the nature of industrial buildings and their potential for Reuse. Those include:

43 Effectively, the adoption of the term 'Attributes' here is mainly based on Wilkinson et al. (2014) and should not be confused with the specific terminology as applied in the Operational Guidelines for World Heritage nominations.

- site characteristics (location and building form)
- heritage merit
- ownership
- financing
- public expectations
- quality of uses
  of industrial sites to be reused.

  Special attention is given to the issues of location and building form. Through the presentation of several cases, the positive and negative influence of rural, urban, suburban and regional locations for Industrial Heritage Reuse is highlighted as well as the particularities of different industrial building forms (such as multi-storey mills, warehouses, daylight factories, great halls, single storey sheds and non-buildings).

  As influential factors on the appropriateness of a new use, Stratton suggests that along with the nature of the industrial site and its physical condition, its plan and structure should be also taken into account. The latter are subdivided as follows:

- Site coverage
- Configuration
  - Single or multi-storey
  - Total floor-space
  - Ceiling heights
  - Nature of space (small/large single space, small/large repeated spaces)
  - Building type
  - Number of stories
  - Attributes (e.g. flexibility)
- Lighting
- Access
- Structure and cladding
- Services
- Fire safety

  A graphic representation of the set of relevant factors influencing the decision-making of Industrial Heritage regeneration in the view of Stratton is presented in Table 5.1.

TABLE 5.1 A graphic representation of the factors influencing the decision-making of Industrial Heritage regeneration according to Stratton (2000,30-50)

Factors	Site characteristics	Location	
		Building form	
		Plan and structure	Site coverage
			Configuration
			Lighting
			Access
			Structure and cladding
			Services
			Fire safety
		Physical condition	
	Heritage merit		
	Ownership		
	Resources		
	Quality of uses		
	Public expectations		

The second contribution, authored by Schmidt and Austin (2016), presents an updated and highly nuanced view on adaptability and the factors influencing it. Based on qualitative and case study research on different reused structures, Schmidt and Austin have identified no less than fifty-six universal building characteristics,[44] which influence adaptability through their relations and their links to the building layers and adaptability types. Table 5.2 presents those characteristics.

TABLE 5.2 Building characteristics that influence adaptability according to Schmidt and Austin (2016, 160).

1. Reversible	**20.** Oversize space	**39.** Multi-functional spaces
2. Movable Stuff	**21.** Typology pattern	**40.** Use differentiation
3. Component accessibility	**22.** Joinable/Divisible space	**41.** Mixed demographics
4. Functional separation	**23.** Modular coordination	**42.** Multiple/Mixed tenure
5. Service zones	**24.** Connect building	**43.** Shared ownership
6. Configurable stuff	**25.** Standard room size	**44.** Isolatable
7. Multifunctional components	**26.** Spatial variety	**45.** Multiple access points
8. Non-precious	**27.** Spatial ambiguity	**46.** Physical linkage
9. 'Extra' components	**28.** Spatial zones	**47.** Visual linkage
10. Durability	**29.** Simple plan	**48.** Attitude and character
11. Mature component	**30.** Standardised grid	**49.** Spatial quality
12. Good craftsmanship	**31.** Simple form	**50.** Building image
13. Overdesign capacity	**32.** Multiple ventilation strategies	**51.** Quirkiness
14. Readily available materials	**33.** Shallow plan depth	**52.** Time interwoven
15. Standardised components	**34.** Building orientation	**53.** Good location
16. Off-site construction	**35.** Good daylight	**54.** Contextual
17. Simple construction method	**36.** Space to grow into	**55.** Circulation (neighbourhood)
18. Open space	**37.** Phased	**56.** A communal space
19. Support space	**38.** User customisation	

44 According to Schmidt and Austin (2016,159) *"Building characteristic is defined as a prominent feature pertaining to the building and/or its constituting parts".*

The third contribution selected, authored by Wilkinson et al.(2014) offers a holistic and updated approach on sustainable building adaptation and its influencing Aspects. Figure 5.5 shows a model of the factors that have been identified by this study as influential to the adaptation decision-making.

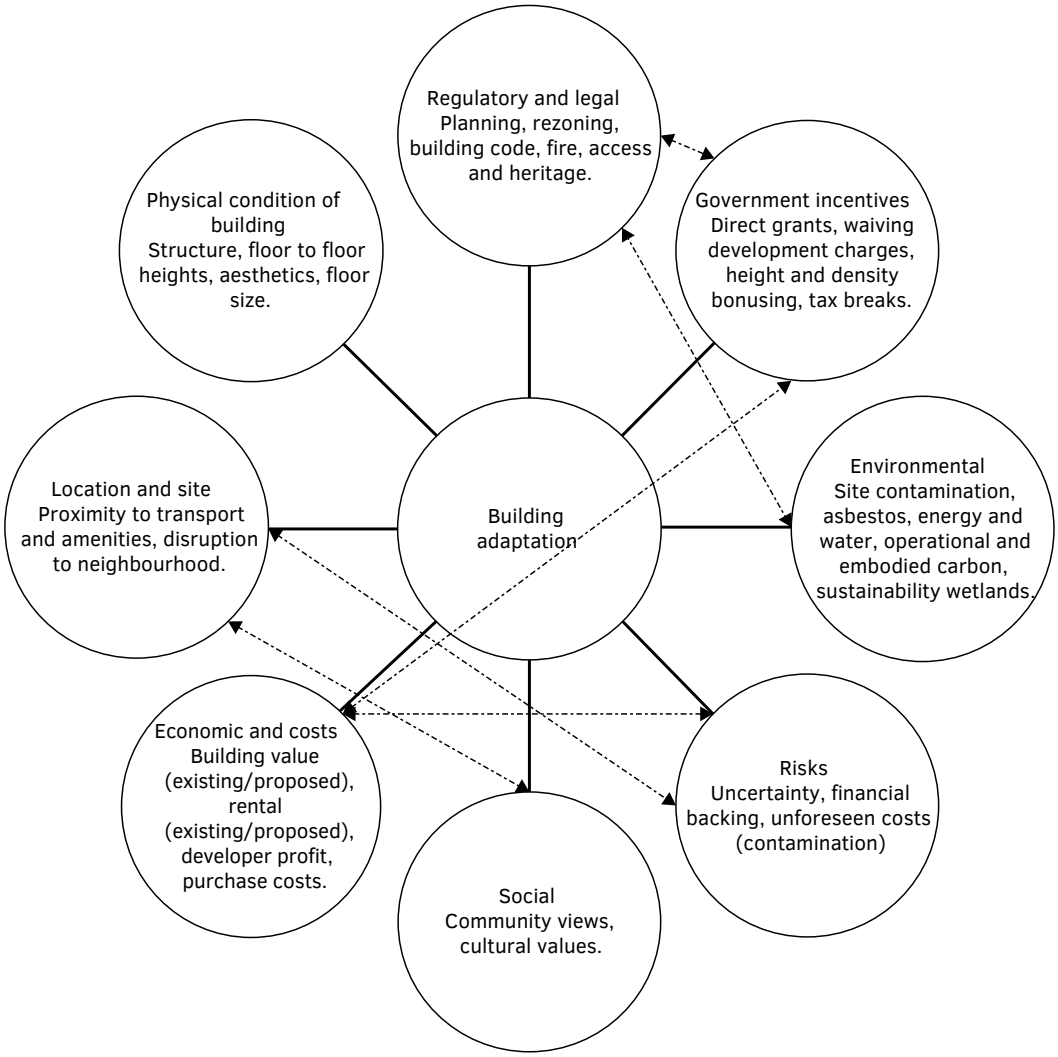

FIG. 5.5 Model of decision-making factors in building adaptation according to Wilkinson et al. (2014,22).

The Table 5.3 presents an analysis of the main Attributes that influence decision-making as presented by Wilkinson et al. (2014, 23).

TABLE 5.3 Building adaptation Attributes grouped into categories according to Wilkinson et al. (2014,23).

Category	Attribute
Economic Attributes	Current value
	Investment value
	Yields
	Increase in value post-adaptation
	Construction and development costs
	Convertibility (ease of conversion to other use and costs associated with the conversion)
Physical Attributes	Building height/number of storeys
	Floor plate size
	Shape of floor plate
	Service core location
	Elasticity (ability to extend laterally or vertically)
	Degree of attachment to other buildings
	Access to building
	Height of floors
	Structure
	Floor strength
	Distance between columns
	Frame
	Deconstruction (safe, efficient and speedy)
	Expandability (volume and capacity)
	Flexibility (space planning)
	Technological and convertibility
	Dis-aggregability (reusability/recyclability)
Location and land use Attributes	Transport
	Access (proximity to airports, motorways, train stations, public transport nodes, buses and trams)
	Land uses (commercial, residential, retail and industrial or mixed use such as office and retail)
	Existing planning zones
	Rezoning potential
	Density of occupation
Legal Attributes	Ownership – tenure
	Occupation – multiple or single tenants
	Building codes
	Fire codes
	Access acts
	Health and safety issues
	Convertibility
Social Attributes	Community benefits – historic listing
	Transport noise
	Retention of cultural past
	Urban regeneration
	Aesthetics
	Provision of additional facilities/amenities
	Proximity to hostile factors
	Stigma
Environmental Attributes	Internal air quality
	Internal environment quality
	Existence of hazardous materials (asbestos)
	Sustainability issues

Examining closely the categorisation of Wilkinson et al, illustrated in Table 5.3, it is evident that along with the Attributes pertaining to the site (endogenous) it also includes other Aspects that pertain to its wider context (exogenous), such as the construction and development costs, the building codes, fire codes, health and safety issues etc. The latter ones have been already identified as part of the Net of Exogenous Conditions (NEC) while the former ones can be used for composing the Net of Endogenous Attributes (NEA).

It is evident that the three guiding studies present multiple overlaps. Being most comprehensive, updated, concise and better-structured, the subdivisions by Wilkinson et al. (2014) will serve as the base for the identification of the Endogenous Attributes and Sub-Attributes, enriched with important input from the other two studies.

The Endogenous Attributes of Industrial Heritage influencing its Reuse is presented below, while their analysis on Sub-Attributes is presented in Table 5.4.

Endogenous Attributes

- Economics and Risks
- Physical Attributes (condition, characteristics and Attributes)
- Location and site
- Legal
- Social
- Environmental
- Heritage significance

TABLE 5.4 The influencing Endogenous Attributes and Sub-Attributes of Industrial Heritage Reuse practice incl. the 'source' of each Sub-Attribute.

Main Attributes	Sub-Attributes	S	A	W
Economic Attr. & Risks	Convertibility (ease of conversion to other use and costs associated with the conversion)		X	X
Physical Attributes	Site type	X		
	Size of site	X		
	Building(s) size	X	X	X
	Coverage (availability of open space)	X		
	Building(s) height/number of storeys	X		X
	Configuration of floor plans	X	X	X
	Services	X	X	X
	Elasticity (ability to extend laterally or vertically)		X	X
	Degree of attachment to other buildings			X
	Access to building	X	X	X
	Height of floors	X		X
	Structure	X	X	X
	Physical condition	X		X
	Distance between columns			X
	Lighting	X	X	
	Building(s) orientation		X	
	Deconstruction (safe, efficient and speedy)			X
	Expandability (volume and capacity)			X
	Flexibility (space planning)	X		X
	Dis-aggregability (reusability/recyclability)			X
	Volume, location and typology of Machinery	X		
	Craftsmanship		X	
	Phased		X	
Location and land use Attributes	Physical linkage	X	X	
	Visual linkage	X	X	
	Transport	X	X	X
	Access (proximity to airports, motorways, train stations, public transport nodes, buses and trams)	X		X
	Land uses (commercial, residential, retail and industrial or mixed use such as office and retail)	X		X
	Traffic/parking	X	X	
	Existing planning zones	X		X
	Rezoning potential	X		X
	Density of occupation	X		X
Legal Attributes	Ownership – tenure	X	X	X
	Occupation			X
Social Attributes	Site connotation (e.g. Site image, Symbol of pride, Stigma, Quirkiness)		X	X
	Location connotation		X	X
	Community benefits			X
	Nostalgia	X		
	Aesthetics		X	X
	Public expectations	X		
	Part of urban regeneration	X		X
Environmental Attributes	Contamination	X		
	Internal air quality			X
	Internal environment quality			X
	Existence of hazardous materials (asbestos)			X
	Sustainability issues			X
Heritage significance	Sociocultural values (evidential, historic, social, cultural, aesthetic, technological and scientific values)	X		X
	Economic values	X		

KEY: S.=Stratton (2000), A.= Schmidt and Austin (2016), W.= Wilkinson et al. (2014)

As shown in Figure 5.5 and further emphasised in Wilkinson et al. (2014,30) there are links and overlaps between Attributes. This can be further highlighted through the following three examples. Firstly, as discussed in Section 2.6, the scientific and technological values of Industrial Heritage are often ascribed in their content and in particular in their mechanical equipment. This reveals a link between the site's machinery (Sub-Attribute of the site's physical Attributes) and its sociocultural values (Sub-Attribute of the heritage significance). Secondly, it is evident that the physical condition of a site largely defines the costs and its ease of conversion to other uses. A site in advanced dereliction would need more resources and effort to convert than one in a good physical condition. This shows the interlink between the physical condition of the site (Sub-Attribute of the site's physical Attributes) and the convertibility (Sub-Attribute of the economic Attributes and risks). Lastly, the environmental footprint of some industrial activities, that is inherited to a society along with the tangible and intangible dimensions of Industrial Heritage, largely affects the local community. The contamination of former industrial sites (Sub-Attribute of the environmental Attributes) therefore is often linked with public expectations (Sub-Attribute of the social Attributes). It is therefore suggested that the links and overlaps of the identified Endogenous Attributes form a Net which influences Industrial Heritage Reuse. The NEA is visualised in FIG. 5.6.

Net of Endogenous Attributes (NEA)

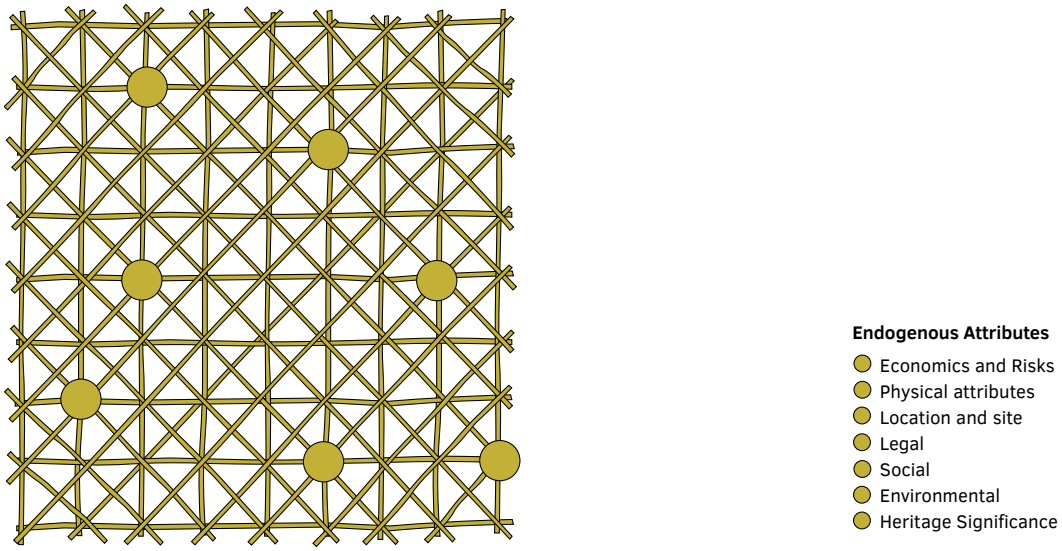

FIG. 5.6 Visualisation of the Net of Endogenous Attributes influencing Industrial Heritage Reuse

As highlighted in the Sub-Section 5.2.1, Time is an important latent Aspect that influences Industrial Heritage Reuse. Its influence, apart from the Exogenous Conditions, can also be traced in part of the defined Endogenous Attributes. For instance, the physical condition of an industrial site (part of its physical Attributes), its access and surrounding land uses (part of its Location and land use Attributes) as well as its connotation (part of its social Attributes) are not static in time. In contrast, Time influences and alters those Attributes and as a result reshapes the NEA.

5.3.2 Lessons from case studies

In the previous Sub-Section the complex 'yarn ball' of the Endogenous Attributes influencing Industrial Heritage Reuse, was unravelled. The Influencing Endogenous Attributes were identified and it was supported that they form a Net. How does this NEA influence Industrial Heritage Reuse however and in which stage of the process can this influence be traced? The analysis of the selected case studies will serve as a basis for answering the above questions.

The results of the case studies' analysis show that the NEA has a wide and far reaching influence. Initially, a number of cases including IGM, TextielMuseum, mNACTEC, Ca L' Aranyó and LTCP, showed that in the preparation stage the heritage significance and the social Attributes of the former industrial sites play an instrumental role for their safeguarding from demolition.

In the stages of preparation and evaluation, the NEA influences vastly the decision regarding the selection of sites for Reuse. This is substantiated through multiple examples. For instance the central and well connected location was one of the principal reasons that fuelled the conversion of sites such as the Ancoats District, King's Cross and Technopolis. In contrast, the same attribute complicated the Reuse of DRU Industriepark and Stanley Mills. Location however is not the only Endogenous Attribute that influences the selection of an Industrial Heritage site for Reuse. The cases of Ironbridge, GWRW and TextielMuseum; Bombas Gens and mNACTEC; Ca L' Aranyó, Tabacalera, LTCP and Mill of Pappas show that their heritage significance, their physical Attributes and their social Attributes respectively are also among the reasons for the selection of those sites for Reuse over others. It should be highlighted that for the majority of the cases, the NEA rather than one single Endogenous Attribute influenced this critical decision.

Apart from the selection for the site for Reuse, in the same stages, certain Endogenous Attributes can have such a weight that they may influence a key part or even the whole course of redevelopment. This is exemplified in cases of the Energiehuis, Westergasfabriek and LTCP. In all three cases Environmental Attributes such as the existence of hazardous materials and contamination influenced both the next stages of redevelopment and most of its components, including its Process, Financing, Architectural approach and Social performance. The cases of DRU Industriepark and Westergafabriek show how the same Sub-Attributes can also have a decisive impact in the collaboration between involved stakeholders.

Furthermore, the NEA's influence can be also traced in the following stage of acquisition**.** The case of Ancoats for instance, demonstrates how legal Attributes, such as the compartmentalised ownership of a prospective regeneration site, can cause complications to the Process and Finances of a scheme. In the next stage, the NEA has been proven to play an instrumental part in the selection of the site's new Programme. This is highlighted by multiple cases including the GWRW, King's Cross, Westergasfabriek and LTCP. The combination of Physical Attributes (Size, Structure, Physical condition), location and land use Attributes (Physical linkage, Visual linkage, Transport, Access) and heritage significance were among the key considerations for deciding the new functions of those sites and their allocation in the available buildings.

In the Procurement stage, the physical, environmental and heritage significance Attributes have been proven to be significantly influential, guiding the Architectural Intervention and the Cultural Significance approach of the Reuse. This is evident in numerous cases. For example, the new volumes constructed in McArthur Glen Swindon as part of the GWRW regeneration (see Vol.2, Ch.2), ICER of the DRU Industriepark (see Vol.2, Ch.9) and in Bombas Gens (see Vol.2, Ch.15) are clearly influenced by the morphology and the materiality of the existing buildings respectively that form part of the physical Attributes of the buildings. The respect for the spatial integrity and the

atmosphere of the grand hall of Vapor Aymerich, Amat i Jover in combination with the morphology and aesthetic quality of its roof were the main reasons for the subterranean extension of mNACTEC instead of a conventional floor addition solution. Moreover, the wish to preserve the sociocultural values, patina and spatial quality of the existing structures led to the differentiation of architectural and cultural significance approaches in the Aneroussis and Kornilakis buildings in the CTC case. Lastly, environmental, structural and heritage significance considerations led to the employment of the box in a box idea in the cases of BJF, Energiehuis and Ca L' Aranyó.

Finally, as clearly highlighted in the Evaluation Part of each case study in Volume 2, the NEA's influence extends to the occupation and management phase too. As shown from multiple cases including the BJF, Het Jannink and the Mill of Pappas, the physical and environmental Attributes largely affect the functionality of the reused sites. Apart from that, the NEA is highly influential for the attraction of prospective users (visitors, tenants or residents) and in turn for the social performance and financial viability of the reuse scheme during its operation. Sub-Attributes, such as the physical and visual linkage, access, surrounding land uses can play a positive (e.g. in the cases of Ancoats, Jannink, Westergasfabriek and Technopolis) or negative role (e.g. in the cases of Energiehuis and mNACTEC) while the heritage significance of the site and its social Attributes usually serve as assets, strengthening its operation.

In short, it was shown that the NEA influences every single Component[45] of Industrial Heritage Reuse practice throughout the process, from its preparation to its occupation and management stage. Its influence can be both positive (facilitating a stage of Reuse or informing key decisions) or negative, causing challenges (delays, inflated budget, functionality and operational issues). Furthermore, it was highlighted that the influence of the NEA also extends to the stakeholders of Industrial Heritage Reuse affecting their decisions, the relationship between them and their relationship with the site.

45 For a more detailed account of Industrial Heritage Reuse Components see Chapter 7.

5.4 Conclusions

5.4.1 Links and interaction between NEA and NEC

So far, the link and impact of the NEC and NEA on Industrial Heritage Reuse and its stakeholders has been highlighted. What still remains obscure is whether there are interactions between the identified NEC and NEA. Evidence from the existing body of literature in combination with the lessons from the case studies' analysis of this dissertation lead to a positive answer.

A characteristic and well substantiated example of this interaction can be given through the examination of the attribute 'Heritage significance'. As showed in Sub-Section 2.2.2, the array of values of each heritage object that constitutes its heritage significance, is a sociocultural construct. It has hence a direct link with the social and cultural Exogenous Conditions identified in the Section 5.2.

The Social Attributes of a site, as for instance the nostalgia, can be also linked with Exogenous social, cultural and financial Conditions. Section 2.4 discussed the transition from a hostile attitude to the symbols of industrialisation to a general feeling of nostalgia towards them, as an effect of the economic and sociocultural upheavals brought by the deindustrialisation in Europe.

Direct and loose links can be also traced between legal Attributes and Regulatory and policy Conditions. For example, the Freehold and Leasehold property law of England and Wales, that can be categorised under the regulatory and policy Conditions, affects directly the legal Attributes of a heritage site and in particular its ownership. Moreover, links can be found between location and land use Attributes and Political as well as Regulatory and policy Conditions. The Sub-Attributes 'Existing planning zones' and 'Traffic/parking' for instance depend on the policy of local authorities and political decisions, too.

The preceding analysis illustrates that there are indeed links and interactions between the NEA and the NEC.

5.4.2 The Net^2 of Factors influencing Industrial Heritage Reuse

This Chapter, drawing from the theoretical concepts of Sub-Section 2.2.4, placed emphasis on the issue of contextual and intrinsic influence on Industrial Heritage Reuse. Its aim was to identify the Factors that affect decisively Industrial Heritage Reuse practice and the way they do it.

Based on literature and case study research it was shown that influence is exerted by a complex interaction of both Exogenous and Endogenous Factors of Industrial Heritage. The Net of Exogenous Conditions, which has local, national and international magnitude, influences Reuse mainly indirectly. On the contrary, the Net of Endogenous Attributes exerts a direct influence to all Components of Industrial Heritage Reuse practice, throughout its process. Through multiple examples anchored in the case study analysis it was highlighted that the influential Factors can affect the Reuse practice and its Actors both positively and negatively.

Lastly, it was shown that there are links and interactions between the NEC and the NEA. The integration of the two Nets composes the multi-layered 'Net^2 of Factors' influencing Industrial Heritage Reuse, illustrated in Figure 5.7. It is worth underlining that the influence of the multi-layered 'Net^2 of Factors' has a much greater extent and should not be interpreted as the mere sum of influence of the NEC and the NEA.

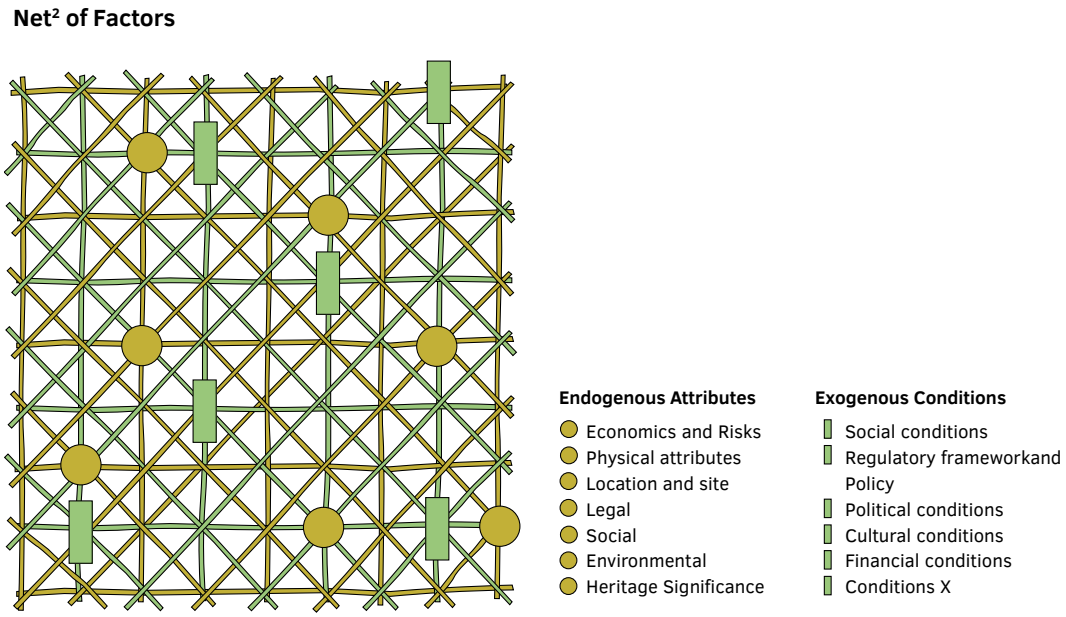

FIG. 5.7 Visualization of the Net^2 of Factors influencing Industrial Heritage Reuse

6 Influencing Actors: The stakeholders of Industrial Heritage Reuse

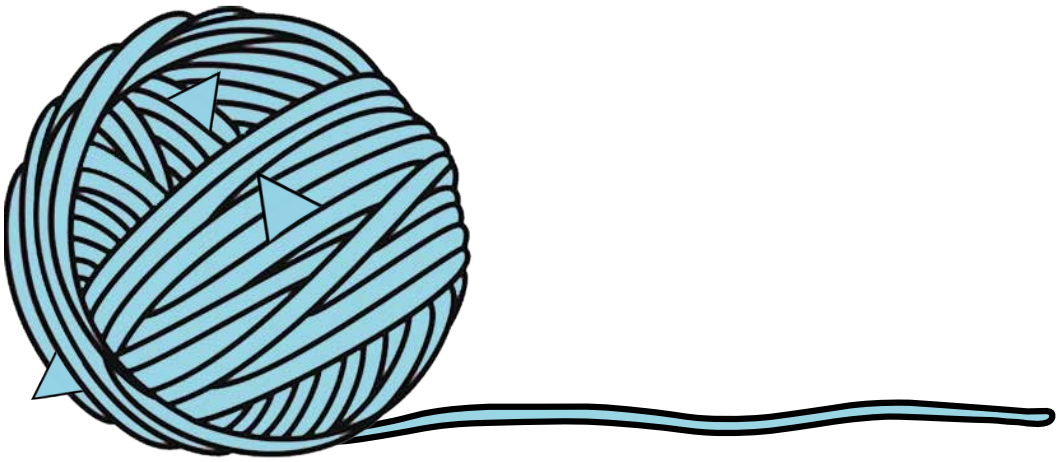

FIG. 6.1 The complex mix of Actors influencing the Industrial Heritage Reuse practice, visualized as a yarn ball to be unraveled in Chapter 6.

6.1 Introduction

The previous Chapter (Ch.5), analysed the complex Net^2 of contextual and intrinsic Factors influencing Industrial Heritage Reuse. This Chapter discusses another important influencing Aspect which pertains to the Actors involved in the practice. This analysis, focusing on the subject of Reuse, will shed light to a complex and relatively underexplored issue providing valuable insights into the decision-making process of the practice (FIG. 6.1). The aim of the Chapter is to answer the S.Q.3 of this dissertation:

'Which Actors, if any, influence the practice, when, where and how?'

The introductory Section (§ 6.1) will provide an overview of the Actors involved in Industrial Heritage Reuse and a brief review of key contributions from the theoretical framework on the subject. Section 6.2 will shed light to the most important Actors involved in the practice, analysing their role, involvement, influence and impact. In Section 6.3, the standing challenges related to their action will be analysed. Section 6.4 will discuss the shifts that have occurred overtime in their role and action. Section 6.5 will provide lessons from the case study analysis which facilitate the interaction of the involved Actors. Finally, the conclusions will highlight essential conditions that contribute to a positive impact of the influencing Actors in projects of Industrial Heritage Reuse.

6.1.1 The subjects of conservation: A Literature review on the stakeholders of conservation

As discussed in Sub-Section 2.2.5 of this dissertation, the identification and analysis of the Subjects of conservation, who will be thereafter referred to as 'Actors' (and interchangeably as 'Stakeholders'), is a highly important and topical task for the study of heritage conservation in the contemporary era. It is now well established that heritage conservation and Reuse cannot be examined independently from the people that influence it. As Berens (2011, 269) puts it:

"If the answer to successful redevelopment were more mechanical, it would be easier, but it is not. In the end it all comes down to people."

The examination of this subject is challenging, due to the shifts brought by the subjectivism of the post-modern era and the changing nature of the stakeholders' role and interaction (see § 2.2.5).

Research over the past two decades has illustrated different angles of the subject, placing emphasis on the role, action and attitude of key decision-makers (Schmidt and Austin, 2016, 205-215, Roos, 2007, 173-185, Stratton, 2000, Mason, 2008, 112-113) and on the challenges they are required to respond to during conservation or Reuse (Bloszies, 2012, 49-61, Howard, 2003, 103-146). In the Sub-Section 2.2.5, reference was made to key works that offer a categorisation of stakeholders, including the work of Mason (2008, 112-113), who classifies them into insiders, outsiders and constituencies and the more nuanced classification of Howard (2003, 103-146) who categorises them into insiders, outsiders, owners, governments, academics and the media. Apart from them, a number of other studies have attempted to cluster stakeholders. Viñas (2005, 153-157) for example distinguishes them in experts and laymen. Orbasli (2008, 8-11, 67-74) initially introduces a similar categorisation (specialists and generalists) and later analyses them based on the scope of action (international, national, local) and the sector they belong into (public and private). Other authors consider the action of stakeholders as part of the analysis of the redevelopment process (Berens, 2011) or they present it through the analysis of case studies and specialists' interviews (Baum and Christiaanse, 2012).

Despite their useful contribution, these studies present important limitations. This is owed to a number of reasons. Firstly, most of them offer a piecemeal picture of the stakeholders' pool having either a restricted geographical scope (Roos, 2007, Cossons, 2008) or considering a quite narrow range of stakeholders (Schmidt and Austin, 2016, Berens, 2011). Secondly, the available research on heritage stakeholders is rather generic (Mason, 2008), providing hardly any insight about their role and action and failing to cover the Actors influencing Industrial Heritage Reuse projects, in specific. Lastly, seminal studies that address the latter issue (Stratton, 2000) have been compiled decades ago, presenting an outdated image of the Actors involvement.

This Chapter, unravelling the 'yarn ball' of Industrial Heritage Reuse Actors (FIG. 6.1), aims to provide a comprehensive, retrospective and topical account of the stakeholders' involved with Industrial Heritage Reuse in Europe. In specific, it will discuss **who** is involved in the practice, **when** (in which stage) and **where** (at which country). The analysis of the role of stakeholders will also cover **how** they are involved and **what** is their influence and the impact of their involvement. The mapping of the Actors' influence will allow to answer who is in control of the process today.

Furthermore, drawing from this study's literature review, qualitative research interviews and case study research, the progress of the stakeholders overtime as well as the standing challenges and the shifts related to them will be discussed. Lessons from the case studies' analysis will provide guidance presenting the essential conditions for a positive Actors' influence within the climate of the analysed challenges. Finally, having established what has changed, towards which direction and what has worked in practice, the conclusions will suggest a net of working relationships between Actors characterised by alternating levels of control, which is likely to produce enhanced Reuse projects.

6.2 Role & influence of stakeholders

"The people for whom a heritage object is meaningful, have been called stakeholders by several authors (Avrami et al., 2000; Cameron et al., 2001), a term which is especially appropriate: stakeholders own a tiny part of something larger; as such, they are affected by the decisions that are taken regarding it, and they have the right to have a say in relation to it. (Viñas, 2005, 154).

An exhaustive list of Industrial Heritage Reuse stakeholders is not easy to make, as the involved bodies and individuals differ from project to project and from country to country. The Factors that dictate this differentiation are the Endogenous Attributes of each site, such as its scale, complexity, cultural significance and appeal of the project as well as its location and the particular 'Exogenous Conditions' that influence it. An attempt to map the array of Industrial Heritage Reuse stakeholders is presented in Figure 6.2.

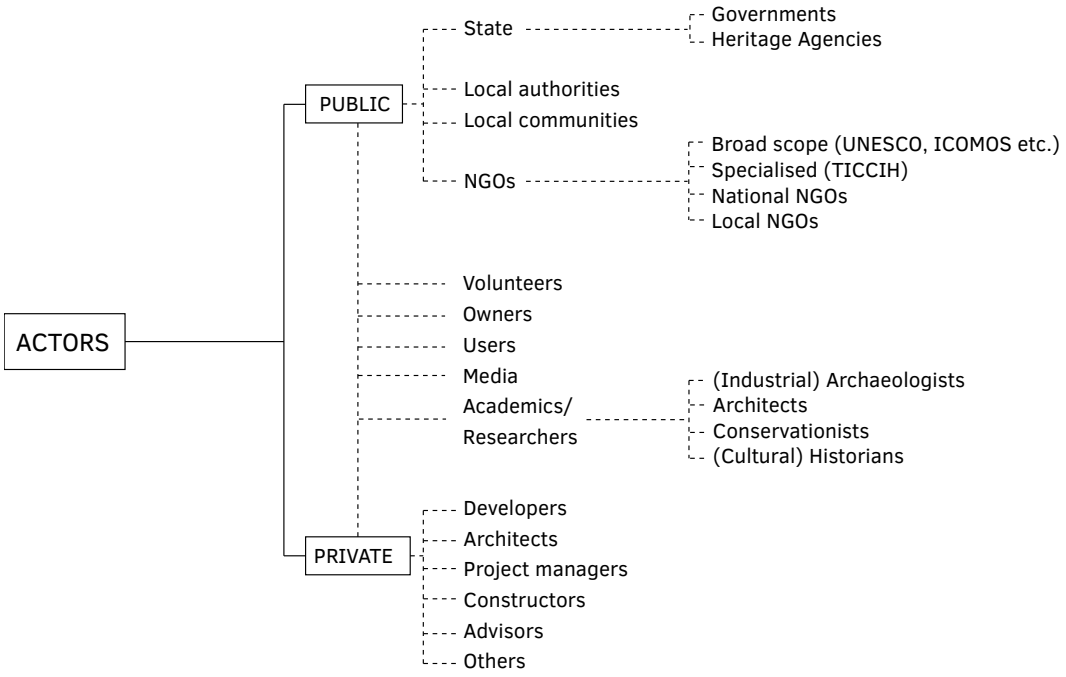

FIG. 6.2 Industrial Heritage Reuse Stakeholders map. The Appendix 05 includes the stakeholder maps of every country under investigation.

According to A. Orbasli (2008, 67):

"Decisions concerning the cultural heritage or about factors that will impact on it are made at many levels and under different circumstances, with different working relationships between the various decision-making bodies."

In what follows, the role, involvement, influence and impact of the main Industrial Heritage Reuse stakeholders will be analysed, based on a categorisation between public and private sector Actors.

6.2.1 Institutional public stakeholders

The protection and conservation of cultural heritage in Europe is in general part of the remit of National authorities, according to relevant legislation.[46] Their responsibilities include the statutory designation, the protection and control of interventions in historic assets, providing advice, granting permits and raising public awareness on the values of cultural heritage (Orbasli, 2008, 66-71).

The particular structure and the involvement of national, regional and local departments in the abovementioned tasks differs from country to country, as the models of legislation on cultural heritage in Europe vary. This diversity is evident in the legal framework of the four countries under investigation, ranging from an exclusively national legislation model (Greece), to a model of national

46 Excluding World heritage Sites, the responsibility of which is shared between national authorities and the UNESCO.

legislation supported by regional or local legislation (UK and the Netherlands) and finally to a legislation model which is largely regional, supported by a general national framework (Spain). The analysis that follows, provides an insight to those highly diversified systems and particularly to the institutional public bodies involved in the decision-making of Industrial Heritage Reuse process.

6.2.1.1 Heritage Agencies

The official public body for the identification and protection of cultural heritage in the cases under investigation is the National Heritage Agency, which is, in general, part of a Ministry. Specifically, in Britain there are four such Agencies, namely Historic England in England (2019a); Historic Environment Scotland in Scotland (n.d.); The Historic Environment Service of the Welsh Government in Wales (Cadw, 2019) and the Northern Ireland Environment Agency in Northern Ireland (Department of Agriculture Environment and Rural Affairs, n.d.). The Dutch equivalent department is called Rijksdienst voor het Cultureel Erfgoed (Cultural Heritage Agency) and it is an executive body of the Ministry for Education, Culture and Science (Cultural Heritage Agency, n.d.). In Greece the main body responsible for the identification and protection of heritage differs according to period of construction of the cultural heritage assets. Most Industrial Heritage sites fall in the jurisdiction of the Directorate of Protection and Restoration of Modern and Contemporary Monuments (n.d.) that belongs to the Ministry of Culture and Sports. Finally, in Spain there are two departments of the Ministry of Culture, namely the General Sub-directorate for Historic Heritage Protection and the General Sub-directorate of the Institute for Cultural Heritage of Spain, which share the responsibility of National Cultural Heritage (Ministerio de Cultura y Deporte, n.d.). In what follows, selected examples of the Heritage Agencies mentioned will be presented in detail, shedding light to their role and responsibilities.

Historic England

The Heritage Agency of England, established in 1984, was commonly known as English Heritage. In April 2015 its name was changed to Historic England (HE) and a new charity was created, under the name English Heritage Trust. HE is responsible for the designation of heritage assets,[47] advice to government for policy, planning advice to local authorities and curation of the national archive for the historic environment. It also raises awareness, undertakes research, offers education and training as well as providing grants.

Since the 1960s and 1970s Industrial Heritage, despite being endorsed by Government policy and listed by HE was not taken into the State's guardianship. In contrast, its management and operation was pushed to local authorities and volunteers (Cossons, 2008, 11). Today, Industrial Heritage is considered an intrinsic part of the British Historic Environment. Thus, HE has set in motion a number of actions tailored to the needs of this particular heritage group including:

47 There are three types of listed status for buildings in England and Wales:
Grade I: buildings of exceptional interest.
Grade II*: particularly important buildings of more than special interest.
Grade II: buildings that are of special interest, warranting every effort to preserve them.
In the UK, the buildings which are not formally listed yet present a heritage interest tend to be in the remit of Local authorities, many of which maintain a list of locally listed buildings. A similar hierarchy of responsibility between the Central Heritage Agency (RCE) and the local authorities has been established in the Netherlands, too.

— **Research and publications**
The most important and comprehensive piece of research work HE has recently undertaken about Industrial Heritage is the 'Industrial Heritage at Risk' programme, launched in 2011 (Gould, 2015, English Heritage, 2011).

— **Stakeholders' support, advising and guiding**
HE offers support via its website, providing a number of advising documents addressed to the whole array of Industrial Heritage stakeholders. In terms of practical support, the agency has focused primarily on the voluntary sector. In acknowledgment of their key role and their need for guidance, HE has established an Industrial Heritage Support Officer since 2011. Besides the voluntary sector, HE is in the process of enhancing the skills of local authorities' archaeologists and conservation officers as well as its own stuff in order to be able to deal with Industrial Heritage.

— **Grant aiding**
HE provides funds for Industrial Heritage care. Its financial support aims at the identification and knowledge enrichment of industrial sites; the support of Industrial Heritage owners for the stewardship of their property; the acquisition of selected sites; urgent repairs and expert advice for exceptional sites at risk (English Heritage, 2011, 56–57).

— **Developing iconic industrial sites** (e.g. J.W. Evans Silverworks in Birmingham's Jewellery Quarter and Shrewsbury Flaxmill Maltings).

Advice on policy and practice in relation to England's Industrial Heritage is provided by the Industrial Archaeology Panel (Historic England, 2015).

Historic Scotland

Historic Scotland is the Heritage Agency of the Scottish Government. In October 2015, Historic Scotland was merged with the Royal Commission on the Ancient and Historical Monuments of Scotland (RCAHMS) and was renamed Historic Environment Scotland (HES).

HES has a similar role in Scotland with that of the Heritage Agency of England. In respect to Industrial Heritage, there is a Scottish industrial archaeology Panel, active for five decades. In 2011, a two-member dedicated Industrial Heritage team was created within the Conservation Directorate of Historic Scotland. Its main aim was to prepare the nomination of the Forth Bridge for World Heritage listing and provide the Ministers with an Industrial Heritage strategy.

— **On-going projects, Research**
HES has created and maintains a 'Buildings at Risk register' similarly with that of HE. A critical difference between the two is highlighted by M. Watson, Deputy Head of Industrial Heritage HES:

"In Scotland any listed building and even some buildings that are not even listed might be on the register. That way we can monitor change more efficiently." (Resp. no 2, interview, 11/6/2015).

The output of HES' research is disseminated in the form of reports or guides, accommodated to the needs of various stakeholders (e.g. INFORM Guides addressed to homeowners, Short guides for homeowners and building professionals).

— **Funding and development**
HES is investing in the Scottish Historic Environment, offering grants (Historic Scotland, 2016) and advising the HLF on other grant schemes.

Its financial contribution also extends to the acquisition of some sites of special importance, enabling their conversion. One of the most significant projects that HES was actively involved in was the conversion of Stanley Mills into a mixed use scheme (see Vol.2, Ch.3).

Directorate of Protection and Restoration of Modern and Contemporary Monuments, Ministry of Culture and Sports

The official public bodies for the identification and protection of Industrial Heritage in Greece are the Ministry of Culture and Sports and the Ministry of Environment and Energy. As stated above, in contrast with the rest of the countries under investigation, Greece has retained the tasks of heritage care exclusively on a national level.

Within the responsibilities of the Ministry of Culture and Sports is the listing of historic buildings and complexes, the restoration and the evaluation of interventions of monuments. Responsible for the sites that date after 1830, is the Directorate of Protection and Restoration of Modern and Contemporary Monuments (n.d.), which collaborates with the nine Regional Services of Modern Monuments and Technical Works, scattered across Greece.

The Directorate is a relatively young Service, fruit of consecutive restructurings within the Ministry of Culture and Sports (n.d.). It is important to highlight that it was not until 1963 when a Department of Modern Monuments was created, while the systematisation of the protection of younger monuments only began in 1977, with the establishment of the Section of Modern Monuments in the Directorate of Folk Culture (Π.Δ. 942/1977). With those developments, the Greek State acknowledged for the first time the architectural value of 19th and 20th century buildings, focusing however mainly on neoclassical buildings and sites related to seminal historic personalities or events (Chatzinikolaou, 2001).

The widening of the scope of heritage for a country like Greece, which is still massively identified by its ancient culture, was a difficult and lengthy process. As a result, it took more than another decade for the acknowledgment of the multifaceted values of 'unorthodox' cultural assets like the relics of industrialisation. In detail, the State assumed an active role in the protection of the Greek historic industrial stock only in 1989, with the establishment of the group of 'Industrial Archaeology' in the Directorate of Folk Culture of the Ministry of Culture and Sports. The action of the short-lived group is analysed in Section 4.4.4.2. In the decades that followed, no similar targeted team was formed within the Ministry. The care and responsibility for the listing and preservation of Industrial Heritage was passed to the Section of Modern Monuments and the Services that succeed the Directorate of Folk Culture.

Significant contributions of the Ministry of Culture and Sports are the multiple listings of industrial buildings and the creation of an archive of preindustrial and industrial monuments that exceeds 1500 entries. The exhibition 'Industrial monuments of Greece', organised in 1997 within the framework of the 10th International TICCIH conference and its catalogue (Ministry of Culture of Greece - Directorate of Folk Culture, 1999), summarised the work of the Ministry on the documentation and listing of Industrial Heritage in the 20th century (Mari, 1999).

In the 21st century, the Ministry of Culture and Sports continues its activity documenting, safeguarding and projecting industrial buildings and their content. Important recent activities involve the establishment and update of a digital registry which includes a thematic catalogue of industrial, technical monuments and workshops and the organisation of educational programmes for the familiarisation of teachers and school kids with Industrial Heritage.

As posed above, the second public body responsible for the listing of settlements and buildings, including the industrial ones, is the Ministry of Environment and Energy[48] (n.d.). The Ministry has assumed that responsibility since the 1970s. An important achievement of the Ministry, besides the protection of multiple industrial sites, is the creation of the online registry Estia (Ministry of Environment and Energy, n.d.).

As revealed in the detailed analysis of the three examples presented above, the role of the Heritage Agency in the practice of Industrial Heritage Reuse is both proactive and reactive. Its responsibilities include the designation of Industrial Heritage assets, the curation of national archives, the generation of awareness on the subject and the organisation of training and educational activities. Furthermore, it plays the role of the advisor to the government, the local authorities and other stakeholders, it evaluates intervention proposals and offers grant aiding.

The Heritage Agency, while having no involvement in the Reuse of unlisted buildings, is an important stakeholder in the cases of buildings of national significance. In these cases, the Heritage Agency may be involved in the preparation period that precedes the Reuse of heritage assets and it always plays a key role in the decision-making during the redevelopment of listed heritage sites, providing permits, advice and in some countries grants, too. In later stages its involvement usually fades.

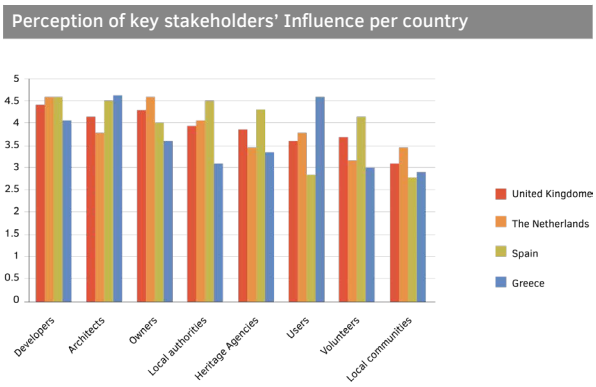

FIG. 6.3 The diagram depicts the results of qualitative research interviews on the influence of key stakeholders. The sample of respondents included 66 experts from the UK, the Netherlands, Greece and Spain representing the full spectrum of stakeholders. Respondents were asked to rate the influence of key stakeholders in the country of residence (KEY: 0= no influence, 5=high influence)..

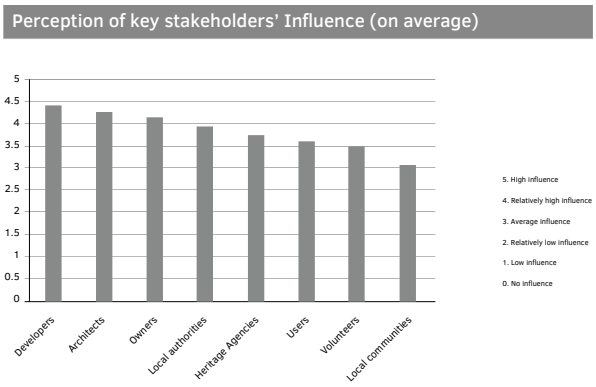

FIG. 6.4 The diagram presents the average influence of each key Industrial Heritage Reuse stakeholder in Europe. It was generated based on the processing of the data presented in Figure. 6.3 (KEY: 0= no influence, 5=high influence).

48 The Ministry of the Environment and Energy has territorial competence across the Greek territory except for the regions of Macedonia - Thrace and North - South Aegean. The Directorate of Macedonia and Thrace (Ministry of interior) and the Directorate of the Aegean and Island politics (Ministry of Infrastructure, Transport and Networks) respectively have relevant responsibilities for the above-mentioned regions.

TOC

As for its influence, according to the results of the qualitative research interviews in all countries under investigation it ranges between average and relatively significant (FIG. 6.3). Heritage Agencies act as mainly as advisors and facilitators but not as the principle decision-makers. Their influence can be traced more as part of the 'Net of Exogenous Conditions' while it is more indirect in the actual Reuse process. In respect to their impact there is lack of consensus among the respondents. G. Rich, architect, explains:

"The quality of advice can be variable, depending on location, experience and workload of the person involved" (Resp. no 35, interview, 16/6/2015).

6.2.1.2 Local authorities

As posed above, the limits of the role of Local Authorities on a Regional or Municipal level in the care of Industrial Heritage sites vary profoundly from country to country. In all countries under investigation however Local Authorities are considered a key stakeholder in the process of Industrial Heritage Reuse, being in charge of the planning process. The local authority planning department is usually the body actively involved in the decision-making of Reuse projects. Local politicians may also play a significant role in the process (Roos, 2007, 182).

In detail, the responsibilities of the local authorities can be summarised in three main tasks. Firstly, the generation of town plans and development policies, which largely influence the direction and boundaries of any Reuse project. Secondly, the review of planning applications and the granting of permits. Thirdly, the promotion of historic areas and their conservation.

In the UK, the Netherlands and Spain, the remit of local authorities is not limited only to those three tasks. Many City Councils have assumed an elevated role in heritage conservation, maintaining a list of locally protected buildings as separate to the statutory list. In large cities, historic building issues are addressed by a special local department for the conservation of historic buildings, which in certain cases issues 'design guidelines' to inform conservation.

In what follows the role of local authorities in the UK and Spain will be further analysed.

Local Authorities in the UK

Local authorities play a key role in the safeguarding of the historic industrial environment in the UK. The State's choice to play a subordinate role in the stewardship of Industrial Heritage since the 1960s has transferred the 'weight' to the local authorities and the voluntary sector as well. Local authorities have a quadruple function in relation to the historic environment:

- **Taking planning decisions and managing change**
  They are the primary decision-makers for Grade II listed buildings in their territory while working in partnership with the Heritage Agency on proposals concerning Grade I and II* listed buildings.

- **Owning and running large parts of the British Industrial Heritage**
  "Every authority (in England) possesses at least one industrial monument of its own…" (English Heritage, 2011, 25).

- **Supporting community involvement**

— **Promoting and encouraging awareness of local heritage**
This is achieved through the selection of Heritage Champions and the compilation and update of local heritage lists (Historic England, 2019b).

Local authorities also have the power to use several pieces of legislation, taking action to protect buildings when in danger.[49]

Local Authorities in Spain

The Spanish system of cultural heritage protection and conservation presents key differences to the described systems of the other three countries under investigation, due to its high fragmentation. The responsibility for cultural heritage in Spain lies primarily with the corresponding autonomous regional governments. Despite the Law 16/1985 on Spanish Cultural Heritage, Autonomous Regions have developed their own legislation for the protection of cultural assets. Furthermore, some Regions have also established Heritage Institutes, a number of which are autonomous entities with respect to their regional Department of Culture, thus complicating the structure further (Council of Europe, 2019).

J. Sobrino Simál, Art History Professor and vice-president of TICCIH Spain, commenting on the role of the public institutional stakeholders in Spain states:

"The central government has no administrative power in the subject of Industrial Heritage. The power has been transferred to the autonomous regions. The state intervenes secondarily, being responsible for coordination and the national plans." (Resp. no 186, interview, 10/26/2017).

In light of the above analysis, it appears that the remit of local authorities is far wider than the Heritage Agencies' as they deal both with listed and unlisted assets. Local authorities are involved in Reuse projects from the early stages, providing advice and support during the pre-application process. In the planning application phase, they are among the principle decision-makers. They have a statutory role and any development is impossible without their consent. After this phase, provided that there are no appeals, their role becomes subordinate.

Local authorities have a wide and direct implication in the Reuse process and are thus more influential than national Heritage Agencies. Their Influence in most countries according to the qualitative research interviews was rated as relatively significant with a notable exception the case of Greece (FIG. 6.3). This divergence is expectable since the role of the Greek local authorities in Industrial Heritage care and Reuse is comparatively restricted.

Many noteworthy examples of reused industrial sites can be attributed to motivated local authorities (e.g. the STEAM museum, the Energiehuis, the Mill of Pappas and the BJF). Yet, there are also problematic cases of neglect, decay, poor interpretation and inadequate opening hours in the

49 Since the mid-1980's several pieces of legislation have been developed in England that allow the local authority to protect buildings when in danger, forcing the hand of the owners or even removing the site from their ownership when they fail to take proper care of it. The most important of these include:
– Section 79 Building Act 1984
– Section 215 Town and Country Planning Act 1990
– Section 54 P (Listed Buildings & Conservation Areas) Act 1990
– Enforced sales (Law and Property Act 1925)
– Power of Sale
– Compulsory Purchase Order
(Orbasli, 2008, 72-73, Skinner, 2015).

care of local authorities (Cossons, 2008, 18). Case study research showed that the political agenda of local politicians, their tenure and frequent alteration in power can largely influence for better or worse the process and outcome of a reused project, especially when it is local authority driven. The cases of DRU Industriepark, Technopolis, 22@ and many more confirm that.

As a result, it can be supported that the impact of local authorities in the process of Industrial Heritage Reuse varies massively, depending on the one hand on the agenda of local politicians and their tenure time limitation; and on the other, the experience, the attitude and skills of the staff of their planning department.

6.2.2 Local communities

The local community has a special significance in Industrial Heritage Reuse as a knowledge-keeper of the site's former function. Nevertheless, it is often overlooked when referring to historic buildings' stakeholders (Bloszies, 2012, Schmidt and Austin, 2016). As highlighted in Sub-Section 2.2.5, in the 21st century the role of local community in the conservation and management of cultural heritage has changed, becoming more and more prominent. Many theorists and practitioners have noted that civil society plays an increasingly greater role in heritage care and management (Avrami, 2009, 178, Orbasli, 2008, 71, Meurs and Steenhuis, 2017, 12, Göttler and Ripp, 2017).

Discussing the matter Roos (2007, 184), notes:

"During the planning process the public remains an unpredictable factor. As a form of emancipation, the way in which people look at experts and authorities is changing. It is not surprising that the architect too is no longer seen as the one who naturally knows what is good for people and their environment. The public is becoming more outspoken and more expert, or arranges for its own experts to counterbalance the planning process. The architect does not make his design together with the public, but nevertheless he cannot keep residents and close neighbours out of consideration. He must allow room for them in the debate, convince them with arguments and not try to overrule or to overwhelm them with academic jargon. In the debate with the public his expertise and arguments must not degenerate into an elitist attitude."

Despite the wide differentiation of their involvement in Industrial Heritage Reuse projects, local communities often play a significant role in the preparation period and after the redevelopment of the heritage site. In the first instance by flagging the project and by pushing the institutional parties to take action (e.g. cases of Westergasfabriek, LTCP, mNACTEC) and in the second, by sustaining reused projects with a public scope as users (e.g. cases of GWRW, Energiehuis, Mill of Pappas, Bombas Gens).

Apart from this involvement, the 21st century saw local communities assuming new roles, with far more participation in the decision-making process prior to the planning application stage (e.g. case of Kings Cross). There are also examples of local communities that have assumed the role of proponent rather than reactor (Berens, 2011, 45), acting as a developer and manager of heritage assets. The case of Tabacalera (see Vol.2, Ch.14) sheds light to this new role (Chatzi Rodopoulou, 2019).

In spite of the indisputably larger participation of the local community in the decision-making process of Industrial Heritage Reuse its actual influence in most cases remains relatively low. This is confirmed by both case study research and the qualitative research interviews (FIGS. 6.3, 6.4). J. Corfield, Principal conservation and design officer at Stoke-on-Trent, commends:

"They play an important role in the planning process but in the end they get what they are given. The planning advice from central government is to consult but developers do not need to comply with what the community wants…" (Resp. no 7, interview, 2/6/2015).

In England, since 2010 local communities' control over their physical, social and economic environments is encouraged by the State through the creation of new legislation, actions such as: 'My community network & Advice Service' and programmes like 'Our Place!' (West, 2015). Support to communities is also offered by the Prince's Regeneration Trust and the Heritage Lottery Fund.

In regard to the situation in Spain where the influence of the local community appears to be lower than all other countries (FIG. 6.3), M. Álvarez Areces, president of TICCIH Spain and INCUNA, states:

"The influence of the local community should be higher. The mechanisms for the community implication are very limited" (Resp. no 188, interview, 1/10/2017).

The impact of the local community involvement also varies widely. According to Berens (2011, 65):

"C*ommunity input is a double-edged sword. Community activism can initiate as well as impede, prevent or change projects-whether for the better or worse is quite subjective."*

The subjectivism of community input coupled with limited appreciation of Industrial Heritage in the late 20th century acted in certain cases negatively, complicating the preservation and conversion of industrial relics at the time (e.g. TextielMuseum Tilburg and Technopolis). Today, however local communities are far more informed and empowered and as a result, they have usually a positive impact in the process. This can be ascribed to the lengthy efforts of the Industrial Heritage advocates (see also § 6.4.1) and to the new technologies available (internet, social media) that largely facilitate the propagation of information.

As revealed by two thirds of the cases investigated, the **social underpinning of Industrial Heritage Reuse projects and the engagement** of the local community are essential throughout the process, especially in interventions of district or landscape scale (see also § 6.5). Lack of those characteristics can render the redevelopment vulnerable in times of crisis or not durable after delivery.

In short, the local community appears to be able to make a difference in Industrial Heritage Reuse only if it is informed, involved and passionate.

6.2.3 Non-governmental organisations (NGOs) and associations

A wide array of NGOs and amenity groups supports the protection of the historic environment including Industrial Heritage, on an international, national and local level. For example, UNESCO and ICOMOS[50] since their foundation have played a catalytic role in the conservation and dissemination of value of cultural heritage globally. Apart from the advocacy of cultural heritage, some international NGOs, like Europa Nostra (n.d.), also campaign for the protection of heritage sites at risk and grant technical and financial aid. It is important to stress that despite the estimated role of the international NGOs their influence is indirect, acting mainly as lobbyists and advisors. In spite of the international conventions, there is no international law governing conservation (Orbasli, 2008, 68). As a result, the national, or in certain cases local legislation govern the conservation and management of cultural heritage.

The most important body with a global remit focusing on Industrial Heritage is TICCIH. Its goals are to promote international cooperation in preserving, conserving, investigating, documenting, researching, interpreting, and advancing education of the Industrial Heritage (TICCIH, 2019a). Its action and activities are discussed in detail in the Chapters 32-33 of the book *"Industrial Heritage retooled"* (Douet, 2012) and in the website of the organisation.

On a national level, there is also a number of NGOs that focus on the protection and raising of awareness for the historic environment. Industrial Heritage is in the scope of various associations. Some of them have a broad scope (e.g. the Victorian Society, the Erfgoedvereniging Bond Heemschut ect) while others focus only on the legacy of industrialisation (e.g. the National Committees of TICCIH, AIA, FIEN etc.). Finally, on a local level there are multiple associations advocating the protection of Industrial Heritage (e.g. Instituto Andaluz del Patrimonio Histórico, Asociación Vasca de Patrimonio Industrial y Obra Pública in Spain, STIEL - Stichting Industrieel Erfgoed Leiden, USINE - Utrechtse Stichting voor Industrieel Erfgoed in the Netherlands etc.). In what follows, a detailed analysis of the most important national organisations focusing on Industrial Heritage in the countries under investigation is offered.

Association for Industrial Archaeology (AIA)

The AIA is an NGO that has been playing a decisive role in the safeguarding of the British Industrial Heritage for the last five decades. Formed in 1973, it remains today a volunteer-led national organization. The AIA raises awareness for Industrial Heritage, sponsors and promotes further research and publication in the field and offers awards and grants for the conservation and Reuse of historic industrial sites. It has also a supporting role in the establishment of relevant smaller groups, an advisory role to local planning authorities and the British Heritage Agencies (English Heritage, 2011, 39-40).

50 UNESCO's declared purpose is to contribute to the promotion of international collaboration in education, sciences, and culture in order to increase universal respect for justice, the rule of law, and human rights along with fundamental freedom proclaimed in the United Nations Charter. The International Council on Monuments and Sites (ICOMOS) is a professional association that works for the conservation and protection of cultural heritage places around the world.

Federation of Industrial Heritage Netherlands (FIEN)

FIEN was founded in 1984, as a national charitable platform, uniting a number of young heritage organizations focused on the Dutch Industrial Heritage. Inspired by the endeavors of local and regional volunteer organizations in the UK and Belgium, it was born at a time when there was little attention to Industrial Heritage and its conversion in the Netherlands.

FIEN serves up to date as a national platform for the exchange of knowledge and experience, contact and cooperation. The purpose of the Foundation is to promote knowledge and advocate for the preservation, reuse and management of Industrial Heritage in the Netherlands. FIEN seeks to achieve its goal principally by acting as a discussion partner with various governments, the business community and other organizations; organizing trips, seminars and an annual consultation between the affiliated organizations in order to achieve information exchange and cooperation; stimulating and supporting local and regional initiatives and providing information about the affiliated organizations and their field of activity.

Between 1990 and 2015, FIEN was issuing the bulletin 'Industria', which offered up-to-date reports about Industrial Heritage in the Netherlands, relevant book reviews, as well as information about exhibitions, lectures and news from the affiliated organizations. The publishing of the bulletin was made possible by the financial support from the Prince Bernhard Culture Fund. Today, relevant information is available on the website of FIEN (Federatie Industrieel Erfgoed Nederland, 2018).

Greek Section of TICCIH

The Greek Section of TICCIH was established in 1992, reflecting the growing interest for the historic industrial stock, expressed in the last two decades of the 20th century in Greece. Counting nearly three decades since its establishment, the Greek Section of TICCIH has been one of the most important advocates of the Greek Industrial Heritage (Greek Section TICCIH, 2018b).

Its action involves the information and dissemination of Industrial Heritage values to the specialists and the public, the promotion of cooperation between different bodies and the encouragement of knowledge interaction between key stakeholders. The means for achieving those ends are the organisation of relevant conferences, seminars and exhibitions and the publication of the journal TICCIH Bulletin[51] (TICCIH Greece and KAM, 2015). Along with the aforementioned activities, the Greek Section of TICCIH has produced various proposals for the support and safeguarding of Industrial Heritage in Greece (Greek Section TICCIH, 2018a). Furthermore, it serves as a link between Greece and the international community advocating for the preservation of the traces of the historic industrial culture.

One of the initiatives of the group that stands out is the creation of a national registry of the Greek Industrial Heritage. In collaboration with the NTUA, the Greek Section of TICCIH coordinated the research programme "Registry of the Greek Industrial Heritage", implemented in the period 2005-2007 (Greek Section TICCIH, 2006).

51 TICCIH Bulletin was issued from 1994 until 2010 sporadically. It served as an important source of information and awareness for the issues related to industrial archaeology and heritage in Greece and abroad.

INCUNA (Spain)

Similarly to Greece, TICCIH has a national committee in Spain too, called TICCIH Spain. However, the oldest and most active association focusing on the national Industrial Heritage is INCUNA. (Resp. no 188, interview, 1/10/2017). INCUNA (Industry, Culture, Nature) was established in 1999 in Asturias as an association for the study of industrial archeology, cultural and natural heritage. Its scope surpassed the regional framework, reaching a national and international framework.

The objectives of the association include the promotion of study, conservation, defense and diffusion of Industrial Heritage in relation to people and the natural environment. Since its establishment INCUNA has carried out a broad agenda of activities involving the realization of inventories and registries; campaigns for Industrial Heritage defense; publications and organization of training courses, itineraries, and congresses throughout Spain and Latin America (INCUNA, n.d.).

Drawing from the analysis of the four presented associations, it is evident that the national NGOs play an important yet indirect role in the process of Industrial Heritage Reuse. They have a positive impact as advocates of heritage assets, facilitators and consultants on a national level raising awareness on the values and potential of Industrial Heritage, yet they do not take decisions on a case to case basis. Thus, their involvement cannot be placed in a particular phase of the project but it can be traced as part of the 'Net of Exogenous Conditions'.

6.2.4 Volunteers

Apart from the role of NGOs in Industrial Heritage Reuse analysed above, the action of volunteers needs to be further examined as it presents multiple variables. In all countries under investigation, volunteers have been actively involved in Reuse projects, either as part of an association or group or as individuals. Despite the heterogeneity of the voluntary sector, Industrial Heritage usually attracts former workers and their relatives, engineers as well as historians, archaeologists, architects and other heritage professionals.

Case study research reveals that in most cases, the active involvement of volunteers is mainly restricted to the preparation period and the management process of sites with a new public programme. For example, it is common that volunteers, run the operation or support of industrial museums and visitor attractions as tour guides and personnel (e.g. IGM, ICER in DRU Industriepark). Through organisations referred to as "Friends", volunteers may also contribute to the redevelopment and operation phase of industrial museums by raising funds and attracting donations (e.g. TextielMuseum Tilburg, CTC).

It should be stressed that volunteers' action differs vastly from country to country. There are countries, such as Greece, where the active involvement of volunteers in Industrial Heritage Reuse is very restricted and others, like the UK, that have based the care of industrial relics to this sector. The latter case presents a heightened interest and merits further discussion.

Volunteers_The case of the UK

Since the early days of industrial archaeology, the voluntary sector had a predominant role in the safeguarding of the British Industrial Heritage. According to Cossons (2008, 14-15) the reinforced role of volunteers was a conscious choice made by the British State. Cossons (2008,18) also reveals the profound problem that this choice generated, stating:

"There was not a comprehensive strategy of saving the most important buildings. Preservation was driven by the spontaneous enthusiasm of the volunteers."

Apart from a political choice, leaving Industrial Heritage to the voluntary sector was also a matter of a pragmatic deficiency in the skill set and know-how of the Heritage Agency officials at the time. As S. Gould, Senior Local Government and National Infrastructure Adviser, Historic England, highlights:

"The Industrial Heritage care was left to the voluntary sector basically because they knew the industry and we did not. Back then, English Heritage did not have the knowledge and skills to deal with these sites." (Resp. no 3, interview, 21/5/2015).

Today, the voluntary sector remains a major player in the safeguarding of Industrial Heritage. Volunteers contribute to the rescue of the historic industrial stock and its maintenance either as individuals or by forming Building Preservations Trusts.

Building Preservation Trusts

Building Preservation Trusts (BPTs) have played a decisive role in the conservation and Reuse of the British Industrial Heritage. BPTs are charities, focused on the restoration or conversion of historic buildings, through public grant funds. BRTs, once established and having accessed funds, act as property developers. A crucial difference between commercial developers and BPTs, according to Kate Dickson (2009, 44) is that the latter are driven by heritage and not profit. The case of Murray's Mills in Ancoats (see Vol.2, Ch.4) is an example of BPT development, shedding light to the achievements and shortcomings of this special type of institutionally and professionally-aided voluntarism.

Prince's Regeneration Trust (PRT)

The PRT, founded in 2005, is a charitable organisation with a wider scope than a typical Revolving Fund BPT. The Trust is a merge of two earlier charities with impressive contributions: the Regeneration through Heritage and the Phoenix Trust, founded in 1996 under the initiative of HRH The Prince of Wales (The Prince's Regeneration Trust, 2015).

Today, the PRT is an important stakeholder having a dual role:

A **Advisor, facilitator, fundraiser and advocate for community groups, building owners, local authorities and other public bodies**
The Trust offers free consultancy and support to the aforementioned groups through the programme BRICK.[52]

52 The BRICK (Building Resilience, Innovation and Community Knowledge) Programme was a four-year UK-wide capacity-building programme designed by The Prince's Regeneration Trust (PRT) running from April 2014 to March 2018.

B **BPT**

The PRT also acquires and reuses historic buildings at risk, having today an extensive portfolio of reused buildings all over UK (see the Stanley Mills case, Vol.2, Ch.3).
The value of its action is highly recognised among the stakeholders involved with Industrial Heritage Reuse.

No similar forms of voluntarism as the ones described above can be found in the Netherlands, Greece and Spain. Volunteers in those countries act either as part of an NGO or as individuals.

Individuals

Volunteers, acting on an individual level, have limited impact and power in Industrial Heritage preservation and Reuse. However, depending on their experience and skillset, they contribute by means of advising, raising awareness or helping in the preparation, operation and maintenance of various reused industrial sites. It is certain that without their endeavours, many formerly industrial sites would have been condemned to dereliction.

As posed above, the influence of BPTs and individual volunteers in Industrial Heritage Reuse differs profoundly. The former, acting as developers are highly influential in all stages of the project. In contrast, the latter act mainly as consultants, facilitators or advocates having no say in the decision-making process. The impact of volunteers is the process of Reuse is usually positive. Yet, according to Cossons (2008) and Stoyanidis (Resp. no. 263, interview, 22/3/2017) when there is not sufficient knowledge or understanding of the conservation principles and the practices of historic environment management, volunteers' impact can become problematic.

Special emphasis needs to be placed in the role of volunteers in the creation and management of industrial museums. It is a fact that the intrinsic characteristics and the financial requirements of Industrial Heritage render its Reuse and care very hard for the voluntary sector only, even in the UK (see Ancoats, Vol.2, Ch.4). However, as revealed from the case study research volunteer-led Reuse and maintenance is not impossible.

Furthermore, case study research showed that sustaining a volunteer base is critical for the survival of industrial museums. Many museums, including the CTC in Hermoupolis and the Gas Museum in Technopolis have recognised this, implementing strategies for volunteer attraction. IGM (see Vol.2, Ch.1), with 500 volunteers though has a lot to teach.

"Our programme is not only for individuals but also corporate groups. It is also a steppingstone to a permanent job." explains P. Gossage, Director of marketing and PR, IGM (Resp. no 15, interview, 15/5/2015). For recruiting new volunteers, is therefore important to address the whole spectrum of potential individuals or groups. Also, giving incentives such as training and experience for the unemployed is a powerful motive for volunteers' attraction.

6.2.5 Architects

Architects involved in Industrial Heritage Reuse form a heterogeneous group with profound differences in terms of status, training, skills and approach towards the historic fabric. To better understand architects' role and influence, a categorisation in three main groups[53] is offered.

A **Broad practice architects**
The majority of Industrial Heritage Reuse developments are designed by local or international broad practice architectural firms. In general, such firms specialise in the design of new-built projects and have little experience in Heritage Reuse.

B **Specialised architects**
There is a relatively smaller number of firms in Europe that over the years have developed an expertise in the field of historic industrial building conservation and Reuse (e.g. Braaksma & Roos architectenbureau, Kizis architects, Purcell architects, Feilden Clegg Bradley studios). A key difference that distinguishes them from broad practice architects is the design methodology they use. Their point of reference is a value assessment of the existing building rather than a concept to be imposed on it.

C **Starchitects**
The emergence of the so-called 'starchitecture' has had a decisive impact in the formation of the built environment. A key shift, coinciding with the culmination of starchitecture in the turn of the 21st century, is the involvement of starchitects in conversion projects as well. Celebrated examples of Starchitectural Industrial Heritage Reuse include the Tate Modern in London and the CaixaForum in Madrid, by Herzog & de Meuron as well as the Zeche Zollverein in Essen by OMA and Foster and Partners. As the essence of Starchitecture is signature-design, starchitects tend to pay more attention to the new layer they add through intervention in expense of the existing fabric and its content.

The involvement of architects in heritage conversion includes the design, yet their role is much broader than that. In detail, architects are responsible to investigate, analyse and evaluate the existing building in the first steps of the Reuse process; they come in touch with the owner (or a project manager representing the owner); consulting experts, prepare cost estimations and delivery deadlines; they create the new design, collaborating with other specialists such as technical advisors and cultural historians; they are involved in the building permission application; they answer to concerned parties such as neighbours associations and provide the media with promotion material; in the final steps of the process they usually supervise the construction of the site.

Traditionally, architects also played the role of project coordinator and mediator among stakeholders (Roos, 2007, 174). In the last two decades however, the coordination of large and complex projects has been passed to project managers and the role of the architect seems to be shifting.[54]

53 This categorisation can be enriched with other less prominent categories (e.g. architect-developer).

54 Van 't Klooster in her book 'Reactivate!' (2013) explores the issue in the Dutch context. According to her findings, the architect of the 21st century is not just a designer but can play the roles of the curator, economist, researcher, political activist, developer, creative strategist, anthropologist, adviser, process coordinator, and sociologist.

The above analysis suggests that architects are involved in most steps of the Reuse process, interacting with all key stakeholders. Their involvement stops at the delivery of the project, having no contribution to the occupation and management phase.

The level of influence and the impact of architects on Industrial Heritage Reuse, according to the results of the qualitative research interviews, is relatively to highly significant depending on the country (FIG. 6.3). A deeper analysis of the total corpus of the cases reviewed in this research allows a more insightful interpretation of the influence and the impact of the three categories of architects discussed above. In detail, an array of features appears to regulate the level of influence and impact of the stakeholders under discussion. The three most important ones are presented below.

1 Status of the architect

FIG. 6.5 The Banksite power station before and after its conversion to Tate Modern by Herzog & de Meuron. The architects gutted the building, leaving no trace of its former function (Tate Modern).

FIG. 6.6 The Beko masterplan in Belgrade by Zaha Hadid Architects involving the conversion of an old factory to a mixed use scheme. The character of the factory is largely overshadowed by signature architecture (http://www.dezeen.com/2012/12/05/beko-masterplan-by-zaha-hadid/).

FIG. 6.7 Bilbao waterfront before and after the construction of the Guggenheim Museum by Frank Gerhy. The redevelopment erased the historic industrial landscape and replaced it with iconic architecture (Robert Grounds).

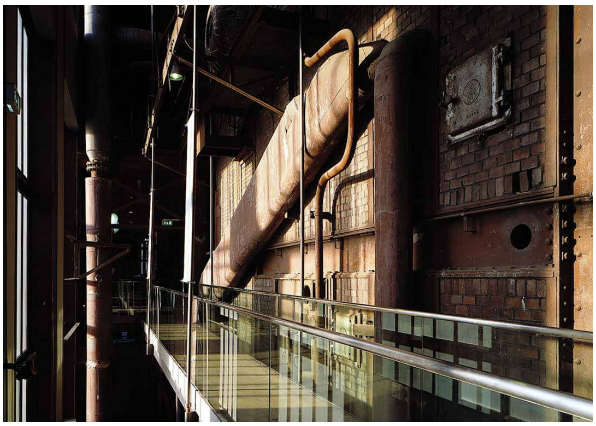

FIG. 6.8 Red Dot Design Museum Essen housed in the boiler house of the Zollverein coal mine. The building was converted by Foster + Partners. The architects preserved the atmosphere and big part of the machinery of the industrial site contradicting it with new dynamic architectural features, 2014.

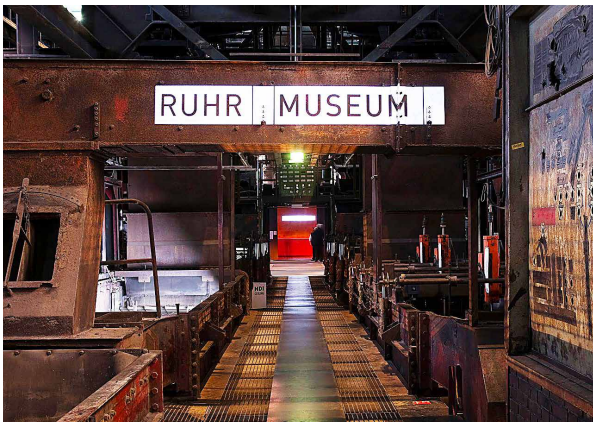

FIG. 6.9 The Ruhr Museum housed in the coal-washing plant of the Zollverein coal mine in Essen. The plant was converted by Rem Koolhaas in collaboration with the Essen architects Böll and Krabel The architects preserved the atmosphere and big part of the machinery of the industrial site achieving a sympatheric conversion, 2014.

Case study review shows that starchitects tend to have far bigger influence and greater freedom by the developers and the local authorities than the other two groups of architects. The very nature of starchitecture though, comes at odds with the principles of historic preservation of heritage sites. The discourse around starchitecture highlights the 'signature design' and the iconic character of the building as two of its key features (Klimek, 2013, 2, 4). Therefore, the buildings' or landscapes' cultural values are more likely to be sacrificed in favour of an iconic starchitectural result (FIGS. 6.5, 6.6, 6.7).

As a consequence, even though starchitects' influence is high in the process, it is suggested that their actual impact can be compromising in terms of cultural significance preservation. These findings however cannot be extrapolated to all Industrial Heritage projects signed by starchitects, as there are also bright exceptions of careful and sympathetic conversions (FIGS. 6.8, 6.9).

The analysis of the cases examined and the qualitative research shows that the impact of the broad practice and specialised architects varies, depending on their skills and approach.

2 Training, skill set and experience

According to Orbasli (2008, 11), "*At the present time training, in the core disciplines of architecture, town planning, building surveying or structural engineering incorporates little or no emphasis on understanding the existing building stock.*" This statement which is also shared by other theorists (Douet, 2012, 215), indicates that the majority of architects have piecemeal or no understanding over the redesign of historic structures. This deficiency is reflected on the historic built environment.

Case study research shows that the architects' lack of training, skills and experience, especially in early cases of conversion (e.g. IGM, Technopolis, BJF), led to some invasive and irreversible interventions which compromised the historic fabric and its content. Recent cases, however, present a much more optimistic situation. It appears that there are also skilled architects with a positive impact, who have capitalised on the experience of former interventions or on specialised training.

3 Approach towards redesigning historic structures

The transformation of an industrial site offers a multitude of design possibilities (Wong, 2017, Brooker and Stone, 2004). The approach of the architect in conjunction with the developer's vision and priorities have a decisive impact on the fabric of the site. As discussed above, starchitects tend to have an invasive approach, compromising the site's values. The other categories of architects employ different approaches towards Reuse, with the specialised architects being usually more conservative.

In short, architects are key decision-makers with large influence on the process and outcome of the Reuse (FIG. 6.4). Excluding starchitects who enjoy a greater level of freedom, they are not omnipotent as their power is restrained mainly by the developers and client's wishes as well as the conservation and planning framework. They can have a positive or negative impact depending on their training, skill set, experience and attitude, too.

6.2.6 Developers

The role of developers is synonymous with the financial aspect of the project. However their involvement extends to much more than that. Developers form the project's vision, choose its future programme and shape its outcome. Selecting and controlling the design team, they have also a say on the aesthetical result of the Reuse. In certain cases, they act as project coordinators, or appoint a project manager to fulfil this role on their behalf. Usually developers are involved in all stages of redevelopment from the preparation to the management of the asset.

It is a common misperception when using the term developer to think only about commercial property developers. However, there are many other parties that act as developers, such as architects, heritage agencies, local authorities, BPTs, housing corporations and entrepreneurs. Volume 2 of this dissertation presents a wealth of cases, illustrating the action of various types of developers. At this point, emphasis should be also placed on special developers that have contributed greatly to the Reuse of Industrial Heritage in Europe over the last few decades. Two such examples of special developers in the Netherlands and Greece are analysed below.

Special developers

BOEi

BOEi (National Society for the Preservation, Development and Exploitation of Industrial Heritage) is a special developer, active in the Netherlands for over twenty years. It was founded in 1996 as a product of collaboration between market parties and the Province of Noord-Holland. Its foundation reflects the rising interest in Industrial Heritage in the Netherlands during the 1990s, that culminated in the 1996 with the Year of Industrial Heritage.

With shareholders from property development sectors, banking and housing associations, the organisation functions as a heritage developer, preserving and reusing heritage sites. BOEi's primary focus for over a decade was Industrial Heritage but since the 2010s its scope extended to agricultural and religious heritage, too. In 2015 the organization was renamed National Society for the Restoration & Reuse of Cultural Heritage Ltd, retaining however its initial brand name.

"BOEi is an entrepreneurial non-profit organization and has the ambition to find a solution to the social problem of vacant heritage." (BOEi, n.d.-a). In terms of fundraising, it is supported by the 'Friends of BOEi'. BOEi is granted with tax exemptions by the government, it receives funding annually from the BankGiro Lottery and occasionally from other funds such as the VSB Fund. Part of its resources comes from its properties' rent. Its modest profit is reinvested in new projects.

Since its establishment, BOEi has reused 89 buildings, 52 of which were industrial. Apart from redeveloping heritage sites, the organisation functions also as a consultant and an owner, having conducted more that seventy feasibility studies and owning twenty buildings with c. 300 tenants in the first twenty years of its function. All its projects are presented in the online database of BOEi. (BOEi, n.d.-c)

It is important to highlight that the mission of the organisation places particular emphasis to the concepts of authenticity, durability, quality and innovation. BOEi is one of the few Professional Organisations for the Conservation of monuments in the Netherlands (it has been given a quality accreditation called POM-status). According to S. te Brake, BOEi Development manager:

"We really want to be pro-heritage. Our philosophy is to take the objects that the market parties or other parties do not want to do. So, the really difficult ones." (Resp. no 176, interview, 16/08/2016).

Since 2016, the organisation has launched the project 'Mensen vertellen over monumenten' (People talk about monuments). This has given the chance to locals or former users of nineteen reused buildings to share their experiences. This valuable intangible evidence is presented in various forms including video, stories, photos, poems in the website of BOEi (BOEi, n.d.-b).

Cultural Technological Foundation of the ETBA Bank and the Piraeus Bank Group Cultural Foundation (PBGCF)

The Cultural Technological Foundation of the Hellenic Industrial Development Bank (CTF of ETBA Bank) was established in 1981. The scope of the Foundation was the safeguarding of the traditional technology and the Greek Industrial Heritage. In order to achieve that, it took a fourfold action including: organisation of research programmes and publications, creation of museums, safeguarding motions, knowledge exchange and dissemination (Papadopoulos, 1987).

A pioneer activity of the Foundation was the creation of a network of technological, industrial and preindustrial museums. With this action, the Foundation adopted a hands-on approach of industrial archaeology, paving the way in Greece for the systematic documentation and interpretation of preindustrial and industrial production and the careful transformation of preindustrial and industrial disused premises into museums.

The first museum of the network, dedicated to the silk production, was inaugurated in 1990 (Piraeus Bank Group Cultural Foundation, 2016c). Seven years later, the Open air water power museum of Dimitsana opened its doors, highlighting the importance of water-power in traditional society (Piraeus Bank Group Cultural Foundation, 2016b). The studies for the PBGCF Museum of olive and olive oil in Sparta and the Tinos museum of Marble crafts, which were inaugurated in 2002 and 2006 respectively, were also conducted by the CTF of ETBA Bank.

It should be highlighted that the innovation of the museums' network was not only restricted to the documentation and transformation scientific approach mentioned above but it also extended to a showcase model of financing and management. The financing of the projects was

a mixed one. The buildings were municipal assets provided to the Foundation for free, under the condition of their transformation into a museum The ETBA Bank was only financing the studies for the buildings' transformation and later their operational and maintenance costs. The capital for the transformation works and the museums' fittings was covered by EU funds. According to the contract between the local authorities and the Foundation, the latter was assuming the responsibility of the operation of the museum for a period of 50 years after its inauguration. Upon the completion of that period the museum would be passed into the hands of the local authority.

"This model was efficient for the Bank. The Foundation had the appropriate services for the creation and management of the museums." argues A. Louvi, Director of CTF of ETBA Bank 1998-2001 (Resp. no 242, interview, 7/6/2017).

The posed services, including a powerful accounts department experienced in European programmes, a department of museums staffed with skilled museologists and a publishing section for issuing tickets, guides and monographs, maximised the efficacy and flexibility of the Foundation while minimising the costs for the museums' creation and operation.

In 2002, the ETBA Bank was privatised, being absorbed by the Piraeus Bank (n.a., 2002). The latter founded the Piraeus Bank Group Cultural Foundation (PBGCF) which embraced and continued the work of the CTF of ETBA Bank.

According to the Act of its establishment, *"The PBGCF supports the preservation and showcasing of Greece's cultural heritage, with an emphasis on its artisanal and industrial technology, and promotes the connection of Culture with the Environment.*

The Foundation's work is carried out through its:

- *Thematic Museum Network in the Greek provinces*
- *Historical Archives*
- *Library*
- *Research work*
- *Publications*
- *Educational programmes*
- *Cultural and academic events."* (Piraeus Bank Group Cultural Foundation, 2016a)

The wealth of the aforementioned activity is analysed in detail in the website of the Foundation (Piraeus Bank Group Cultural Foundation, 2016a). Nevertheless, it is worth discussing further the development of the Thematic Museum Network as it is very relevant to this dissertation.

Piraeus Bank inherited and preserved from ETBA an experienced team and a tested model.

"This sophisticated model, which did not burden the bank with operating costs, was embraced and extended by Piraeus Bank... Normally every museum had to have an administration office, a bookstore and a ticket office. In the case of the PBGCF 's museum network, everything was run from the central office and every museum was staffed with highly qualified custodians.

The main reason for the model's embracing was its viability. It costed less than any other type of advertising of the Bank and it became part of its corporate social responsibility." explains A. Louvi, Director of PBGCF 2002-2013 (Resp. no 242, interview, 7/6/2017).

In the last sixteen years of its existence the PBGCF has been running the CTF ETBA museums while creating seven new thematic museums (FIG. 6.10). Apart from the environment museum of Stymphalia, all the rest present key industrial and preindustrial production processes closely linked to the museums' location. Furthermore, three museums are housed in former production spaces. The development of the Rooftile and Brickworks Museum N. & S. Tsalapatas is presented in Volume 2 of this dissertation (see Vol.2, Ch.19), offering an insight into the network and the activity of the PBGCF.

FIG. 6.10 The Thematic Museum Network of the PBGCF (source: PBGCF).

Developers' power is mainly linked to their financial capability of bankrolling the project. In relation to this issue J. Cornfield, Principal Conservation and Design Officer, Stoke City Council states: "*They are the key. They always have an opinion and the last word because they provide the money.*" (Resp. no 7, interview, 2/6/2015).

This view is shared among the respondents of this research and it is clearly illustrated in Figures 6.3 and 6.4. The developer appears to be the most influential stakeholder in Industrial Heritage Reuse across countries. The only exception to that rule is Greece. This can be attributed to the real estate system of the country which is not yet controlled by large commercial developers, due to its high fragmentation in small holdings and other reasons that escape the scope of this dissertation.

In regard to the impact of developers, it appears to be related to their attitude and ambitions.

Non-for-profit developers, like special developers discussed above, have in general a positive impact as they are driven by a cultural and social agenda. Commercial developers require further analysis as their impact is widely diversified. The cases of Ancoats, GWRW and Tsalapatas (in their early stages), show the negative effects of developers who were only aiming to maximise their profit through heritage redevelopment. In contrast, the case of King's Cross illustrates a different attitude and a positive impact. Finally, the case of Westergasfabriek, with its transition from an experimental cultural hub to a culturally infused commercial venue, clearly highlights the relation between the developer's attitude and impact.

The above examples, and evidence from literature review and qualitative research interviewing, confirm the established notion of developers being driven mainly by profit. However, they also demonstrate that part of them have a different attitude which works in favour of heritage. In respect to this issue T. Giddings, partner in Argent development, argues:

"I think that the days that developers were viewed as being horrible people who only did things for money are gone. Of course, they are some who still do. I think that you will find that most of us here… want to make money but the real reason to get out of bed in the morning is to see this area changed and to fulfil our wish to make it a really attractive, desirable place to be." (Resp. no 65, interview, 6/7/2015).

T. Bloxham, Developer and Chairman of Urban Splash (Baum and Christiaanse, 2012, 90) adds:

"Without making profit you can't continue. You need to make a profit. Our driving force, the reason why we are doing these things, is primarily because we like creating great buildings and hope to improve and create good cities".

The above analysis illustrates that there is a new generation of developers that identifies with historic assets despite the high risk it entails, having a positive impact. Those are not driven by short term profits, but by long and stable returns (Baum and Christiaanse, 2012, 364). This can be attributed to charismatic broad-minded personalities, or individuals sensitive to heritage. Nevertheless, as revealed in the case study research, this might as well have nothing to do with personality traits and interests but with the rationalistic law of supply and demand (see King's Cross case, Vol.2, Ch.5).

The rising appeal of heritage to the market appears to have influenced the attitude of developers. As a result, there are a lot of cases where heritage sites are no longer treated as barriers to development but as highly valuable assets to be preserved, offering great opportunities for branding (FIGS. 6.11). This has contributed to less harmful interventions to the historic fabric.

FIG. 6.11 The heritage assets of King's Cross serving as branding mediums of the mega redevelopment, 2018.

Yet, heritage is used more as a medium of producing surplus value rather than a cultural and educational asset. Despite preserving the shell, the commercialisation of heritage poses a direct threat to its content, intangible values and social dimensions (Chatzi Rodopoulou, 2016).

In sum, developers are a principle stakeholder with considerable power over Industrial Heritage Reuse. Their attitude and ambitions greatly influence the impact they have on the project.

6.2.7 Owners

The owners of historic industrial sites is a diverse group of natural or legal persons. In many cases, the owner and the developer are one and the same. As a result, the owner is also considered an influential decision-maker (FIGS. 6.3, 6.4) who is usually involved in all stages of redevelopment, from the preparation to the management of the asset.

Investigating such a body makes it challenging to generalise. Examining the two different scenarios presented below, provides a more accurate picture of the stakeholder in question and its impact on the outcome of Reuse.

1 Owner as the driving force of the project

According to Keith Falconer, Head of Industrial Archaeology at English Heritage (Retired) and founding member of AIA, the owners are the ones who *"…most of the times take the initiative and without their good will not much is being done."* (Resp. no 1, interview, 30/6/2015). If the site is not listed, the preservation or loss of the qualitative characteristics of the site is a matter of the owners' ambitions.

2 Indifferent/ Negative owner

Expressing a different view from Falconer's, K. Dickson, Heritage Works Trust director, states:

"If we are talking about a redundant industrial site often the owner is the reason that the site is redundant. They literally hold the keys to the building. You cannot do anything if the owner is not cooperating." (Resp. no 49, interview, 15/6/2015).

Lack of financial means, desire for big profit margins, unwillingness to take the risk and absence of vision are only some of the reasons why owners may be indifferent or negative to the Reuse of their property.

Despite the diverse character of the stakeholder group in question, there are two points that can be made with certainty. Firstly, in most cases the owner of the site to be reused is an influential figure and secondly his attitude plays a key role for the future of the site. D. Ratcliffe, Historic places adviser HE, gives a picture of the relation between the owner's attitude and their impact on the site.

"It really comes down to the owner and what they want to do with the site. If they are just looking at the immediate profit or […] if they are actually looking at the building as an investment and see potential in it. The building could then actually generate more value and you can look after it better, because you can get a better return from it." (Resp. no 10, interview, 15/6/2015).

J. Roos (2007, 177), referring to the impact of the owners supports that "*aspects such as professionalism, experience, understanding of architecture and of their 'property'"* are necessary for a positive result.

6.2.8 Users

The variety of possible uses that industrial buildings can be converted into, dictates a diverse group of potential users for these buildings. A way to cluster users is to examine the stage in which they join the project. In that sense, they can be categorised into two main groups:

A **'Decision-making' users**
'Decision-making' users can be described as the ones who are involved in the decision-making process of the project. Typically, this is done when potential users enter into a pre-let agreement. In some cases their role is so critical that they have the power to either drive or terminate the project. 'Decision-making' users are usually involved in the project in every step after the evaluation phase.

B **'Non-Decision-making' users**
In most cases, users only come in after the delivery of the project. In other words, they do not take part in its shaping but they only step in when the building is already converted and complete, adjusting their needs to it.

The cases of Ca L' Aranyó and King's Cross (See Vol. 2, Ch.13 and Ch.5) offer examples for both types of users. UPF and the Central Saint Martins College can be listed as 'Decision-making' users while the tenants, personnel and students can be categorised to the 'Non-Decision-making' users.

It is important to emphasise that both types of users and their attitude, are highly significant for the survival and the maintenance of the project. *"If you don't have a user, you don't have a building."* argues K. Dickson, Heritage Works Trust director, stressing their impact (Resp. no 49, interview, 15/6/2015). More than half of the case studies analysed in this research showed that users have a significant impact on the project as they can determine, for better or worse, the character of the project during operation, influencing its financial and social performance, too. A combination of permanent and incidental users has proven in many cases instrumental for the project, offering on the one hand continuity and security and on the other a continuously refreshed image of the site (e.g Westergasfabriek, DRU Industriepark, LTCP). In contrast, the lack of diversity in users, evident in the cases of Ancoats and Stanley mills, can lead to problematic situations with social repercussions.

In the words of Baum and Christiaanse (2012, 363):

"In order to have users who are not consumers but are able to take responsibility over their environment requires strong locations with their own identity and opportunities for participation. Establishing a communication structure and mutual trust among individual protagonists involved are decisive aspects for successful development."

In sum, it is evident that the influence of users varies, depending on the stage in which they enter the redevelopment process. They can either be powerful decision-makers or 'proxies' of the developer. In any case, users play a paramount role in the occupation and management phase.

6.2.9 Funding parties

The economic weight of Industrial Heritage conversion is usually very high and thus most of the projects require a mixture of intricate financial mechanisms and government support for their development (Berens, 2011, 131). Funds, grants and loans for the conservation and Reuse of Industrial Heritage are provided by various public and private bodies with an international, national, regional or sectoral scope. In Europe for example, among the funders with an international scope are certain European (EU) Structural Funds. Financial support is also given by National Heritage funds, Private Credit-Providers, Heritage Agencies, Provincial authorities and City Councils, Associations and private bodies such as companies and banks. An overview of the financial mechanisms available for heritage Reuse in the UK, Netherlands and the US is given by Orbasli (2008, 102-103), Corten (in Meurs & Steenhuis, 2017,20-25), Morin (in Douet, 2012, 118-124) and Berens (2011, 131-145) respectively.

Funders are typically involved in the acquisition and procurement phases of the redevelopment, acting also sometimes as evaluators after delivery. Despite having a reactive role, they exert influence being among the key stakeholders of the project. Through preconditions for their financial contribution and the amount of money granted, they can influence the course and several Components of the project.

The case of LTCP is a good example of the level of influence a funder can exercise on the redevelopment. The European Commission that provided part of the funds for the implementation of the project, imposed the condition of soil and buildings decontamination; a parameter that would have otherwise been overseen. Respectively, the Heritage Lottery Fund, a major player in Britain, works with an outcomes framework. This pertains to a set of preconditions ensuring the protection of qualitative characteristics as well as the physical and financial upgrade of the project and its content. B. Greener Policy Advisor- Historic Environment HLF, explains:

"Every programme has to achieve a set of outcomes. It is like a menu. 'Heritage enterprise' is about rescuing derelict vacant buildings and putting business in them. In detail, the building must be better managed and in a better condition after the project, people should have a chance to develop skills and learn about heritage, the negative environmental impact should be reduced, the area of the community should be a better place to live, work or visit and the economy should be boosted." (Resp. no 13, interview, 22/6/2015).

In order to provide an insight to the role of the funders as part of Industrial Heritage Reuse stakeholders' team, examples of major funders in the UK and the Netherlands are presented below.

HLF

The Heritage Lottery Fund (HLF), a QUANGO created in 1994, is the largest funder of heritage in the UK. In the period 1994 - 2015, the HLF has awarded £1.08bn to over 3,000 Industrial Heritage projects (Table 6.1). In specific, the grants were spent for repairing, conserving and reusing former industrial sites; protecting and raising awareness of industrial machinery, archives, collections, equipment and technological innovations; recording and promoting intangible Industrial Heritage and boosting volunteering and training for sustaining industrial machinery and sites (English Heritage, 2011, 52-53).

TABLE 6.1 HLF funding for industrial maritime & transport heritage by financial year. Source HLF, 2014.

Year	Sum of Grant awarded (£)	Count of Grant awarded
1994-95	1.121.929	3
1995-96	38.357.883	55
1996-97	105.370.463	118
1997-98	62.940.692	82
1998-99	63.327.014	105
1999-00	43.478.063	111
2000-01	57.495.834	133
2001-02	56.409.751	155
2002-03	52.341.460	173
2003-04	74.981.464	233
2004-05	77.062.714	188
2005-06	27.397.085	184
2006-07	36.252.660	228
2007-08	55.990.148	218
2008-09	35.742.511	181
2009-10	32.668.703	101
2010-11	20.584.900	86
2011-12	57.403.700	137
2012-13	59.898.400	196
2013-14	73.915.900	193
2014-15	47.397.000	161
Grand total	1.080.138.274	3.041

The HLF has a reactive role, responding to proposals made by people who claim their building is important. That way, it also funds selected unlisted buildings that have a central heritage value to communities (Resp. no 13, interview, 22/6/2015).

In 2013 the HLF launched a new programme called 'Heritage enterprise', which is addressed to collaborations with for-profit businesses.

The National Restoration Fund (the Netherlands)

In 1985 the Dutch government decided to partially replace subsidies for monuments to low interest loans. In order to achieve that, it established the National Restoration Fund (NRF), a private credit provider, which offers loans to owners and managers of monuments for the maintenance, restoration, reuse or purchase of their assets. The NRF is a non-for-profit organisation which works in cooperation with the Dutch Government and the Heritage Agency using a revolving fund. In addition to its financial role, the NRT also provides information, advice and guidance on financial and process aspects of restoration projects (Restauratiefonds, n.d.).

Case study research showed that the role of funders is absolutely critical for the completion of projects of Industrial Heritage Reuse. The impact of organisations such as the HLF and the NRF has enabled the transformation of seemingly unaffordable ideas on large sites with a highly elevated level of complexity. The same applies to EU Funds, too. It is characteristic that almost half of the cases examined were made possible by programmes like Urban, Feder and the Regional development fund.

6.2.10 Other stakeholders

Complex Reuse projects are often undertaken by a wider team of Actors, who complement the action of the above-mentioned stakeholders. The preparation and evaluation phase of industrial Reuse projects often requires the expertise of cultural historians, (industrial) archaeologists and technology experts. Those consultants can offer significant insights for the definition, evaluation and preservation of the site's cultural values and machinery.

Furthermore, in the procurement stage, architects usually need to cooperate with other specialised designers, such as urban designers, landscape architects and interior designers, as well as with technical advisors including constructors, installation technicians and building physicists. Media can play an instrumental role both during conversion and during operation, raising awareness, promoting or undermining a project. This has indirect yet significant impact on the project as it shapes public opinion and puts pressure to the key decision-makers.

A stakeholder whose role is becoming more and more prominent in the process in the last decades is the project manager (Roos, 2007, 177). Project managers are usually involved from the evaluation to the delivery of the project. They deal with the issues of budget, scheduling, and quality control, advising, facilitating and representing the owner. It is therefore evident that, when present, the project manager is an influencing figure and acts as the coordinator of the process.

The case studies examined in this dissertation illustrate the role and action of the whole array of stakeholders discussed above, enriching the list with more players. Among them the significance of the Higher Education institutes in the process needs to be acknowledged. The cases of King's Cross, Tsalapatas (in the wider framework of Volos' regeneration) but particularly the LTCP showed that **Higher Education institutes** can play a crucial role in the Reuse of Industrial Heritage, acting not only as users but also as instigators, consultants and managers of converted industrial sites. Their power and influence stems from their knowledge base and their scientific, cultural, social and political sway.

Closing this Section, it is essential to summarise the main points discussed. Drawing from the above analysis and the analysis of Section 4.4 of this dissertation, it appears that there is an important distinction between the role of Actors across Europe. The care and management of Industrial Heritage is championed by different stakeholder groups in each country, namely the voluntary sector in the UK, the private sector in the Netherlands, the public sector in Greece and the regional authorities in Spain. Those asymmetries are necessary to be taken into account when reflecting on the Actors' influence on the Industrial Heritage Reuse practice in each country.

Furthermore, it is useful to clarify further the involvement of stakeholders across the stages of Reuse. This is attempted through a visual representation. Table 6.2 offers an overview of the stakeholders' involvement in the various stages of redevelopment, based on the data presented in the above analysis.

TABLE 6.2 Involvement of stakeholders in the stages* of Industrial Heritage Reuse process.

Stages of reuse	Stakeholders	Developers	Architects	Owners	Local Authorities	Heritage Agencies	Users (non decision-makers)	Volunteers	Local communities	Funding parties
Preparation	Raising of awareness	X		X	X	X		X	X	
	Lobbying	X		X	X	X		X	X	X
	Listing	X		X	X	X				
Evaluation	Market analysis	X		X						X
	Site investigation	X	X	X						X
	Feasibility study	X	X	X						X
Acquisition	Professional appointments	X	X	X						X
	Financing	X	X	X						X
	Planning Application	X	X	X	X	X				X
	Site assembly/purchase	X	X	X	X	X				X
Procurement	Design	X	X	X	X	X				X
	Tendering/Contracting	X	X	X	X	X				X
	Construction	X	X	X	X	X				X
Disposal	Promotion	X	X	X				X		X
	Letting	X		X			X			X
	Sale	X		X			X			X
Occ. & Managment	Maintenance	X		X			X	X	X	X

** The stages of Industrial Heritage Reuse process are an adaptation of those identified by Birrell and Bin (1997).*

6.3 Standing Challenges

The detailed analysis of the role, involvement, influence and impact of the stakeholders of Industrial Heritage Reuse process that was presented in Section 6.2, lays the foundation for the identification of key challenges related to the Actors who influence the practice. Two main points have been identified and will be further analysed.

6.3.1 Clash of agendas

"Buildings are a product of a variety of stakeholders – including clients, funders, developers, architects, engineers, planners, contractors, valuers, quantity surveyors and manufacturers – each of whom have different, and sometimes conflicting, motives and values." (Schmidt and Austin, 2016, 213)

"People who are prepared to devote time, money and effort to heritage want different things from it, including legitimation, cultural capital, identity and, sometimes, financial reward or just a living." (Howard, 2002, 102)

The divergent agendas of stakeholders is one of the greatest challenges in a Reuse project to deal with and if not properly managed it can lead to failure or a dead end. The issue that was briefly touched in Sub-Section 2.2.5 of this dissertation, has been discussed by a number of studies that emphasise the clash between the 'typical' ambitions of stakeholders (Schmidt and Austin, 2016, 213, Bloszies, 2012, 49, Howard, 2003, 102-146) or stress a conflict between two particular Actors. For example, Roos (2007, 183-184) discusses the clash between the Architects and Civic society; Dushkina (2008, 191-192) the clash between Architects and Conservationists and Orbasli (2008, 72) the clash between Owners and Permit granting authority clerks.

Drawing from those studies and the present research, it can be supported that problems typically arise when Actors remain fixed or try to maximise their own stake, in expense of the stakes of the rest of the team. Commercial developers and owners who only seek to maximise their profits, architects who are only driven by aesthetical criteria, inflexible public institutional bodies with unrealistic demands and short-sighted local communities are agents of problematic situations leading to delays or unsuccessful interventions.

In short, it can be argued that there are three ways of addressing the problem: through power, through conciliation or through the employment of both at different phases. The case studies present a solid foundation for the identification of stakeholders' agendas, which keep shifting in the course of time, and alternative solutions that can be used as references of good practice. The lessons learned from case study research will be analysed in more detail in Section 6.5.

6.3.2 Bureaucracy and High expectations

Another challenge, which pertains to the stakeholders discussion touching also the realm of the influencing 'Net of Exogenous Conditions', relates mainly to policy. The latter has a decisive impact on the interaction of the involved Actors with the permit granting authorities and in turn on the Reuse result. Qualitative research interviews, case study and literature review showed that

conforming with the standing policy when reusing Industrial Heritage is tough. Moreover, securing the permits required for the conversion is a problematic stage that discourages redevelopment in the countries under investigation. Bloszies (2012, 49), Orbasli (2008, 72), Vlandou & Koudouni (2016) discuss the matter, touching on a number of issues. The present research considers three main points that aggravate the cooperation between civil servants and project instigators.

Firstly, the current policy subjects project instigators to a complex and inflexible planning application and consent granting process. Existing historic buildings are often impossible to comply with current building codes while ensuring the protection of their cultural values within a viable financial scheme. Without a flexible policy or understanding by civil servants of the need to allow exceptions, tensions are created between stakeholders. As confirmed by various cases (e.g. Technopolis, LTCP) this process can have important negative consequences on an operational and financial level, posing threats for the project.

Secondly, too often there are overlapping jurisdictions between public institutional authorities resulting in confusion, discrepancy of guidance, significant delays and sometimes even legal dead ends. The phenomenon is common for all countries under investigation, yet it appears with greater emphasis in Greece. The overlapping responsibilities of the two Ministries in charge of heritage care and the various regional services cause an excessive bureaucracy that can sometimes prove fatal for buildings and equipment in danger. Apart from that, the ineffectiveness of the standing model has multiple other manifestations. For example, there is no uniform registry of listed buildings let alone industrial ones.

Lastly, especially in the countries of Southern Europe with weaker economies, there are high expectations from owners yet no incentives for supporting them.

According to Vlandou & Koudouni (2016) who examine the Greek scope, there is a profound lack of balance between the imposed duties of the owners and the offered incentives from the State. Despite the legal provisions for financial support and tax reliefs for the owners of listed buildings, in practice there is hardly any support from the Public Sector. As a result, many listed sites are left to deteriorate, with the tolerance of the State.

This analysis highlights a double need. On the one hand, the necessity for adjusting the standing policy for facilitating and simplifying processes while addressing key stakeholders' needs.[55] On the other, the necessity for a smoother collaboration between civil servants and project applicants. A way to achieve that is given by F. Asselbergs, Director for the Cultural Heritage of the Netherlands, at that time. Referring to the Dutch situation he states:

"The National Service for Archaeology, Cultural Landscape and Built Heritage (RACM) needs more people who have been trained as designers and, in addition to the assessment of the cultural historic values, are also capable of giving convincing advice on architectural or urban development interventions. On the other hand, the designers have too little understanding of the history. It cannot be so that the RACM is in the service of the past and 'Delft'[56] *is the motor of the future. Because the preservation and creation of culture are two aspects of the same thing."* (Roos, 2007, 182)

More suggestions for dealing with the aforementioned problem will be discussed in Section 6.5.

55 It is encouraging that this process is examined by some Heritage Agencies, at least in some forerunner and follower countries. HE, for example, since 2011 is looking for ways to facilitate investors who are willing to get involved with Industrial Heritage at Risk (Colliers International, 2011). RCE in the framework of the programme 'Herbestemming' (2010-2015) policy was amended encouraging reuse.

56 He refers to the Faculty of Architecture of the University of Technology, Delft.

6.4 Shifts

Since the early days of Industrial Heritage protection much has changed in regard to its stakeholders. The analysis of Section 6.2 allowed the pinpointing of key shifts overtime. The changes reflect both the progress made in the last five decades and the problems that still need to be resolved.

The shifts identified, can be summarised to five major points.

6.4.1 Awareness and appreciation

It is evident that since the 1970s, the perception over Industrial Heritage protection and Reuse has changed profoundly. The majority of stakeholders in all four countries under investigation have developed a growing awareness of their industrial legacy. This translates to more involved civil servants, a local community that welcomes and supports Industrial Heritage conversion and a growing number of advocating voluntary groups. Furthermore, it is reflected in an increasing number of conversions many of which are more sympathetic, since part of the architects and developers have started seeing value in the existing historic fabric.

The growing awareness and appreciation on a European level is confirmed both by quantitative and qualitative data. The results of the 'bdrc continental' public attitudes survey, which was carried out in 2011, was based on 2,000 online interviews that were overwhelmingly positive, demonstrating that the general public clearly values England's industrial past (Gould, 2015, 76). A striking number of expert respondents, in the framework of Delphi technique of this research and a vast number of studies (e.g. Douet, 2012, Berens, 2011, English Heritage, 2011) verify that awareness and appreciation has risen across Europe.

This positive development can be attributed to the endeavours of NGOs and in general of the voluntary sector; the action of the State or Regional Authorities; and to some forerunner cases that proved early the advantages of protecting and reusing Industrial Heritage (e.g. IGM and mNACTEC). Open-minded individuals and groups as well as experts such as historians, conservationists, engineers and architects also contributed in different levels from country to country to the raising of awareness of this heretic heritage group. Awareness campaigns on an international or national level (e.g. 1975-Monuments' year, European Council; 1996-Year of Industrial Heritage in the Netherlands and 2011-Industrial Heritage at Risk campaign in the UK) offered a significant contribution to the rise of awareness and appreciation in Europe, as well. In regard to the subject in question the following experts state:

"One of the major contributions of the AIA is the growing appreciation of Industrial Heritage and the widening of the 'traditional' archaeology's scope" (D. de Haan, Secretary of the AIA in 2015, Resp. no 4, interview, 8/6/2015).

"Industrial Heritage came into perspective in the Netherlands in the 1990s. However, even then it was considered dirty and not very interesting. Only some people, including Peter Nijhof, were strongly supporting it. In 1996 the year of Industrial Heritage was organised and a lot of publicity was given to the issue. Until the opening of the Westergasfabriek though, people had not realised the importance of this heritage group and the different approach that was required for its safekeeping." (F. Strolenberg, Programme manager Herbestemming & Agenda Toekomst Religieus Erfgoed, Resp. no 92, interview 13/7/2016).

"The perception of the people towards Industrial Heritage in Spain has changed a lot in comparison to the past. This is evident as every year there are protests for preserving a site and also more and more buildings are preserved." (E. Casanelles, Director of mNACTEC,1996-2013, Resp. no 177, interview, 25/9/2017).

"People, realising that the State protects and lists industrial buildings has started to appreciate them. Thus, a big shift is the progressive appreciation and acknowledgement of those buildings from the public as well as their integration in the modern environment with new uses." (A. Androulidaki, Head of Protection and Restoration of Newer and Modern Monuments, Ministry of Culture of Greece, Resp. no 248, interview, 8/5/2017).

Despite the large steps taken for the acknowledgment of the historic industrial sites' value since the 1970s, awareness and appreciation of Industrial Heritage is not reflected equally and with the same intensity everywhere in Europe. On the contrary, qualitative research interviews show that there is a difference between countries pioneers, followers and late comers. In the latter two, there are still appreciation gaps. Discussing the matter J. Sobrino Simál, Vice-coordinator of the Plan Nacional de Patrimonio Industrial, Spain (2009-2011), states:

"The perception of civil society has changed. In the Basque Country, Catalonia, Andalusia and Valencia, the awareness has risen. In other autonomous regions, people do not understand the value of Industrial Heritage." (Resp. no 186, interview, 26/10/2017).

6.4.2 Enhanced skills and elevated experience

Another positive development in comparison to the past is the enhancement of skills of the stakeholders responsible for the protection, conversion and management of Industrial Heritage. This can be attributed to training programmes developed by academic institutions, heritage agencies and NGOs since the 1970s and to the longstanding involvement of certain Actors with the practice.

In general, public sector civil servants, archaeologists, conservators and other professionals have become more knowledgeable and better in their roles as advisors, researchers and interpreters of Industrial Heritage values. In some countries heritage agencies and local authorities have become more proactive and responsive. National programmes such as 'Industrial Heritage at Risk' (UK), 'Herbestemming'(NL) and the 'National Plan of Industrial Heritage' (Spain) verify that.

Moreover, Industrial Heritage Reuse has become common practice for a number of developers and architects who appear much more experienced and prudent. Funding organisations have also become more knowledgeable and experienced in the course of time, refining their selection process and helping in the delivery of more viable and durable projects.

Despite the progress, as analysed in the Section 6.2, there is still much room for improvement. A big part of designers and developers still present a shortage of training and understanding of historic buildings; an issue which can lead to loss of the historic fabric and its cultural significance during conversion. Furthermore, with the future of Industrial Heritage relying increasingly on local authorities, volunteers and local communities, more groups require access to appropriate training and specialist expertise.

Lastly, due to cultural differences and dissimilar lines of education in Europe, targeted training is required in some countries more than others for familiarising professionals in power with the practice and bringing them up to speed with its particularities. The Heritage Agency's civil servants in Greece provide a good example for understanding the issue. Their training and attitude remains largely absorbed in the established conceptions and practices of the ancient monuments' preservation tradition. This fixation has an impact on the preservation and Reuse of industrial buildings. In the words of A. Androulidaki, Head of Protection and Restoration of Newer and Modern Monuments, Ministry of Culture of Greece:

"The problem is that the majority of heritage civil servants of the Ministry of Culture do not believe that industrial buildings are a priority." (Resp. no 248, interview, 8/5/2017).

There is therefore a need for targeted training in order to shift the established perception of the Heritage Services' staff on the one hand and on the other, to familiarise them with the appropriate methodology of intervention and the particularities of this heritage group. It is encouraging that currently the architectural graduate and postgraduate studies in Greece include courses of industrial archaeology and intervention practices.

6.4.3 Changing roles

Maybe the most notable shift, introduced in the Sub-Section 2.2.5 and clearly confirmed in the analysis of Section 6.2, is the changing power balance of Industrial Heritage Reuse stakeholders. This stems largely from upheavals in the Net of Exogenous Conditions. In detail, from the 1990s, major developments in the global economy (Gilpin, 2000) coupled with shifts in the conservation movement (see Ch.2) and changes in the building sector have caused successive alterations in the roles of heritage stakeholders. State bodies appear to lose or hand off power to private parties. Responsibilities of long-established professionals are scattered among a number of other specialists while communities have turned from spectators to players. The said shifts are identified with greater intensity in the UK and the Netherlands.

As J.P. Corten, Senior Policy officer, Rijksdienst voor het Cultureel Erfgoed, argues referring to the Dutch situation:

"The role of the government is shifting. It has less and less means and power and thus less capacity to act. The government is no longer rowing but steering. For Industrial Heritage other parties are important." (Resp. no 91, interview, 4/7/2016).

Both in the UK and in the Netherlands, Heritage Agencies are being restructured, handing off their assets to private bodies (e.g. English Heritage Trust and Dutch Monuments Organisation) while pushing more and more responsibilities to regional or local authorities. The privatisation and regionalisation of heritage gives rise to a number of issues that will be discussed later.

As the State loses control, private sector players and in particular commercial developers and Trusts appear to follow a reverse path. The transition from a state-dominated to a market-dominated world has empowered the latter parties, who own large sums of capital and can invest and control large scale projects.

At the same time, architects appear to lose their role as the sole fountain of expertise during the evaluation and procurement process. Other professionals, such as industrial archaeologists, cultural historians, technology experts and project managers have assumed part of the traditional responsibilities of the architect. Finally, the local community is becoming increasingly involved in the process having established its role as a consultee and claiming more and more a place in the table of decision-makers. In respect to the last shifts described, Viñas (2005, 154) notes:

"Architects, conservators, art historians, archaeologists, scientists and a few other educated professionals are the ones who can discuss conservation treatments because conservation is supposed to be an experts-only zone, and they are supposed to be 'the experts'. Admitting that a larger number of people are authorized to voice opinions on a conservation treatment would likely result in a loss of the authority which has traditionally been given to conservators and other experts. Taking into account the opinions of non-experts implies that the experts-only zone becomes an affected-people zone. This zone can be very populated, indeed, and some people in the zone will have a more substantial stake in an object than others, as the object may be more meaningful to them than to the rest of the people."

The described shifts have caused upheavals in the established power balance of stakeholders. This transitional situation presents both opportunities for the practice as well as hiding risks for its future.

On the one hand, the growing interdisciplinarity and the increasing involvement of the local community to projects of Industrial Heritage Reuse have important advantages for the practice. In detail, the input of more specialists contributes to projects that are better documented, analysed and interpreted, presenting improved financial, energy and social performance. Moreover, bottom-up involvement can turn the decision-making process to a far more democratic and inclusive procedure that satisfies the needs of both prospective users and the community.

On the other hand though, the shifting situation in the stakeholders' power balance can also lead to loss of control and frictions between players with a threefold effect on the care and Reuse of Industrial Heritage in Europe.

Firstly, the loss of power of the National Heritage Agencies presents multiple issues. The regionalisation of heritage care hinders its proper guardianship, as it is synonymous with fragmentation and loss of overview. As shown in the case of Spain, fragmentation has considerable repercussions as it leads to care and management of different standards from place to place. The loss of overview entails risks, as it makes it harder to take informed decisions on the future of heritage sites based on a comparative assessment of the assets' cultural values. Furthermore, the regionalisation involves the transfer of responsibility to local authorities that usually lack the highly specialised staff required for so complex and demanding projects. The privatisation of heritage on the other hand, makes its commercialisation far more probable.

Secondly, with the growing power of commercial developers, a plethora of historic buildings has been left to their mercy. This has caused two phenomena. On the one hand, Industrial Heritage is more likely to be left at dereliction as developers are not willing to invest in projects with such high risk and uncertainty, especially in times of crisis (Colliers International, 2011). On the other hand, unlisted buildings are facing elevated risks given that there are minimum restrictions to prevent developers from compromising their architectural and cultural heritage values.

Thirdly, the shifting power balance has resulted in tensions between parties as formerly established experts who see their role changing, are not always willing to adjust to the new situation, handing off control. Discussing the subject Jo Coenen, Chief Government Architect of the Netherlands 2000-2004, emphatically argues:

"Architecture is created on the basis of arguments and not on the basis of what the majority wants. Certainly not if the majority, and that is unavoidable, are poorly informed. The interactive talks in advance, the democratic decisions, can lead to no one being satisfied in the end." (Jo Coenen in Roos, 2007,183).

The above statement, highlights the issue of contrasting agendas, reflects the downsides of participatory process as well as the risks of enabling laymen who lack training.

6.4.4 Financial pressure

As analysed in Section 2.6, Industrial Heritage requires large amounts of money for its conversion and maintenance. The financial crisis of the late 2000s led to a significant reduction of both private and public investment, highly intensifying the financial pressure of programmed, under development and delivered Reuse projects.

In detail, Heritage Agencies and local authorities across Europe were subjected to major budget cuts (Table 6.3). This has caused a triple effect. Firstly, it has placed the historic sites under their care in danger (e.g. Stanley Mills Industrial museum, Energiehuis, CTC). Secondly, it has resulted in a significant reduction of the number of front-line staff, providing expert conservation advice which in turn is translated into inappropriate or inadequate service and support. Thirdly, it has caused a drastic reduction of financial support that was formerly offered to selected projects (Gould, 2015).

TABLE 6.3 Historic Scotland Funding from Scottish government from 2010 to 2015. The table shows the vast reduction of available funds of the Heritage Agency during crisis (Source: The Scottish Government, 2016).

BUDGET	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015
Total (£m)	43	47	45	35	37.8

In turn, BPTs and voluntary groups supported by public grants have been equally affected, restricting their action. Lastly, property developers have largely retracted from risky investments, turning to more secure projects.

Besides the aforementioned negative repercussions, the financial situation of the stakeholders resulted in a sharp reduction of Industrial Heritage Reuse projects (Gould, 2015). Moreover, regeneration projects were paused and programmed projects were delayed (e.g. 22@; Mining and Metallurgy Museum in the LTCP, King's Cross).

In this climate of dismay however with the top-down model of Industrial Heritage Reuse crumbling, new bottom-up initiatives started forming. On the one hand, entrepreneurs and architects showed alternative ways of reusing industrial sites with less funds and more creativity. On the other hand, urban social movements employed a different approach that came in sharp contrast with the former established paradigm. The examples of the Candy Factory in Copenhagen and Tabacalera in Madrid present the effects of that grassroots process of Industrial Heritage Reuse, which emerged in the times of recession. The article 'The opportunities of crisis' (Chatzi Rodopoulou, 2019) analyses the subject in question.

6.4.5 Aging of volunteers

Finally, an alarming shift, which seems to be a general phenomenon in the lines of Industrial Heritage advocates in Europe, is the ageing of enthusiasts who are willing to get actively involved with the relics of industrialisation on a voluntary basis. This development is particularly evident in the UK and the Netherlands. Long standing NGOs, such as the AIA and FIEN, are in a desperate need of fresh blood for continuing their important action.

For the former case, the ageing of enthusiasts is also coupled with the shrinkage of the sector. According to a public attitudes survey launched by English Heritage (2011), young people are not very interested in Industrial Heritage. This fact makes the possibility to volunteer rather slim. This is identified as a key problem, as the UK has largely based the care of historic industries to the volunteer sector.

The analysis of the Sections 6.3. and 6.4. showed that the challenges Industrial Heritage stakeholders need to respond to have increased overtime. Summarising, these include the clash of the Actors' agendas, the burreocracy and standing policy inflexibility, the reprecursions of their shifting roles, the financial pressures caused by the crisis of the late 2000s and the aging of volunteers**. Does this climate of change lead to loss of contol? What are the conditions under which stakeholders can collaborate effectively overcoming those challenges and who should be in control for succeeding a balanced result after the wave of changes breaks?**

6.5 Lessons from case studies

The previous discussion highlighted a necessary condition for a positive influence of stakeholders.

- **Continuous training and familiarity with the particularities of Industrial Heritage** are important as they shape the approach of the stakeholders towards the historic site and positively influence their cooperation.

Key findings of case studies of best practice that relate to the involved stakeholders will complement the above. The analysis of case studies led to a number of results presented below:

- The action of the party that **initiates** the project is highly important.

The thriving majority of case studies showed that initiators, who may often not take part in the decision-making, contribute decisively to the formation of preconditions that enable or obstruct the creation of the project. In specific, those preconditions include the promotion of awareness, the creation of necessary momentum that paves the way for redevelopment, the listing of heritage assets and the pressure to decision-makers in order to avoid the levelling of heritage assets in danger (see cases of IGM, Stanley Mills, TextielMuseum Tilburg, DRU Industriepark, LTCP and BJF). On the other hand, the hesitation or indifference from initiators can also create a climate that hinders successive developments (see cases of Ca L' Aranyó and Mill of Pappas).

— **Interdisciplinarity** is crucial, aiding to determine the right balance between preservation, change, financial, social and functionality variables. **An interdisciplinary approach** can inform and shape a compatible intervention. More than half of the cases examined, highlighted that the widening of the involvement of stakeholders has proven beneficial for the project.

— **The attitude of the decision-makers and their drive** is decisive for the result of the Reuse. **Those factors were discussed in the analysis of architect's impact yet according to the case studies results they can be generalised for all stakeholders.** The example of Energiehuis can be used to further clarify that. The case shows on the one hand the positive impact of the architect's receptiveness to the users' suggestions and the architectural result stemming from his emphasis in the old fabric. On the other hand, it highlights the link of the project with the shifting attitude of the owner, from a pro-heritage party that prioritises the accommodation of social needs to an investor who is mainly preoccupied with securing a return from his tenants. **Without a positive attitude and convergent drives, the current challenges are likely to lead prospective Industrial Heritage Reuse projects to problems or failure.**

— **The Coordination of a Reuse project, influences the action of the stakeholders' team and it is highly important for its process, outcome, operation.** Multiple cases, including the IGM, the mNACTEC and the Energiehuis show that a devoted coordinator (such as the IGM Trust, the mNACTEC director and the Energiehuis architect respectively) can reconcile opposing views or contrasting needs, adjust the project when needed without harming its identity and therefore keep it afloat when difficulties arise during the implementation or occupation and management process. In contrast, the case of Technopolis (in its early days) shows the catastrophic impact of the lack of coordination on the cultural significance, architectural approach and financial performance of the project.

  Besides the lessons from the case study analysis, the issue of coordination was also explored through qualitative research interviews (See Appendix 2, Questionnaire type 1: D.1.2). Their results supported unanimously that the coordination of a Reuse project is fundamental. However, there was no agreement over which stakeholder would be the most appropriate for that role (Project managers and architects were the two stakeholders mentioned more). Nevertheless, a key finding from the interviews that was widely echoed in the views of the interviewees was that the **coordinator should be somebody with a 'can-do' attitude and great social skills, who understands the particularities of the project and makes sure that all views are heard.**

— **The social underpinning of Industrial Heritage Reuse projects and the engagement of the local community are essential, across the course of a project. Lack of those characteristics can render it vulnerable in times of crisis or not durable after delivery.** This is widely reflected in the two thirds of the cases examined. The case of DRU Industriepark shows the merits of social underpinning both in the preparation (flagging of the project) and in the occupation and management phase (large support of volunteers, great resonance of the public to the public uses). The case of Tabacalera shows the catalytic effect of social underpinning in times of crisis. In contrast, the case of the CTC shows the negative effects in the operation and upkeep of the project, due to the lack of those characteristics.

— **Determination and tenacity** of the decision-makers is important.

  Surprises and unforeseen difficulties are in the DNA of Industrial Heritage Reuse projects. Within a climate of financial instability and great bureaucracy, the attempt to convert so complex and vast sites might seem utopic. The two thirds of the cases examined showed that determination and

tenacity are essential characteristics of stakeholders who have managed to turn utopia into reality. IGM Trust, the Historical Association of the Municipality of Gendringen in the case of DRU Industriepark, the representatives of the local community of Lavrion and the collectives of the Tabacalera in Madrid constitute only a small part of the wealth of examples of stakeholders with the described qualities.

— A **good collaboration** and supplementary role between stakeholders is crucial for the outcome of the Reuse. In contrast, a bad collaboration can lead a project to a dead-end, delays or unsuccessful interventions. This statement which is supported by two thirds of the case studies merits further analysis. A good collaboration involves a solid coordination (see for example the cases of: King's Cross, TextielMuseum Tilburg, Westergasfabriek, LCTP, mNACTEC), good communication (see for example the cases of: IGM, DRU and Bombas Gens), **firm contracts** between stakeholders involved (see for example the cases of Westergasfabriek, Tsalapatas and Tabacalera) and mutual understanding between key stakeholders (see for example the cases: Swindon, Westergasfabriek and Bombas Gens).

  In order to ensure the last point three conditions are essential. Firstly, stakeholders need to be willing to hand off control to others when issues arise that are irrelevant to the merits of their expertise or interest. Secondly, specialists need to be willing to share their expertise to the rest of their team. Thirdly, stakeholders need to be able to understand the full scope of the project, leaving their comfort zone. For example, developers and architects should start recognising the significance of cultural values, the heritage sector should start to think more commercially, permit granting authorities should be more practical and owners more flexible in regard to cost estimations and timelines.

— **Key personalities** can keep the project afloat.

  Securing all the above conditions is rather unlikely in Industrial Heritage Reuse projects. The current challenges seem to aggravate the perspectives for Reuse. A striking number of case studies spanning from the early attempts to the present day, supported by findings of other researchers (Berens, 2011, 46, Cerutti, 2011, 140-141) shows that this deadlock situation can be resolved. When the project starts suffering critical setbacks, key personalities are essential for keeping the project afloat. Driven by vision, enthusiasm and passion they are the ones, who despite the difficulties, will not get discouraged nor take 'no' for an answer. They can essentially be described as the motors of the Reuse. (see for reference the cases of IGM, Westergasfabriek, LTCP and mNACTEC)

  The above analysis leads to the conclusion that a positive stakeholders' influence depends on three key characteristics. The first one is skills, acquired with training and accumulation of experience through the involvement in projects of Industrial Heritage Reuse. Skills alone however are not enough for bring a project to fruition against the current challenges. As Tom Bloxham argues: *"In order to get any project done you need people with vision, leadership and charisma."* (Baum and Christiaanse, 2012, 89).

  The second characteristic therefore pertains to particular traits of the stakeholders (determination, tenacity, passion, enthusiasm etc.). Finally, the third characteristic involves harmonious relationships between Actors (interdisciplinarity and collaboration).

6.6 Conclusions

The above analysis provided answers on who is involved with Industrial Heritage Reuse in Europe, when, where and how. One interesting finding was that the care and management of Industrial Heritage is championed by different stakeholder groups in each country, namely the voluntary sector in the UK, the private sector in the Netherlands, the public sector in Greece and the regional authorities in Spain.

Furthermore, a comprehensive account of achievements and challenges presented to stakeholders was offered along with the reasons that led to them. In short, the achievements highlighted pertain to the elevated awareness and appreciation of Industrial Heritage as well as to the enhanced skills and the experience of stakeholders in Industrial Heritage Reuse projects in comparison to the early days of the practice. The challenges regarded the clash of agendas between stakeholders, the bureaucracy and high expectations, the repercussions of their shifting roles, the financial pressures caused by the crisis of the late 2000s and the aging of volunteers.

The overview of achievements and challenges reinforces the notion that Time is an underlining Aspect influencing Industrial Heritage Reuse. Over time the Actors' skills developed, their involvement changed while their power balance shifted.

Finally, based on the outcomes of case study analysis, a set of conditions was presented, contributing to a positive influence of the involved Actors.

In order to further clarify the level of Actors' influence a new categorisation, that differs from the ones described in the introduction of this Chapter, is essential. Table 6.4 shows a tripartite categorisation, in main decision-makers, direct influencers and indirect influencers, according to the level of stakeholders' involvement with the process. The table shows that certain Actors may fall in more than one category under certain conditions.

TABLE 6.4 Categorisation of Industrial Heritage Actors based on their involvement with the project. This categorisation is broad and can be applied to different national contexts with small adjustments.

		Heritage Agency	Local authority	Local community	NGO	Volunteers	Architect	Developer	Owner	User	Funder
High involvement	Main decision-makers									When involved in the process	
	Direct influencers	In listed sites				If implicated in the project				When coming after delivery	
Low involvement	Indirect influencers	In unlisted sites				As advocates					

According to Viñas (2005, 154) *"People's right to impose their views is proportional to their involvement with the object."* Based on this statement, the interpretation of the above table suggests that the Actors in control of Industrial Heritage Reuse are the main decision-makers. The power of direct influencers is moderate while indirect influencers exercise hardly any control on the projects in question.

This interpretation though is misleading as it does not take into account the fluctuations of involvement during the different stages of Reuse. Figure 6.12 depicts those fluctuations, showing that their involvement differs vastly from phase to phase.

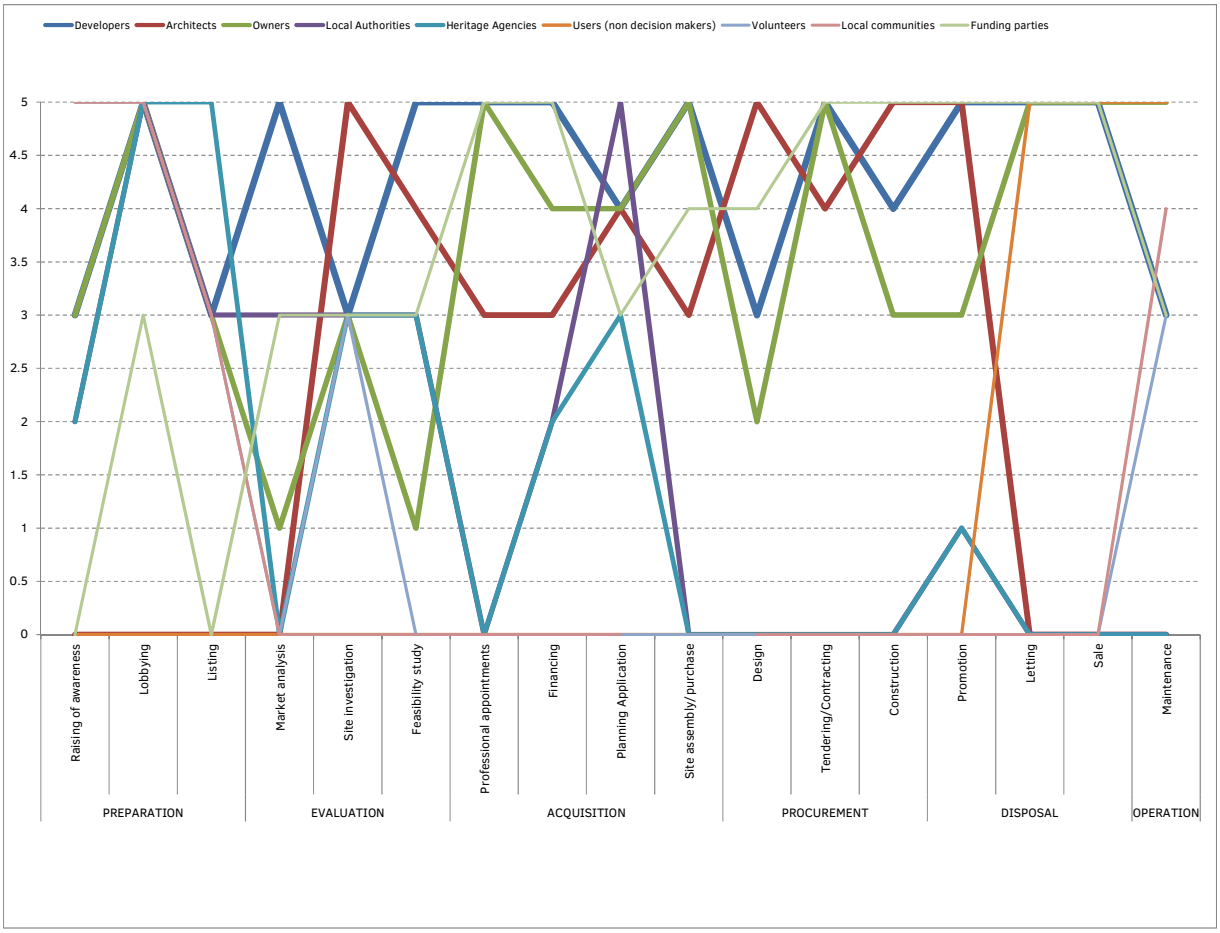

FIG. 6.12 Level of involvement of Actors during the distinct phases of Reuse (5=High level of involvement, 0= No level of involvement).

As a result, it can be suggested that all parties play an indispensable role in the process of Industrial Heritage Reuse. The action of one is not irrelevant from the action of the others and no contribution, no matter how modest, is meaningless. On the contrary, stakeholders' action is interlinked and can be visualised as a Net (FIG. 6.13).

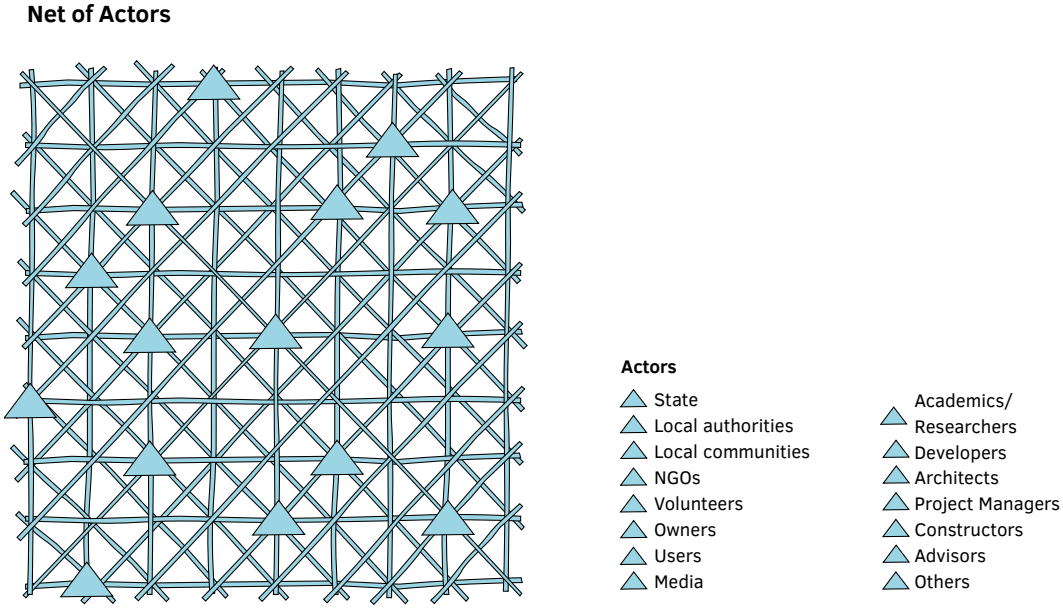

FIG. 6.13 Visualization of the Net of Actors influencing Industrial Heritage Reuse

Creating and using this Net requires the contribution of all Actors. The civic society and the public institutional parties are usually responsible for the initial step in the manufacture of the Net, namely spinning the fibres for forming strong yarns. The next step, namely weaving those yarns into a net, is undertaken mainly by specialists. Finally the last step that involves the usage of the Net, is left to users, volunteers and the local community under conditions.

Therefore, in the question who should control Industrial Heritage Reuse there are no simple answers. Control should be passed and interchanged from one stakeholder to the other as the project progresses. Power of any form -financial, political, institutional or technical- can definitely monopolise or overshadow a project, yet it usually does not lead to conversions of high standards. As Bloszies (2012, 50) supports*: "Successful projects are based on designs that balance the desires of the stakeholders"*. For achieving that, integration and conciliation of conflicting views rather than power imposition is important. This strengthens the arguments of Staniforth (2000), Sörlin (2001), Avrami et al. (2000), Vinas (2002) and Roders and Velpaus (2013), presented in Sub-Section 2.2.5, for a participatory and agreed-upon conservation process. In order to achieve that, it was found that an effective coordination, skilful stakeholders with specific traits and quality relationships between them are necessary.

7 Reuse Components

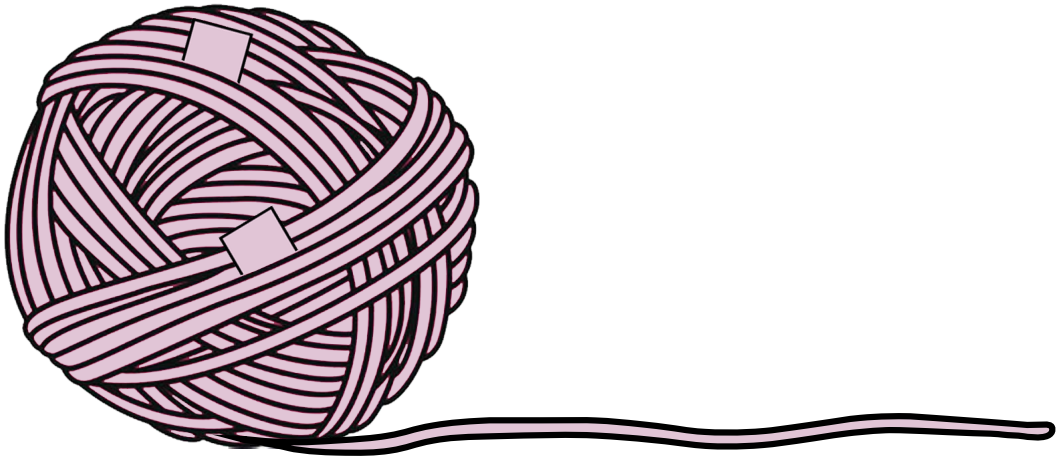

FIG. 7.1 The complex mix of Industrial Heritage Reuse Components, visualized as a yarn ball to be unraveled in Chapter 7.

7.1 Introduction

The previous two Chapters analysed the influence of the Factors and Actors on Industrial Heritage Reuse. It was revealed that this influence is not uniformly allocated. On the contrary, it is exercised at different stages of the process, affecting different Components of Reuse. This Chapter will identify and discuss in detail those key Components, the interaction of which shapes the outcome of Industrial Heritage Reuse, unravelling the 'yarn ball' depicted in Figure 7.1. Drawing from the case study analysis, it will present the lessons learned per Component, highlighting at the same time underlying links, interactions and dilemmas between influencing Factors, Actors and Reuse Components.

The Chapter seeks to answer the S.Q.4. of this dissertation:

"Which are the key Components of Industrial Heritage Reuse and how does their composition influence the practice?"

In order to respond to this question, an anatomy of Industrial Heritage Reuse will be performed. Sub- Section 7.2.1, drawing from the existing literature base, will present the macroscopic analysis of the practice, pinpointing its key Components. Sub-Section 7.2.2, drawing from the selected case studies, will present the microscopic analysis, pertaining to the examination of each identified Component in depth. Furthermore, it will discuss the links and dependencies formulated between Components and the Dilemmas arising, pertaining either to one or more Components. The conclusions of the Chapter will provide a comprehensive view of the links, dependencies and tensions between the identified Components, the influencing Actors and Factors.

7.2 An Anatomy of the Reuse strategy

One of the key origins of Industrial Heritage Reuse challenging nature, as explained in Section 2.6, is its multidimensional character. A solution for coping with this challenge is to dissect the strategy in its key Components and conduct a macroscopic and microscopic analysis. This will allow to better understand the subject under investigation, opening possibilities for its enhancement.

7.2.1 Macroscopic analysis

In Chapter 2 it was shown that hitherto a holistic examination of Industrial Heritage Reuse is missing. Nevertheless, the existing theoretical base, placing emphasis on specific Reuse dimensions, provides valuable lessons that can frame the anatomy of the strategy. A literature review of key contributions on the subject that discuss a number of its Components, allows the identification of those that are repeatedly stressed as most important and a preliminary diagnosis of their interaction. In what follows, six important works published in the last two decades are analysed, following a chronological order.

The work of Stratton (2000) *'Industrial Buildings: Conservation and Regeneration'* with contributions from historians, researchers, conservationists, designers and entrepreneurs, besides providing valuable lessons for the Endogenous Attributes of Industrial Heritage Reuse, offers one of the most comprehensive analyses of the key Components of the practice. Setting the scene for the wave of the practice's inherent dilemmas which are introduced in the book, Stratton (2000, 8) argues that "*The key challenge* (for Reuse) *is to find the right balance between preservation and change."* as well as *"[…] to achieve a balance in terms of appropriate and complimentary uses and in gaining the right mix of public and private money."* Moreover, he identifies "*the combination of economic pragmatism of reuse in the past with inspirational qualities and community benefits of successful modern projects"* as the key to the success of Reuse and regeneration.

In Chapter 2 of the book, Stratton discusses the dilemma between cultural values preservation and architectural approach, supporting that "*Different approaches are valid in different contexts."* (Stratton, 2000, 50). Finally, the issue of new programme identification in relation to financial viability is introduced (Stratton, 2000, 40-44). In later Chapters more aspects are discussed by the book's contributors. From a different standpoint both Falk (Stratton, 2000, 89-102) and Worthington (Stratton, 2000, 159-161) stress the importance of the process followed for the adaptation of industrial sites, linking it to the stakeholders involved and the financial aspect.

In short, Stratton's work despite not aiming for a systematic identification of the Reuse constituent parts, presents an extensive and recurring discussion over some key Components of the practice. Those are summarised in Table 7.1. It should be also highlighted that the aforementioned Components are presented as interlinked yet antagonistic. As a result, their handling and control appears to present multiple dilemmas and challenges.

In her highly regarded work *'Architectural conservation'*, Aylin Orbasli (2008) also touches on the complexity of the Reuse practice. Some of the Components presented in Stratton's book are revisited while new dilemmas between them are posed. In detail, Orbasli links the financial Component with the architectural approach stating:

"The reuse of an existing building is partly about imaginative design solutions but predominantly about economic feasibility. For a project to be successful, the cost of refurbishment and alterations need to be weighed against the economic value of the outcome." (Orbasli, 2008, 192).

Furthermore, she emphatically introduces the link between the cultural significance protection of a heritage site as a base for the new use selection, noting:

"Not every use is appropriate for a historic building. Proposals for a new use must first consider whether the building is appropriate for this use and secondly, whether the new use and necessary changes protect and enhance the cultural significance of the building." (Orbasli, 2008, 194).

An overview of the Reuse Components analysed in Orbasli's work is offered in Table 7.1.

Baum and Christiaanse in their book *'City as Loft'*, through the analysis of thirty selected best practice projects of reused industrial sites located across the globe, discuss a wide set of Components which *"provide the basis for dynamic-stable structures to arise"* (Baum and Christiaanse, 2012, 365). Those include the Reuse process, the new programme, the architectural intervention as well as financial and social dimensions (Table 7.1). In their conclusions they emphatically support:

"A careful strategic approach takes spatial, architectural, functional, programmatic and social aspects into account and develops a vision for the future, defines quality targets and monitors the whole process in all its complexity." (Baum and Christiaanse, 2012, 363).

In contrast with Stratton and Orbasli therefore, Baum and Christiaanse highlight the synergies between key Components.

Apart from the abovementioned authors, international and national guidelines also offer insights, emphasising a selection of heritage Reuse Components. The '**Dublin Principles'** (ICOMOS – TICCIH, 2011) call attention primarily to the preservation of cultural significance of Industrial Heritage. This key Component is linked with four others. Firstly, with the **process** followed for the Reuse, encouraging the documentation, research and understanding of heritage as a base for conservation and management (Articles I.3 - I.4), the legal protection of its structures, machinery and records, too (Article II.6) and the dissemination of its values (Articles IV.13 -1.14). Secondly, **the preservation of cultural significance** is linked with the **new programme** of the heritage asset (Article III.10); thirdly, with the skills and synthesis of **the involved specialists' and stakeholders' team** (Articles I.4, III.10). Lastly, the preservation of cultural significance of Industrial Heritage is linked with **the architectural approach**, highlighting the necessity for a reversible and respectful transformation while prompting the restriction of preservation 'eclecticism' (Article III.11).

The **guidelines of English Heritage** titled: *'Heritage Works: The use of historic buildings in regeneration.'* (English Heritage, 2013b) make also a valuable contribution to the subject, discussing the Components of Heritage Reuse and regeneration. The document emphasises some issues covered in previous works, such as the importance of a financially viable **new programme**, the significance of a robust **funding strategy** and a **process** that will ensure the **preservation of the cultural values** of the asset. Apart from those, extensive reference is made to the significance of **stakeholders** and their impact in the process. Furthermore, the document forms a link between the Reuse process and future **functionality** of the transformed heritage site.

Lastly, the rich lexicon of theoretical elements on adaptability features and their influencing factors presented in the book of Schmidt & Austin (2016) *'Adaptable architecture: Theory and practice'*, can be used for the identification of the key Components of Reuse. Despite focusing on the concept of adaptability rather than that of Reuse, Schmidt & Austin clarify that there is a wide overlap in meaning and essence between the two terms (Schmidt and Austin, 2016, 94). Thus, the elements of the analysis of the former can be borrowed for facilitating the anatomy of latter. The concepts that are presented in detail in the book include the architectural approach (Schmidt and Austin, 2016, 158-159) as well as the process (Schmidt and Austin, 2016,223-229) and economics (Schmidt and Austin, 2016, 230-245) of adaptability.

This brief review of seminal studies on the practice of Reuse, regeneration and adaptability confirms the complexity of Industrial Heritage Reuse as a practice. Despite the divergent focus between the authors, a number of Components has repeatedly come to the forefront and highlighted as highly significant. Table 7.1 presents an overview of them.

TABLE 7.1 . The table provides an overview of the Components found in the reviewed studies.

DOCUMENT	IDENTIFIED COMPONENTS						
	Process	Programme	Architectural approach	Cultural significance approach	Financial approach	Social	Functionality
Stratton (2000)	X	X	X	X	X	X	X
Orbasli (2008)	X	X	X	X	X		X
Baum and Christiaanse (2012)	X	X	X		X	X	X
ICOMOS – TICCIH (2011)	X	X	X	X			
English Heritage (2013)	X	X	X	X	X	X	X
Schmidt and Austin (2016)	X		X		X		

In order to strengthen clarity in relation to the identified Components, a set of definitions formulated by the author, are offered below.

Definitions of Industrial Heritage Reuse Components

- **Process**: The set of actions or stages[57] taken in order to achieve the Reuse of an Industrial Heritage site. Those include the stages of preparation, Reuse implementation (evaluation, acquisition, procurement and disposal) while extending also to the stage of occupation and management.
- **Programme**: The new use, or mix of uses, introduced in an existing Industrial Heritage site during its Reuse.
- **Architectural approach:** The set of decisions related with the selection, combination and application of a single or different design strategies for the physical transformation of Industrial Heritage.
- **Cultural significance approach:** The set of decisions related with the detection, evaluation, protection, projection and interpretation of an Industrial Heritage site's set of values during its Reuse.

57 In the theoretical base of the fields of architecture, real estate and conservation there are multiple different interpretations of the stages of a site's development and redevelopment process (e.g. Orbasli, 2008, 91-111, English Heritage, 2013, 18, Schmidt and Austin, 2016, 223-229). The stages presented in this dissertation are an adaptation of those identified by Birrell and Bin (1997).

— **Financial approach:** The set of financial decisions related with the full process of Industrial Heritage Reuse.
— **Social Component:** The set of decisions related with the social sustainability of Industrial Heritage Reuse.
— **Functionality:** The capability of a reused industrial site to serve the purpose for which it was re-designed in a practical and ecological way.

Analysed in great detail or completely overlooked according to the focus, experience and expertise of the authors, the said Components appear to form the base of multiple dilemmas; dilemmas that every single Reuse project needs to face as they shape its outcome. Surprisingly, this critical issue to date has not been examined systematically. In a number of studies focus is only cast on one single dilemma. For example, Brooker and Stone (2004), Jäger (2010) and Wong (2017) investigate the balance between the architectural approach and cultural values preservation. The review of studies with a wider scope presented above, shows that there is a lack of consensus as to the role of the analysed Components in the Reuse result and the best answers to the dilemmas they form. Summing up, it is supported that in the field of Industrial Heritage Reuse, a systematic and holistic research offering topical answers that can guide the control of those Components, is missing.

7.2.2 Microscopic analysis

Following the identification of Industrial Heritage Reuse Components, there is now a need to conduct a microscopic analysis of them. The analysis' results of the selected case studies of best practice, presented in Volume 2 of this dissertation, will serve as the base for the close examination of the identified Components.

As explained in the Chapter 'Methodology' (§ 3.4.1.4), a ‘monster matrix’ (Miles and Huberman in Swanborn, 2010, 122-123) was generated as a tool for enabling this analysis. The matrix included all influencing Aspects (Asp), namely the Factors, Actors and Components and for each one of them Statements (Stat) grounded on the case study evidence about the influence they exercise on the process and outcome of the Reuse. That same matrix also revealed the links between the influencing Aspects.

Upon the completion of the compilation of the ‘monster matrix’ with the evidence of the 20 cases, the replication number of statements was explored. Statements that replicated across more than three cases were considered a pattern and were used as a basis for the formulation or the results of the case study research. This process ended with the definition of the final statements.

In what follows, the aforementioned final statements, are presented as Lessons (L) learned.[58] Those Lessons are categorised per Component (C1-C7). Most Lessons reveal Relations and dependencies (R) between the Components. Following the analysis of each Lesson the respective Relations and dependencies will be discussed and visualised, using a Dependency Structure Matrix (TEXTBOX 7.1). The Lessons summarising the dependencies of each Component from the rest of the Aspects have been marked as Basic Lessons (BL) and are presented at the end of each Component’s analysis.

58 A table illustrating the replication of the Lessons presented in the Sub-Section 7.2.2 across the case studies analysed, can be found in the Appendix 6.

The above analysis will reveal with clarity the Dilemmas (D) presented in Industrial Heritage Reuse practice, pertaining either to one or more Components. Those will be also discussed at the end of this Sub-Section.

The identification of the Lessons, Relations and Dilemmas (LRDs) between Aspects of Industrial Heritage Reuse will help to respond to the research gap presented in the previous Sub-Section.

TEXTBOX 7.1: VISUALISING LINKS AND DEPENDENCIES: THE DEPENDENCY STRUCTURE MATRIX

Aiming to shed light to the complex interdependencies between the Components of Reuse and their influencing Factors and Actors, led to the search of a tool, that will allow a clear and eloquent visual representation of the detected links. Drawing from Schmidt & Austin ‘s methodology (2016, 119 -120), the Dependency Structure Matrix (DSM) was selected as a powerful tool for achieving the aforementioned goal.

In the words of from Schmidt & Austin (2016,119):

“A dependency structure matrix (DSM) is a square N 3 N cell matrix that maps the relationships between elements within a single domain. DSMs are powerful devices that capture the dependency state of a system, each pair being either independent (blank cell), dependent (Y depends upon X) or interdependent (X depends on Y and Y depends upon X). They not only present an excellent graphical picture but can also be manipulated to identify optimal patterns and disentanglement strategies.”

In the Sub - Section 7.2.2 a simplified version of the DSM will be used for highlighting relations and interdependencies (R) between Components as well as between Components, influencing Factors and influencing Actors.

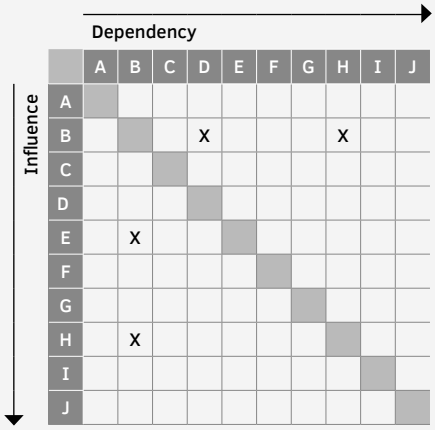

FIG. 7.2 A DSM model of ten elements. The model shows that the element B depends upon the elements D and H, while it influences the elements E and H. As a result the elements B and H are interdependent.

C1: Process

The Lessons and Relations (LRs) regarding the Process of Industrial Heritage Reuse will be analysed per stage, from its preparation, to its implementation, occupation & management. Lastly, general LRs that pertain to the totality of the Process will be discussed.

Preparation

L1.1 A Proactive approach has advantages, impeding the dereliction that elevates the cost and renders the attraction of investors harder. This is clearly illustrated by the cases of Westergasfabriek, DRU Industriepark, mNACTEC, LTCP and Tsalapatas. The cases of Ca L' Aranyó, Bombas Gens and the Mill of Pappas on the other hand, reveal the pitfalls and risks of a reactive approach.

L1.1 shows that the process of an Industrial Heritage Reuse project can influence the financial approach and some of the Attributes that form part of the NEA as well as the synthesis of the involved Actors' team. In other words, the financial approach, the synthesis of the involved Actors' team and some Attributes are Aspects that depend to an extent upon the process of an Industrial Heritage Reuse project. Those relations are visualised in the following DSM (FIG. 7.3).

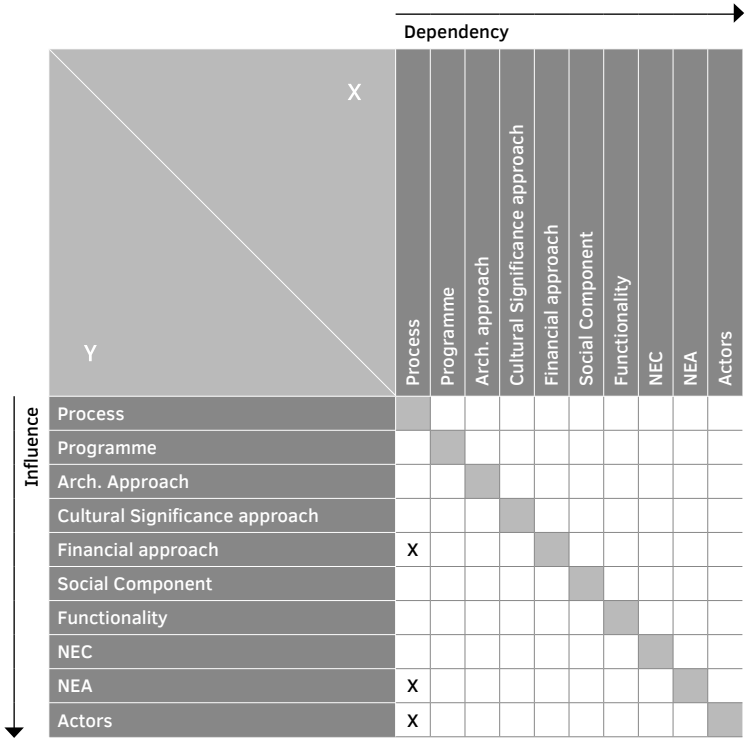

FIG. 7.3 DSM of relations and dependencies (R) identified in Lesson 1.1.

L1.2 The large majority of the case studies shows that the **preparation period of Reuse is significant** for the launch and the direction of a project. It usually involves its listing, documentation, physical interventions in its context, the rebranding of the project and the promotion of its cultural significance, the lobbying among stakeholders, the attraction of grants, local community struggles and the development of preliminary ideas for future function. All those actions render the project mature enough for launch during the right timing (See also L1.3).

L1.3 The selection of the right timing for the implementation of a project is highly important. This is illustrated in almost half of the cases examined. Those cases show that the combination of circumstances, involving significant developments in the Endogenous Attributes of a site (e.g. the creation of a key transport hub next to the site), ripe Social Conditions (e.g. elevated awareness of the site's cultural significance), Political Conditions (e.g. the election of politicians that support the project) and Financial Conditions (e.g. the availability of grants for redevelopment as a result of the HLF establishment) as well as the clustering of key stakeholders, largely influence the decisions of key decision-makers for setting the project in motion.

L1.3 shows that the process of an Industrial Heritage Reuse project (specifically the selection of the right timing for the implementation of a project) depends on the interaction of the NEC, the NEA and the dynamics of the Actors' team. Those relations are visualised in the following DSM (FIG. 7.4).

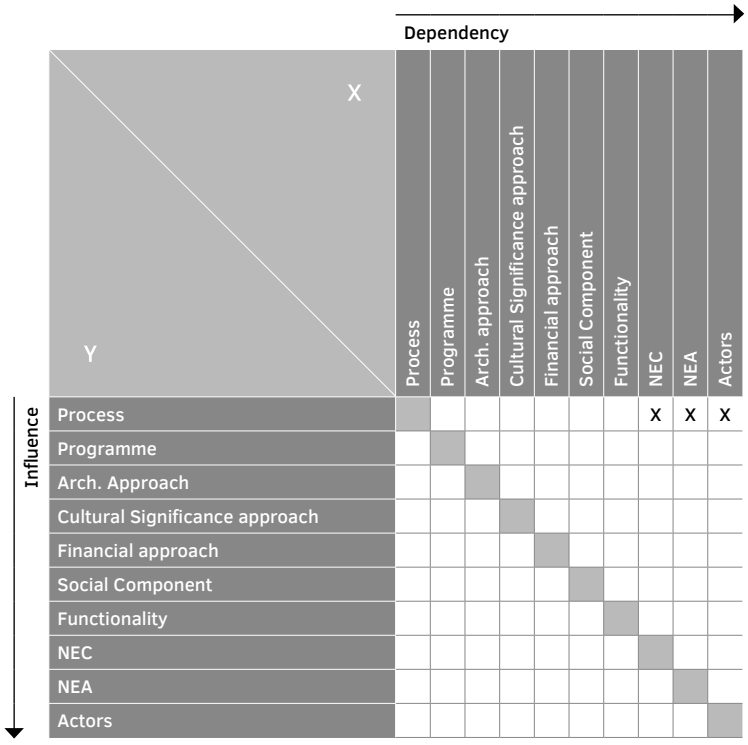

FIG. 7.4 DSM of relations and dependencies (R) identified in Lesson 1.3.

L1.4 Consultation with direct and indirect influencers in the preparation stage can provide valuable insights for the handling of various Reuse Components and it can also have a positive impact in the occupation and management stage of the Reuse. The cases of DRU Industriepark, Energiehuis, Tabacalera and Bombas Gens show that the level of receptiveness of the views of the direct and indirect influencers by the main decision-makers during the preparation period, can inform the architectural approach, allowing for a better response to the needs of the new users and contributing to the selection of a socially compatible new programme. Furthermore, it was revealed that through that process, the stakeholders consulted were engaged with the project and formed ties with it. This in turn resulted in the support of the project during its operation.

L1.4 shows that when a process is inclusive in its early steps, it can positively influence the new programme of the site, its architectural approach, its social Components and the relation of part of the Actors to the site. In other words, the direct and indirect influencers, that form part of the Actors, when consulted in the preparation stage, can have a positive influence to all the aforementioned Aspects. Those relations are visualised in the following DSM (FIG. 7.5).

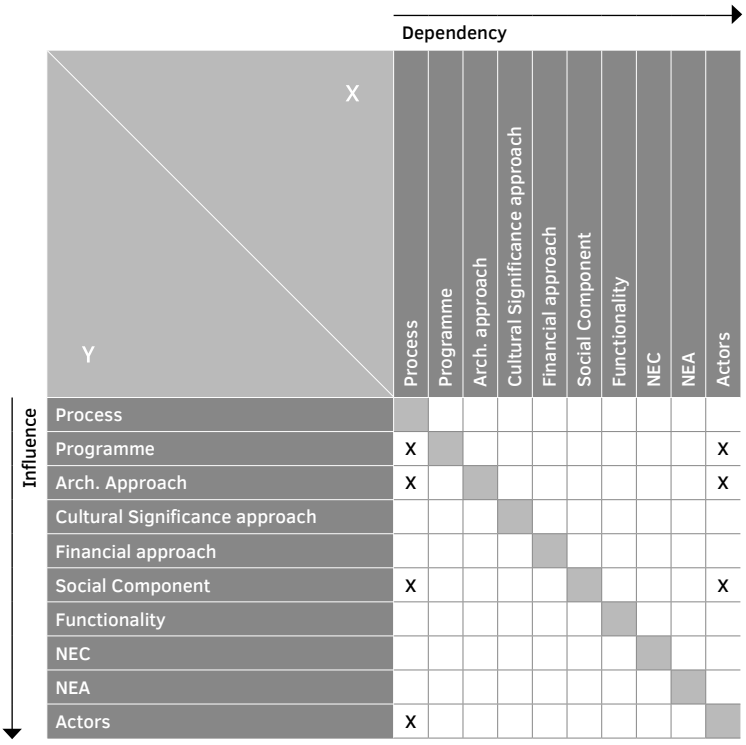

FIG. 7.5 DSM of relations and dependencies (R) identified in Lesson 1.4.

Implementation: Evaluation

L1.5 The examination of reference projects and the consultation of international experts is an important method that can inform the handling of Reuse Components.[59] Later and recent cases of best practice of countries followers, including the DRU Industriepark, the Energieuis and even early cases of countries latecomers, such as the CTC, drew key decisions over their Reuse Components based on the examination of early reference cases (such as the IGM, the Ruhr region and the mNACTEC) or/and based on the consultation of international experts (including Barry Trinter, Stuart Smith, Luis Bergeron and Eusebi Casanelles).

59 There was no detailed data on which particular components were influenced by the examination of reference projects and the consultation of international experts. As a result, no DSM model can be generated for this Lesson.

Implementation: Acquisition & Procurement

L1.6 Rebranding is a valuable step that precedes the physical transformation of Industrial Heritage, influencing the financial and social Components of its Reuse. The cases of Ancoats, King's Cross, Energiehuis, Ca L' Aranyó, Tabacalera, Bombas Gens, Technopolis and LTCP provide various models of rebranding. Between those, place marketing (see King's Cross, Vol.2 Ch.5), the creation of a new name for the project loaded with positive connotations (e.g. 'Ancoats Urban Village'; 'Technopolis' that translates to 'City of the Arts' in Greek and 'Tabacalera: Promocion del Arte' that translates to 'Tobacco factory: Promotion of Art' in Spanish) as well as small interventions (such as street face lifting in the cases of Ancoats and King's Cross or the renovation of the entrance in the case of the Tabacalera) have been commonly used for suppressing the negative Influencing Attributes of the complex (e.g. stigma) and emphasize the positive ones (e.g. cultural significance). The aforementioned cases also show that rebranding is an effective way of engaging prospective investors, tenants, users and visitors to the project, affecting positively the economics of its Reuse and strengthening its financially viability.

L1.6 demonstrates that the Process, when including Rebranding in its early steps, can positively influence the financial approach, the social Component of Reuse, part of the Endogenous Attributes of the industrial site as well as the composition of the Actors' team. Those relations are visualised in the following DSM (FIG. 7.6).

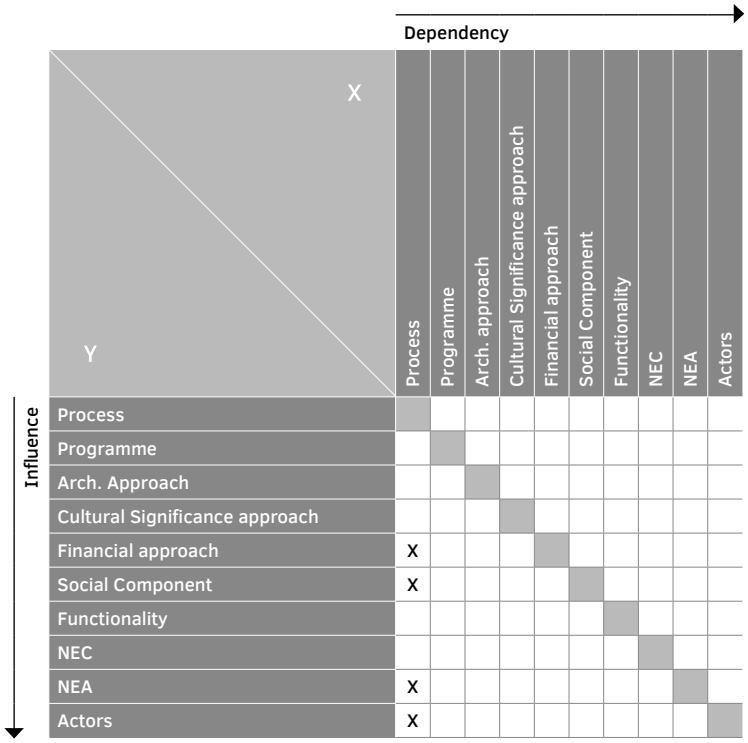

FIG. 7.6 DSM of relations and dependencies (R) identified in Lesson 1.6.

L1.7 Before or during the physical transformation of a complex, **'open days' can serve as a valuable instrument for the engagement of key stakeholders, the enhancement of the process and the opening of multiple possibilities for the improvement of cultural significance protection, social returns and economic benefits.** The 'open days' organised during the Reuse of the cases of IGM, Stanley Mills, King's Cross, DRU Industriepark, Tabacalera and Bombas Gens, created social engagement (e.g. the IGM engaged multiple volunteers during its open days in its early days); contributed to the preservation of cultural values (e.g. Stanley Mills and Bombas Gens integrated to their exhibition the oral testimonies of former workers collected during the open days, safeguarding intangible dimensions of heritage); created momentum sustaining enthusiasm and finally offered financial benefits (e.g. in Stanley Mills material and donations for the upcoming museum were collected during the open days).

L1.7 demonstrates that the Process, when including 'open days' in its preparation or implementation phase, can positively influence the cultural significance and financial approach, the social Component of Reuse, as well as the composition of the Actor's team and their future relation to the site. Those relations are visualised in the following DSM (FIG. 7.7).

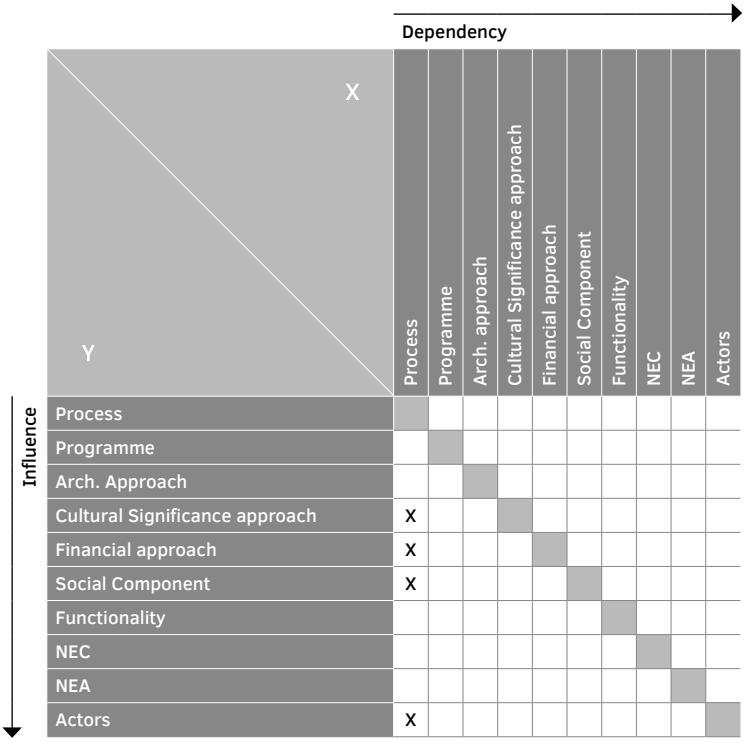

FIG. 7.7 DSM of relations and dependencies (R) identified in Lesson 1.7.

L1.8 An interim use presents multiple merits. The cases of IGM, Westergasfabriek, Energiehuis and the Mill of Pappas show that their interim use served as a test phase highlighting a financially and socially sound future programme while stressing operational challenges. It also generated interest and awareness among stakeholders. In certain cases that was used as a pressure point for the listing of the complex. Lastly, the interim use prevented vacancy and in turn delayed the structural deterioration of the complex.

L1.8 demonstrates that the Process, when including an -in between- phase when the site is provisionally used, can positively influence the decisions taken over the future programme, the financial approach, the social Component of the Reuse project and its functionality. Furthermore, it can positively influence some endogenous Attributes (e.g. improvement of Physical condition or prevention of further decay) and exogenous Conditions (e.g. Regulatory framework and Policy) as well as the composition of the Actor's team and their future relation to the site. Those relations are visualised in the following DSM (FIG. 7.8).

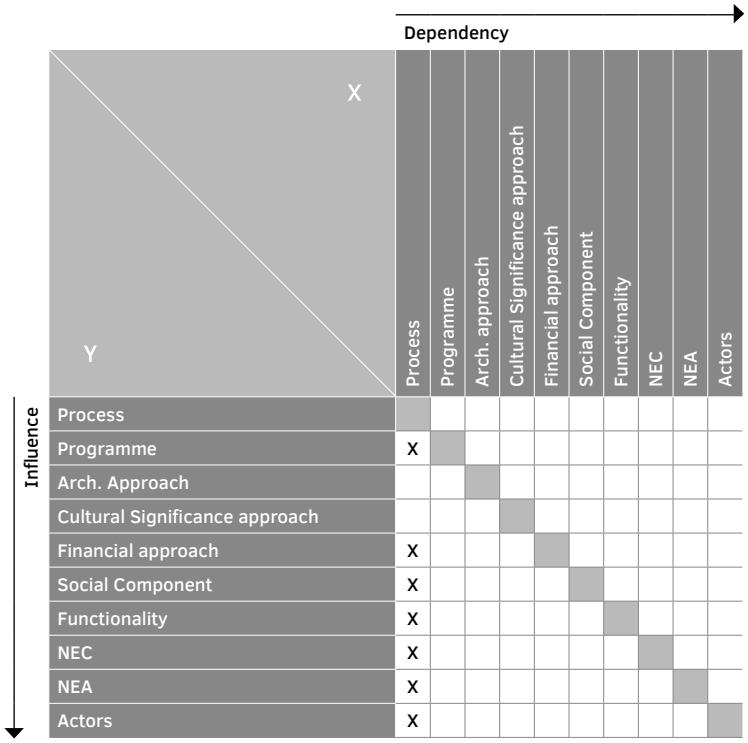

FIG. 7.8 DSM of relations and dependencies (R) identified in Lesson 1.8.

Implementation: Disposal

L1.9 More than half of the cases studies, with Ancoats, King's Cross and 22@ being the most indicative, showed that **the creation and prompt delivery of the 'designed open space'**[60] **in the redevelopment scheme plays an important role for the perception of the project from the public and for the attraction of prospective investors, partners, users and visitors**.

L1.9 shows that the process can positively influence the financial and social Components of Reuse while strengthening the operation of the Reuse outcome if the delivery of designed open space is prioritised over the rest parts of the project. This can also positively influence the composition of the Actor's team and their future relation to the site. Those relations are visualised in the following DSM (FIG. 7.9).

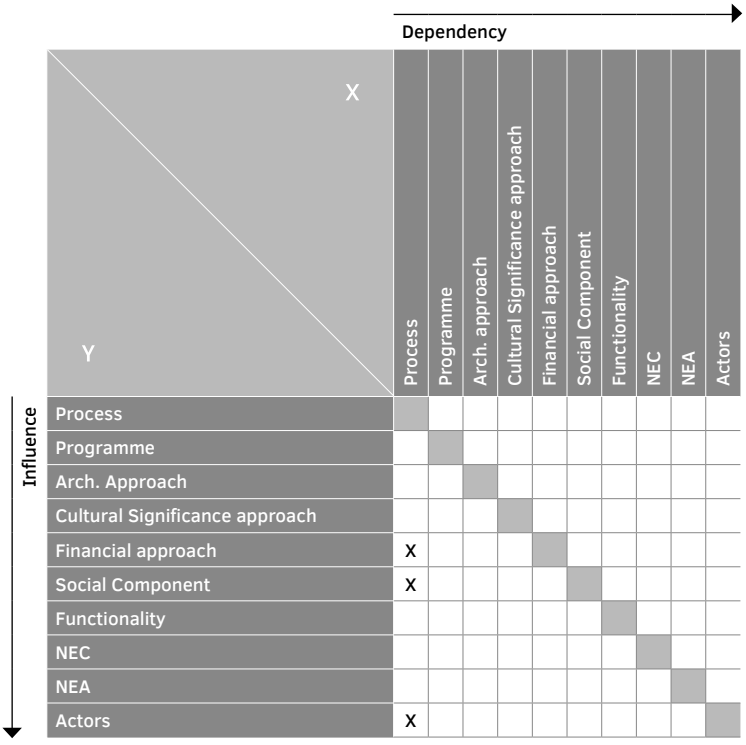

FIG. 7.9 DSM of relations and dependencies (R) identified in Lesson 1.9.

60 The term 'Designed open space' was preferred over the term 'public space' for describing the outdoor areas of the former Industrial Heritage sites that form part of the redevelopment project and are accessible by the public. Those spaces, despite their characteristics are not always public (e.g. designed open space of King's Cross).

L1.10 The selection of users/tenants, which largely depends on the drives and the goals of the main decision-makers, is an important step in the process that determines the character of the project and influences its financial performance. This was illustrated with clarity in more than half of the case studies. The cases of King's Cross, Westergasfabriek, DRU Industriepark, Technopolis, Tsalapatas and Mill of Pappas revealed the merits of a scheme that combines permanent and incidental tenants. The former offer continuity and security to the project while the latter refresh the image of the site.

L1.10 shows that the financial approach of a Reuse project depends to an extent upon the decisions of the Actors (and specifically the decisions of the main decision-makers) over the composition of the future users/tenants' group and the formulation of the process. Those relations are visualised in the following DSM (FIG. 7.10).

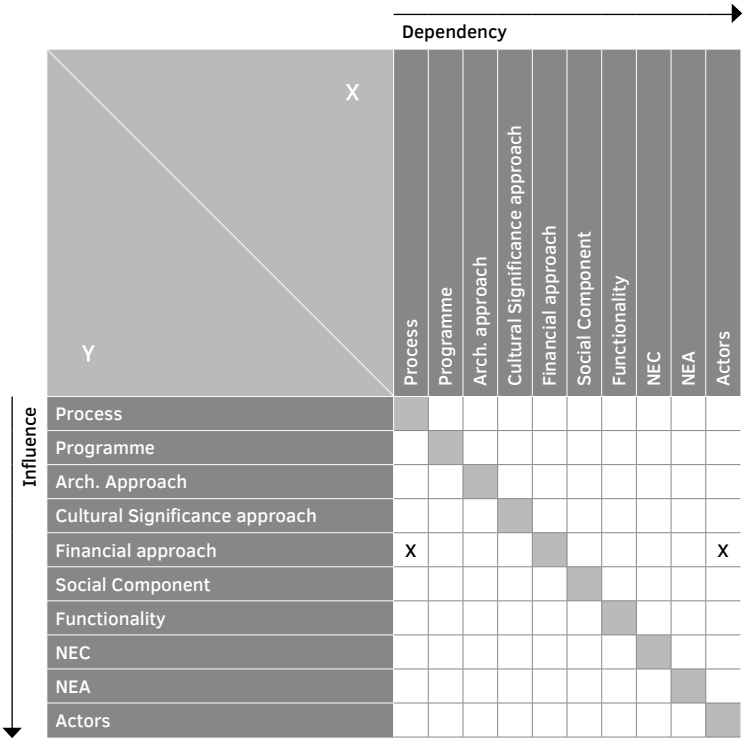

FIG. 7.10 DSM of relations and dependencies (R) identified in Lesson 1.10.

Occupation and management

L1.11 The **management of the delivered outcome** (especially in multifunctional schemes) **plays a crucial role for the operation and financial viability of the Reuse site**. This is confirmed by more than half of the case studies. The case of King's Cross shows the merits of a well-defined management strategy. In contrast, the case of CTC highlights the problems occurring by the lack of a management strategy.

L1.11 shows that the financial approach of a Reuse project in its last stage, depends to a large extent upon the last stage of the process of the Reuse and in specific upon the management of the delivered outcome. This relation is visualised in the following DSM (FIG. 7.11).

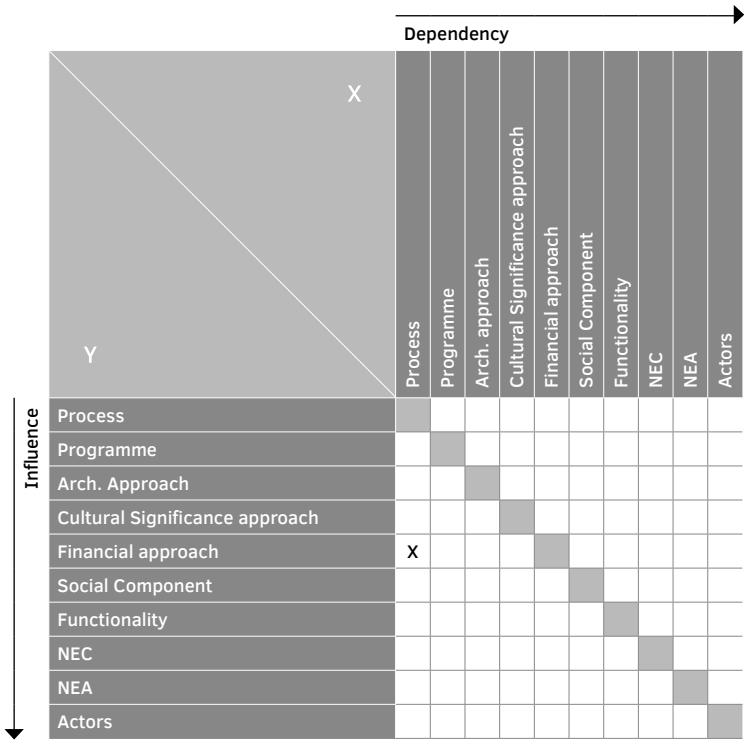

FIG. 7.11 DSM of relations and dependencies (R) identified in Lesson 1.11.

L1.12 According to the vast majority of the cases analysed, **branding, continuous reinvention and innovation during operation are essential, yet guided by a comprehensive strategy.** Branding attracts more visitors, enlarges the recognition of a site and makes it more competitive, having in turn a positive financial and social impact. A medium of branding, widely employed in all cases with a cultural and recreation programme, is the organisation of events or temporary exhibitions. Another medium of branding is the refurbishment of part of the complex. As shown from the cases of IGM, TextielMuseum and mNACTEC, a refurbishment during a site's operation, provides an excellent chance for marketing and image re-establishment. Architecture can be thus used as a branding medium. Such refurbishments may also have a positive impact on a site's functionality, as illustrated in the cases IGM and GWRW. **Continuous reinvention and innovation** during a site's operation, as shown from the cases of IGM, TextileMuseum and Tsalapatas, also refresh its programme, keeping it relevant and more responsive to the shifting sociocultural conditions and expectations.

L1.12 reveals multiple relations and dependencies between Industrial Heritage Reuse Components. In detail, it shows that the last stage of the process, when involving branding, continuous reinvention and innovation, can positively influence the programme of the site, the cultural significance approach, the financial approach of its operation, its social Component and the relation of the Actors to it. Moreover, it reveals that the refurbishment of part of the complex during operation (which is part of the architectural approach) can also positively influence the financial approach of its operation, its social Component as well as its functionality. Those relations are visualised in the following DSM (FIG. 7.12).

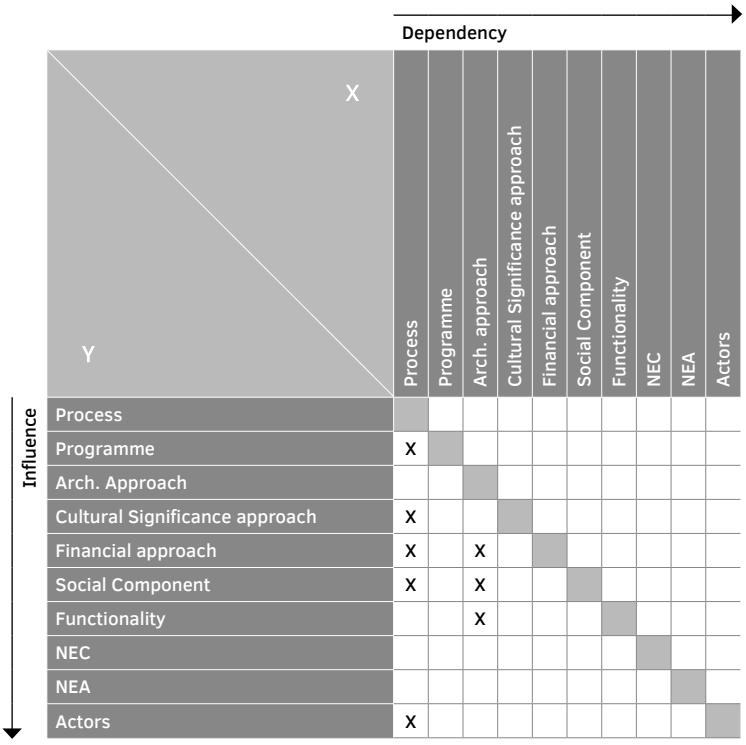

FIG. 7.12 DSM of relations and dependencies (R) identified in Lesson 1.12.

General

L1.13 The large majority of the case studies showed that **flexibility and creativity in the process are essential**. Multiple cases, including the IGM, King's Cross, Westergasfabriek, Energiehuis, CTC, LTCP, mNACTEC, Ca L' Aranyó, Tabacalera and Bombas Gens, revealed that a flexible process that allows the emergence of details overtime, leaving room for change, negotiation and experimentation has direct and indirect financial advantages, minimising the risks for the developers while allowing them to respond better to the shifting market demands. Additionally, this allows to successfully deal with surprises -a typical characteristic of Industrial Heritage- and come up with solutions on the spot. For example, the flexible process of Bombas Gens allowed the incorporation of unexpected findings of high cultural significance (namely the 15th century cellar), contributing to the delivery of a richer and diverse programme.

L1.13 shows that the process, when characterised by flexibility and creativity, can positively influence the cultural significance approach, the financial approach and the social Component of an Industrial Heritage Reuse project. Those relations are visualised in the following DSM (FIG. 7.13).

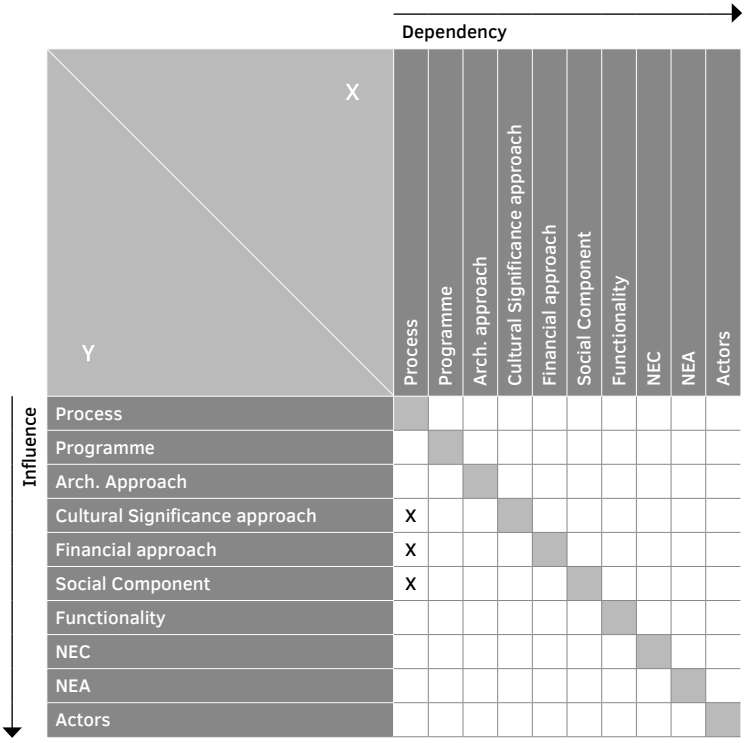

FIG. 7.13 DSM of relations and dependencies (R) identified in Lesson 1.13.

L1.14 As discussed in Sub-Section 5.2.1, **the economic Exogenous Conditions influence Reuse.** In specific it was found that **a financial crisis can destroy or seriously postpone the Reuse process**. Half of the cases, with most indicative those of GWRW, Ancoats, LCTP and Bombas Gens, revealed the **proportional relation between the vulnerability of the project to the shifting economic Conditions and the large scale, linearity and inflexibility of the process**. The cases of King's Cross and Tabacalera showed that **during financial crisis incremental development and flexible schemes are more durable and efficient**. The cases of Ancoats, 22@ and Tsalapatas complex in particular, highlighted that the commercial developer-led model of Reuse is highly vulnerable to the financial crisis. The organisation of the process dictates to an extent if the development will withstand or get destroyed by the crisis.

L1.14 reveals that the Process of Industrial Heritage Reuse is highly depended on the NEC and in specific of the economic Exogenous Conditions. This relation is visualised in the following DSM (FIG. 7.14).

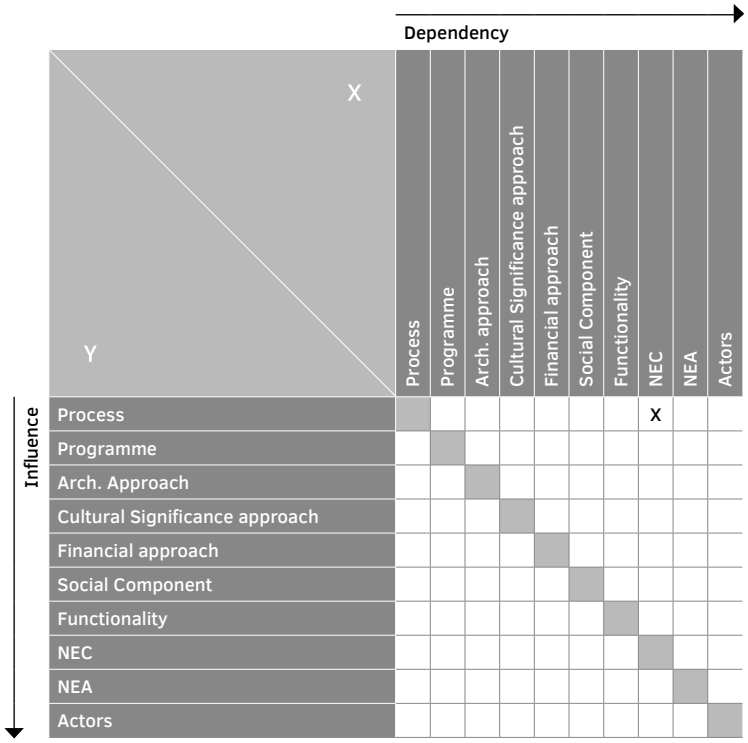

FIG. 7.14 DSM of relations and dependencies (R) identified in Lesson 1.14.

L1.15 Natural disasters, apart from a negative impact on the Attributes of a site, can negatively influence the process, the preservation of cultural values and the economic Component of Reuse. This was illustrated in the cases of IGM, Energiehuis, mNACTEC, Tsalapatas complex and Mill of Pappas. In detail, phenomena, such as landslips, fires and floods, largely affected the physical, location and site Attributes of the aforementioned cases. They caused damages to the archival material, machinery, building parts (e.g. in the case of mNACTEC and the Mill of Pappas), compromising their cultural significance. Furthermore, they influenced the process (causing delays) and the financial viability of the project (inflating the budget).

L1.15 reveals that the NEC, and in specific the Unforeseen and Sporadic Events, can seriously influence the process of Industrial Heritage Reuse, its cultural significance approach, its financial approach as well as the Attributes of a site. Those relations are visualised in the following DSM (FIG. 7.15).

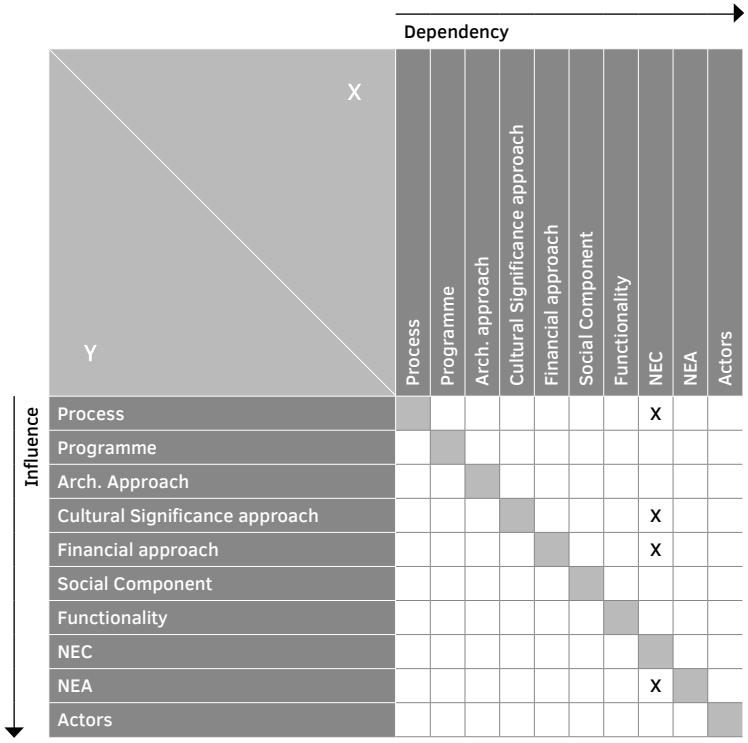

FIG. 7.15 DSM of relations and dependencies (R) identified in Lesson 1.15.

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L1.16 The vast majority of case studies revealed that **the adaptability of a Reuse project to the shifting Exogenous Conditions is highly important.** Sustaining momentum and success has proved difficult for all cases examined. The key appeared to be in grasping the NEC's shifts and responding to them efficiently. Early cases tested in time, such as the IGM, TextielMuseum, Technopolis and mNACTEC, provide valuable evidence for achieving that. The most important of those include firstly the acknowledgement of changes in the available sources of funding (such as the disbandment of funding institutions or the launch of national and international grants along the way) and the engagement in a continuous process of fundraising for securing the continuity of the influx of assets and grants despite the alterations. Secondly, the employment of continuous reinvention and innovation (see L12) for responding to the rising competition from similar sites, the shifting Sociocultural Exogenous Conditions (e.g. redefinition of the museums' role) and to the changing expectations of the public.

L1.16 discusses the large significance of the dependence of the process upon the NEC. It also shows that the process, when characterised by adaptability during the stage of occupation and management, can positively influence all the other Components of Industrial Heritage Reuse. Those relations are visualised in the following DSM (FIG. 7.16).

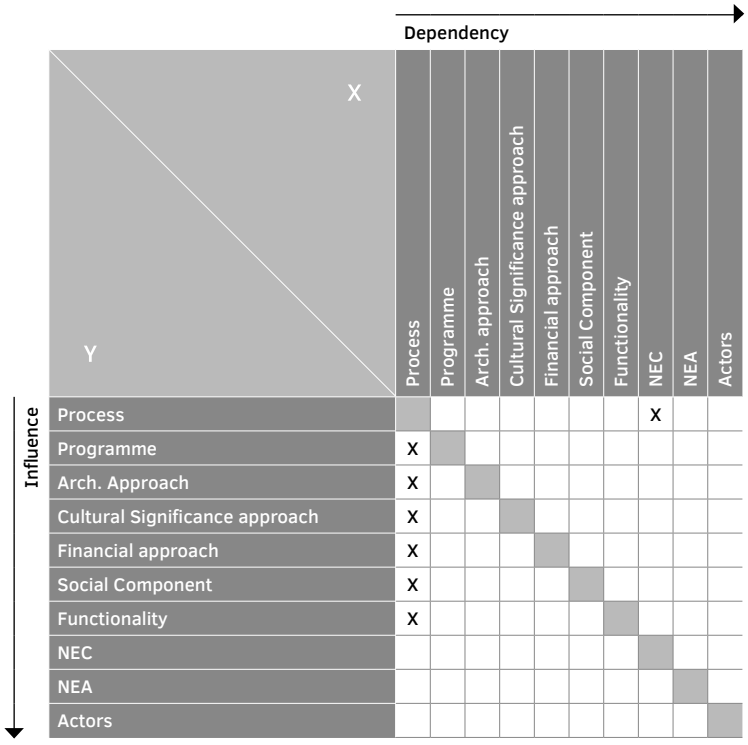


FIG. 7.16 DSM of relations and dependencies (R) identified in Lesson 1.16.

L1.17 An Incremental process presents multiple merits. The vast majority of the cases showed that an incremental process sustains the momentum, encourages further investments and provides the opportunity to reflect on the decisions taken for each Component of the Reuse while alleviating existing operational problems. This is highlighted with greater emphasis in the cases of King's Cross, DRU Industriepark, LTCP and BJF.

L1.17 shows that an incremental process, can positively influence all the other Components of Industrial Heritage Reuse. Those relations are visualised in the following DSM (FIG. 7.17).

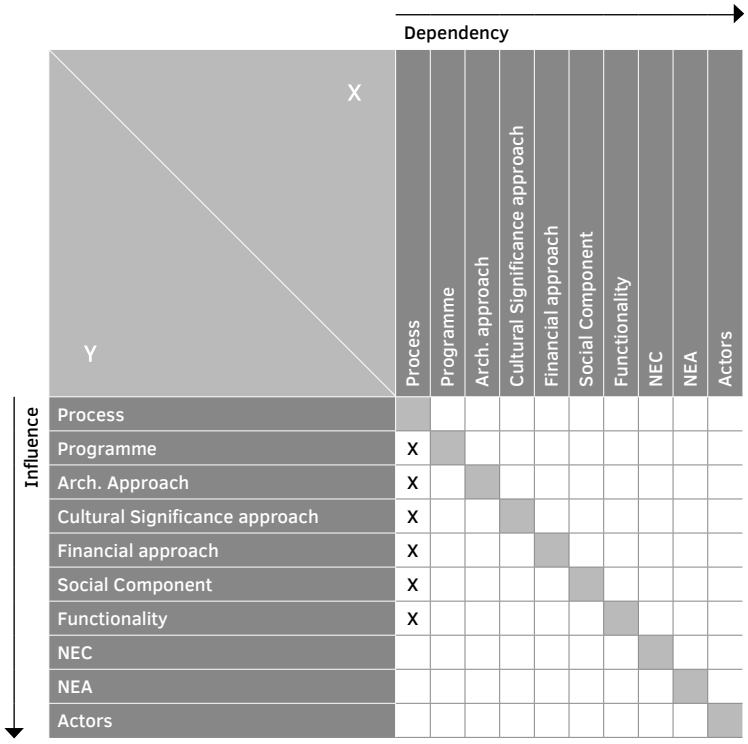


FIG. 7.17 DSM of relations and dependencies (R) identified in Lesson 1.17.

L1.18 Networking with other industrial sites presents multiple merits. This is illustrated by the IGM, Stanley Mills and DRU, which are part of the ERIH.net; the CTC which was conceived as a network of industrial visitor attractions of Hermoupolis; the Tsalapatas complex which forms part of the PBGCF museums' network; the mNACTEC which forms part both of the Regional Structure of mNACTEC and of ERIH.net and by Ca L' Aranyó which forms part of the 22@ heritage sites network. The aforementioned cases show that networking facilitates branding and contributes to the attraction of visitors, having in turn positive financial and social results. In regard to the industrial museums and visitor attractions, networking also has a positive impact on the preservation of the site's cultural significance. Placing the site in a broader context presents opportunities for a comprehensive interpretation of heritage.[61]

L1.18 shows that a process defined by a Network initiative or a process that eventually allows the Networking of the reused Industrial Heritage site with other relevant sites, can positively influence the cultural significance approach of the site, its financial approach and its social Component. This can also positively influence the relation of certain Actors to the site. Those relations are visualised in the following DSM (FIG. 7.18).

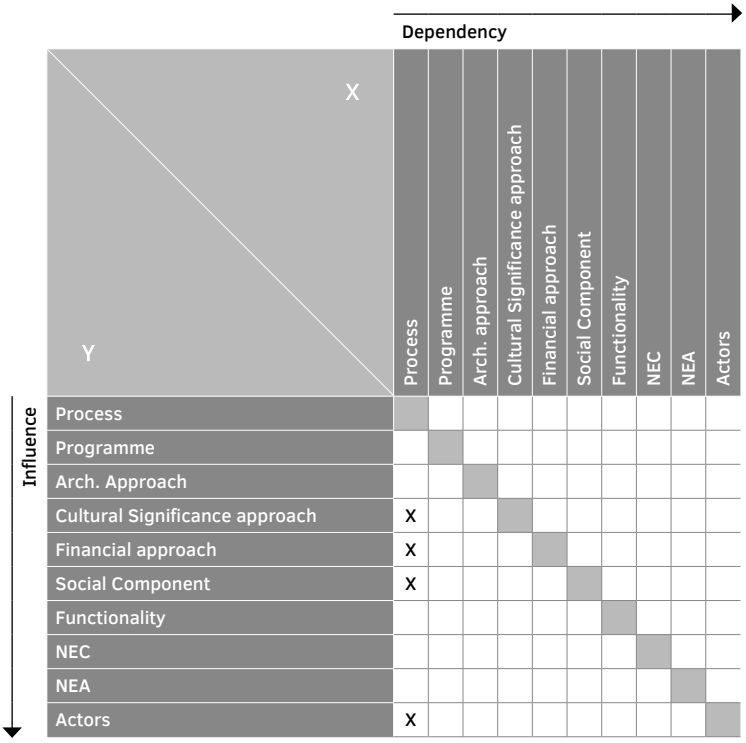


FIG. 7.18 DSM of relations and dependencies (R) identified in Lesson 1.18.

61 The merits of the interpretation in the broader context are analysed by Price (2006,118-119).

L1.19 Changes in the process due to political and/or economic reasons if not followed by a fundamental shift in the Reuse strategy can have a dual negative impact. On the one hand they can compromise the Endogenous Attributes of the reused Industrial Heritage, influencing the architectural and cultural significance approach and on the other they can negatively influence the operation of the project. This is evident on almost half of the cases. The cases of Technopolis and Tsalapatas offer characteristic examples of such changes due to political reasons. As a result of those changes, the architectural integrity and the cultural values of both cases were highly compromised. The cases of Ancoats, CTC and Mill of Pappas offer characteristic examples of changes in the process due to economic reasons. The impact of those changes is similar to those of the former cases. The case of Tabacalera is a valuable example of a fundamental shift of the Reuse strategy following a change in the process due to economic reasons (that involved the inversion of the process from top-down to bottom-up).

L1.19 discusses the important predicaments of the dependence of the process upon the NEC and specifically upon the exogenous financial and political Conditions. It also shows that the process, if not followed by a fundamental shift in the Reuse strategy, can negatively influence the architectural and cultural significance approach of Industrial Heritage Reuse. Those relations are visualised in the following DSM (FIG. 7.19).

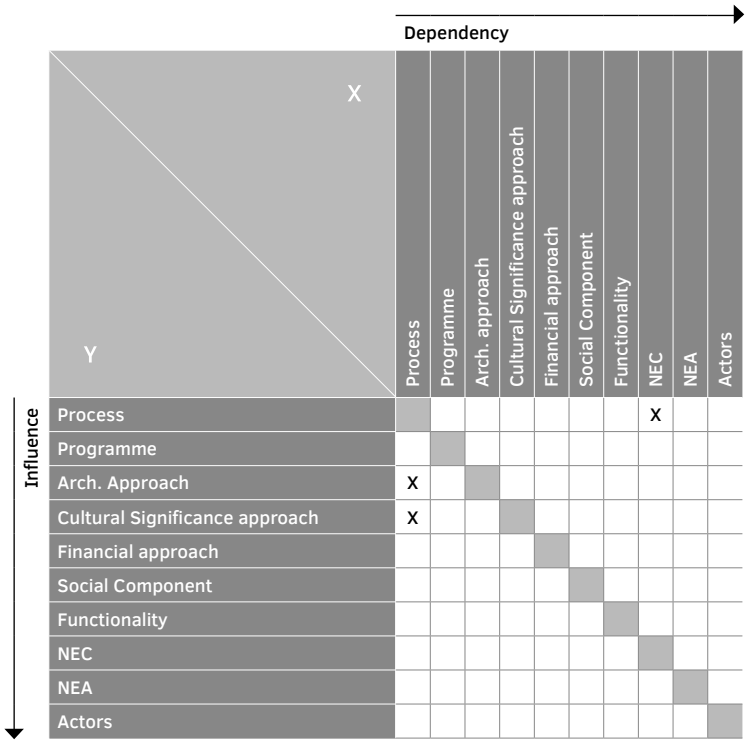


FIG. 7.19 DSM of relations and dependencies (R) identified in Lesson 1.19.

TOC

BASIC LESSON 1: BL1 According to the case study analysis, **the Process of Industrial Heritage Reuse depends on numerous Aspects.** Those include mainly the decisions and drive of the involved stakeholders and secondarily the architectural approach (e.g. an invasive architectural approach, such as the one of Tsalapatas' first phase, can give rise to conflict and in turn delay the process), the cultural significance approach (e.g. archaeological findings can redirect the process), the financial approach (restricted financial means can impose an incremental process), the NEC (e.g. favourable political Conditions can catalyse the process), the NEA (e.g. contamination can cause serious delays in the process). Finally, in the stage of occupation and management, the process is also influenced by the programme and functionality of the Reuse. Those relations are visualised in the following DSM (FIG. 7.20).

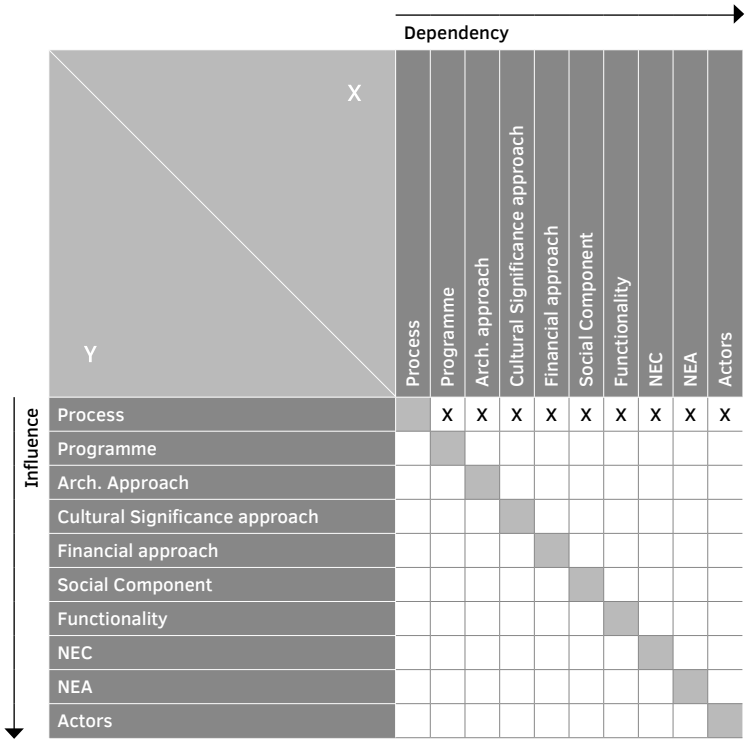


FIG. 7.20 DSM of relations and dependencies (R) identified in Basic Lesson 1.

C2: Programme

L2.1 All cases examined stressed the importance of **a programme compatible with the existing fabric**. Compatibility can be traced in relation to the size and spatial requirements of the new use as well as in its symbolic relation with the existing heritage site. For example, in the case of the TextielMuseum, the cultural programme that was selected for the historic mill, was evaluated as compatible, at least in the first twenty years of its operation, as it fitted the historic character of the complex both in terms of size, spatial requirements (the existing fabric featured large halls that could house the growing machinery collection of the museum) and in terms of symbolism (the museum's theme was relevant with the former function of the historic site). Numerous cases demonstrate that the lack of compatibility can cause compromises to the architectural integrity and the cultural significance of the historic building. In the case of Tsalapatas complex for instance, the high requirements of the commercial functions for floor space in relation to the capacity of the existing complex, resulted in the construction of new structures and the destruction of valuable historic structures and mechanical equipment.

L2.1 discusses the significance of the relation between the programme and the NEA. It also shows that the compatibility of the programme (or the lack of it) largely influences the architectural and cultural significance approach of Industrial Heritage Reuse. Those relations are visualised in the following DSM (FIG. 7.21).

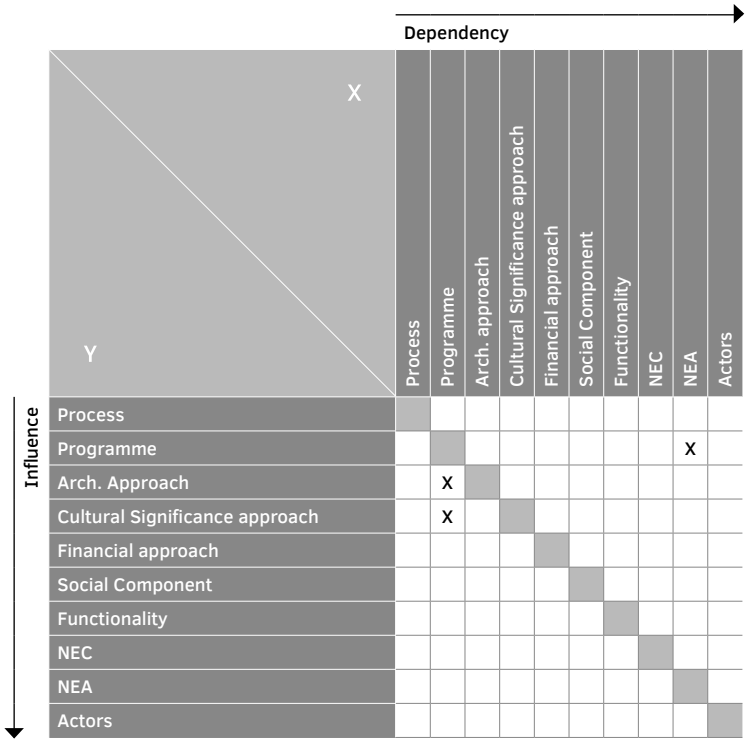


FIG. 7.21 DSM of relations and dependencies (R) identified in Lesson 2.1.

L2.2 A mixed use programme presents multiple advantages. Firstly, it attracts a wide range of people, increasing the social added value of the project. Secondly, when there is synergy between functions, a mixed use programme strengthens the project's financial viability. Thirdly, it addresses the challenges posed by the Endogenous Attributes of the site (big size, remote location, elevated cultural significance) more effectively. All the above are confirmed by all cases with a multifunctional programme. The single-functional cases support the above argument, too. The case of Ancoats for example shows the limitations of a single-functional programme and its negative impact particularly in the cultural significance and social outcome of the Reuse.

L2.2 shows that a mixed use programme can positively influence the cultural significance and the financial approach as well as the social Component of the reused site. Furthermore, such a programme can positively influence the composition of the Actor's team and their relation to the site. Those relations are visualised in the following DSM (FIG. 7.22).

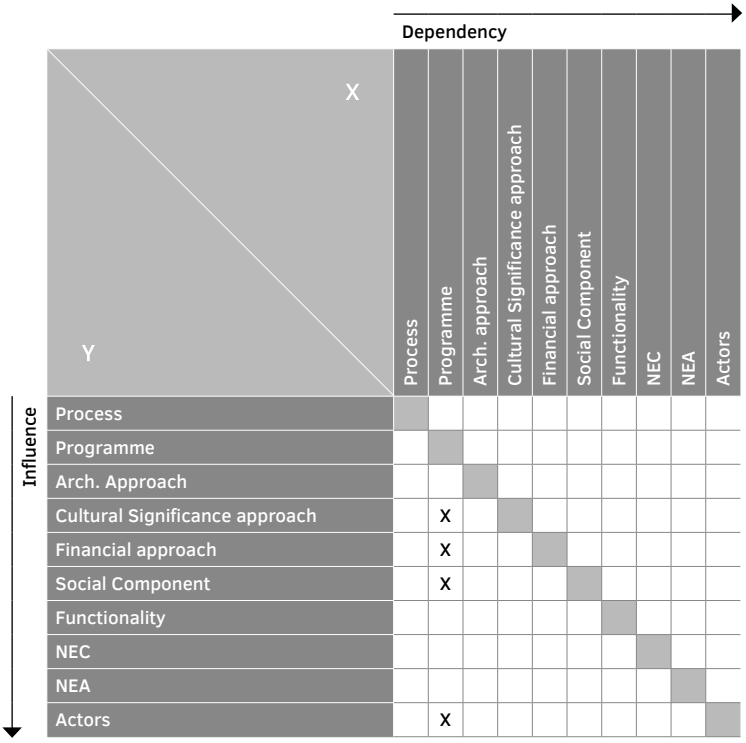


FIG. 7.22 DSM of relations and dependencies (R) identified in Lesson 2.2.

L2.3 In a multifunctional programme a combination of complementary functions is important. In other words, the individual functions of the programme need to be mutually beneficial to each other. Numerous cases with a mixed use programme highlighted the issues originating from a mix of non-complementary functions. The case of DRU Industriepark, for example presented operational problems. Those were caused by the frictions between the residential and recreational functions as the latter were causing high levels of noise and traffic, disturbing the former.

L2.4 The vast majority of cases support that **in a multifunctional programme the synergy between the project's functions and the context's functions is crucial for the financial viability and the social impact of the scheme**. **Most cases achieve this synergy by establishing a balance between commercial and sociocultural functions.** On the one hand, the commercial functions strengthen the financial viability of the scheme while one the other, the sociocultural functions strengthen its accessibility, openness and inclusiveness. The case of the IGM exemplifies that. The case of Westergasfabriek in contrast, highlights the negative repercussions of the imbalance between commercial and cultural functions.

L2.4 stresses the significance of the influence of the programme on the financial and social Components of Industrial Heritage Reuse. Those relations are visualised in the following DSM (FIG. 7.23).

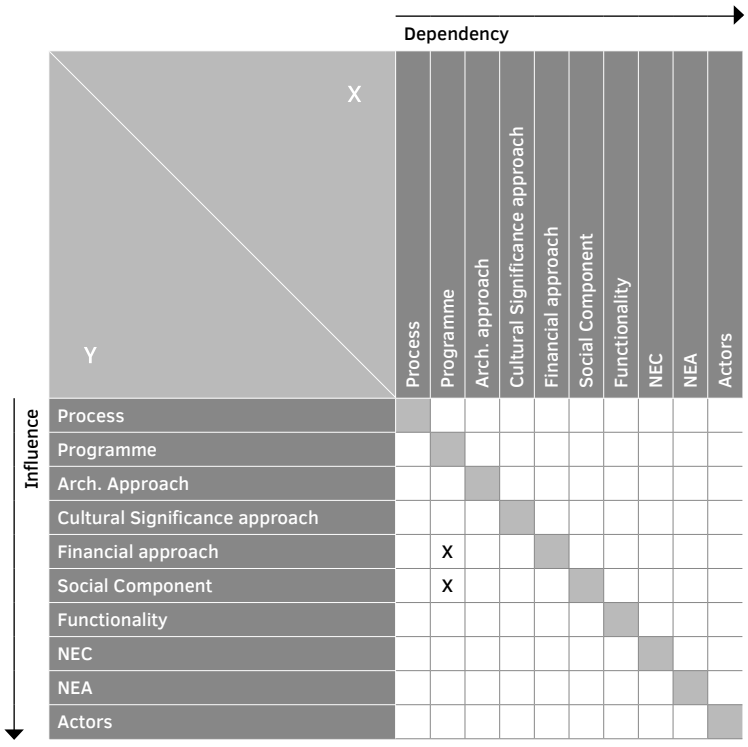


FIG. 7.23 DSM of relations and dependencies (R) identified in Lesson 2.4.

L2.5 A combination of functions that keeps the site alive around the clock all year long is desirable for security and operational reasons. This is supported by multiple case studies including King's Cross, Westergafabriek, DRU Industriepark, Energiehuis, Technopolis, Mill of Pappas, Tsalapatas complex and Tabacalera. As revealed from the case of Stanley Mills, seasonal use may be financially viable, yet it takes a toll in the atmosphere of the complex.

L2.5 shows that the programme influences the final stage of the process of Reuse, namely the occupation and management. This relation is visualised in the following DSM (FIG. 7.24).

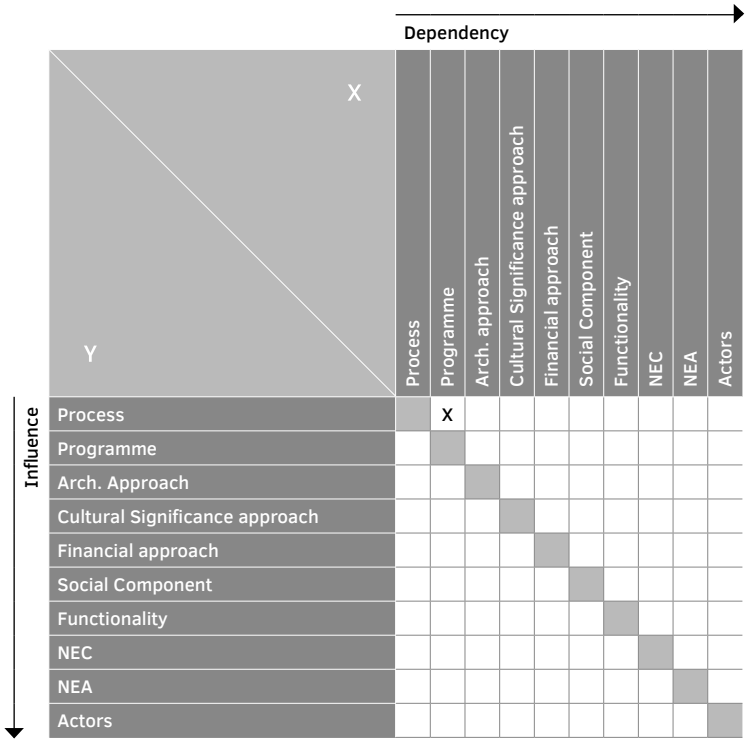


FIG. 7.24 DSM of relations and dependencies (R) identified in Lesson 2.5.

L2.6 The quality of the designed open space and its characteristics play a crucial role for the social impact of Industrial Heritage Reuse, both during its preparation (see L1.9) and during its operation. Its programme, its design but most importantly its qualitative characteristics either make it a key supplement or a burden to the project while establishing its relationship with the public realm and the local community. This is confirmed by two thirds of the case studies. Cases with a designed open space of exceptional quality include the DRU Industriepark, Technopolis, Mill of Pappas and mNACTEC (public and accessible, useful, filled with programme, surprising, inviting and safe). In contrast, cases with a problematic unbuilt space include Stanley mills, Ancoats (lack of amenities), Energiehuis (poor design) and Ca l'Aranyo (sterile and over-controlled).

L2.6 shows that the social Component of Reuse depends to an extent upon the programme of the designed open space, the architectural and cultural significance approaches that have formulated it and the process that shapes its operation. Those relations are visualised in the following DSM (FIG. 7.25).

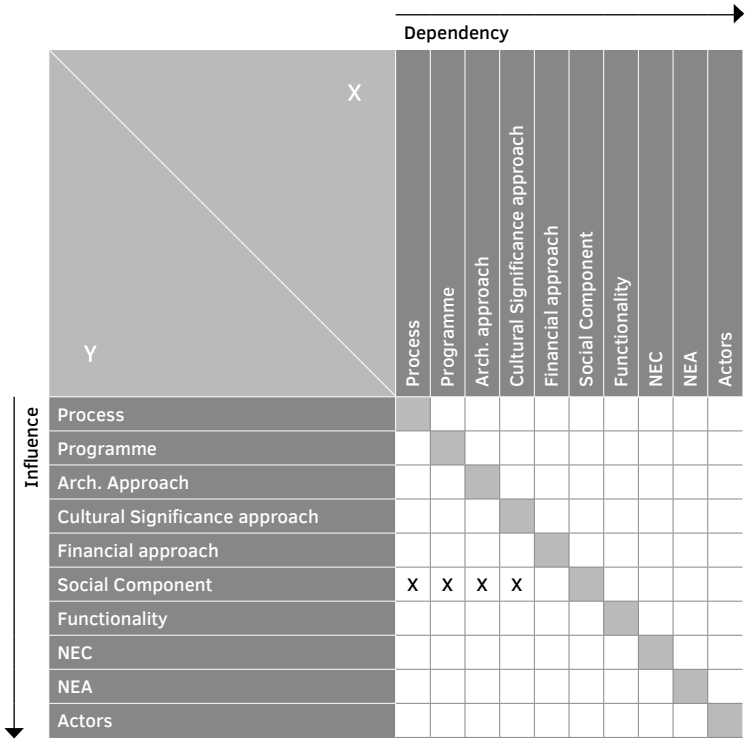


FIG. 7.25 DSM of relations and dependencies (R) identified in Lesson 2.6.

L2.7 An attractive new programme which is useful, compatible and open to the public can catalyse the development of a remote or a stigmatised area and restore its economy. This positive influence of Reuse to its NEC and NEA is clearly demonstrated by the cases of IGM, DRU industriepark and LTCP.

L2.7 discussed the significance of the influence of the new programme of the Reuse to the NEC and NEA. Those relations are visualised in the following DSM (FIG. 7.26).

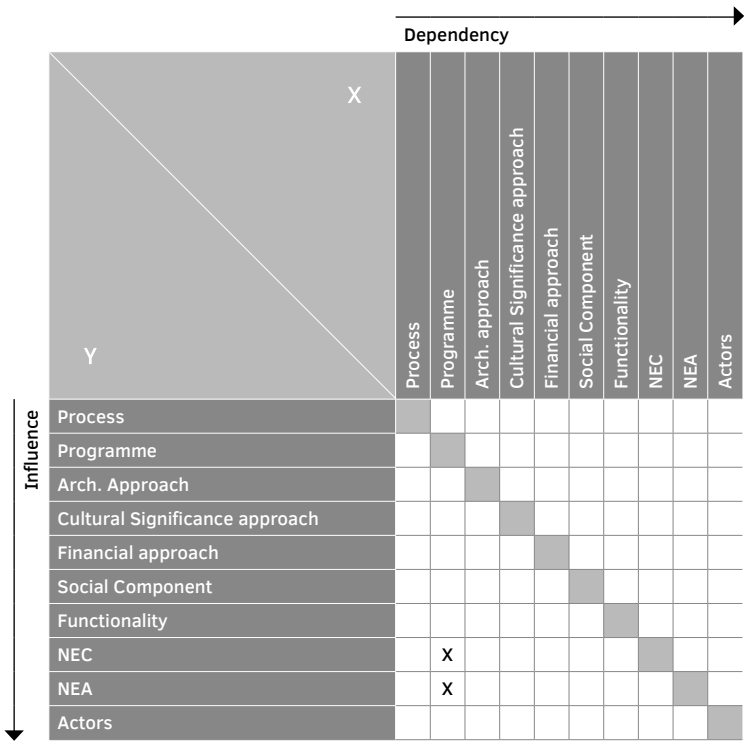


FIG. 7.26 DSM of relations and dependencies (R) identified in Lesson 2.7.

L2.8 Industrial museums and visitor attractions are in general compatible new uses for Industrial Heritage sites. The Reuse of Industrial Heritage into an industrial museum or visitor attraction safeguards the historic continuity of the site. It preserves and disseminates its cultural significance and it has an elevated social added value. Furthermore, it requires relatively modest architectural interventions. Nevertheless, when not combined with other functions, it is challenging to be financially durable**.** This is confirmed by all cases with a relevant programme. Apart from those, Bombas Gens provides a valuable example of an alternative way to achieve cultural significance preservation and historic continuity. **When the new programme of a site bears no relation to its old use, the organisation of a small exhibition on its history can provide valuable insights about its former function, offering sociocultural added value and playing an educational role.**

L2.8 stresses the influence of Industrial museums and visitor attractions, as a new programme for an Industrial Heritage site, on the architectural approach, the cultural significance approach, the financial approach and the social Component of the Reuse. Those relations are visualised in the following DSM (FIG. 7.27).

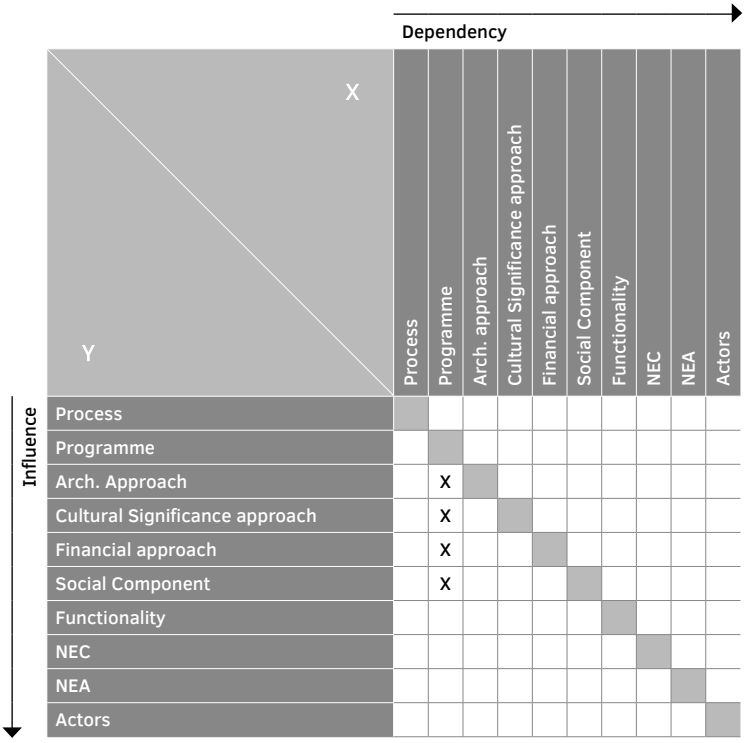


FIG. 7.27 DSM of relations and dependencies (R) identified in Lesson 2.8.

L2.9 Housing often presents important compatibility issues as a new programme for Industrial Heritage sites. The Reuse of Industrial Heritage into a residential complex is usually a financially viable and durable conversion. Nevertheless, it often demands extensive compromises in the architectural fabric and the cultural values of the site (e.g. extensive compartmentalisation, machinery removal), also precluding the public from it. Usually such a conversion presents important functionality issues. This is reflected in all cases with a residential programme.

L2.9 stresses the influence of housing, as a new programme for an Industrial Heritage site, on the other Components of the Reuse. Those relations are visualised in the following DSM (FIG. 7.28).

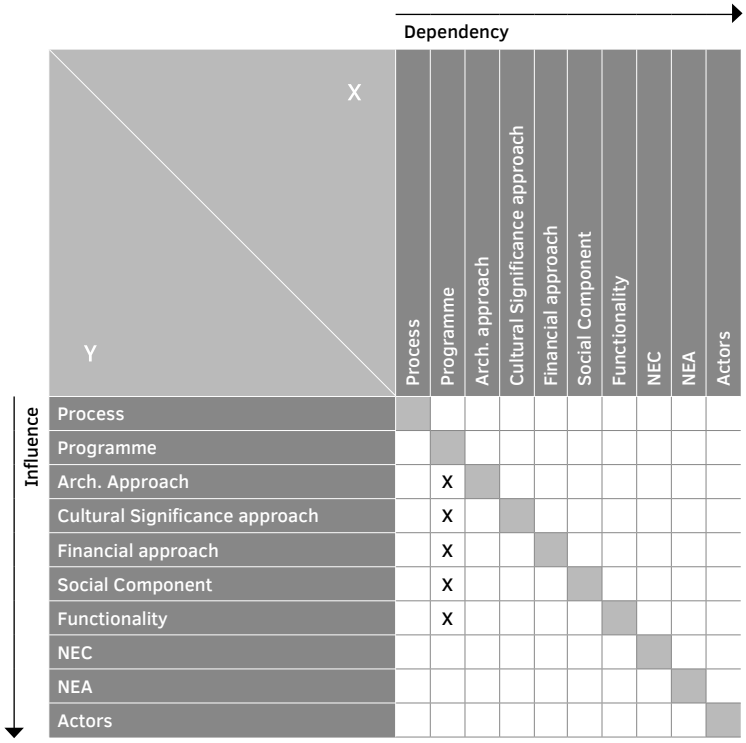


FIG. 7.28 DSM of relations and dependencies (R) identified in Lesson 2.9.

L2.10 Innovative production is in general a compatible new use for Industrial Heritage sites. The Reuse of Industrial Heritage into hubs of innovative production (e.g. textile lab, fab-lab) requires relatively modest architectural interventions. Industrial buildings offer the spatial Conditions required (e.g. size, dimensions) while the new function serves as a medium of continuation of the historic use on a symbolic level. This is highlighted by the cases of IGM, TextielMuseum, DRU Industriepark and LTCP. The case of the TextielMuseum in particular shows that historic continuity is emphasised even more when the innovative production is linked with the former product of the industrial shell. Finally, the aforementioned cases show that innovative production can be a viable and durable new programme.

L2.10 stresses the influence of innovative production, as a new programme for an Industrial Heritage site, on the architectural approach, the cultural significance approach and the financial approach of the Reuse. Those relations are visualised in the following DSM (FIG. 7.29).

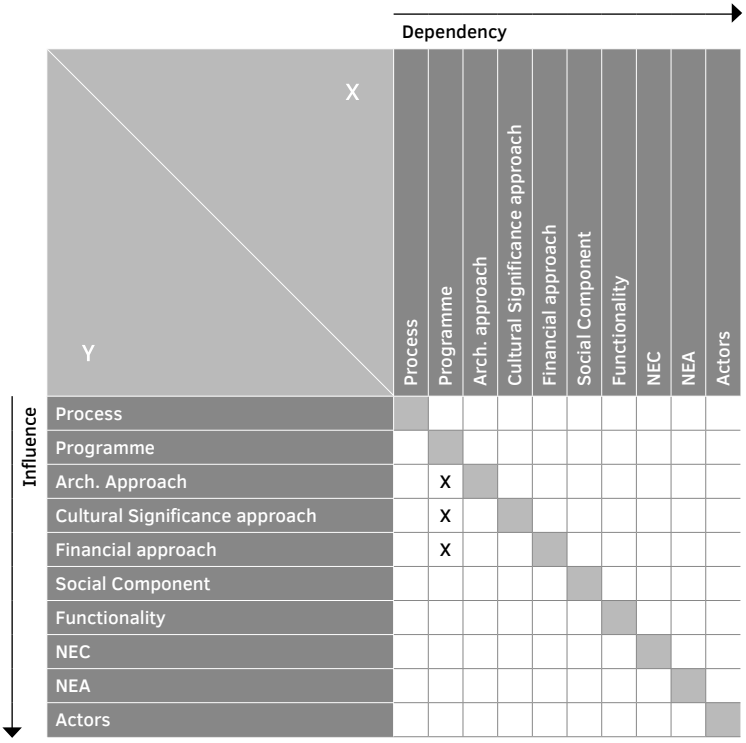


FIG. 7.29 DSM of relations and dependencies (R) identified in Lesson 2.10.

L2.11 Cultural functions are in general a compatible new programme for Industrial Heritage sites. They allow public accessibility and they do not require extensive interventions to the historic fabric. This is confirmed by multiple case studies. In the form of cultural entrepreneurship, a new cultural programme can be also financially viable (e.g. Westergasfabriek). Nevertheless, as shown from the cases of Technopolis and Energiehuis a cultural programme does not necessarily contribute to the safeguarding of the site's cultural significance.

L2.11 stresses the influence of cultural functions, as a new programme for an Industrial Heritage site, on the architectural approach, the financial approach and the social Component of the Reuse. Those relations are visualised in the following DSM (FIG. 7.30).

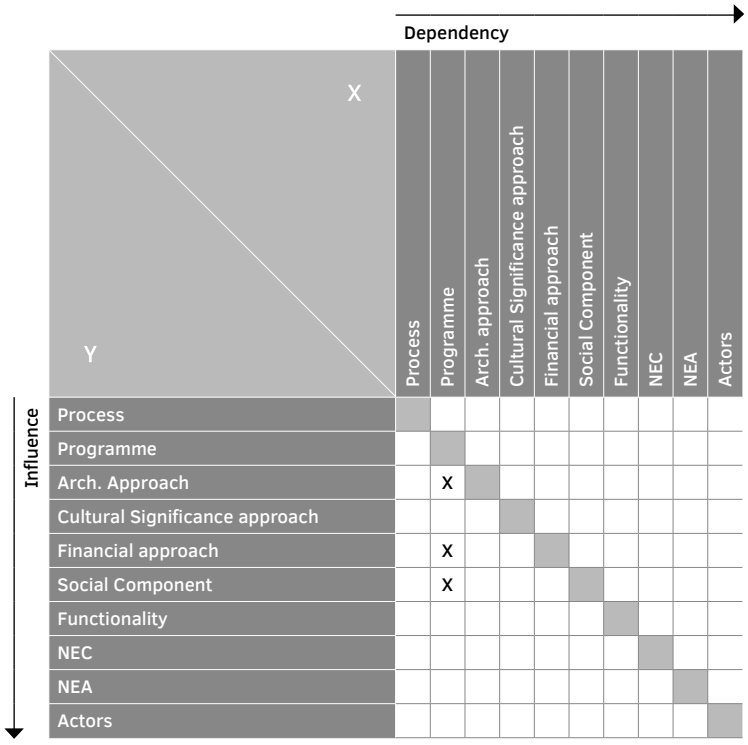


FIG. 7.30 DSM of relations and dependencies (R) identified in Lesson 2.11.

L2.12 An office use[62] **can be a compatible new programme for an Industrial Heritage site when the architectural approach is respectful to the Cultural Significance of the site (e.g. Westergasfabriek, Mill of Pappas) and public accessibility is allowed.** Otherwise the new function can largely compromise the spatial qualities and the cultural significance of the historic site (e.g. the conversion of Technopolis' Gasholder 1 into a radio station offices).

L2.12 stresses the influence of the office use, as a new programme for an Industrial Heritage site, on the architectural approach, the cultural significance and the social Component of the Reuse. Those relations are visualised in the following DSM (FIG. 7.31).

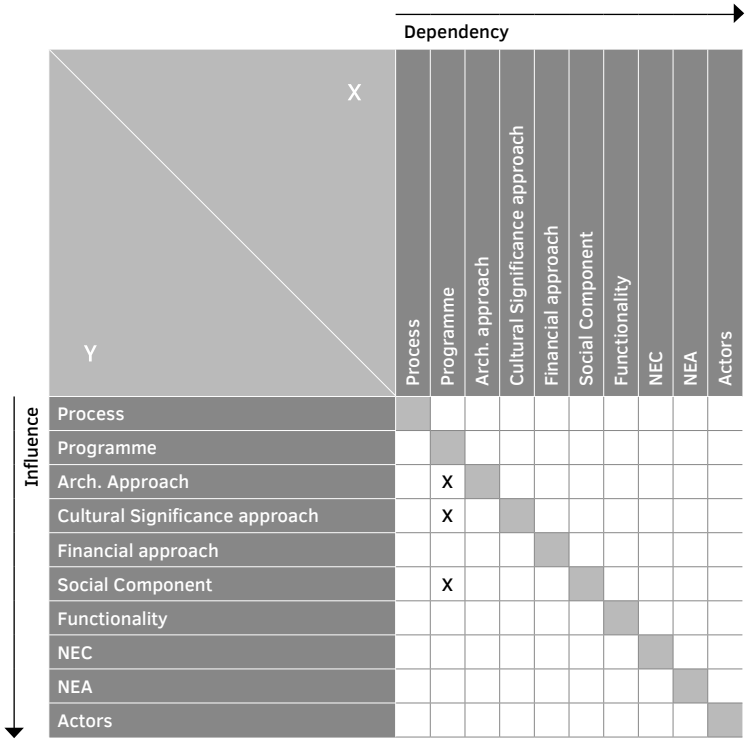


FIG. 7.31 DSM of relations and dependencies (R) identified in Lesson 2.12.

62 No single-functional reuse examples with an office use were studied for reflecting on their financial outcome.

TOC

L2.13 An Educational function **(such as university facilities) can be a compatible new programme for Industrial Heritage when the architectural approach is respectful to the Cultural Significance of the site (e.g. Mill building of Ca L' Aranyó) and public accessibility is allowed.** Otherwise the new function can largely compromise the spatial qualities and the cultural significance of the historic site (e.g. IGM: Large Warehouse). **A new educational programme can be financially viable.**

L2.13 stresses the influence of educational functions, as a new programme for an Industrial Heritage site, on the architectural approach and the cultural significance approach, the financial approach and the social Component of the Reuse. Those relations are visualised in the following DSM (FIG. 7.32).

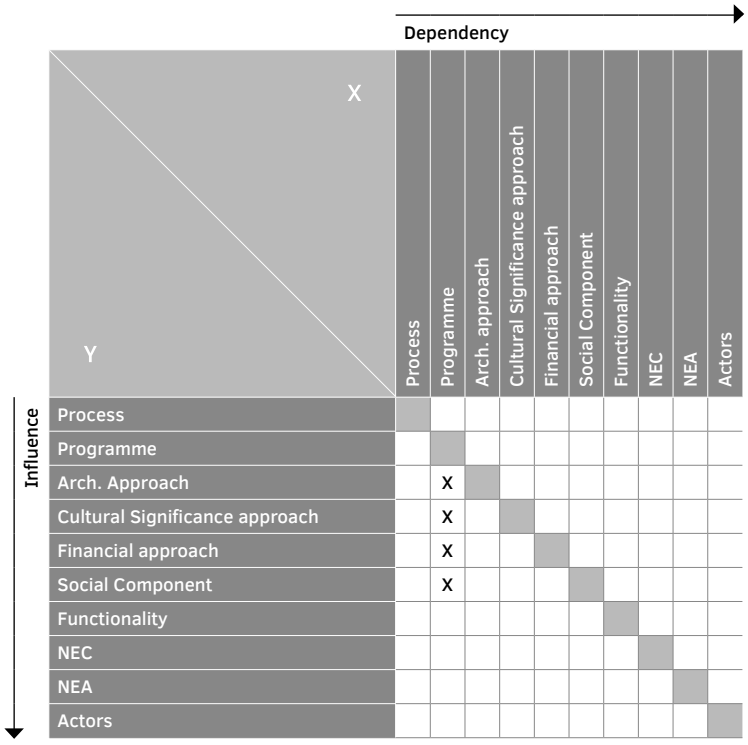


FIG. 7.32 DSM of relations and dependencies (R) identified in Lesson 2.13.

BASIC LESSON: BL2 The selection/formulation of the new programme in an Industrial Heritage Reuse project relies on a complex mixture of Aspects. Those that have been proven to play a fundamental role include the Endogenous Attributes of the site (e.g. location, physical Attributes, cultural significance); the Exogenous Conditions with most important the economic, regulatory, social and cultural ones (e.g. the input of reference projects, favouring market conditions, new planning regulations) and the decisions and interests of the stakeholders. This is supported by all cases examined.

The process, the financial and cultural significance approach as well as the social Component also influence the selection/formulation of the new programme. The case of Westergasfabriek shows that an interim use (that forms part of the process) can influence the programme. In certain cases, such as Ancoats, the new programme is selected solely based on its market value and its expected financial return. In other cases, such as the Energiehuis, the programme is formulated for covering existing needs of the local community. Lastly, in cases such as the IGM and the CTC, the cultural significance approach is the most important Aspect that affects the programme selection. Those relations are visualised in the following DSM (FIG. 7.33).

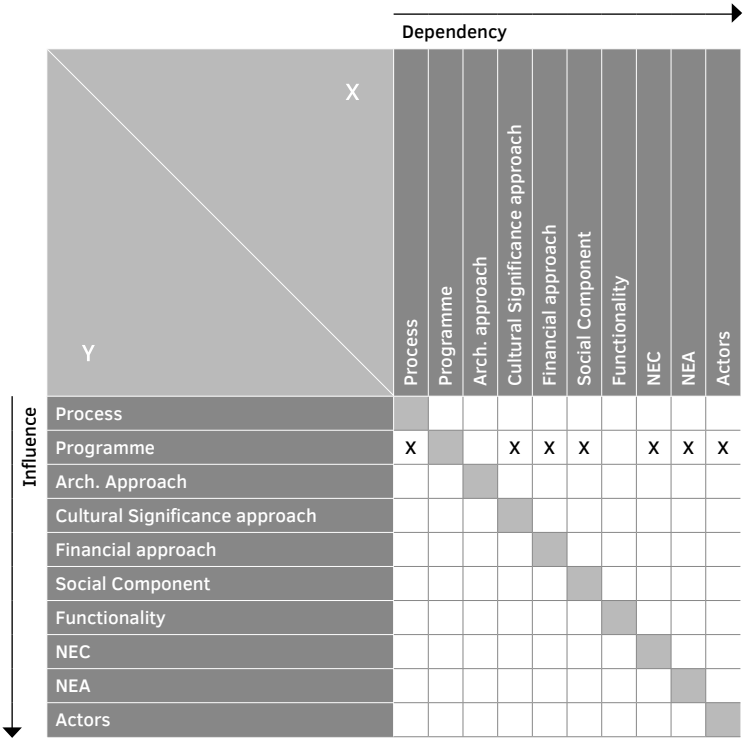


FIG. 7.33 DSM of relations and dependencies (R) identified in Basic Lesson 2.

C3: Architectural Approach

L3.1 The listing (that is part of the NEC) can contribute to a respectful architectural intervention and the preservation of a site's cultural significance. This is reflected by the vast majority of case studies with most characteristic the example of CTC. However, as shown from the examples of the IGM old furnace and the Technopolis New Retort house, listing **cannot always ensure a respectful architectural outcome nor the preservation of the site's cultural significance for particular characteristics**.

L3.1 demonstrates the influence of the NEC on the architectural approach and the cultural significance approach of Industrial Heritage Reuse. Those relations are visualised in the following DSM (FIG. 7.34).

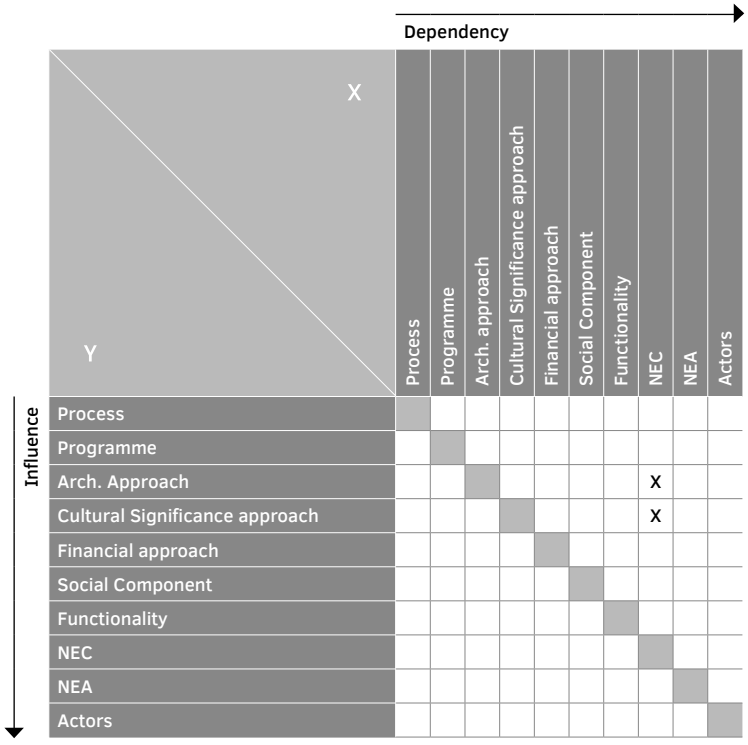


FIG. 7.34 DSM of relations and dependencies (R) identified in Lesson 3.1.

L3.2 When additions are necessary in an Industrial Heritage Reuse scheme, the relation of old and new is critical. More than half of the case studies with DRU Industriepark, Energiehuis, Tsalapatas complex and Bombas Gens being the most indicative, show that **an appropriate balance between contrast and influence by the existing fabric is necessary for the preservation of the site's character**. **This balance can only be achieved if the architectural and the cultural significance approach are influencing each other.** The effects of an imbalance are highlighted through the examples of the TextielMuseum and Ca' L'Aranyo.

L3.2 stresses the importance of the interdependence between the architectural approach and the cultural significance approach of Industrial Heritage Reuse. Those relations are visualised in the following DSM (FIG. 7.35).

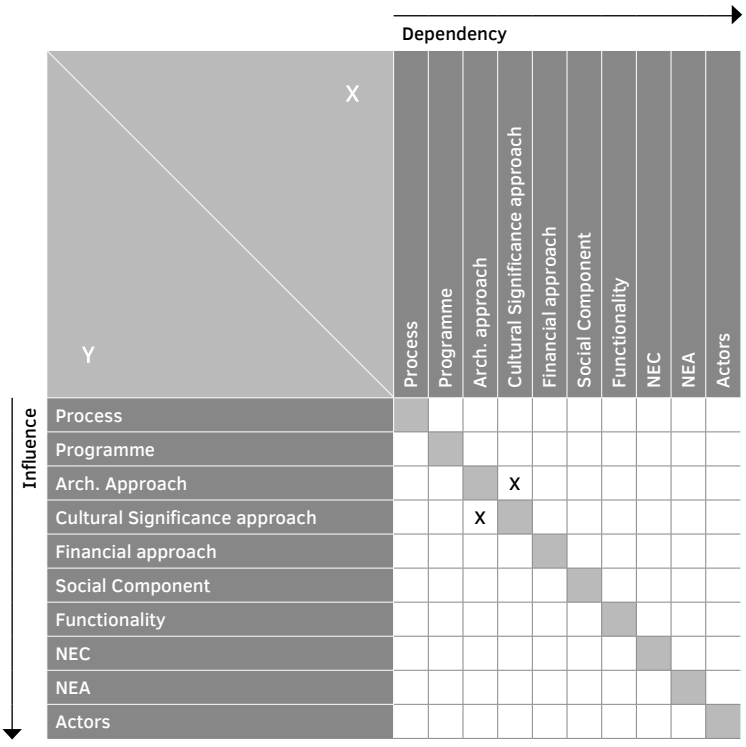


FIG. 7.35 DSM of relations and dependencies (R) identified in Lesson 3.2.

L3.3 Allowing public access in a reused Industrial Heritage site (fully or partly) makes it more open and welcoming while efficiently integrating it to the social realm. This is confirmed by more than half of the case studies. The case of Energiehuis indicates a good design solution for facilitating and filtering public access to selected building parts.

L3.3 shows that the architectural approach can influence the social Component of Industrial Heritage Reuse. This relation is visualised in the following DSM (FIG. 7.36).

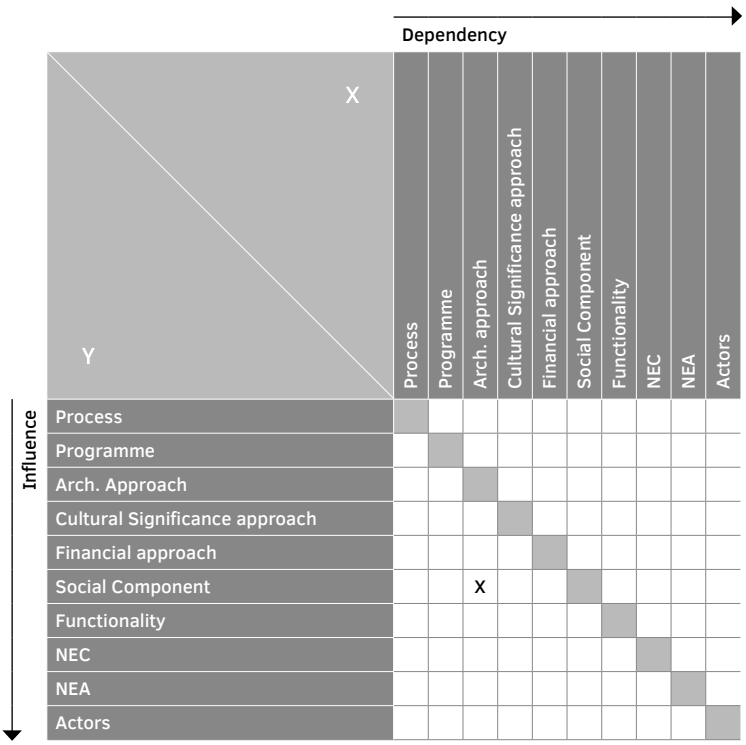


FIG. 7.36 DSM of relations and dependencies (R) identified in Lesson 3.3.

L3.4 The full set of cases examined showed that **a balance between architectural expression and safeguarding of cultural significance is necessary for the preservation of the site's character**. The cases of IGM, BJF and 22@ showed that **at a landscape scale, different architectural approaches in the various buildings can be employed** to protect the cultural significance of the whole while accommodating the needs of a new programme. As revealed from the case of Westergasfabriek, starchitecture rarely allows the balance between architectural expression and preservation. On the contrary, it is focused on creating iconic structures, often disregarding the cultural significance of the existing historic fabric.

The importance of the interdependence between the architectural approach and the cultural significance approach of Industrial Heritage Reuse has been also discussed in L3.2 and it has been visualised in Fig. 7.35.

BASIC LESSON: BL3 The Aspects contributing to a sympathetic architectural intervention include the statutory protection of a site; the process followed for its Reuse (e.g. documentation/ research, consultation); the understanding of its Endogenous Attributes; the synergy with the cultural significance approach and the accommodation of the social Component; the consideration of functionality principles; the multidisciplinarity of the stakeholders' team; the attitude of the key decision-makers (e.g. allocation of necessary funds for architectural interventions); the compatibility of the selected programme and the accommodation of its needs which depends largely from the skills and experience of the architect. This is confirmed by the thriving majority of the cases investigated. The aforementioned relations are visualised in the following DSM (FIG. 7.37).

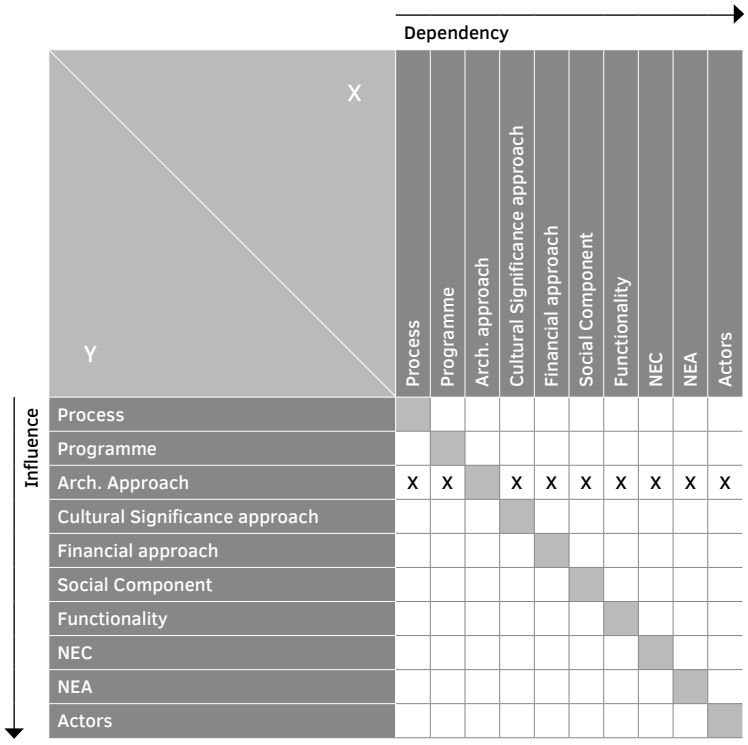


FIG. 7.37 DSM of relations and dependencies (R) identified in Basic Lesson 3.

C4: Cultural significance approach

L4.1 More than half of the cases show that **research and documentation (that form part of the Process) help to prioritise and decide the appropriate balance between cultural significance preservation and architectural interventions, to satisfy the needs of the new programme, increase the functionality of the outcome and safeguard the values of the heritage site.** The merits of research and documentation are clearly highlighted by the GWRW case.

L4.1 shows the positive influence that the process can have if it includes a stage of research and documentation, upon the decisions related with the programme, the architectural approach, the cultural significance approach and the functionality of the site to be reused. Those relations are visualised in the following DSM (FIG. 7.38).

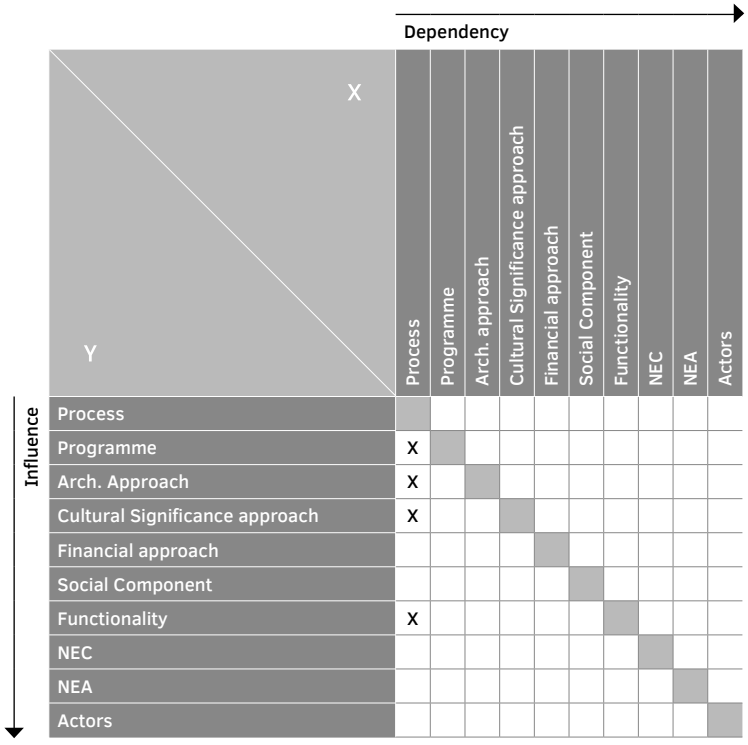


FIG. 7.38 DSM of relations and dependencies (R) identified in Lesson 4.1.

L4.2 More than half of the cases examined highlight the **importance of cultural significance interpretation to safeguard the site's intangible values and disseminate its history. Interpretation creates social added value and makes the site appealing to a broader audience.** As shown in the cases of IGM, Stanley Mills and Tsalapatas complex, a combination of interpretation approaches allows the understanding of the tangible (buildings, machinery, products) and the intangible cultural values (history, production process, people, working conditions, social and economic parameters). Demonstration and display of skill (organised in IGM and TextielMuseum) strengthen the appeal of the site.

L4.2 shows the positive influence of interpretation (that is a necessary task of the cultural significance approach), upon the social Component of the site and the relation of part of the Actors to it. Those relations are visualised in the following DSM (FIG. 7.39).

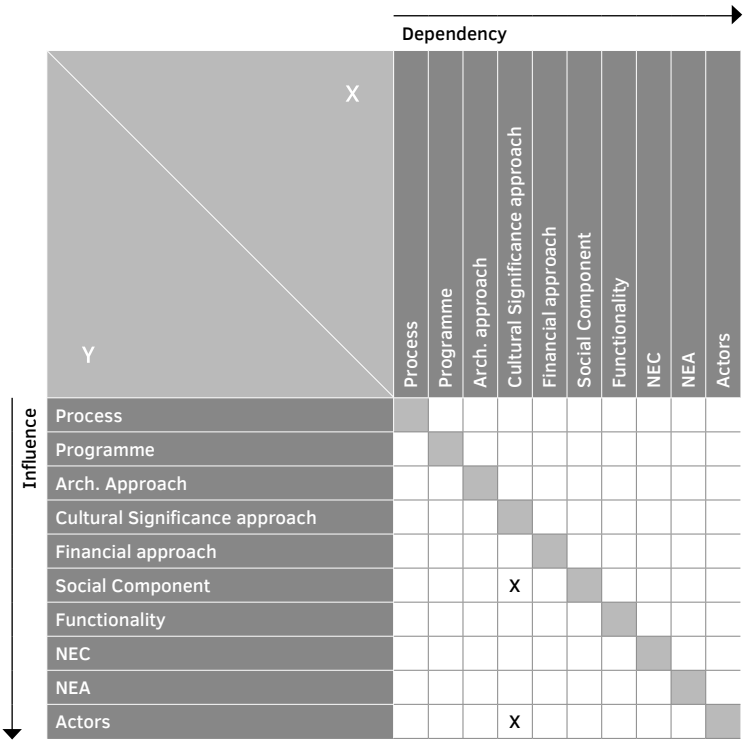


FIG. 7.39 DSM of relations and dependencies (R) identified in Lesson 4.2.

L4.3 The retention of machinery and installations as aesthetical objects and their reinstallation at random spots of the site without any interpretation may contribute to the formation of an architectural experience with references to the past yet have hardly any contribution to the preservation of the site's cultural significance. This is exemplified from the case of the Royal Mills in the Ancoats district.

L4.4 The retention of the historic names of the complex and its buildings serve as a direct reference to the site's former use, contributing positively to its preservation of cultural significance. This is reflected in the vast majority of case studies.

L4.5 The preservation of machinery in situ is highly important in safeguarding the cultural significance of an Industrial Heritage site. The Aspects favouring the preservation of machinery in situ in an Industrial Heritage Reuse scheme include the statutory protection of machinery; the compatibility of the selected programme; the multidisciplinarity of the stakeholders' team; the attitude and drive of the key decision-makers (e.g. allocation of necessary funds for machinery preservation and interpretation, the skills and experience of involved stakeholders) and the architectural approach. This is confirmed by the majority of the cases investigated.

L4.6 Striking a balance between the preservation of cultural significance and the application of safety and comfort standards (part of functionality) is necessary yet challenging. Numerous cases with high standards of cultural significance preservation presented serious functionality issues. Nevertheless, the users of those cases in their large majority appeared tolerant to the comfort deficit as they value the historic sites' cultural significance more.

L4.6 shows that the cultural significance approach influences (usually in a negative way) the functionality of the converted industrial site. This relation is visualised in the following DSM (FIG. 7.40).

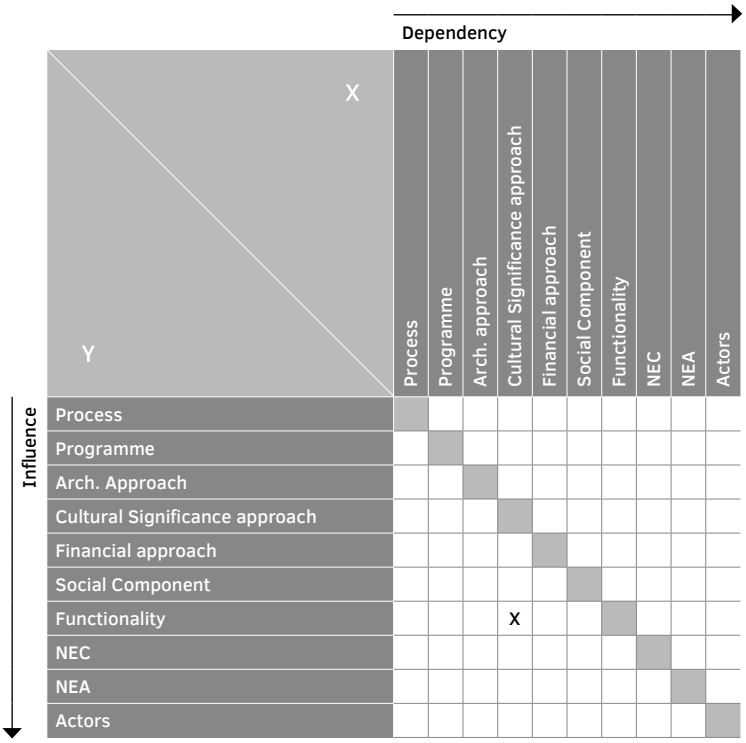


FIG. 7.40 DSM of relations and dependencies (R) identified in Lesson 4.6.

BASIC LESSON: BL4 The Aspects leading to a respectful cultural significance approach include the statutory protection of the reused site; the process followed for its Reuse (e.g. documentation, flexibility to make adjustments) and the understanding of its Endogenous Attributes; the multidisciplinarity of the stakeholders' team; the attitude and drive of the key decision-makers (e.g. allocation of necessary funds for cultural significance preservation and interpretation); the skills and experience of involved stakeholders; the architectural approach and the compatibility of the selected programme. This is confirmed by all cases investigated. The aforementioned relations are visualised in the following DSM (FIG. 7.41).

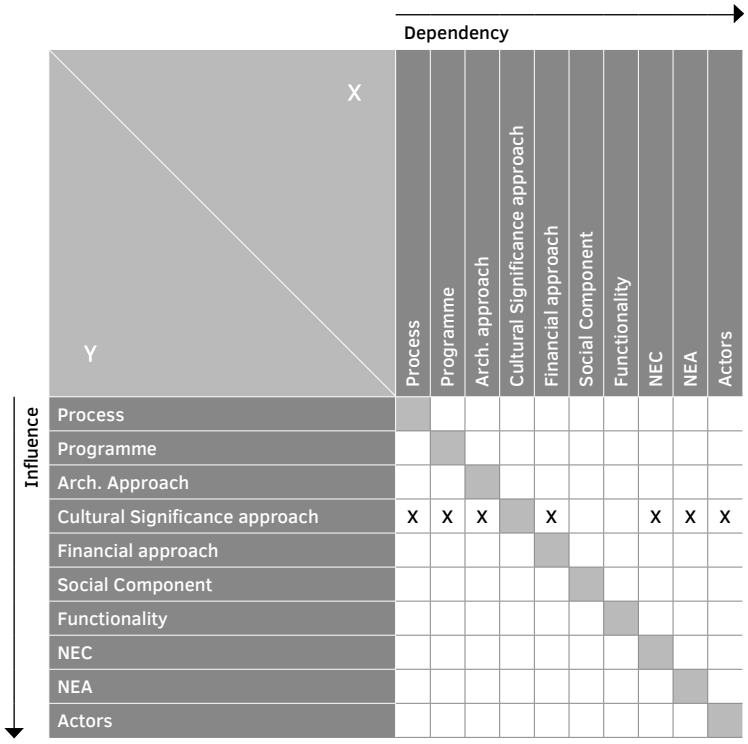


FIG. 7.41 DSM of relations and dependencies (R) identified in Basic Lesson 4.

C5: Financial approach

L5.1 According to the analysis of all cases investigated, there is a set of Aspects that encourage investments in Industrial Heritage Reuse. Those include sociocultural, economic, political and regulatory Exogenous Conditions (e.g. awareness of Industrial Heritage cultural significance, positive precedents, good economic climate, availability of funders and financial support, political will to reverse the tarnished image of an area, statutory protection of the site); Endogenous Attributes (e.g. advantageous location, high cultural significance which will allow to source grant money, cheap price) and traits of key decision-makers (e.g. special interests and willingness to enter in a collaboration).

L5.1 shows the dependency of part of the financial approach, namely the attraction of investments, upon the NEC, the NEA and the traits of the Actors. Those relations are visualised in the following DSM (FIG. 7.42).

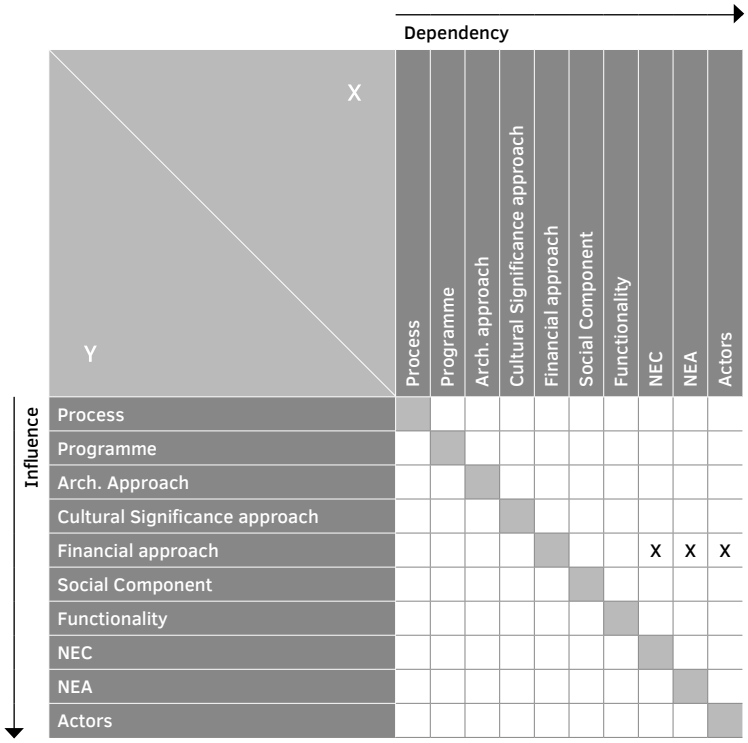


FIG. 7.42 DSM of relations and dependencies (R) identified in Lesson 5.1.

L5.2 The financial viability of a reused Industrial Heritage site depends on an array of Aspects. Those include financial Exogenous Conditions (e.g. a financial crisis, financial support from the public sector) and unforeseen events (e.g. natural disaster); Endogenous Attributes (e.g. location. As shown from the case of Stanley Mills the effects of a remote location can be low visitor numbers, and difficulty to attract investors for converting the remaining buildings); the characteristics, synergies and social appeal of the new programme; the Process (e.g. the phasing of planning and delivery and the attraction of tenants/users); the decisions, skills and experience of the stakeholders responsible for the site's management, as well as the management of the delivered outcome (e.g. branding strategy, attraction of funds and grants and periodic adjustment of the financial strategy). This is confirmed by all cases analysed. The aforementioned relations are visualised in the following DSM (FIG. 7.43).

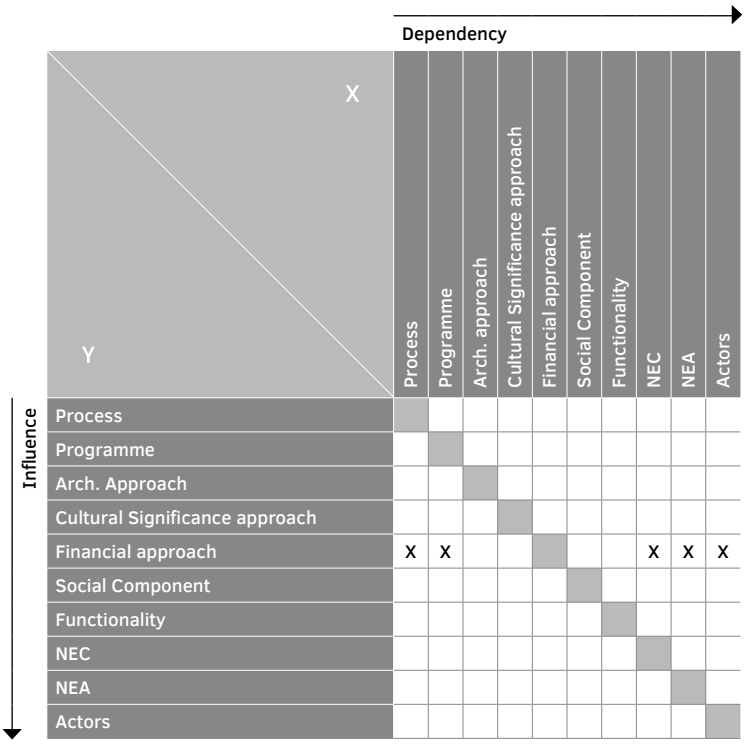


FIG. 7.43 DSM of relations and dependencies (R) identified in Lesson 5.2.

L5.3 One fourth of the cases highlighted the value of 'enabling development' (for a comprehensive presentation of enabling development, see: Historic England, 2008). **If funding for Reuse is available yet insufficient to cover the conservation deficit of a heritage site, it should be considered in combination with enabling development for securing its future.** In the cases of King's Cross and DRU Industriepark for example, the developers were given the right to raise profit from mix-use and residential enabling development respectively, in order to cover the conservation deficit of the project.

L5.3 shows the dependency of the programme formulation by the financial approach. This relation is visualised in the following DSM (FIG. 7.44).

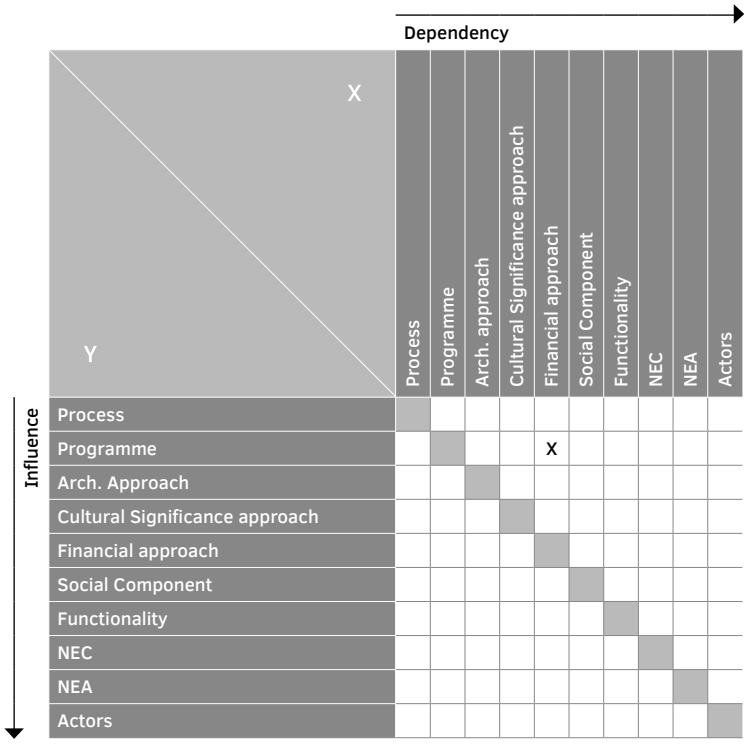


FIG. 7.44 DSM of relations and dependencies (R) identified in Lesson 5.3.

L5.4 A viable model for the financing of an industrial museum/visitor attraction relies in the mix of funding sources. According to numerous relevant cases, the aforementioned mix can include: revenue generated by the entrance tickets and secondary commercial functions (e.g. shop, hiring of spaces for events, café), sourcing of grants from available funders from the local to the European level, harnessing volunteer power and gathering donations through a friends organisation. An exemplary case that has achieved a combination of all the above sources is the IGM.

L5.4 shows that the financial approach of an industrial museum/visitor attraction depends to an extent on the programme of the Industrial Heritage reused site, on the synthesis of the involved Actors and on their relation to the site. Those relations are visualised in the following DSM (FIG. 7.45).

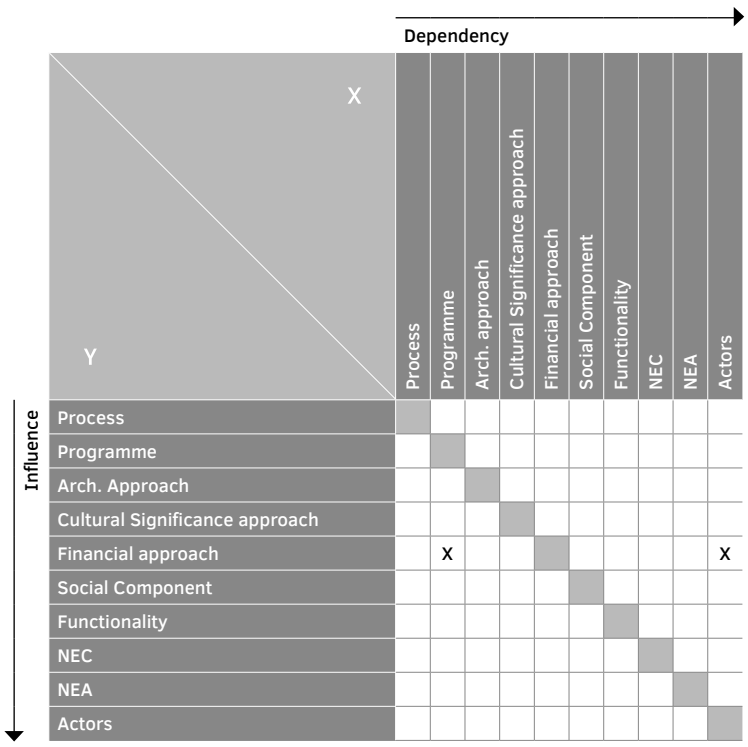


FIG. 7.45 DSM of relations and dependencies (R) identified in Lesson 5.4.

BASIC LESSON: BL5 The financial approach depends on an array of Aspects. Those include the process, the programme, the architectural and cultural significance approach, the social Component, the provisions for functionality, the financial Exogenous conditions, the Endogenous attributes of the site (e.g. contamination, physical condition) and the attitude of the involved stakeholders. This is confirmed by all cases analysed. The aforementioned relations are visualised in the following DSM (FIG. 7.46).

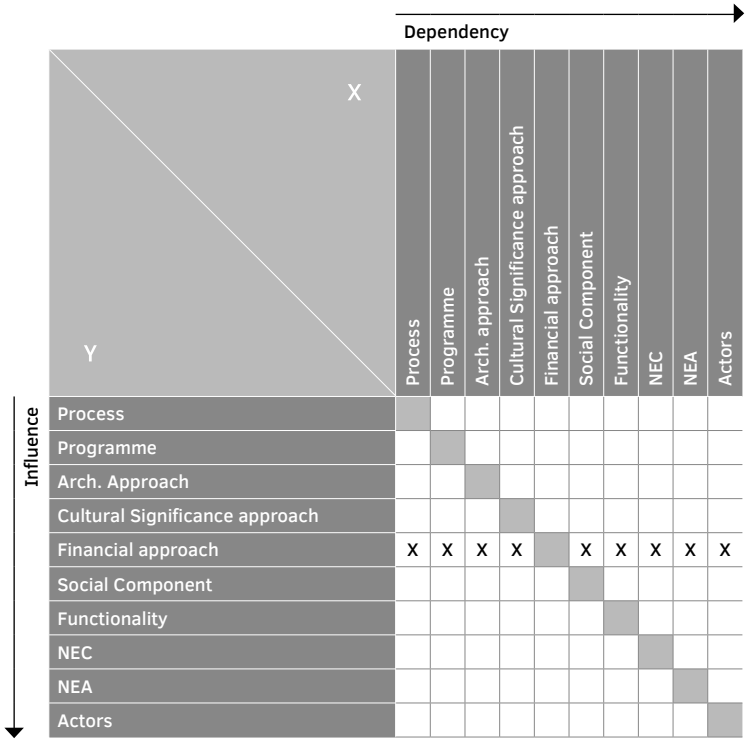


FIG. 7.46 DSM of relations and dependencies (R) identified in Basic Lesson 5.

C6: Social Component

L6.1 All cases examined confirm that **every Industrial Heritage Reuse scheme that makes accessible a site that was formerly a no-go area, offers some social added value. The social sustainability of the project however depends largely on the ratio of the offered social added value against the effects of displacement and social exclusion that are frequent 'side effects' of heritage regeneration.**

L6.2 Reversing the tarnished social status of an area is a lengthy process and requires interventions for the alleviation of spatial, financial and social problems. This is supported by all cases of such scale. The cases of Ancoats and King's Cross highlight the social and operational problems occurring from a piecemeal approach to the above complex issue (focus only on physical interventions). In contrast, the case of BJF shows the positive results of a comprehensive approach.

L6.3 The character and frequency of events during operation, in Industrial Heritage Reuse projects with a new cultural programme, shape the relationship of the site with the local community (See L1.12). The case of King's Cross highlights the positive social outcome of events organisation during operation. Westergasfabriek in contrast, shows the problems of the frequent organisation of commercial events during operation (including noise, traffic, littering, occupation of public space and visual disruptions) and the discontent and negativity of the local community to the project.

L6.3 shows that the social Component depends to an extent upon the new programme of the reused Industrial Heritage site and upon the operation process. Those relations are visualised in the following DSM (FIG. 7.47).

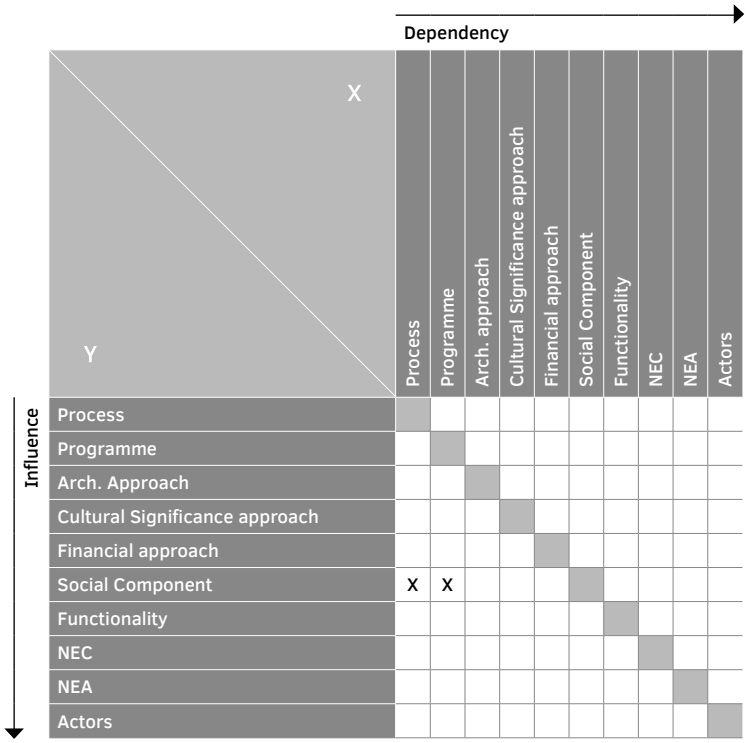


FIG. 7.47 DSM of relations and dependencies (R) identified in Lesson 6.3.

L6.4 Social engagement during the Process is crucial for the operation of industrial museums and visitor attractions. This was confirmed by the majority of the cases with such a programme. The IGM clearly shows the merits of the social engagement for the project's operation while the CTC presents the problems occurring from the lack of it.

L.6.4 shows the dependency of the process (in its final stage) upon the social Component. This relation is visualised in the following DSM (FIG. 7.48).

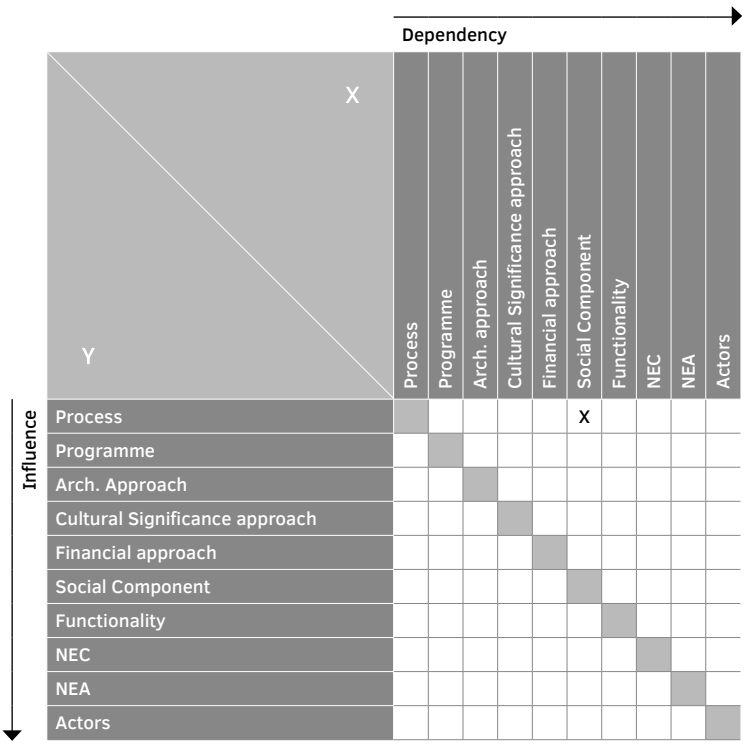


FIG. 7.48 DSM of relations and dependencies (R) identified in Lesson 6.4.

BASIC LESSON: BL6 The social added value of an Industrial Heritage Reuse scheme depends on an array of Aspects. Those, according to the case study analysis include: the level of involvement and control of stakeholders such as the local authority and the local community, the transformation and operation Process (e.g. participatory, bottom-up, engagement of the public during operation), the characteristics of the Programme (including both financial characteristics, such as the price of offered services/accommodation and qualitative characteristics such as the accessibility/ openness, the character of the site), the social relevance of the programme (e.g. responsive to social Exogenous conditions and the endogenous attributes; local amenity, educational pole, source of pride, creation of jobs, impact to the local economy; catalyst of new social links) and the Cultural Significance approach (e.g. preservation of social history). The aforementioned relations are visualised in the following DSM (FIG. 7.49).

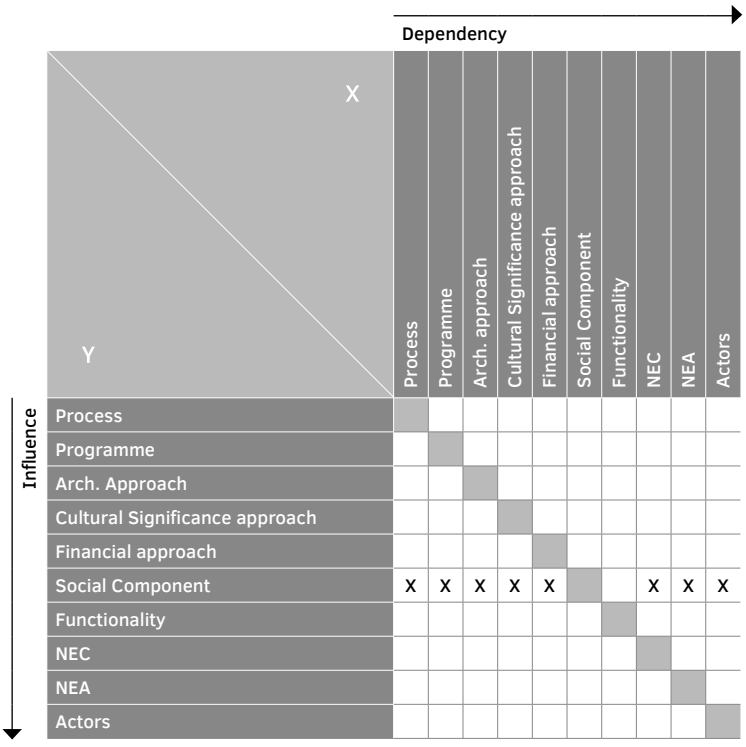


FIG. 7.49 DSM of relations and dependencies (R) identified in Basic Lesson 6.

C7: Functionality

L7.1 For Achieving functionality and accommodating the requirements of a new programme without compromising the cultural significance of the heritage site, clever architectural solutions (e.g. box in a box idea, extension underground) and enough financial means are necessary. This is confirmed by one third of the cases investigated.

L7.1 reflects the influence of the architectural and financial approach upon the programme the cultural significance approach and the functionality of the reused Industrial Heritage site. Those relations are visualised in the following DSM (FIG. 7.50).

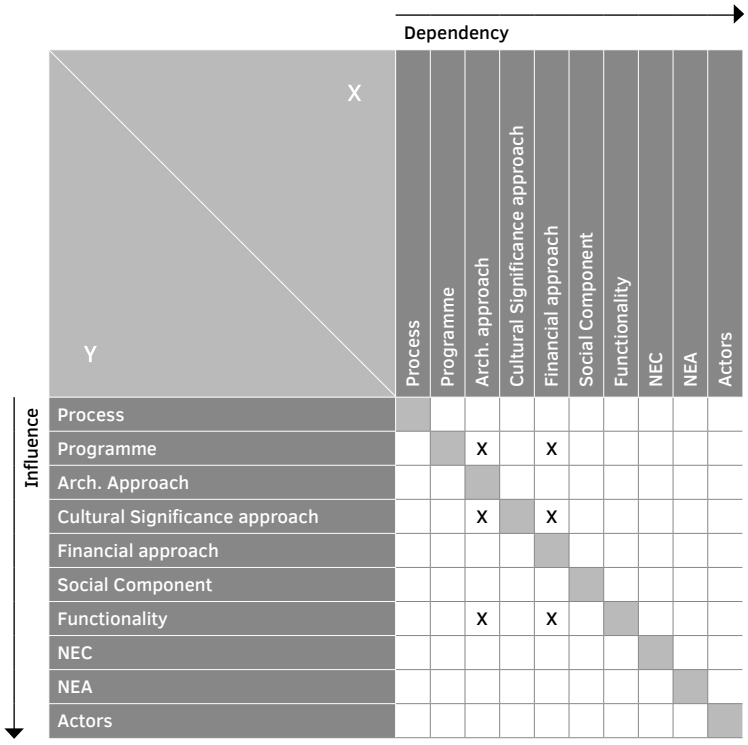


FIG. 7.50 DSM of relations and dependencies (R) identified in Lesson 7.1.

L7.2 Trying to fit an existing programme into an Industrial Heritage site is more challenging and usually leads to more damage than conceiving a programme based on the capacity of the site. This is confirmed by the cases of GWRW, TextielMuseum (after 2000) Tsalapatas and Ca L' Aranyó. The cases of Energiehuis, mNACTEC and Bombas Gens show that an informed and respectful architectural approach can accommodate the elevated requirements of the new programme without harming its cultural significance.

BASIC LESSON: BL7 The Aspects that influence the functionality of a reused industrial site include its Endogenous Attributes (e.g. physical characteristics like the former set up and the available room for extension); its statutory protection; the new programme; the cultural significance approach (e.g. preservation of machinery in situ); the financial approach employed (e.g. availability of funds for a proper refurbishment and for the site's maintenance); the Architectural Approach employed (e.g. careful detailing and provisions for the necessary installations); the operation process (the seasonal use of a site, like Stanley Mills, involves its closure during the wintertime and in turn its faster rate of decay) and the decisions, skills and experience of the key decision-makers. This is confirmed by all cases analysed. The aforementioned relations are visualised in the following DSM (FIG. 7.51).

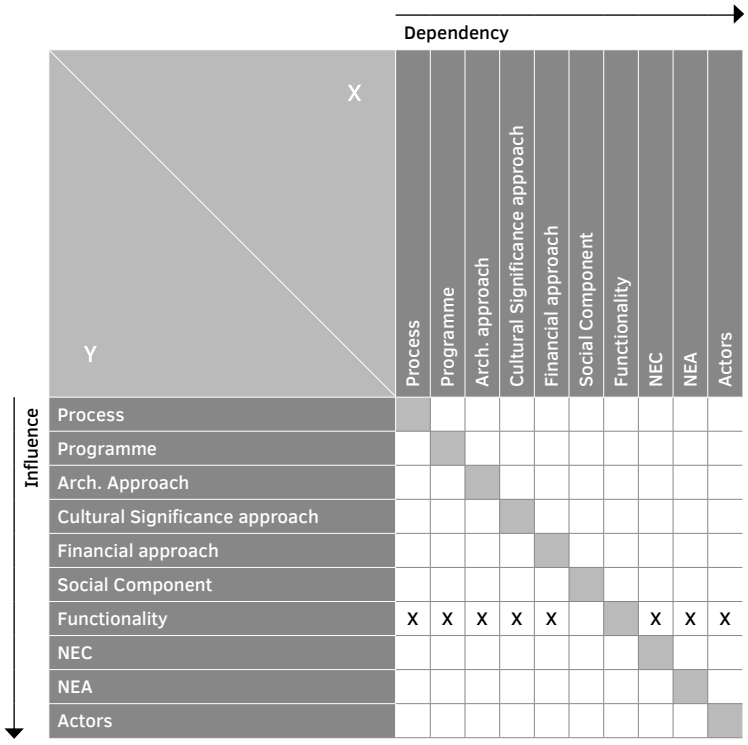


FIG. 7.51 DSM of relations and dependencies (R) identified in Basic Lesson 7.

7.2.2.2 Dilemmas (D)

As discussed in Section 2.6, Industrial Heritage Reuse is challenging due to its multiplicity and the internal tensions it presents. This was clearly reflected on the results of the case study analysis. Apart from the relations and dependencies between Aspects, multiple dilemmas were identified as well as tensions between them. Those will be presented below.

Process

In Sub-Section 7.2.2.1 it was presented that a process of Industrial Heritage Reuse characterised by flexibility (L1.14), an incremental approach (L1.17) and continuous branding efforts (L1.6, L1.12) presents multiple merits. Those features have been also highlighted as important in multiple publications, including Stratton (2000), Orbasli (2008), Baum and Christiaanse (2012) and English Heritage (2013). The case study results however support that the above features can also have a negative influence on certain Components of the project.

In detail, several cases showed that flexibility has divergent effects, especially on the social and financial Components of the Reuse. For example, the cases of Stanley Mills, LTCP and Bombas Gens showed that the flexibility to make adjustments based on the archaeological or conservation findings during the transformation works, allowed a better adjustability to the site's Attributes, enhancing in turn the preservation of its cultural significance. On the other hand, the economics of those cases were largely complicated due to flexibility. Furthermore, the case of King's Cross revealed the use of flexibility as a medium for the minimisation of the social returns of the project that involved the sharp reduction of the social housing ratio during the redevelopment process.

In regard to the incremental approach in the process the case study results highlighted that it can lead to piecemeal gestures and a problematic operation. The cases of CTC and Technopolis clearly reflect this issue.

As for the branding, the case study results suggested that it can contribute to ambiguous developments. Dilemmas are raised mainly between the clearly positive financial outcome of branding and its ambiguous social effects. The rebranding of the King's Cross case for example, involved the implementation of policing measures and social control, opening the way for the gentrification of the area and the exclusion of 'undesired elements'.

Furthermore, it was shown that excessive branding and reinventions driven only by financial motives can lead to the compromise of the cultural significance and the social sustainability of the project. This is clearly revealed in the cases of GWRW, TextielMuseum and Westergasfabiek.

In regard to the process, therefore it was shown that the decisions regarding the nature of the process are complex and form the base of dilemmas, as some of its characteristics can produce divergent effects on the various Components of Industrial Heritage Reuse.

Programme

The choice of the appropriate programme in Industrial Heritage Reuse is also an issue raising dilemmas.[63] Lessons 2.8 - 2.13 presented the influence of various mono-functional programmes to the other Components of Reuse. It was shown that each function can have both positive and negative effects. In detail, functions that usually present high market value and are financially viable (such as offices and residential functions), have often a negative impact on the spatial quality and the cultural significance of the heritage site as well as jeopardising the social sustainability of the project. On the other hand, more compatible functions (such as industrial museums and cultural functions) often present financial issues.

Architecture

As discussed in the Sub-Section 2.2.3, a typical and much discussed dilemma of heritage Reuse pertains to the decisions over the appropriate balance between preservation and change. L3.2 readdressing the issue shows that the core of the dilemma lies in the tensions between the architectural and the cultural significance approach.

Another dilemma related with the architectural approach, expressed with increasing intensity since the turn of the 21st century, stems from the divergent effects of starchitecture in Industrial Heritage Reuse projects. As mentioned in the Sub-Section 6.2.5, in most starchitectural projects, priority is given principally on the architectural expression in expense of preservation. In other words, the architectural approach largely overshadows the cultural significance preservation. Nevertheless, starchitectural projects are often highly attractive and at the same time they catalyse the development of their context and boost its economy.

Cultural significance

As discussed in Section 2.6 and restated in L4.5, the preservation of the machinery is highly important in Industrial Heritage Reuse as it embodies sensitive values. Machinery preservation is at the heart of one of the most critical dilemmas of the practice under investigation. Preserving this highly valuable part of heritage is on the one hand essential for the preservation of the site's cultural significance. One the other hand though, machinery preservation creates important issues making the accommodation of the needs of the new programme difficult while also perplexing the architectural approach, complicating the financial approach and making the operation and maintenance of the site hard.

63 The issue has been briefly discussed in Stratton (2000) and Berens (2011).

Dilemmas concerning multiple Components and other Aspects

L 4.6 and L7.2 expressed a multi-composite dilemma with no simple solution. Achieving functionality and accommodating the requirements of a new programme while staying on budget without compromising the cultural significance of the heritage site, was a major problem in the thriving majority of the cases examined.

As shown in the analysis of Sub-Section 7.2.2, a project of Industrial Heritage Reuse has multiple positive effects on its NEC, NEA and can benefit (part of) the Actors. In detail, through its programme, process and social Components Industrial Heritage Reuse can catalyse the development of a remote or a stigmatised area, restore its economy and become a source of pride. Those positive effects however usually give rise to a process of gentrification which involves the exclusion and displacement of the disadvantaged social strata. This poses a serious and hard dilemma to solve.

In the projects of Industrial Heritage Reuse, as mentioned above, there is always the dilemma of balancing the needs of the new use (programme) and the comfort of the users (functionality) with safeguarding the atmosphere of the historic site (preservation of cultural values). As proven from the case study results, in the equilibrium between the aforementioned Components the weight falls on the first two. **Retaining the character and especially the inherent messiness of the historic industrial site has been proven very hard.** In almost all the cases examined with the exception of the LTCP, the architectural outcome was too neat. This was expressed in the buildings. but it was especially evident in the design of the open space. The result of the LTCP, is possibly owed to the pairing of a respectful combination of architectural and cultural significance approach with the 'unfinished' state of the project.

The dilemmas analysed above shed light on some complex unresolved issues of Industrial Heritage Reuse. The following concluding chapter will provide guidance for overcoming some of those issues.

7.3 Conclusions

This Chapter, drawing from the theoretical base of conservation, reuse, regeneration and adaptability and on the case study analysis, presented the anatomy of the Industrial Heritage Reuse practice. Firstly, seven main Components of Industrial Heritage Reuse, including the Process, the Programme, the Architectural approach, the Cultural Significance Approach, the Financial approach, the Social Component and the Functionality, were identified. Following that, the influence of each Component during the Reuse process was discussed, based on 59 Lessons (L), drawn from the analysis of the selected case studies of best practice.

Those Lessons also highlighted the multiple links and Relations (R) between the identified Components. The preceding analysis allowed the unravelling of the 'yarn ball' of Industrial Heritage Reuse Components (FIG. 7.1) and its re-composition as a Net including the key Components and their links (FIG. 7.52).

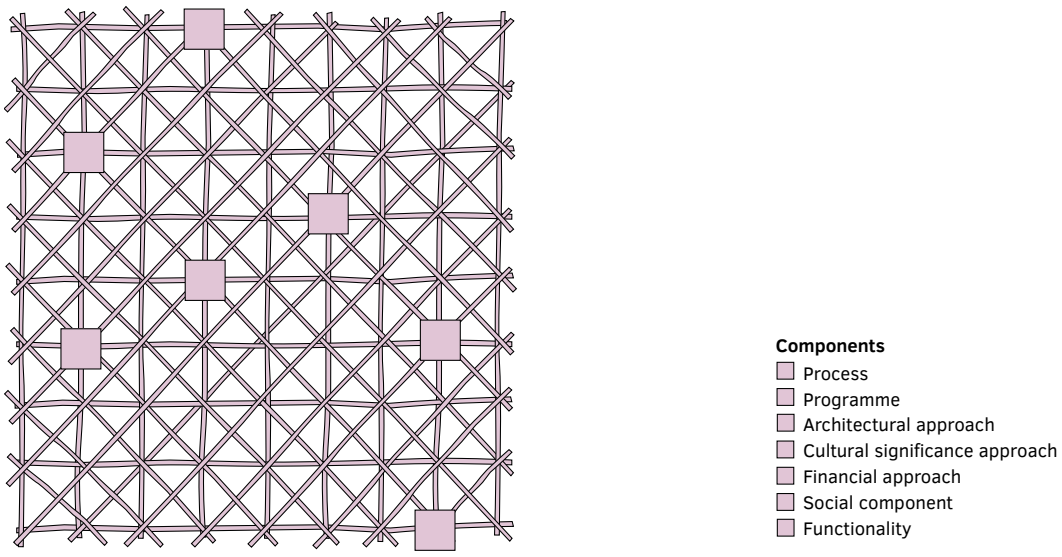


FIG. 7.52 The Net of Reuse Components reflects the multiple links between the identified Components of Industrial Heritage Reuse which shape the outcome of the practice.

Apart from that, the Lessons of the case study analysis showed the influence of the identified Components on the preparation, implementation and the outcome of Reuse. Special emphasis should be given to the lessons concerning the (C1) Process of Industrial Heritage Reuse. This relatively underexplored part of Reuse (see § 2.7) was proven to play a crucial role in the formulation of the Reuse result and in the future performance of the converted Industrial Heritage site.

Returning to the full range of the Lessons presented, it was demonstrated that the nature of influence was hardly even owed to one single Component. On the contrary, the relations (R) between Components, influencing Factors and Actors were proven decisive for the formulation of positive or negative implications for Industrial Heritage Reuse. Comprehending and shedding further light to those relations was deemed essential.

49 DSM models facilitated the visualisation of the identified relations between the aforementioned Aspects, contributing to a better understanding of the complexity of Industrial Heritage Reuse practice. The following Figure (FIG. 7.53) presents the synthesis of the 7 Basic Lessons DSM models. The DSM model visualises the dependencies (X) and interdependencies (highlighted in light gray colour) between Components, influencing Factors and Actors.

Dependencies (Summation of Basic lessons)

Dependency

Influence	X / Y	Process	Programme	Arch. approach	Cultural Significance approach	Financial approach	Social Component	Functionality	NEC	NEA	Actors
	Process								X	X	X
	Programme								X	X	X
	Arch. Approach								X	X	X
	Cultural Significance approach								X	X	X
	Financial approach								X	X	X
	Social Component				X				X	X	X
	Functionality		X		X				X	X	X

KEY

- Component X and Component Y are interdependent
- X Component Y depends upon Component X / Component X influences Component Y
- No dependance found

FIG. 7.53 DSM of relations and dependencies (R) identified in all Basic Lessons presented in Sub-Section 7.2.2.

This DSM model (FIG.7.53) provides a clear view of the links between Components, that were visualised in the FIGS.7.20, 7.33, 7.37, 7.41, 7.46, 7.49 and 7.51. Furthermore, including the Factors and Actors of Industrial Heritage Reuse, it paints a more comprehensive picture of the dependencies between Aspects. In detail, in the DSM model it is apparent that all Reuse Components are influenced by the influencing Factors (the NEC and NEA) and Actors, analysed in Chapter 5 and Chapter 6 respectively, and that the vast majority of the Reuse Components are interdependent.

The Lessons of the cases study analysis, apart from the dependencies also revealed the dilemmas and tensions between Components helping to highlight unresolved and problematic issues. The following table brings together all of the tensions expressed between the Components' dimensions in the Lessons.

Y \ X	Process	Programme	Architectural Design	Preservation of Cultural Significance	Financial viability	Social sustainability	Functionality
Process							
Programme							
Architectural Design							
Preservation of Cultural Significance							
Financial viability							
Social sustainability							
Functionality							

KEY

- Tension between the Components X and Y
- No tension found

FIG. 7.54 Visualisation of the Tensions detected between Components

What is striking in this model and largely explains the challenging nature of Industrial Heritage Reuse practice, is that there are multiple tensions between the Reuse sub-Components while there are a few Aspects, such as the process, programme and the social sustainability that also present internal tensions (e.g. in regard to the programme, internal tensions were found when there is no synergy between the new functions). It was shown that those tensions, if left unresolved may hinder or even be proven fatal for the Reuse practice.

The high level of interaction and interdependence between the Components of Industrial Heritage Reuse, clearly illustrated in this Chapter, suggests that the enhancement of the practice relies to a great extent on the improvement of each individual Component, the optimisation of their relations and the resolution of the tensions between them. Deciphering these three key topics, that was attempted in this Chapter, can therefore possibly pave the way for the enhancement of the practice.

8 Conclusions: Towards an enhanced Industrial Heritage Reuse practice

"To see complex systems of functional order as order and not as chaos, takes understanding."
Jane Jacobs, 1961, 376

8.1 Introduction

This doctoral research examined the Reuse of Industrial Heritage in Europe, through the concept of 'Control Shift'. This is a reinterpretation of the contemporary conservation axiom 'Managing Change', which on the one hand places emphasis on the practice's shifting Components and on the other, on the Actors and Factors that exercise influence and control.

Industrial Heritage Reuse was defined in the framework of this dissertation as a broad conservation approach, capable of incorporating a variety of diverse strategies simultaneously (see § 2.8.2). It implies the balancing of change and preservation of Industrial Heritage cultural significance within the wider scope of sustainability and it involves the modification of the conservation object (in part or in its full extent) for a compatible use.

In the first Chapter of this dissertation, a twofold problem was identified in relation to Industrial Heritage Reuse practice. Firstly, it was revealed that there is a need for an enhanced approach of Reuse, as a broad conservation approach, for tackling the risks the European Industrial Heritage is currently facing and secondly, it was shown that there is a lack of a deep and holistic understanding of the practice.

The first aspect of the problem, emphasised by academic and professional circles, was shown to be emerging from the current pressures for the conformation of Industrial Heritage Reuse to a growing set of contemporary ideals. Specifically, it was shown that the 21st century Industrial Heritage Reuse practice is required to be more responsive, more sustainable, more inclusive, more value-driven and more holistic.

The second aspect of the problem was proven to be related mainly to the dynamic and complex character of Industrial Heritage Reuse. Its visualisation as a yarn ball (FIG. 2.1) was introduced to reflect its highly perplexing nature. In Section 2.6, Industrial Heritage Reuse was portrayed as a highly complex and challenging assignment due to its nature and the embedded dilemmas it

entails as well as the particularities of this special heritage group (tangible and intangible special characteristics and values of Industrial Heritage). The ambiguities in the contemporary theoretical framework of conservation were identified as a factor that causes further confusion in the Industrial Heritage Reuse practice. Finally, it was shown that to this day, unravelling and analysing the vastly perplexing yet fascinating 'yarn ball' of Industrial Heritage Reuse, against the circumstances dictated by the contemporary era, has not been achieved.

Based on the premise that the first aspect of the problem is not likely to be solved without facing the second one, this doctoral research attempted to respond to the problem as a whole. The aim of this dissertation is therefore to explore the potential of enhancement of Industrial Heritage Reuse, through its deep and holistic comprehension, pertaining to the identification and analysis of its influencing Aspects, under the light of the contemporary theoretical conservation concepts, the current demands of the field of practice and the rising challenges of the 21st century context.

In order to meet the aforementioned aim of the research, it was firstly necessary to analyse the evolving theoretical framework of conservation, position Industrial Heritage in it and identify the demands and challenges of the 21st century context. Based on the review of the existing research base the four following theoretical propositions were formulated and served as starting points for the study.

1 Industrial Heritage Reuse is influenced both by its intrinsic characteristics and by contextual conditions.
2 The stakeholders of Industrial Heritage Reuse are Actors who exercise influence in the practice.
3 The stakeholders of Industrial Heritage control a number of Components the composition of which affects the practice.
4 The interplay of all the above Aspects can determine the outcome of Industrial Heritage Reuse. The comprehension of this interplay in turn can provide lessons for the 'control shift' concept.

To better establish and sharpen the focus of the dissertation, a main research question was formulated, namely:

How can the European practice of Industrial Heritage Reuse be better understood, and possibly enhanced, through the close examination of the Aspects influencing it?

Drawing from the theoretical analysis and the theoretical propositions, the Main Research Question was analysed into the following five sub-questions.

— **S.Q.1.** How has the current state of Industrial Heritage Reuse practice been formed as an accepted form of heritage conservation during the last fifty years in Europe?
— **S.Q.2.** Which Factors, if any, influence decisively Industrial Heritage Reuse practice and how?
— **S.Q.3.** Which Actors, if any, influence the Industrial Heritage Reuse practice, when, where and how?
— **S.Q.4.** Which are the key Components of Industrial Heritage Reuse and how does their composition influence the practice?
— **S.Q.5.** How do those Aspects influence each other and how does this impact Industrial Heritage Reuse?

8.2 The influencing Aspects of Industrial Heritage Reuse: Understanding the 'FACTs' of the practice

Using a mixed methodology, based on case study research, historical research and qualitative interviews this doctoral research provided informed answers to the aforementioned questions and verified the theoretical propositions. The intricate yarn ball of Industrial Heritage Reuse was unravelled to its constituent yarns and Aspects (FIG. 3.1) and successively each one was analysed in detail.

Firstly, it was shown that **Industrial Heritage Reuse, almost five decades after its first applications in Europe, is now a mature and widely employed practice across the continent**. All European countries under investigation are now going through the stage of post adaptation. It was highlighted that, on their way to this stage, they all experienced similar transitions, passing through the same stages of development, namely recognition, protection, adaptation and post adaptation. Nevertheless, this occurred at different instances in each country and in some cases following a different order (FIG. 4.5). This was due to the different country-specific Conditions that largely forged the trajectory of care and Reuse of Industrial Heritage in each nation. The same Conditions render the transferability of national models of care and Reuse difficult and problematic. That is why no such general lessons are offered in this dissertation.

Three common challenges between the countries under investigation concerning Industrial Heritage Reuse were identified. Firstly, the continuation of the employment of Reuse for the conservation of the remaining obsolete Industrial Heritage sites; secondly, the reinvention of the early reused sites that are on the edge of obsolesce once again and thirdly the mounting side-effects and remnants of the financial depression of the early 21st century. Other challenges identified in only some of the countries investigated were: the repercussions of the fragmentation of certain nations and the lack of collaboration between the administrational fragments; the effects of the contraction of the State interventionism and the decentralisation of heritage care; the lack of a comprehensive record of Industrial Heritage assets and the absence of a systematic selection process for their listing and educated management. Taken together, these results suggest that despite the progress, there are still problems, shortcomings and challenges concerning the earlier stages of the practice.

Secondly, the **Factors** influencing decisively Industrial Heritage Reuse were identified. In specific, it was shown that influence is exerted by a Net^2 of Factors, including two intertwining multileveled Nets of contextual and intrinsic influence (FIG. 5.7). The Net of Exogenous Conditions (NEC), which has a local, national and international magnitude, influences the practice mainly indirectly (FIG. 5.3). On the contrary, the Net of Endogenous Attributes (NEA) exerts a direct influence to all Components of Industrial Heritage Reuse practice, throughout its process (FIG. 5.6). The multiple links and interactions between the NEC and the NEA and their influence on the Actors involved with Industrial Heritage Reuse were discussed. It was also emphasised that the multi-layered 'Net^2 of Factors' has a much greater extent and should not be interpreted as the mere sum of influence of the NEC and the NEA. Furthermore, through multiple examples anchored in the case study analysis, it was highlighted that the Net^2 of Influencing Factors can affect Reuse both positively and negatively.

Thirdly, the **Actors** influencing decisively Industrial Heritage Reuse were identified as well as the standing challenges and the shifts related to them. The elevated awareness, and the rising appreciation of Industrial Heritage as well as the enhancement of stakeholders' skills and their

increasing experience were identified as the shifts with a positive effect in the practice. The challenges identified, that pose threats to the practice include the bureaucracy imposed by the institutional public stakeholders, the unequal ratio of expectations from the owners of Industrial Heritage sites and incentives offered to them, the changing roles of the Actors, the clash of agendas between them, the financial pressure imposed by the Exogenous financial Conditions and the aging of volunteers.

Alongside the identification of the involved Actors, a classification of them was formulated. The subjects of Industrial Heritage Reuse were classified in three categories, namely the main decision-makers, the direct influencers and the indirect influencers, based on their level of involvement in the process. Moreover, the fluctuation of their involvement in the duration of the Reuse process was highlighted. Based on that and the analysis of the Section 6.2, it was emphasised that all parties, despite the category they belong into, play an indispensable role in the process of Industrial Heritage Reuse. Moreover it was stressed that all Actors' action is interlinked, forming yet another Net (FIG. 6.13) and no contribution, no matter how modest, is meaningless for the course of the practice.

Furthermore, it was found that the Actors' positive influence depends largely on the integration and conciliation of conflicting views rather than power imposition. This enhanced state of participatory and agreed-upon conservation requires effective coordination, skilful stakeholders with specific traits and quality relationships between them.

Fourthly, the key **Components** of Industrial Heritage Reuse were identified. Those include the Process, the Programme, the Architectural approach, the Cultural Significance Approach, the Financial approach, the Social Component and the Functionality. It was shown that the identified Components shape and influence directly both the process and the outcome of Reuse. Furthermore, it was demonstrated that the nature of influence is hardly even owed to one single Component. On the contrary, the relations between Components, Factors and Actors were proven decisive for the formulation of positive or negative implications for the Reuse.

Finally, **Time** was defined as an important, yet latent Aspect, that influences the aforementioned Factors and Actors, and in turn Industrial Heritage Reuse practice.

Figure 8.1 provides an overview of all the aforementioned Aspects influencing Industrial Heritage Reuse.

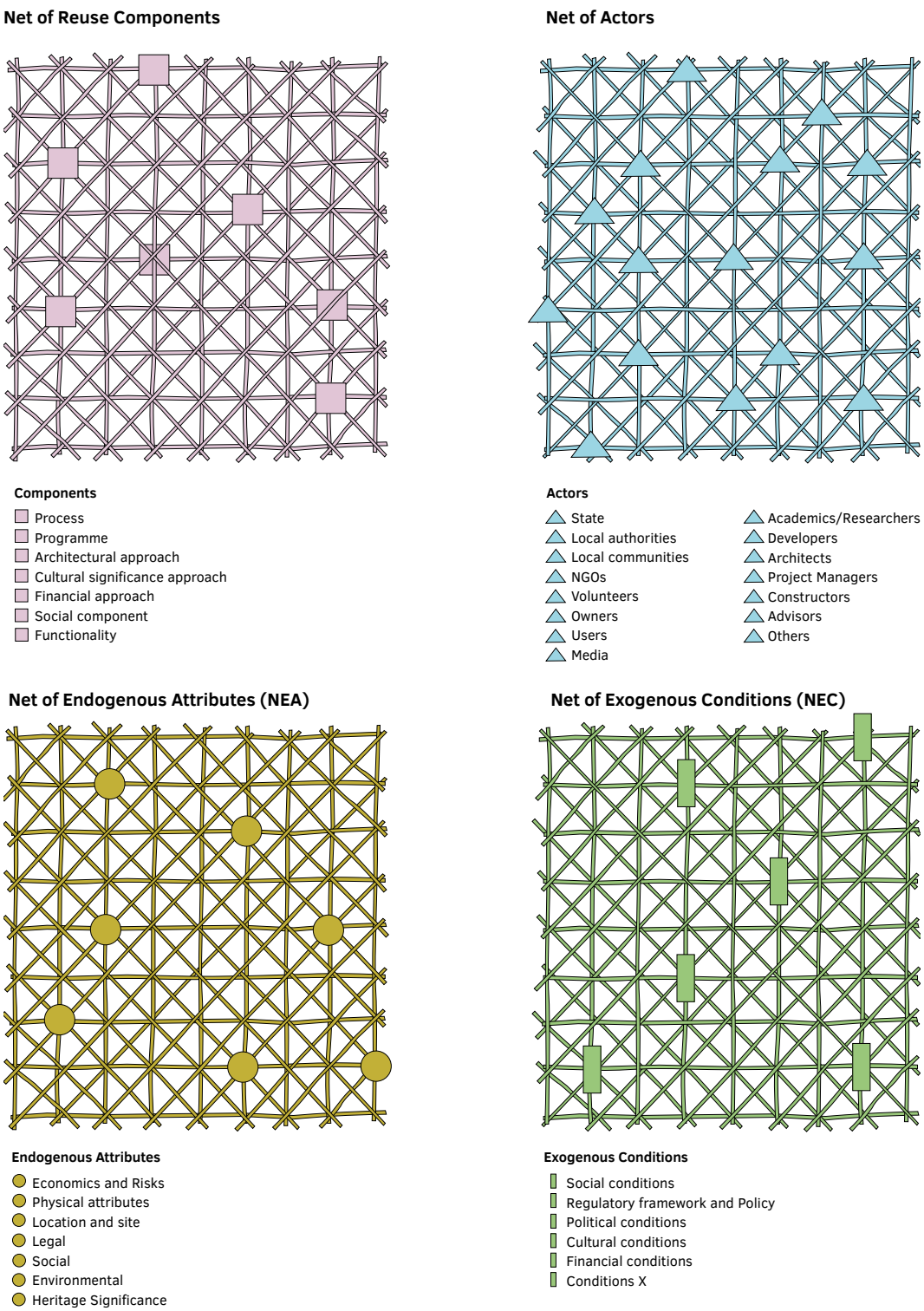
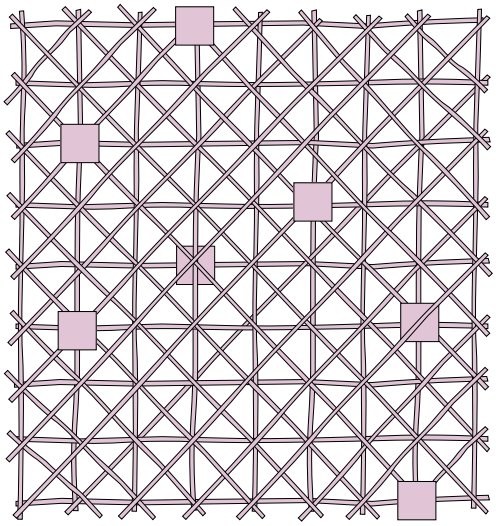


FIG. 8.1 Overview of the identified Aspects influencing Industrial Heritage Reuse. Time being an underlying Factor is not included in those visualisations.

This analysis allows a deeper and comprehensive understanding of Industrial Heritage Reuse practice. In contrast with a simplistic perception, drawing only from the analysis of the outcome of Industrial Heritage Reuse (FIG. 8.2), that merely considers certain Components, this dissertation, drawing from a multileveled analysis with special emphasis on the Reuse process, reveals Industrial Heritage Reuse as a multi-composite assignment (FIG 8.3).

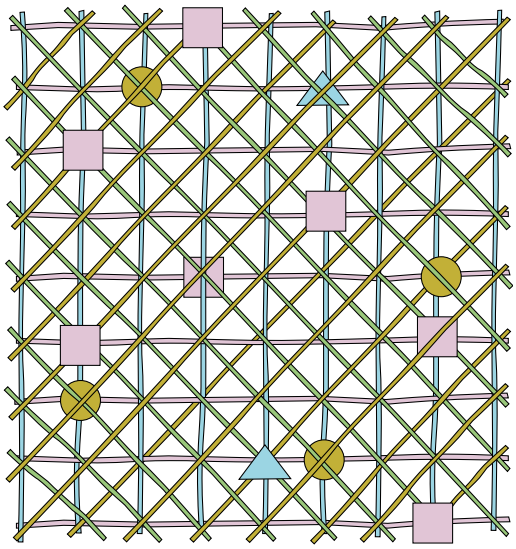
Reuse (as perceived)



KEY
Components
- Process
- Programme
- Architectural approach
- Cultural significance approach
- Financial approach
- Social component
- Functionality

FIG. 8.2 Industrial Heritage Reuse outcome as perceived.

Reuse (as it is)



KEY
- Components
- Attributes
- Conditions
- Actors

FIG. 8.3 The 'Fabric of Industrial Heritage Reuse'. The Industrial Heritage Reuse outcome as a composition of its Components and its other influencing Aspects.

Figure 8.4 shows how the distinctive Aspects, revealed from the unravelling of the Industrial Heritage yarn ball, are woven together forming the 'Fabric of Industrial Heritage Reuse', or in other words the outcome of the practice. The yarns of that Fabric reveal the links between selected Aspects of Reuse, including its Components, some of its Attributes and Actors. In this colourful Fabric, certain Aspects are visible (e.g. new programme, architectural result, the end-users) while others remain concealed (e.g. financial performance, social added value, certain Actors like the managers of a site and the adjusted Attributes of the site).

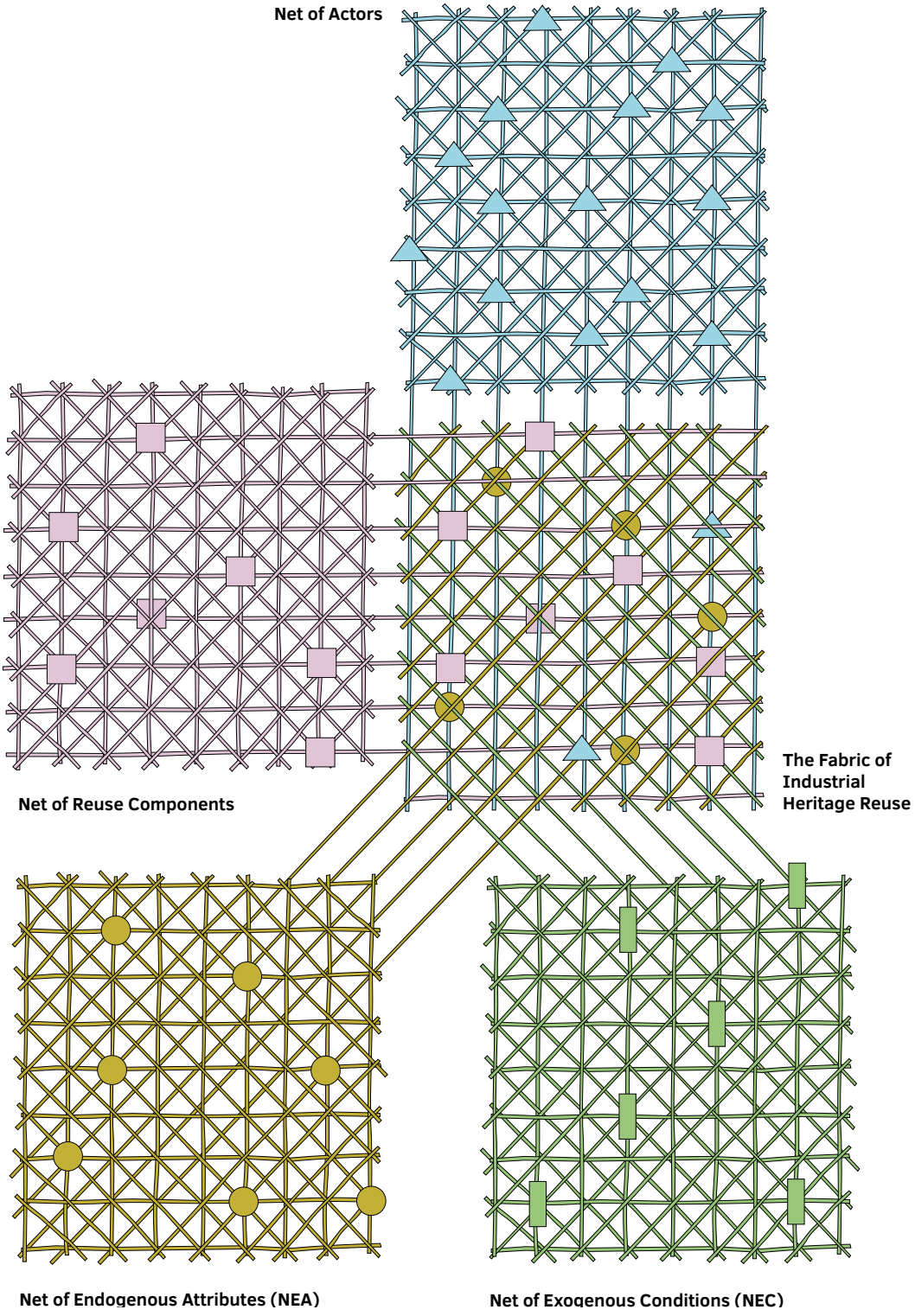


FIG. 8.4 The composition of the identified Aspects to the 'Fabric of Industrial Heritage Reuse.'

Composing the research results summarised above, it is supported that Industrial Heritage Reuse is influenced by a complex interaction between Aspects, including Factors, Actors, Components and Time (FACTs). Understanding Industrial Heritage Reuse FACTs and unravelling their interaction is an important step that can possibly open the way for the enhancement of the practice.

8.3 Links and tensions between influencing Aspects

A summary of the research findings answering the S.Q. 1-4 was presented in the previous Section. What still remains unanswered is the S.Q.5: *'How do those Aspects influence each other and how does this impact Industrial Heritage Reuse?'*

Figure 8.5 visualises the links between NEC and NEA and between Components, Factors and Actors. Based on the analysis of Chapters 5, 6 and 7, the influence of the Actors to the identified Factors and Components is presented in the following Table.

TABLE 8.1 Influence of Actors to the Factors and Components of Industrial Heritage Reuse.

	NEC	NEA	Process	Programme	Arch. Approach	Cult. Significance approach	Financial approach	Social Component	Functionality
Heritage Agencies (in listed sites)	X		X	–	X	XX	X	–	X
Local authorities	X	X	X	X	X	X/O	X	X	X/O
Local communities	X	X	X	–	–	X/O	X	XX	X
NGOs/Volunteers	X	–	X/O	–	–	X/O	X/O	X/O	X/O
Architects	–	–	X	X/O	XX	X	X	X	X
Developers	–	–	XX	XX	X	X	XX	X	X
Owners	–	X	X	X	X	X	X	X	X
Users (direct influencers)	–	–	–	X	–	–	X/O	X/O	XX
Funding Parties	X	–	X	X/O	X/O	X/O	XX	X/O	X

***XX** = highly influential, **X** = influential, **X/O** = influential only in certain cases, **–** = uninfluential*

Table 8.1 shows that only part of the Actors influence the Net of Exogenous Conditions. The analysis of Chapters 5 and 6 reveals that this influence is exerted mainly into the political, social, regulatory & policy, cultural and financial Conditions. Furthermore, the Table highlights that the Endogenous Attributes of Industrial Heritage sites are hardly influenced by the Actors' team. The influence of the local authorities, local communities and owners can be traced principally on the land use, social and legal Attributes of Industrial Heritage sites, respectively. Finally it is shown that the Actors' influence on the Reuse Components is massive. The main decision-makers influence all Components while the rest influence only part of them.

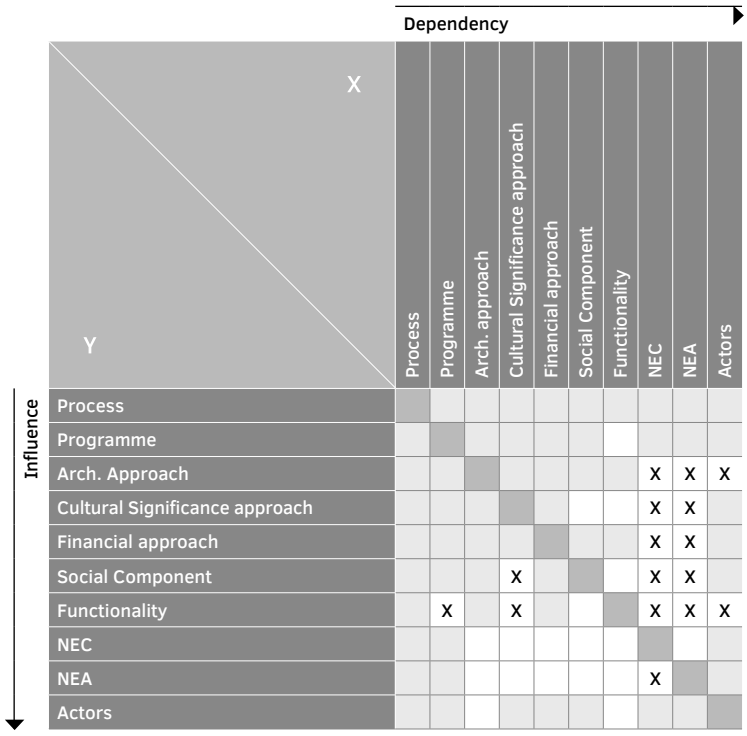


FIG. 8.5 DSM Model: Influence interaction between Industrial Heritage Reuse Aspects

The full range of the influence relations between Industrial Heritage Reuse Aspects is presented in the Dependency Structure Matrix model of Figure 8.5 (DSM model) (see TEXTBOX 7.1). The model is the result of the synthesis of all findings illustrated in the Figure 7.52 and the Table 8.1.

Figure 8.5 provides a precise answer to the influence interaction between the Reuse Aspects. In detail, it shows that most Aspects of Industrial Heritage Reuse rely on each other, being interdependent. A few links between them are unilateral. For example, the Net of Exogenous Conditions (NEC) influences the Net of Endogenous Attributes of the Site (NEA) yet the latter does not influence the former. Finally, there is a small number of combinations between Aspects where no influence or dependency has been found.

A concise answer to the influence interaction between the Reuse Aspects, which shows however the intensity of influence, is given in the Figure 8.6.

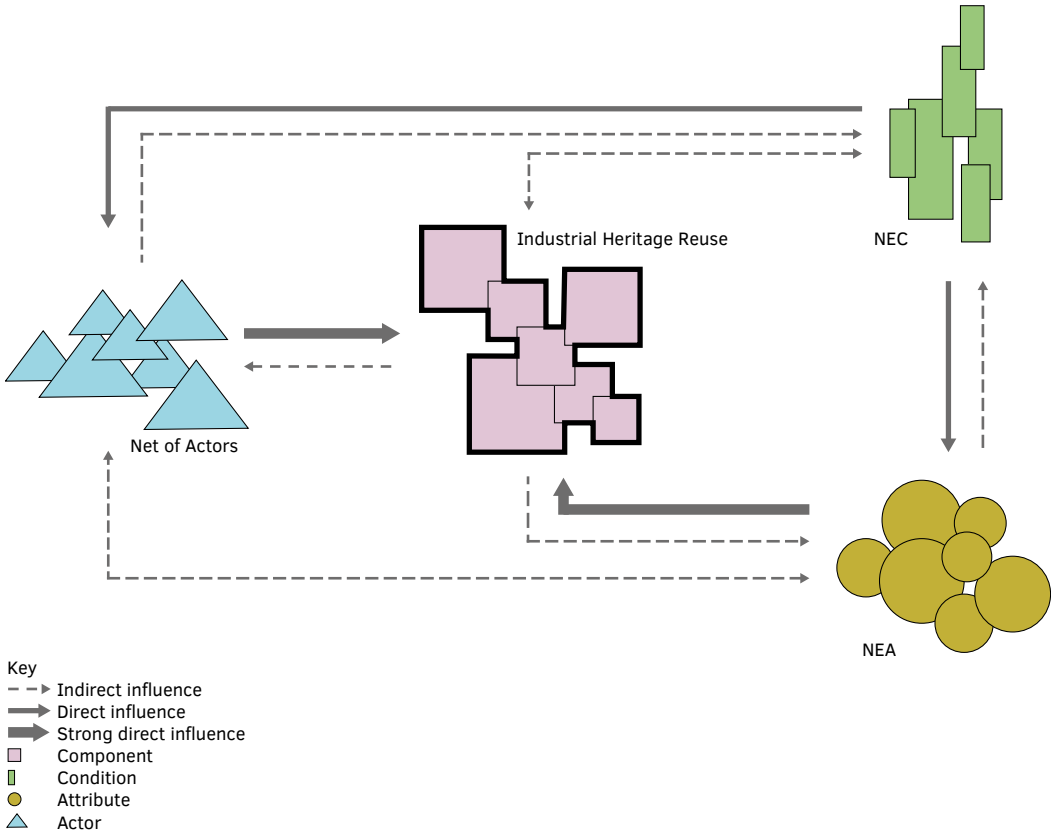


FIG. 8.6 Intensity of influence interaction between Industrial Heritage Reuse Aspects

Figure 8.6 shows that there are three levels of influence. The NEA and Network of Actors exert a strong direct influence upon the Components that form Industrial Heritage Reuse. The NEC has a direct influence upon the Net of Actors and the NEA. The rest interactions between the identified Aspects are indirect.

For deepening the understanding of those relations, it is crucial to refer to their nature. As discussed in Chapters 5, 6 and 7 the interaction between the identified FACTs is not always smooth. On the contrary, multiple tensions have been identified. Those pertain to tensions between Exogenous Conditions (see § 5.2.1), between Actors (see § 6.3) and between Components (see § 7.3). All the above complicate and hinder Industrial Heritage Reuse practice.

The high level of interaction and interdependence between the Aspects of Industrial Heritage Reuse, clearly illustrated in the Figures 8.5 and 8.6, suggests that the **enhancement of the practice relies on the improvement of each individual Aspect, the optimisation of their relations and the resolution of the identified tensions between them.**

8.4 Control shift. A Framework of guidelines for an enhanced Industrial Heritage Reuse practice

The salient objective of this doctoral research was to respond to the need for an enhanced, richer and more varied approach of Industrial Heritage Reuse. Achieving this objective and answering to the Main Research Question of the dissertation, involved firstly, the identification and thorough analysis of the Aspects that influence the practice and secondly, the exploration and documentation of their interaction and interdependences. The last step necessary is the establishment of a framework that will show which identified Aspects can be improved and how; how can the links between Aspects be optimised and how can the identified tensions be reduced.

The following framework of guidelines has a twofold significance. On the one hand, it offers a meaningful contribution to the scientific discourse, shedding light to a hazy and confusing subject by addressing the tensions and the unresolved dilemmas, highlighted in the existing literature on multiple disciplines and in this research, too. On the other hand, it informs future practice and provides guidance, offering a useful springboard for the stakeholders of Industrial Heritage Reuse, capable of practical implementation.

Control Shift: Guidelines for an enhanced Industrial Heritage Reuse practice

1. In Industrial Heritage Reuse, **a proactive approach** has advantages, impeding the dereliction that elevates the cost and renders the attraction of investors harder.
2. **The preparation stage** of Industrial Heritage Reuse is significant for the launch and the direction of a project.
3. **The selection of the right timing** for the implementation of a project, which depends on the interaction of the NEC, the NEA and the dynamics of the Actors' team, is highly important.
4. **Consultation with direct and indirect influencers** in the preparation stage of a project can provide valuable insights for the handling of the Reuse Components and it can also have a positive **impact in the occupation & management stage** of the Reuse.
5. The **examination of reference projects and the consultation of international experts** is an important method that can inform the handling of Reuse Components.
6. **Rebranding** is a valuable step that precedes the physical transformation of Industrial Heritage, influencing the financial and social components of its Reuse. Rebranding however should be employed with caution based on the comprehensive concept of sustainability, as it may also contribute to ambiguous developments.
7. Before or during the physical transformation of a complex, **'open days'** can serve as a valuable instrument for the engagement of key Actors, the enhancement of the process and the opening of multiple possibilities for the improvement of cultural significance protection, social returns and economic benefits.
8. **An interim use** presents multiple merits. It can serve as a test phase highlighting a financially and socially sound future programme while stressing operational challenges. It can also generate interest and awareness among stakeholders. Furthermore, it can be used as a pressure point for the listing of the complex. Lastly, the interim use prevents vacancy, delaying the structural deterioration of the complex.
9. **The creation and prompt delivery of the designed open space** in a redevelopment scheme plays an important role for the perception of the redevelopment from the public and for the attraction of prospective investors, partners, users and visitors.

10 **The selection of tenants/users**, which largely depends on the drives and the goals of the main decision-makers, is an important step in the process that determines the character of the project and influences its financial performance.

11 **The management of the delivered outcome** plays a crucial role for the operation and financial viability of the reuse site.

12 **Branding, continuous reinvention and innovation** during operation are essential, yet need to be guided by a comprehensive strategy that draws from the programme, the cultural significance approach, the social components and the financial approach, too.

13 **Flexibility and creativity** in the process are essential. A flexible process that allows the emergence of details overtime, leaving room for change, negotiation and experimentation has direct and indirect financial advantages, minimising the risks for the developers while allowing them to respond better to the shifting market demands. Flexibility and creativity also allow to deal successfully with surprises which are a typical characteristic of Industrial Heritage and come up with solutions on the spot. In a flexible process extra attention is needed on the social and financial Components of the Reuse.

14 **The adaptability of a Reuse project** to the shifting Exogenous Conditions is highly important. Sustaining momentum and success is hard. The key is to grasp the NEC's shifts and respond to them efficiently. In detail, it is important to acknowledge the changes in the available sources of funding and engage in a continuous process of fundraising to secure the continuity of the influx of assets and grants despite the alterations. Furthermore, it is crucial to employ continuous reinvention and innovation to respond to the rising competition from similar sites, the shifting Sociocultural Exogenous Conditions and to the changing expectations of the public.

15 **An Incremental process** presents multiple merits. It sustains the momentum, encourages further investments and provides the opportunity to alleviate existing operational problems. In order to avoid piecemeal gestures and a problematic operation, such a process should be guided by a stable coordinator with a comprehensive plan.

16 **Networking with other industrial sites** presents multiple merits. It facilitates branding and contributes to the attraction of visitors, having in turn a positive financial and social impact. In regard to the industrial museums and visitor attractions, networking also has a positive impact on the preservation of the site's cultural significance. Placing the site in a broader context presents opportunities for a comprehensive interpretation of heritage.

17 **Changes in the process due to political and/or economic reasons** should be followed by a fundamental shift in the Reuse strategy based on the comprehensive concept of sustainability.

18 **The new programme should be compatible with the existing fabric**. Compatibility can be traced in relation to the size and spatial requirements of the new use as well as its symbolic relation with the existing heritage site.

19 **A mixed use programme** presents multiple advantages. Firstly, it attracts a wide range of people, increasing the social added value of the project. Secondly, when there is synergy between functions, a mixed use programme strengthens the project's financial viability. Thirdly, it addresses the challenges posed by the Endogenous Attributes of the site (big size, remote location, elevated cultural significance) more effectively.

20 In a multifunctional programme **a combination of complementary functions is important**.

21 In a multifunctional programme **the synergy between the project's functions and the context's functions** is crucial for the financial viability and the social impact of the scheme. This synergy can be achieved by balancing commercial and sociocultural functions.

22 **A combination of functions that keeps the site alive around the clock all year long** is desirable for security and operational reasons.

23 **The quality of the designed open space** and its characteristics play a crucial role for the social impact of Industrial Heritage Reuse, both during its preparation and during its operation. Its programme, its design but most importantly its qualitative characteristics make it a key supplement or a burden to the project while establishing its relationship with the public realm and the local community.

24 **When the new programme of a site bears no relation to its old use, the organisation of a small exhibition on its history can provide valuable insights about its former function, offering sociocultural added value and playing an educational role.**

25 **The listing** of a former industrial site can contribute to a respectful architectural intervention and to the preservation of a site's cultural significance, yet it cannot ensure them.

26 **A balance between contrast and influence by the existing fabric is necessary for the preservation of the site's character.** This balance can only be achieved if the architectural and the cultural significance approach are influencing each other.

27 **Allowing public access** in a reused Industrial Heritage site (fully or partially) makes it more open and welcoming while integrating it better to the social realm.

28 **A balance between architectural expression and safeguarding of cultural values** is necessary for the preservation of the site's character.

29 The **Aspects contributing to a sympathetic architectural intervention** include the statutory protection of a site; the process followed for its Reuse; the understanding of its Endogenous Attributes; the synergy with the cultural significance approach and the accommodation of the social Component; the multidisciplinarity of the stakeholders' team; the attitude of the key decision-makers as well as the compatibility of the selected programme and the accommodation of its needs, which depends largely from the skills and experience of the architect.

30 **Research and documentation** (that form part of the Process) help to prioritise and decide on the appropriate balance between cultural significance preservation and architectural interventions, in order to satisfy the needs of the new programme, increase the functionality of the outcome and safeguard the values of the heritage site.

31 **Interpretation** is necessary for the safeguarding of the site's intangible values and the dissemination its history. Special attention is needed in the interpretation of **the machinery and installations** preserved in reused industrial sites. Interpretation creates social added value and makes the site appealing to a broader audience.

32 **The retention of the historic names of the complex** and its buildings serve as a direct reference to the site's former use, contributing positively to the preservation of its cultural significance.

33 **The Aspects leading to a respectful cultural significance approach** include the statutory protection of the reused site; the process followed for its Reuse (e.g. documentation, flexibility to make adjustments) and the understanding of its Endogenous Attributes; the multidisciplinarity of the stakeholders' team; the attitude and drive of the key decision-makers (e.g. allocation of necessary funds for cultural significance preservation and interpretation); the skills and experience of involved stakeholders; the architectural approach and the compatibility of the selected programme.

34 **The preservation of machinery in situ is important for the safeguarding of the cultural significance of an Industrial Heritage site. The Aspects favouring the preservation of machinery in situ** in an Industrial Heritage Reuse scheme include the statutory protection of machinery; the compatibility of the selected programme; the multidisciplinarity of the stakeholders' team; the attitude and drive of the key decision-makers (e.g. allocation of necessary funds for machinery preservation and interpretation); the skills and experience of involved stakeholders and the architectural approach.

35 **Striking a balance between the preservation of cultural significance and the application of safety and comfort standards is necessary yet challenging**.

36 **Aspects that encourage investments for Industrial Heritage Reuse** include the sociocultural, economic, political and regulatory Exogenous Conditions (e.g. awareness of Industrial Heritage cultural significance, positive precedents, good economic climate, availability of funders and financial support, political ambitions to reverse the tarnished image of an area, statutory protection of the site), Endogenous Attributes (e.g. advantageous location, high cultural significance which will allow to source grant money, cheap price) and traits of key decision-makers (e.g. special interests and willingness to enter in a collaboration).

37 **The financial viability of a reused Industrial Heritage site depends on an array of Aspects.** Those include financial Exogenous Conditions (e.g. a financial crisis, financial support from the public sector) and unforeseen events (e.g. a natural disaster); Endogenous Attributes (e.g. the effects of a remote location can be low visitor numbers and lack of passing trade); the characteristics, synergies and social appeal of the new programme, the Process (e.g. the phasing of planning and delivery and the attraction of tenants/users); the decisions, skills and experience of the stakeholders responsible for the site's management, as well as the management of the delivered outcome (e.g. branding strategy, attraction of funds and grants and periodic adjustment of the financial strategy).

38 **Enabling development** may be considered when funding for Reuse is available yet insufficient to cover the conservation deficit of a heritage site. Enabling development should respect and not overshadow in any way the heritage site.

39 **A viable model for the financing of an industrial museum/visitor attraction relies on the mix of funding sources**. This mix can include: revenue generated by the entrance tickets and secondary commercial functions (e.g. shop, hiring of spaces for events, café), sourcing grants from available funders from the local to the European level, harnessing volunteer power and donations through a friends organisation.

40 **An elevated social added value of an Industrial Heritage Reuse scheme can be achieved by a combination of the following Aspects:** an elevated level of involvement and control by stakeholders such as the local authority and the local community; a socially conscious transformation and operation process; a socially relevant and compatible Programme (e.g. responsive to social Exogenous Conditions and the Endogenous Attributes, local amenity, educational pole, source of pride, creation of jobs, impact to the local economy, catalyst of new social links) and a socially aware Cultural Significance approach.

41 Every Industrial Heritage Reuse scheme that makes accessible a site that was formerly a no-go area offers some social added value. **The social sustainability** of the project however depends largely on the ratio of the offered social added value to the effects of displacement and social exclusion, which are frequent 'side effects' of heritage regeneration.

42 **Reversing the tarnished social status of an area** is a lengthy process and requires interventions for the alleviation of spatial, financial and social problems.

43 **The relationship of the site with the local community** is shaped by the character and frequency of events during operation, in Industrial Heritage Reuse projects with a new cultural programme.

44 **Social engagement** during the Process is crucial for the operation of new cultural programmes and especially for industrial museums and visitor attractions.

45 **The creation of a functional** reused industrial site depends on the combination of the following Aspects: Exogenous Conditions (mainly regulatory conditions) that facilitate the intervention in historic buildings; Appropriate Endogenous Attributes (e.g. physical characteristics with high potential); a compatible new programme; a far-sighted financial approach that allocates funds for a proper refurbishment and for the site's maintenance; a careful architectural Approach (e.g. careful detailing and provisions for the necessary installations) and a well-organised operation process.

46 **Achieving functionality and accommodating the requirements of a new programme without compromising the cultural significance of the heritage site** requires a suitable architectural and financial approach.

47 **Trying to fit an existing programme into an Industrial Heritage site is more challenging and usually leads to more damage than conceiving a programme based on the capacity of the site.** An informed and respectful architectural approach however can accommodate the elevated requirements of the new programme without harming its cultural significance.

48 **Retaining the inherent messiness of a historic industrial site** is important as it pertains to a significant part of its character. The retention of the inherent messiness however has been proven quite challenging.

49 **The action of the party that initiates** the project is highly important.

50 **An interdisciplinary approach** is crucial, aiding to determine the right balance between preservation, change, financial, social and functionality Components. An interdisciplinary approach can inform and shape a compatible intervention.

51 **The attitude of the decision-makers and their drive** is decisive for the result of the Reuse. Without a positive attitude and convergent drives, the current challenges are likely to lead prospective Industrial Heritage Reuse projects to problems or failure.

52 The **Coordination** of a Reuse project, influences the action of the stakeholders' team and it is highly important for its process, outcome and operation.

53 **The social underpinning of Industrial Heritage Reuse projects and the engagement of the local community are essential**, across the course of a project. Lack of those characteristics can render it vulnerable in times of crisis or not durable after delivery.

54 **Continuous training and familiarity with the particularities of Industrial Heritage** are important as they shape the approach of the stakeholders towards the historic site and positively influence their cooperation.

55 **Determination and tenacity of the decision-makers** is important.

56 **A good collaboration and supplementary role between stakeholders** is crucial for the outcome of the Reuse. In contrast, a bad collaboration can lead a project to a dead-end, delays or unsuccessful interventions.

57 **Key personalities** can keep the project afloat.

Before closing this dissertation there is a need to address the latent objective of this research, namely, the exploration of the concept of 'Control shift' – a reinterpretation of the topical and highly perplexing axiom 'Managing change'.

Through this dissertation's analysis, it was shown that the identified Actors only have partial control over the outcome of the Reuse practice. It was proven that they mainly influence the Reuse Components, yet they have hardly any sway on the Net^2 of Factors, which affects massively Industrial Heritage Reuse. Therefore, despite their important role, it would be erroneous to support that any Actor or team of Actors are empowered to fully control the outcome of the Reuse practice. However, this does not imply that the situation is out of control either.

Control shift is about interpreting and accepting the intrinsic heritage constants, grasping the dynamic contextual variables and based on the understanding of their combined effect, taking informed decisions for the formulation of the Reuse Components, setting boundaries and maintaining a balance between them. The Framework developed in this dissertation can be a useful springboard for the enhancement of this perplexing yet exciting venture.

8.5 Future research

This dissertation offered a holistic, multileveled and multifocal view of Industrial Heritage Reuse practice, based on a retrospective, international analysis. It offered a wide range of evidence which can serve as a solid basis for future research. A natural progression of this work would be to extend its object as well as its geographical and chronological scope. In detail, based on the methodology of this research, future work is necessary for shedding light to the highly challenging relics of the 20th century Industrial Heritage, that are at present in great peril.

Furthermore, future studies should focus on the Industrial Heritage Reuse practice on Eastern Europe, an intriguing and relatively underexplored terrain. Such a research would complement the present study, providing a broader and richer view on the European practice and its asymmetries. Moreover, the post-financial crisis period (from the mid-2010s onwards), that was not analysed in this dissertation is an intriguing one which could be usefully explored in further research.

The present dissertation contributed to the dissolution of the confusion in regard to the Aspects (Factors, Actors, Components, Time) that influence the practice of Industrial Heritage Reuse. The in-depth analysis as well as the identification of links and tensions between Aspects contributed to the formulation of a framework for the enhancement of the practice. What was given significantly less attention however was the rate of influence of the Aspects. A quantitative research collecting and analysing data that reflect the rate of influence of each Aspect could produce useful findings for the guidance of practitioners.

This dissertation along with the wide range of evidence offered, it also highlighted several problems that could be used as starting points for future research and future action. In regard to future research a key issue was identified, that merits special attention as it was not satisfactorily resolved in the majority of the cases examined. Considerably more work needs to be done to determine innovative ways of increasing the functionality of converted industrial sites without sacrificing their cultural significance or financial viability.

In regard to future practice, on an international level greater efforts are needed to ensure the continuation of the care of both industrial relics and reused industrial sites within the new Exogenous Conditions defined in the post-financial crisis period (mid-2010s). On a national level, there is a need to strengthen the collaboration between administrational bodies and minimise as far as possible bureaucracy; it is important to fill in the gaps of documentation and evaluation of the national Industrial Heritage stock for having an overview and taking informed decisions about it. Finally, it is crucial to encourage the involvement of well trained and experienced experts positioned in public administrational bodies who have the aforementioned overview in projects of Industrial Heritage Reuse.

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Appendices

APPENDIX 1

Case study protocol

Based on Yin (2009,80-90)

Level of analysis B

A. Introduction to the case study

- Cases of European countries will be studied for exploring:
  - the evolution of Industrial Heritage care and reuse practice from its early phase up to this day and explain:
  - how do the sociocultural and economic circumstances of each country referred to as the 'contextual conditions' have influenced the practice (Proposition 1)

B. Data collection procedures

- List of selected case studies to be visited

Level of contribution	Country
Forerunner	**1.** United Kingdom
Follower	**2.** The Netherlands **3.** Spain
Latecomer	**4.** Greece

- Techniques: Historical and archival research

C. Outline of case study report

- Discovering Industrial Heritage and the first steps to protect it
- The maturation of the process
- First attempts to reuse industrial buildings
- Key developments overtime
- Key influencing Conditions
- Shifts and the state of Industrial Heritage Reuse practice today

D. Case study questions

1. When did the first steps for the protection of Industrial Heritage take place and what were the developments?
2. How have these efforts evolved over the last decades?
3. When were the first attempts to reuse industrial buildings?
4. How has Industrial Heritage Reuse evolved overtime?
5. What were the key Conditions influencing the practice and how have they done so?
6. Which are the main shifts that took place in the practice since the early days and what is the state of Industrial Heritage Reuse practice today?

Level of analysis C

A. Introduction to the case study

- Cases of best practice of Industrial Heritage Reuse will be studied in order to explain:
  - how components such as the process, new programme, the architectural approach, the cultural significance approach, the social and financial approach and the functionality influence the outcome of Industrial Heritage Reuse (proposition 3).
  - how the involved stakeholders influence the outcome of Industrial Heritage Reuse (proposition 2)
  - how does the interplay of all the above Factors influence the outcome of Industrial Heritage Reuse (proposition 4)
- and explore:
  - if there are other influencing Aspects besides the ones stated in proposition 1

B. Data collection procedures

- List of selected case studies to be visited

Country	UK	NL	ES	GR
Early case	Ironbridge Gorge Museum	Jannink Complex	Mnactec	Centre of Technical Culture
	Great Western Railways Works Swindon	Textiel Museum, Tilburg	Bodegas de Jerez	Technopolis
Later case	Stanley Mills	Westergasfabriek	Ca L'Aranyo, 22@	Lavrion Technological and Cultural Park
	Ancoats district	DRU Industry Park	Tabacalera, Madrid	Tsalapatas complex
Recent case	King's Cross	Energiehuis	Bombas Gens	Mill of Pappas

- Techniques: Historical and archival research, direct observation; interviews with stakeholders and online surveys.

C. Outline of case study report

- Summary
- Analysis
- Historic use
- Reuse Preparation
- Interim use (if applicable)
- Reuse process
- Occupation and management
- Shifts
- Evaluation of Reuse Components

D. Case study questions

1. What were the basic features of the historic use of the site? (construction, architecture, key extensions/demolitions, closure)
2. How was the decision-making process formed, from the stage of preparation to the stage of delivery and how was it influenced?
3. How did the stakeholders influence that process?
4. What were the basic features of the new use of the site after its conversion and how has the operation shifted over the years?
5. What is the rate of (dis)satisfaction over the outcome of the reuse by the involved stakeholders?
6. How have the influencing Factors affected the result of the reuse?

APPENDIX 2

Final interview Protocol and Questionnaires

Final interview protocol

S.Q. / Level of analysis	Who?	Why?	How?
S.Q.3	– Special developers – Heritage services – Local authority planning services – Local and global NGOs – Funders – Volunteer organisations	**A.** Explore the role of each stakeholder in the practice of Industrial Heritage Reuse **B.** Explore the influence and power balance of stakeholders on the result of Industrial Heritage Reuse	**Questionnaire type 1** Face to face interviews or Skype/ phone interviews
S.Q.1_B Intermediate level	– Specialists	**A.** Explore the shifts, problems, achievements and specific developments taking place in a country related with the care and reuse of Industrial Heritage	**Questionnaire type 2** Face to face interviews or Skype/ phone interviews
S.Q.3_C Individual units	Decision-makers – Architects – Developers – Owners – Heritage service clerks – Local authority clerks/politicians – Funders – Project managers	**A.1** Explore the preparation and decision-making process that led to the reuse of the former industrial site **A.2** Explore the influence of the involved stakeholders and its impact on the outcome of the reuse **A.3** Explore the rate of (Dis)satisfaction over the outcome of the reuse by the involved stakeholders **B.** Learn more and/or clarify data about specific case studies.	**Questionnaire type 3** Face to face interviews or Skype/ phone interviews
	Other stakeholders – Users – Local communities – Volunteers	**A.** Explore interviewees' personal experience **A.3** Explore the rate of (dis)satisfaction over the outcome of the reuse by the involved stakeholders **A.4** Explore the occupation and management phase of the reused site. **B.** Learn more and/or clarify data about specific case studies.	**Questionnaire type 4** Face to face interviews or online survey

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URBAN ENVIRONMENT LABORATORY

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Questionnaire type 1

The purpose of this questionnaire is twofold: Firstly to explore the role of your organisation/ profession in the practice of Industrial Heritage Reuse process in your country and secondly to explore the influence and power balance of stakeholders on the result of Industrial Heritage Reuse in your country.

The results of this inquiry will be presented as a part of the PhD research titled *"Ctrl Shift. European Industrial Heritage Reuse in review"*, which is conducted in the Technical University Delft (TUDelft) in cooperation with the National Technical University of Athens (NTUA).

Researcher: Theodora Chatzi Rodopoulou, PhD Candidate (t.chatzirodopoulou@tudelft.nl)

A. Interviewee's profile

Date:

- A.1. Institution (if applicable)
- A.2. Interviewee
  - A.2.1. Name
  - A.2.2. Profession
    - A.2.2.1. Years of service in the institution (if applicable) or other experience

B. Role of stakeholder

- B.1. What is the role of your organisation/profession in the practice of Industrial Heritage Reuse process in your country?
- B.2. What are the achievements of your organisation/profession in relation to the practice of Industrial Heritage Reuse process over the last decades?
- B3. What problems do you identify as a professional in relation to the practice of Industrial Heritage Reuse process?
- B4. Does your organisation have any plans for future action in relation to the practice of Industrial Heritage Reuse process? If yes, please elaborate.

C. General perception

Ask the respondent to elaborate on organisation/profession *specific matters*

D. General perception

D.1. Stakeholders

D.1.1. How would you rate the influence/impact of the following stakeholders (1-8) on the overall result of the reuse of an industrial monument? *Please choose the option you are most comfortable with.*

1 **Architect**
High | Relatively significant | Average | Relatively insignificant | Totally insignificant
Please elaborate

2 **Developer**
High | Relatively significant | Average | Relatively insignificant | Totally insignificant
Please elaborate

3 **Owner**
High | Relatively significant | Average | Relatively insignificant | Totally insignificant
Please elaborate

4 **Heritage service**
High | Relatively significant | Average | Relatively insignificant | Totally insignificant
Please elaborate

5 **Municipality**
High | Relatively significant | Average | Relatively insignificant | Totally insignificant
Please elaborate

6 **User**
High | Relatively significant | Average | Relatively insignificant | Totally insignificant
Please elaborate

7 **Local community**
High | Relatively significant | Average | Relatively insignificant | Totally insignificant
Please elaborate

8 **Volunteer**
High | Relatively significant | Average | Relatively insignificant | Totally insignificant
Please elaborate

9 **Other**
High | Relatively significant | Average | Relatively insignificant | Totally insignificant
Please elaborate

D.1.2. How important is the coordination of a reuse project for its success? Which stakeholder do you think is the most appropriate coordinator for such a project? Please explain the reasons.

THANK YOU!

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Questionnaire type 2

The purpose of this questionnaire is to explore the achievements, problems, shifts and the specific developments taking place in your country related with the care and reuse of Industrial Heritage.

The results of this inquiry will be presented as a part of the PhD research titled *"Ctrl Shift. European Industrial Heritage Reuse in review"*, which is conducted in the Technical University Delft (TUDelft) in cooperation with the National Technical University of Athens (NTUA).

Researcher: Theodora Chatzi Rodopoulou, PhD Candidate (t.chatzirodopoulou@tudelft.nl)

A. Interviewee's profile

Date:

- A.1. Institution (if applicable)
- A.2. Interviewee
  - A.2.1. Name
  - A.2.2. Profession
    - A.2.2.1. Years of service in the institution (if applicable) or other experience

B. General Developments

- B.1. What are the achievements taken place in your country over the last decades in relation to the practice of Industrial Heritage care and reuse process?
- B.2. What are the problems Industrial Heritage faces in your county?
- B.3. What are the shifts taken place in your country over the last decades in relation to the practice of Industrial Heritage care and reuse process?

C. Specific developments

Ask the respondent to elaborate on country-specific developments

THANK YOU!

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Questionnaire type 3

The purpose of this questionnaire is threefold: Firstly, to explore the preparation and decision-making process that led to the reuse of the former industrial site, secondly, to explore the influence of the involved stakeholders and its impact on the outcome of the reuse and thirdly, to explore the rate of (dis)satisfaction over the outcome of the reuse as articulated by the involved stakeholders

The results of this inquiry will be presented as a part of the PhD research titled *"Ctrl Shift. European Industrial Heritage Reuse in review"*, which is conducted in the Technical University Delft (TUDelft) in cooperation with the National Technical University of Athens (NTUA).

Researcher: Theodora Chatzi Rodopoulou, PhD Candidate (t.chatzirodopoulou@tudelft.nl)

A. Interviewee's profile

Case study:
Date:

- A.1. Institution (if applicable)
- A.2. Interviewee
  - A.2.1. Name (optional)
  - A.2.2. Profession
    - A.2.2.1. Years of service in the institution (if applicable) or other experience
- A.3. Please describe your involvement and responsibilities in the process.

B. Case study decision-making process

- B.1. What were the reasons that lead to the choice of this building reuse? (if applicable)
- B.2. How come did you select this particular program for the reused building?
- B.3. What were the most important issues/considerations that drove the reuse?
- (B.4.) Which were the most important decisions that guided the redesign of the building? (for architects/designers only)
- (B.5.) Which were the most important values that were taken into consideration during the redesign of the building? (for architects/designers only)
- (B.6.) Which values of the building, if any, were finally preserved? Why? (for architects/designers only)
- B.7. Were there any problems at any stage of the process (initiative, design, construction, delivery). Please elaborate and explain if and how they were solved.
- B.8. Which are the strong and which are the weak aspects of the reuse project from your point of view?
- B.9. What were your ambitions when joining the team of the stakeholders? Were these ambitions finally realised?

C. Stakeholders

- (C.0.) Who were the stakeholders involved in the project and what were their responsibilities? (optional question. Cross reference with available data)
- C.1. Who was responsible for the coordination of the project?
- C. 2. Who made significant contributions to the project and if any what were they? In which stage of the process did they take place and why are they considered important from your point of view.
- C.3. Were there any problems in the collaboration between the stakeholders? If yes what were they and how were they resolved?

D. Perception of Success and Failure

Please rate each of the following statements (D1-D5) choosing the option you are most comfortable with.

Key:
5. Highly successful | 4. Successful | 3. Average | 2. Rather Unsuccessful | 1. Highly unsuccesful

- D.1. Do you believe that the outcome of the reuse is overall:
  Highly successful | Successful | Average | Rather Unsuccessful | Highly unsuccesful
  Please explain the reasons

- D.2. Do you believe that the architectural outcome of the reuse is:
  Highly successful | Successful | Average | Rather Unsuccessful | Highly unsuccesful
  Please explain the reasons

- D.3. Do you believe that the outcome of the reuse is financially:
  Highly successful | Successful | Average | Rather Unsuccessful | Highly unsuccesful
  Please explain the reasons

- D.4. Do you believe that the outcome of the reuse is socially:
  Highly successful | Successful | Average | Rather Unsuccessful | Highly unsuccesful
  Please explain the reasons

- D.5. Do you believe that the outcome of the reuse is functionally:
  Highly successful | Successful | Average | Rather Unsuccessful | Highly unsuccesful
  Please explain the reasons

THANK YOU!

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Questionnaire type 4

The purpose of this questionnaire is twofold. Firstly, to explore the operation phase of the reused former industrial site and secondly, to explore the rate of (dis)satisfaction over the outcome of the reuse[64] of Industrial Heritage as articulated by the involved stakeholders.

The results of this inquiry will be presented as a part of the PhD research titled *"Ctrl Shift. European Industrial Heritage Reuse in review"*, which is conducted in the Technical University Delft (TUDelft), The Netherlands and the National Technical University of Athens (NTUA), Greece.

Your opinion is crucial to the success of our study. We sincerely appreciate your efforts and time. Individual responses are anonymous and all personal data will be held in confidence. Please take 10-15 minutes of your time to complete this questionnaire and submit it in online at your earliest convenience.

Thank you in advance for your time!

Researcher: Theodora Chatzi Rodopoulou, PhD Candidate (t.chatzirodopoulou@tudelft.nl).

64 *Reuse of a building: […]* **reuse** refers to the process of reusing an old site or building for a purpose other than which it was built or designed for. (Wikipedia)

A. Interviewee's profile

Case study:
Date:

- A.1. Interviewee
  - A.1.1. Profession
  - A.1.2. Highest Educational level completed (*please circle one of the dots*)
    - A. No schooling completed
    - B. Elementary school graduate
    - C. High school graduate
    - D. Trade/technical/vocational training
    - E. Bachelor's degree
    - F. Master's degree
    - G. Doctorate degree
  - A.1.3. Age (*please circle one of the dots*)
    - A. Under 18 years old
    - B. 18-25 years old
    - C. 26-35 years old
    - D. 37-55 years old
    - E. 56-75 years old
    - F. older than 76 years
- A.2. How many years have you been using the building? (*please circle one of the dots*)
  - A. Less than six months
  - B. About a year
  - C. 1-5 years
  - D. More than 5 years
- A.3. What is your affiliation with the reused building
  - A. Living
  - B. Working
  - C. Other
- A.4. What were the reasons that lead you to the selection of this particular building to live/work/etc, (if applicable).

B. Appreciation of the reused building

- B.1. What do you like the most as a user of this reused building?
- B.2. What do you like the least as a user of this reused building?

– Perception of Success and Failure

Please rate each of the following statements (D1-D5) choosing the option you are most comfortable with.

Key:
5. Highly successful | 4. Successful | 3. Average | 2. Rather Unsuccessful | 1. Highly unsuccesful

— D.1. Do you believe that the outcome of the reuse is overall:
Highly successful | Successful | Average | Rather Unsuccessful | Highly unsuccesful
Please explain the reasons

— D.2. Do you believe that the architectural outcome of the reuse is:
Highly successful | Successful | Average | Rather Unsuccessful | Highly unsuccesful
Please explain the reasons

— D.3. Do you believe that the outcome of the reuse is financially:
Highly successful | Successful | Average | Rather Unsuccessful | Highly unsuccesful
Please explain the reasons

— D.4. Do you believe that the outcome of the reuse is socially:
Highly successful | Successful | Average | Rather Unsuccessful | Highly unsuccesful
Please explain the reasons

— D.5. Do you believe that the outcome of the reuse is functionally:
Highly successful | Successful | Average | Rather Unsuccessful | Highly unsuccesful
Please explain the reasons

Comments

THANK YOU!

APPENDIX 3

List of Experts participating in the Delphi technique

Country	Name	Capacity
UK	Keith Falconer	Head of Industrial Archaeology at English Heritage (Retired), Founder member of AIA
UK	Mark Watson	Deputy Head of Industrial Heritage, Conservation Directorate, Industrial Heritage Team, Historic Environment Scotland
UK	David de Haan	Secretary of the Association of Industrial Archaeology, Ironbridge Gorge Museum Trust curator and later director (1978-2012). Programme Director of Ironbridge Institute (1997-2012)
UK	Ian West	Industrial Archaeologist, Volunteer Ironbridge Gorge Museums
The Netherlands	Karel Loeff	Architectural Historian, director of the Erfgoedvereniging Bond Heemschut (volunteers' association)
The Netherlands	Erik Nijhof	Historian and Academic, Assistant Professor, University of Utrecht
The Netherlands	Giel van Hooff	Historian and Academic, University Researcher, Department of Industrial Engineering & Innovation Sciences, Technology, Innovation & Society, TU Eindhoven, Board Member of FIEN
Spain	Eusebi Casanelles	Founder and director of the Museu Nacional de la Ciència i de la Tècnica de Catalunya (MNACTEC) (1996-2013), President at International Committee on the Conservation of the Industrial Heritage (TICCIH), (1997,2009)
Spain	Julián Sobrino Simal	Vice-coordinator of the Plan Nacional de Patrimonio Industrial, Spain (2009-2011); Academic, Profesor titular, Escuela de Arquitectura, Universidad de Sevilla.
Spain	James Douet	Editor of the TICCIH Bulletin, Historic buildings consultant advising on conservation plans and exhibition projects
Spain	Miguel Álvarez Areces	President of INCUNA and TICCIH Spain, Economist
Greece	Christina Agriantoni	Historian, Founding member of the Greek Section TICCIH and the Industrial Museum of Hermoupolis, Curator of the Industrial Gas museum of Athens
Greece	Aspasia Louvi	Archaeologist, Director of the Piraeus Bank Group Cultural Foundation and Vice Director of the Cultural Technological Foundation of the ETBA Bank
Greece	Maria Mavroidi	Industrial Archaeologist, President of the Greek Section TICCIH
Germany	Axel Föhl	Industrial Heritage specialist since 1974 and editor of the Technische Denkmale im Rheinland publication in the Arbeitshefte series
France	Paul Smith	Industrial Heritage specialist since 1979. Historian and employee of the Direction générale des Patrimoines, Ministry of Culture France (1986-2018)

APPENDIX 4

List of interviewees

	Name	Capacity	intvw. date	*
1	Keith Falconer	Head of Industrial Archaeology at English Heritage (Retired), Founding member of AIA	9/5/2015	**F**
2	Mark Watson	Deputy Head of Industrial Heritage, Conservation Directorate, Industrial Heritage Team, Historic Environment Scotland	11/6/2015	**F**
3	Shane Gould	Senior Local Government and National Infrastructure Adviser, Historic England	21/5/2015	**F**
4	David de Haan	Secretary of the Association of Industrial Archaeology, Ironbridge Gorge Museum Trust curator and later director (1978-2012). Programme Director of Ironbridge Institute (1997-2012).	8/6/2015	**T**
5	Miles Oglethorpe	Head of Industrial Heritage, Conservation Directorate, Industrial Heritage Team, Historic Environment Scotland, President at International Committee on the Conservation of the Industrial Heritage (TICCIH), 2018-present.	24/6/2015	**O**
6	Michael Scott	Senior Heritage Management officer, Historic Environment Scotland	10/6/2015	**F**
7	Jane Corfield	Principal Conservation and Design Officer, Stoke City Council	2/6/2015	**F**
8	Darren Barker	Principal Conservation Officer Great Yarmouth Borough Council, Project Director Great Yarmouth Preservation Trust	20/5/2015	**O**
9	Rober Carr	Industrial Archaeologist	28/10/2015	**T**
10	Darren Radcliffe	Historic places adviser, Historic England	15/6/2015	**F**
11	Sally Stone	Architect and Academic, Manchester School of Architecture	16/6/2015	**F**
12	Mike Nevell	Industrial Archaeologist and Academic, Head of Archaeology, Salford University Manchester	17/6/2015	**F**
13	Ben Greener	Policy Advisor – Historic Environment, HLF	22/6/2015	**F**
14	Ian West	Industrial Archaeologist, Volunteer Ironbridge Gorge Museums	15/5/2015	**F**
15	Paul Gossage	Director of marketing and PR, Ironbridge Gorge Museums	15/5/2015	**F**
16	Joanne Smith	Librarian, Ironbridge Gorge Museums	15/5/2015	**F**
17	Rose Lloyd (education dep)	Education administrator, Ironbridge Gorge Museums	14/5/2015	**F**
18	Roger White	Academic, Senior Lecturer, Ironbridge International Institute for Cultural Heritage	9/9/2015	**F**
19	Chris Kelsall	Hostel manager, YHA Ironbridge Coalport	3/6/2015	**F**
20	Respondent 20	Artist and tenant at Jackfield tile museum, Ironbridge Gorge Museums	16/5/2015	**F**
21	Respondent 21	Shop owner/Craftswoman, Maws Craft Centre	16/5/2015	**F**
22	Respondent 22	Shop owner/Craftswoman, Maws Craft Centre	16/5/2015	**F**
23	Respondent 23	Resident, Maws Craft Centre	16/5/2015	**F**
24	Respondent 24	Front desk officer, Coalport China Works, Ironbridge Gorge Museums	16/5/2015	**F**
25	Respondent 25	Workshop demonstrator, Coalport China Works, Ironbridge Gorge Museums	16/5/2015	**F**
26	Respondent 26	Front desk officer, Museum of the Gorge, Ironbridge Gorge Museums	17/5/2015	**F**
27	Respondent 27	Demonstrator (volunteer), Blists Hill, Ironbridge Gorge Museums	17/5/2015	**F**
28	Respondent 28	Demonstrator (employee), Blists Hill, Ironbridge Gorge Museums	17/5/2015	**F**
29	Respondent 29	Front desk officer Enginuity, Ironbridge Gorge Museums	15/5/2015	**F**
30	Mike Haw	Bussiness development and Project Manager, CoRE	3/6/2015	**F**
31	Hardial Bhogal	Chief Operating Officer at Stoke-on-Trent City Council	3/6/2015	**F**
32	Respondent 32	Office manager reception, CoRE	3/6/2015	**F**
33	Respondent 33	Manager of en-CoRE	3/6/2015	**F**
34	Teressa Fox-Wells	Visitor centre manager, Middleport Pottery	4/6/2015	**F**
35	Geoff Rich	Architect, Design team Leader of Middleport Pottery conversion	16/6/2015	**F**
36	Respondent 36	Tenant of Middleport Pottery, Francis & Jellyman director and former factory worker	4/6/2015	**F**
37	Respondent 37	Visitor services assistant, Middleport Pottery	4/6/2015	**F**
38	Respondent 38	Volunteer tour guide, Middleport Pottery	4/6/2015	**F**
39	Respondent 39	Volunteer tour guide, Middleport Pottery	4/6/2015	**F**

** **F** Face to Face interviews / **T** Telephonic interviews / **O** On-line survey*

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TOC

	Name	Capacity	intvw. date	*
40	Marcus Dean	Developer, architect, Anchor Mills	11/6/2015	**T**
41	Respondent 41	Tenant at Anchor Mills. Advertising and Signage company owner.	11/6/2015	**F**
42	Respondent 42	Carpenter. Part of maintenance and refurbishment team, Anchor Mills	11/6/2015	**F**
43	Respondent 43	Marketing administration. Employee, Anchor Mills	11/6/2015	**F**
44	Respondent 44	Resident, Anchor Mills	15/6/2015	**O**
45	Respondent 45	User of Royal Mills. Employee of Advertising company housed in the Royal Mills	17/6/2015	**F**
46	Respondent 46	Tenant of Royal Mills. Clothing agency housed in the Royal Mills	17/6/2015	**F**
47	Respondent 47	Tenant of Royal Mills, Wig making company housed in the Royal Mills	17/6/2015	**F**
48	Phil Collings	Senior Area Manager Greater Manchester, Homes and Communities Agency	25/6/2015	**T**
49	Kate Dickson	Heritage Works Trust director, formerly Ancoats Buildings Preservation Trust Director	15/6/2015	**F**
50	Respondent 50	Resident of Royal Mills (dental surgeon)	24/6/2015	**O**
51	Respondent 51	Resident of Royal Mills (art teacher)	21/6/2015	**O**
52	Respondent 52	Resident of Royal Mills (recruiting)	21/6/2015	**O**
53	Respondent 53	Resident of Royal Mills (doctor)	21/6/2015	**O**
54	Respondent 54	Resident of Ice Plant (administrative)	20/6/2015	**O**
55	Respondent 55	Resident of Waulk Mills (office manager)	19/6/2015	**O**
56	David MacLehose	Former Deputy director Phoenix Trust. Project Manager, entrepreneur.	10/6/2015	**T**
57	Robert Smith	Resident & secretary of owners association, Stanley Mills	12/6/2015	**F**
58	Lauren Elliot	Visitor Services Manager, Stanley Mills	12/6/2015	**F**
59	Patricia Sanderson	Factor of East and Mid Mill, Stanley Mills	23/6/2015	**T**
60	Respondent 60	Resident of Stanley Mills	13/7/2015	**O**
61	Respondent 61	Resident of Stanley Mills	13/7/2015	**O**
62	Respondent 62	Resident of Stanley Mills	13/7/2015	**O**
63	Respondent 63	Resident of Stanley Mills	14/7/2015	**O**
64	Respondent 64	Resident of Stanley Mills	21/7/2015	**O**
65	Tony Giddings	Developer, Board Member of Argent	6/7/2015	**F**
66	Orsalia Dimitriou	User, Architect, Associate lecturer, Central Saint Martins, King's Cross	22/7/2015	**F**
67	Malclom Tucker	Member of the King's Cross Conservation Advisory Committee (KXCAAC) in 1989. Engineering Historian and Industrial Archaeologist.	30/11/2015	**T**
68	Respondent 68	User, College student, Central Saint Martins, King's Cross	29/6/2015	**F**
69	Respondent 69	Tenant, Restaurant manager, Granary complex, King's Cross	29/6/2015	**F**
70	Laura Leighfield	Office manager, McArthurGlen, Swindon	1/7/2015	**F**
71	Ian Leith	Archivist, Historic England Archive, Swindon	2/7/2015	**O**
72	Keith Austin	Archivist, Historic England Archive, Swindon	3/7/2015	**O**
73	Tim Bryan	Museum professional, Curator of the STEAM Museum, Swindon	27/7/2015	**F**
74	Respondent 74	Shop tenant, Barber, Custard Factory	3/7/2015	**F**
75	Respondent 75	Shop employee, Skateboarder, Custard Factory	3/7/2015	**F**
76	Respondent 76	Shop tenant, vintage shop, Custard Factory	3/7/2015	**F**
77	Respondent 77	Shop employee, DJ Shop, Custard Factory	3/7/2015	**F**
78	Respondent 78	Bar supervisor, Custard Factory	3/7/2015	**F**
79	Respondent 79	Receptionist, Custard Factory	3/7/2015	**F**
80	Respondent 80	Shop employee, Retail, Custard Factory	3/7/2015	**F**
81	Hildebrand de Boer	ERIH program manager	22/4/2015	**F**
82	Anna Pereira Roders	Architect and Academic, Assistant Professor, Eindhoven University of Technology	1/10/2015	**F**
83	Job Roos/Olivier Graeven	Partner and co-founder of Braaksma en Roos architectural office and Academic, Associate professor TU Delft/Project architect in Braaksma & Roos architectural office	15/7/2016	**F**
84	Alexander de Ridder	Architect and Academic, Lecturer, TUDelft	20/5/2016	**F**
85	Wessel de Jonge	Architect and Academic, Professor TUDelft	7/7/2016	**F**
86	Karel Loeff	Architectural Historian, director of the Erfgoedvereniging Bond Heemschut (volunteers' association)	13/7/2016	**F**

** **F** Face to Face interviews / **T** Telephonic interviews / **O** On-line survey*

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	Name	Capacity	intvw. date	*
87	Erik Nijhof	Historian and Academic, Assistant Professor, University of Utrecht	31/5/2016	**F**
88	Giel van Hooff	Historian and Academic, University Researcher, Department of Industrial Engineering & Innovation Sciences, Technology, Innovation & Society, TU Eindhoven, Board Member of FIEN	3/6/2016	**F**
89	Jur Kingma	Volunteer, Member of Zaans Erfgoed, Member of NedSEK	6/2/2017	**O**
90	Verra Cerrutti	Researcher, Social Anthropologist	31/5/2016	**F**
91	Jean-Paul Corten	Senior Policy officer, Rijksdienst voor het Cultureel Erfgoed	4/7/2016	**F**
92	Frank Strolenberg	Program manager Herbestemming & Agenda Toekomst Religieus Erfgoed, formerly director of Herbestemmen-programme, Rijksdienst voor het Cultureel Erfgoed	13/7/2016	**F**
93	Ernst Homburg	Historian and Academic, Professor of History of Science and Technology, University of Maastricht	7/6/2016	**F**
94	Leo Hardus	Vice president of FIEN	1/7/2016	**F**
95	Peter van Velzen	Architect, Owner of Sodafabriek, Entrepreneur	5/10/2016	**F**
96	Boudewijn de Bont	Director of Nico de Bont B.V. construction company	7/10/2016	**F**
97	Eric Gude	Concept developer, Van Nelle fabriek	16/9/2016	**F**
98	Bert Haer	Municipal Monuments Office employee, Municipality of Enschede	12/12/2016	**F**
99	Sake Bonne de Boer	Architect, Project Architect in the reuse of Jannink and the of the TextielMuseum	11/10/2016	**F**
100	Hans Jannink	Senior projectmanager at De Woonplaats	12/12/2016	**F**
101	John Nijhuis	Director of Stichting Cultureel Erfgoed Enschede	28/9/2016	**F**
102	Respondent 102	Resident Jannink	28/9/2016	**F**
103	Respondent 103	Resident Jannink	28/9/2016	**O**
104	Respondent 104	Resident Jannink	28/9/2016	**O**
105	Respondent 105	Resident Jannink	28/9/2016	**O**
106	Respondent 106	Resident Jannink	29/9/2016	**O**
107	Respondent 107	Resident Jannink	29/9/2016	**O**
108	Respondent 108	Resident Jannink	1/10/2016	**O**
109	Respondent 109	Resident Jannink	2/10/2016	**O**
110	Respondent 110	Resident Jannink	6/10/2016	**O**
111	Respondent 111	Resident Jannink	6/10/2016	**O**
112	Respondent 112	Resident Jannink	23/10/2016	**O**
113	Respondent 113	Resident Jannink	9/11/2016	**O**
114	Bea Nieuwenhuis	Project manager & coordinator fundraising, TextielMuseum	7/10/2016	**F**
115	Guus Boekhorst	Museum registrar, TextielMuseum	29/11/2016	**F**
116	Jantiene van Elk	Librarian, TextielMuseum	7/10/2016	**F**
117	Respondent 117	Laundry artist (employee), TextielMuseum	7/10/2016	**F**
118	Respondent 118	TextielMuseum employee	12/10/2016	**F**
119	Respondent 119	TextielMuseum employee	12/10/2016	**F**
120	Respondent 120	TextielMuseum employee	13/10/2016	**F**
121	Respondent 121	TextielMuseum employee	13/10/2016	**F**
122	Respondent 122	TextielMuseum employee	17/10/2016	**F**
123	Respondent 123	TextielMuseum employee	19/10/2016	**F**
124	Respondent 124	TextielMuseum employee	27/10/2016	**F**
125	Respondent 125	TextielMuseum visitor	20/10/2016	**F**
126	Nurah Abdulkadir	Marketing Communication manager, Westergasfabriek BV	5/7/2016	**F**
127	Liesbeth Jansen	Former director of Westergasfabriek	30/9/2016	**F**
128	Evert Verhagen	Project Manager of Westergasfabriek (1990-2005)	29/6/2016	**F**
129	Jack van Lieshout	Member of Friends of Westerpark	5/7/2016	**F**
130	Isaac Kalisvaart	Developer, CEO in MAB (2001-2004)	11/7/2016	**F**
131	Martine Fransman	Alderwoman in the District Westerpark (1998-2001)	11/7/2016	**F**
132	Respondent 132	User/tenant, Restaurant manager Mossel &Gin	5/7/2016	**F**
133	Respondent 133	User/tenant, Gym instructor	5/7/2016	**F**

** **F** Face to Face interviews / **T** Telephonic interviews / **O** On-line survey*

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	Name	Capacity	intvw. date	*
134	Respondent 134	User/tenant, Culinary Creative company owner	5/7/2016	**F**
135	Respondent 135	Security guard, Employee	5/7/2016	**F**
136	Respondent 136	User/tenant, Graphic designer	5/7/2016	**F**
137	Respondent 137	User/tenant, The HUB facility manager	5/7/2016	**F**
138	Respondent 138	User/tenant, Digital online marketing people officer	5/7/2016	**F**
139	Respondent 139	User/tenant, Westergasterras facility manager	5/7/2016	**F**
140	Respondent 140	User/tenant, Owner of the fashion company INFACT	5/7/2016	**F**
141	Respondent 141	User/tenant, Kindergarten owner	5/7/2016	**F**
142	Respondent 142	User/tenant, Office manager Pacific Park	5/7/2016	**F**
143	Respondent 143	User/tenant, Owner of the West Pacific jazz club	5/7/2016	**F**
144	Juliette Hofman	Director of DRU Cultuurfabriek	30/6/2016	**F**
145	Peter van Toor	Chairman of ICER Iron museum	30/6/2016	**F**
146	Gerrolt Ooijman	Strategy and real estate manager Wonion	23/9/2016	**F**
147	John Haverdil	Alderman in Oude Ijsselstreek (2005-2014)	30/6/2016	**F**
148	Ron Spaan	Senior Project Manager BOEi, Project leader of DRU	11/7/2016	**O**
149	Respondent 149	House owner of Badfabriek DRU	23/9/2016	**F**
150	Respondent 150	Manager ICER, employee	23/9/2016	**F**
151	Respondent 151	User/tenant, Artist Collectief Breekijzer, ICER	23/9/2016	**F**
152	Respondent 152	User/tenant, Beltmancomplex, DRU	26/9/2016	**O**
153	Respondent 153	Cultuurfabriek employee, DRU	14/9/2016	**O**
154	Respondent 154	Cultuurfabriek employee, DRU	14/9/2016	**O**
155	Respondent 155	Cultuurfabriek employee, DRU	7/9/2016	**O**
156	Respondent 156	Cultuurfabriek volunteer, DRU	14/9/2016	**O**
157	Respondent 157	Popcentrale volunteer, DRU	15/9/2016	**O**
158	Respondent 158	Cultuurfabriek volunteer, DRU	16/9/2016	**O**
159	Respondent 159	Cultuurfabriek employee, DRU	21/9/2016	**O**
160	Respondent 160	Cultuurfabriek employee, DRU	23/9/2016	**O**
161	Respondent 161	User/tenant, Beltmancomplex, DRU	9/6/2016	**O**
162	Respondent 162	User/tenant, Beltmancomplex, DRU	26/9/2016	**O**
163	Respondent 163	User/tenant, Beltmancomplex, DRU	26/9/2016	**O**
164	Respondent 164	User/tenant, Beltmancomplex, DRU	26/9/2016	**O**
165	Respondent 165	Wonion board member	26/9/2016	**O**
166	Respondent 166	User/tenant, Beltmancomplex, DRU	26/9/2016	**O**
167	Respondent 167	Wonion employee	26/9/2016	**O**
168	Respondent 168	User/tenant, Beltmancomplex, DRU	26/9/2016	**O**
169	Respondent 169	Wonion employee	27/9/2016	**O**
170	Respondent 170	User/tenant, Beltmancomplex, DRU	27/9/2016	**O**
171	Respondent 171	User/tenant, Beltmancomplex, DRU	28/9/2016	**O**
172	Respondent 172	Wonion secretary	29/9/2016	**O**
173	Respondent 173	Wonion project leader	29/9/2016	**O**
174	Respondent 174	Wonion project assistant	30/9/2016	**O**
175	Respondent 175	Wonion employee	26/9/2016	**O**
176	Suzan te Brake	Development manager BOEi	16/8/2016	**F**
177	Roel ten Bras	Architect of Energiehuis	6/7/2016	**F**
178	Cilia Hogerzeil	Energiehuis Tenant/User, Director of Music Theatre Hollands Diep	2/6/2016	**F**
179	Respondent 179	Energiehuis Tenant/User, Production leader of Music Theatre Hollands Diep	11/6/2016	**O**
180	Respondent 180	Energiehuis User, Bibelot trainee	8/6/2016	**O**
181	Respondent 181	Energiehuis User, Bibelot trainee	2/6/2016	**F**
182	Respondent 182	Energiehuis Tenant/Grand café/bar Khofinsky owner	2/6/2016	**F**
183	Henk Kranendonk	Director of Art, Culture & inner city development, Municipality Dordrecht	21/9/2016	**F**

** **F** Face to Face interviews / **T** Telephonic interviews / **O** On-line survey*

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	Name	Capacity	intvw. date	*
184	Conny van Nes	Senior Advisor on Cultural Heritage section, Municipality of Dordrecht	21/9/2016	**F**
185	Eusebi Casanelles	Founder and director of the Museu Nacional de la Ciència i de la Tècnica de Catalunya (MNACTEC) (1996-2013), President at International Committee on the Conservation of the Industrial Heritage (TICCIH), (1997,2009)	25/9/2017	**F**
186	Julián Sobrino Simal	Vice-coordinator of the Plan Nacional de Patrimonio Industrial, Spain (2009-2011); Academic, Profesor titular, Escuela de Arquitectura, Universidad de Sevilla.	26/10/2017	**F**
187	James Douet	Editor of the TICCIH Bulletin, Historic buildings consultant advising on conservation plans and exhibition projects.	19/9/2017	**F**
188	Miguel Álvarez Areces	President of INCUNA and TICCIH Spain, Economist	1/10/2017	**F**
189	Joaquin Ibañez Montoya	Architect and Academic, Profesor in the department 'Proyectos Arquitectónicos', Universidad Politécnica de Madrid	17/10/2017	**F**
190	Iñaki Uriarte	Architect	3/10/2017	**F**
191	Carolina Castañeda López	Architect and Academic, Coordinator of the project PHI, Universidad Politécnica de Madrid	18/10/2017	**F**
192	Linarejos Cruz	Archaeologist, Vice- coordinator of the National Plan of Industrial Heritage (Spain)	30/11/2017	**F**
193	Conxa Bayo	Conservator mNACTET	29/9/2017	**F**
194	Roser Bifet	mNACTEC employee, communications department	9/10/2017	**F**
195	Respondent 195	mNACTEC librarian	9/10/2017	**F**
196	Respondent 196	mNACTEC receptionist	3/11/2017	**F**
197	Respondent 197	mNACTEC café employee	3/11/2017	**F**
198	Aitor Fernandez Oneka	Harino Panadera Architect	5/10/2017	**F**
199	Javier Orduna	Harino Panadera Director	5/10/2017	**F**
200	Respondent 200	Harino Panadera User, Doctor	5/10/2017	**F**
201	Respondent 201	Harino Panadera User, Health inspector	5/10/2017	**F**
202	Blanca Brea	Harino Panadera Architect, Subdirector of General Services, Municipality of Bilbao	6/10/2017	**F**
203	Carlos Fernandez Vasallo	Harino Panadera machines' engineer	29/10/2017	**F**
204	Francisco Gomez Diaz	Bodegas Jerez, Architect	26/10/2017	**F**
205	Pablo Diañez Rubio	Bodegas Jerez, Architect	9/11/2017	**F**
206	Manuel Ángel González Fustegueras	Urbanism manager, Municipality of Jerez de la Frontera, Architect, Urban Planner	30/10/2017	**F**
207	Bodega resident	Resident, bodega El Cantón	27/10/2017	**F**
208	Manolo Collado Moreno	Clerk in the Urbanism Department, Municipality of Jerez de la Frontera, Architect	2/11/2017	**F**
209	Benito Garcia Moran	Architect, bodega c. lechugas	27/10/2017	**F**
210	Estanislao Cavanillas	Srchitect, bodega c. cristal	1/11/2017	**F**
211	Antoni Vilanova	Architect, Ca L' Aranyó	29/9/2017	**F**
212	Anna Belchi	Director of UPF campus in 22@	11/10/2017	**F**
213	Ana Baiges	UPF library librarian at 22@	11/10/2017	**F**
214	Respondent 214	UPF library librarian at 22@	11/10/2017	**F**
215	Respondent 215	UPF library librarian at 22@	11/10/2017	**O**
216	Respondent 216	UPF library librarian at 22@	11/10/2017	**O**
217	Respondent 217	UPF library librarian at 22@	13/10/2017	**O**
218	Respondent 218	UPF library librarian at 22@	13/10/2017	**O**
219	Respondent 219	UPF library librarian at 22@	13/10/2017	**O**
220	Respondent 220	UPF library librarian at 22@	16/10/2017	**O**
221	Respondent 221	UPF library librarian at 22@	19/10/2017	**O**
222	Respondent 222	Resident of the Lofts del Passatge del Sucre in 22@	17/10/2017	**O**
223	Respondent 223	Resident of Can Gili Nou in 22@	13/10/2017	**O**
224	Respondent 224	Student in the IAAC in 22@	12/10/2017	**O**
225	Luis Calderon	Tabacalera user, member of communication and relations group	18/10/2017	**F**
226	Respondent 226	Tabacalera user, member of the collective 'tabahack'	18/10/2017	**F**
227	Respondent 227	Tabacalera user, member of the collective 'art keller'	18/10/2017	**F**
228	Respondent 228	Tabacalera user, member of the collective 'abogados malla'	17/10/2017	**F**

** **F** Face to Face interviews / **T** Telephonic interviews / **O** On-line survey*

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	Name	Capacity	intvw. date	*
229	Respondent 229	Tabacalera user, member of the collective 'abogados malla'	17/10/2017	**F**
230	Respondent 230	Tabacalera user, member of the collective 'nave trapecio'	17/10/2017	**F**
231	Respondent 231	Tabacalera user, member of the collective 'phycologia solidaria'	17/10/2017	**F**
232	Respondent 232	Tabacalera user, member of the collective 'phycologia solidaria'	17/10/2017	**F**
233	Respondent 233	Information Assistant, employee in the art gallery 'Tabacalera. Promoción del Arte'	18/10/2017	**F**
234	Respondent 234	Information Assistant, employee in the art gallery 'Tabacalera. Promoción del Arte'	18/10/2017	**F**
235	Paloma Berrocal	Archaeologist, Director of the archaeological and historical intervention in Bombas Gens	6/11/2017	**F**
236	Toni Colomina	Art conservationist in Bombas Gens	8/11/2017	**F**
237	Nuria Enguita Mayo	Director of the Art Centre Bombas Gens	7/11/2017	**F**
238	Sonia Martínez	Cultural and educational activities coordinator Bombas Gens	7/11/2017	**F**
239	Eva Bravo	Heritage Mediator, Bombas Gens	8/11/2017	**F**
240	Respondent 240	Secretary of Bombas Gens	8/11/2017	**O**
241	Christina Agriantoni	Historian, Founding member of the Greek Section TICCIH and the Industrial Museum of Hermoupolis, Curator of the Industrial Gas museum of Athens	3/7/2017	**F**
242	Aspasia Louvi	Archaeologist, Director of the Piraeus Bank Group Cultural Foundation 2002-2013 and Director of the Cultural Technological Foundation of the ETBA Bank (1998-2001)	7/6/2017	**F**
243	Maria Mavroidi	Industrial Archaeologist, President of the Greek Section TICCIH	12/6/2017	**F**
244	Nikos Belavilas	Architect and Academic, Professor, School of Architecture NTUA, Project manager of CTC and LTCP	12/7/2017	**F**
245	Yiannis Kizis	Architect, responsible for the conversion of the Tsalapatas complex and the Kornilakis tannery	16/6/2017	**F**
246	Kostas Adamakis	Architect, Vice Mayor of Volos (1990-1998)	1/6/2017	**F**
247	Olga Deliyanni	Architect, Founding Member of the Greek Section TICCIH, employee of the Ministry of Culture (retired)	5/2/2018	**F**
248	Amalia Androulidaki	Head of Protection and Restoration of Newer and Modern Monuments, Ministry of Culture	8/5/2017	**F**
249	Maria Balodimou	Architect, Secretary of the Greek Section TICCIH	8/5/2017	**F**
250	George Adamopoulos	Civil Engineer, Head of the Municipal Company of Development of Hermoupolis (1993-2003)	13/7/2017	**F**
251	Ioannis Dekavallas	Mayor of Hermoupolis-Syros (1990-2014)	22/6/2017	**F**
252	Antonis Plitas	Electrical Engineer, Member of the CTC scientific team	7/6/2017	**F**
253	Leda Papastefanaki	Historian, Member of the CTC scientific team	5/7/2017	**F**
254	Achilleas Dimitropoulos	Employee of the CTC	22/6/2017	**F**
255	Margarita Kalouta	Chairwoman of the Association of Friends of the Technical Culture of Hermoupolis	20/6/2017	**F**
256	Dina Sikoutri	Member of the Association of Friends of the Technical Culture of Hermoupolis	22/6/2017	**F**
257	Irene Drakou	Member of the Association of Friends of the Technical Culture of Hermoupolis	22/6/2017	**F**
258	Aliki Tsoukala	Aegean University library librarian at Kornilakis building	22/6/2017	**F**
259	Paraskevi Kontou	Aegean University library librarian at Kornilakis building	22/6/2017	**F**
260	Maria Florou	Head of the Industrial Gas Museum of Athens	6/3/2017	**F**
261	Erato Koutsoudaki	Architect and museologist, museological designer of the Industrial Gas museum of Athens	6/3/2017	**F**
262	George Macheras	Architect, founding member of the Greek Section TICCIH, employee of the Ministry of Culture (1986-1989) in the Industrial Archeology team	21/3/2017	**F**
263	Yiannis Stoyannidis	Historian, member of the Industrial Gas Museum's scientific team	22/3/2017	**F**
264	Andromachi Gazi	Archaeologist, museologist, member of the Industrial Gas Museum's scientific team	10/4/2017	**F**
265	Ikonomou Antonis	Director of INNOVATHENS	21/3/2017	**F**
266	Respondent 266	INNOVATHENS employee	21/3/2017	**F**
267	Respondent 267	INNOVATHENS employee	21/3/2017	**F**
268	Respondent 268	Technopolis catering manager	21/3/2017	**F**
269	Respondent 269	Technopolis events department staff	21/3/2017	**F**
270	Respondent 270	Industrial Gas Museum employee	7/3/2017	**O**
271	Respondent 271	Technopolis marketing & communications manager	22/3/2017	**O**
272	Respondent 272	Head of management and Technical operations of the radio station «Athena 984»	27/4/2017	**O**
273	Dimitris Kaliambakos	Vice Chairman of the NTUA AMDC Managing Committee and Academic, Professor in the School of Mining Engineering and Metallurgy, NTUA	21/4/2017	**F**

** **F** Face to Face interviews / **T** Telephonic interviews / **O** On-line survey*

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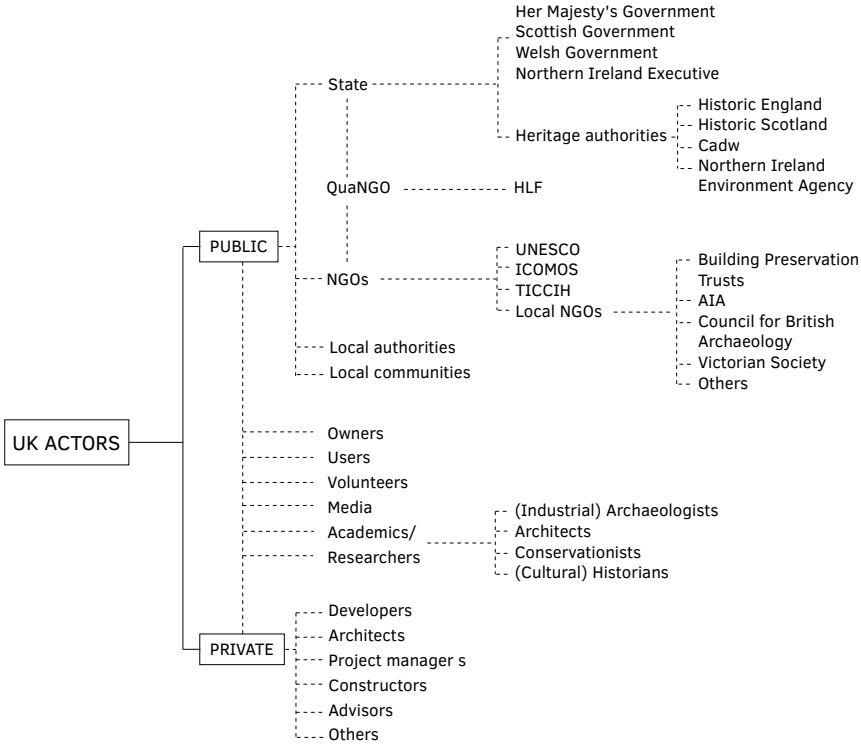
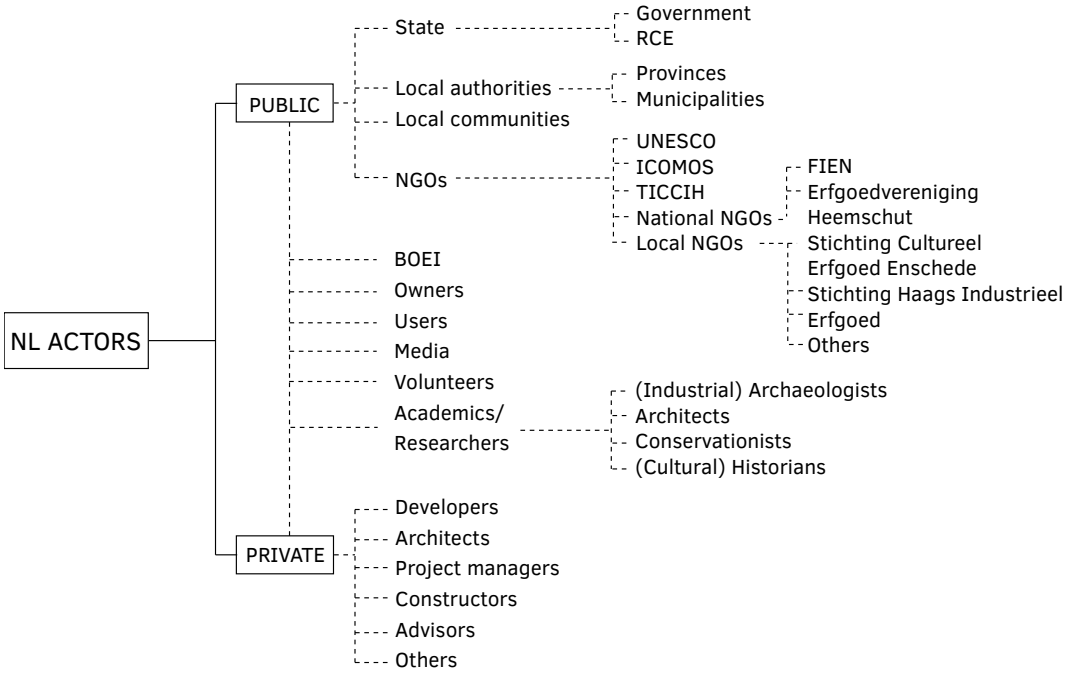
	Name	Capacity	intvw. date	*
274	Kostas Panagopoulos	Instigator of LTCP, Emeritus Professor in the Faculty of Mining Engineering and Metallurgy, NTUA	8/5/2017	**F**
275	Makis Chadoumelis	Site Manager of the LTCP	29/3/2017	**F**
276	Olga Seni	LTCP employee, Architect	27/3/2017	**F**
277	Despina Balopita	LTCP employee	29/3/2017	**F**
278	Ioannis Polizos	Former chair of the senate committee LTCP, Vice Rector NTUA (1994-97), Emeritus Professor in the School of Architecture NTUA	18/7/2017	**F**
279	Konstantinos Pongas	Lavrion Mayor (1975–1994)	28/3/2017	**F**
280	Kostas Manthos	Architect, Member of the local scientific association 'Lavreotiki studies company', Founding member of the Greek Section TICCIH	28/3/2017	**F**
281	George Dermatis	Historian, Member of the local scientific association 'Lavreotiki studies company'	28/3/2017	**F**
282	Eva Tsitou	LTCP secretariat	27/3/2017	**F**
283	Respondent 283	LTCP employee, Assistant accountant	30/3/2017	**F**
284	Respondent 284	User/Tenant, Employee of the Lifelong Learning Centre for the Environment and the Sustainability of Lavrion	28/3/2017	**F**
285	Sofia Rok Mela	User/Tenant, Head of the Crafts-Industrial Educational Museum	27/3/2017	**F**
286	Respondent 286	User/Tenant, Employee of the Crafts-Industrial Educational Museum	28/3/2017	**F**
287	Respondent 287	User, Researcher in the Laboratory of environmental measurements	29/3/2017	**F**
288	Respondent 280	User/Tenant, in.mat-lab employee	29/3/2017	**F**
289	Konstantinos Kinoussis	User/Tenant, CEO of Kinousis Group company	30/3/2017	**F**
290	Respondent 290	User, Researcher in the Laboratory of metallurgy	28/3/2017	**O**
291	Respondent 291	User/Tenant, Employee of the Lifelong Learning Centre for the Environment and the Sustainability of Lavrion	28/3/2017	**O**
292	Egli Dimoglou	Historian, Head of the Municipla Center for History and Documentation of Volos	1/6/2017	**F**
293	Respondent 293	Tsalapatas Museum employee	31/5/2017	**F**
294	Respondent 294	Tsalapatas Museum employee	31/5/2017	**F**
295	Respondent 295	Tsalapatas Museum employee	31/5/2017	**F**
296	Emilia Manioti	Site manager of Tsalapatas commercial, cultural and recreational centre	1/6/2017	**F**
297	Respondent 297	Tsalapatas tenant, Basilico Cucina & Pizza Italiane Restaurant owner	2/6/2017	**F**
298	Respondent 298	Tsalapatas tenant, Ethrion Restaurant owner	2/6/2017	**F**
299	Respondent 299	Tsalapatas User, Employee of the University of Thessali	31/5/2017	**F**
300	Respondent 300	Tsalapatas User, Lawyer, Employee of the University of Thessali	2/6/2017	**O**
301	Respondent 301	Tsalapatas User, Employee of the University of Thessali	2/6/2017	**O**
302	Panayiotis Sapkas	Vice Mayor of Larissa (1999-2003, 2014-present)	31/5/2017	**F**
303	Lili Giovri	Architect, Head of the Municipal Technical Service of Larissa	30/5/2017	**F**
304	Maria Kotoula	Employee of the Municipal Technical Service of Larissa	31/5/2017	**F**
305	Michalis Tsiaris	Head of Public Works department of the Municipality of Larissa	30/5/2017	**F**
306	Kostas Skroubelos	Mill of Pappas reuse architect	7/6/2017	**F**
307	Kostas Tsianos	User, former Director of the Theatre of Thessaly	29/5/2017	**F**
308	Respondent 308	User, Employee of the Theatre of Thessaly	29/5/2017	**F**
309	Respondent 309	Mill of Pappas employee, Cleaning lady	29/5/2017	**F**
310	Respondent 310	User, Employee of the Municipality of Larissa, Department of Culture	29/5/2017	**F**
311	Respondent 311	User, Archeologist	29/5/2017	**F**
312	Respondent 312	User/tenant, Mill of Pappas puppet theatre	30/5/2017	**F**
313	Respondent 313	User/Tenant, Choreographer in the ballet school, Mill of Pappas	3/6/2017	**O**
314	Theodora Sargioti	Architect, Head of the Municipal Technical Service of Trikala	1/6/2017	**F**
315	Axel Föhl	Industrial Heritage specialist since 1974 and editor of the Technische Denkmale im Rheinland publication in the Arbeitshefte series	22/11/2017	**T**
316	Paul Smith	Industrial Heritage specialist since 1979. Historian and employee of the Direction générale des Patrimoines, Ministry of Culture France (1986-2018)	26/11/2015	**F**

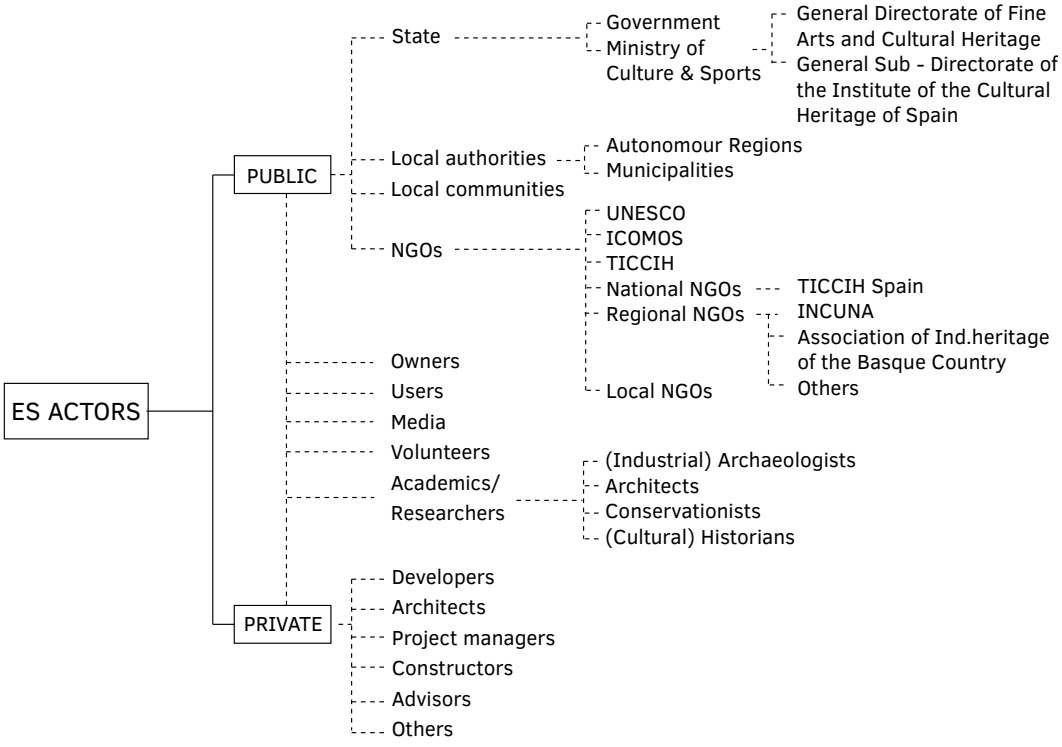
* ***F*** *Face to Face interviews /* ***T*** *Telephonic interviews /* ***O*** *On-line survey*

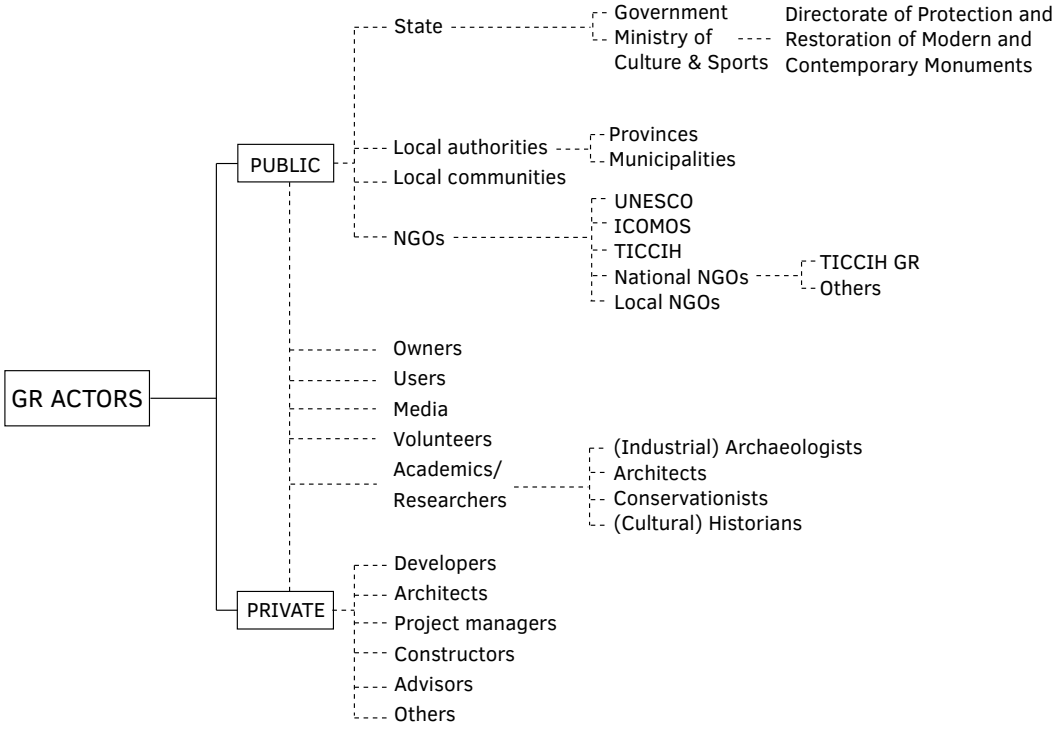
APPENDIX 5

Stakeholders Maps






ES ACTORS
PUBLIC
State
Government
Ministry of Culture & Sports
General Directorate of Fine Arts and Cultural Heritage
General Sub - Directorate of the Institute of the Cultural Heritage of Spain
Local authorities
Autonomour Regions
Municipalities
Local communities
NGOs
UNESCO
ICOMOS
TICCIH
National NGOs
TICCIH Spain
Regional NGOs
INCUNA
Association of Ind.heritage of the Basque Country
Local NGOs
Others
Owners
Users
Media
Volunteers
Academics/ Researchers
(Industrial) Archaeologists
Architects
Conservationists
(Cultural) Historians
PRIVATE
Developers
Architects
Project managers
Constructors
Advisors
Others


GR ACTORS
PUBLIC
State
Government
Ministry of Culture & Sports
Directorate of Protection and Restoration of Modern and Contemporary Monuments
Local authorities
Provinces
Municipalities
Local communities
NGOs
UNESCO
ICOMOS
TICCIH
National NGOs
TICCIH GR
Others
Local NGOs
Owners
Users
Media
Volunteers
Academics/ Researchers
(Industrial) Archaeologists
Architects
Conservationists
(Cultural) Historians
PRIVATE
Developers
Architects
Project managers
Constructors
Advisors
Others

APPENDIX 6

Replication of Lessons presented in Chapter 7 across the case studies analysed

	Case studies																			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Lessons																				
L1.1								X	X		X		X		X		X	X	X	X
L1.2	X	X	X	X	X	X	X	X	X	X	X	X	X	X			X	X	X	X
L1.3	X		X		X				X		X		X	X		X		X		
L1.4									X	X				X	X					
L1.5									X	X	X					X		X		X
L1.6				X	X					X			X	X	X		X	X		
L1.7	X		X		X				X					X	X					
L1.8	X							X		X									X	
L1.9	X			X	X			X	X	X			X				X	X	X	X
L1.10			X	X	X			X	X			X	X				X	X	X	X
L1.11	X	X			X			X	X	X			X	X		X	X	X		X
L1.12	X	X	X		X	X	X	X	X	X	X		X	X	X	X	X	X	X	X
L1.13	X	X	X	X	X			X		X	X	X	X	X	X	X	X	X		
L1.14		X	X	X	X	X						X	X	X	X		X	X		X
L1.15	X									X	X								X	X
L1.16	X	X	X		X		X	X		X	X	X	X	X		X	X	X	X	X
L1.17	X	X	X		X				X		X	X	X		X	X	X	X	X	
L1.18	X		X						X		X		X			X				X
L1.19				X								X		X		X	X	X	X	X
L2.1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
L2.2	X	X	X		X	X	X	X	X		X		X	X	X	X	X	X	X	X
L2.3	X	X	X		X	X	X	X	X				X	X		X	X	X	X	X
L2.4	X	X	X	X	X	X	X	X	X	X	X			X	X	X	X	X	X	X
L2.5			X	X	X	X		X	X	X			X	X			X		X	X
L2.6	X		X	X	X			X	X	X	X		X	X	X		X	X	X	X
L2.7	X				X				X	X							X	X		
L2.8	X	X	X			X	X		X		X					X	X	X	X	X
L2.9			X	X		X			X			X								
L2.10	X						X		X									X		
L2.11								X	X	X				X	X		X	X	X	X
L2.12		X						X					X		X		X	X	X	X
L2.13	X				X								X					X		X
L3.1	X	X	X	X	X		X	X	X			X	X			X	X	X	X	X
L3.2	X						X		X	X		X	X		X	X	X	X	X	X

X = Case study that confirms the lesson

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TOC

	Case studies																			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Lessons																				
L3.3	X	X			X			X	X	X	X			X			X	X	X	X
L3.4	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
L4.1	X	X	X				X			X		X	X		X	X	X	X	X	X
L4.2	X	X	X				X		X		X				X	X	X	X	X	X
L4.3	X			X	X				X											
L4.4	X		X	X	X	X		X	X	X			X	X	X	X	X	X	X	X
L4.5	X	X	X	X		X	X		X		X				X	X	X	X	X	X
L4.6	X	X	X	X	X		X	X	X	X	X	X	X			X	X	X	X	X
L5.1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
L5.2	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
L5.3	X			X	X			X	X				X							
L5.4	X		X				X				X		X			X	X			X
L6.1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
L6.2	X			X	X							X	X				X	X		
L6.3	X				X			X	X	X				X	X	X	X	X	X	X
L6.4	X		X				X		X							X	X			X
L7.1					X				X	X	X	X	X		X					
L7.2		X					X			X	X		X		X					X
Basic Lessons																				
BL.1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
BL.2	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
BL.3	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
BL.4	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
BL.5	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
BL.6	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
BL.7	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

***X** = Case study that confirms the lesson*

APPENDIX 7

“ReIH” An online knowledge platform for Industrial Heritage Reuse

This Appendix presents the paper on the ‘ReIH. Industrial Heritage Reuse in Europe’ (Chatzi Rodopoulou, T. & Floros, X. ReIH: An online knowledge platform for Industrial Heritage Reuse. In: RETTIG, J. M., ed. XVII TICCIH International Congress: Industrial Heritage: Understanding the Past, Making the Future Sustainable., 2018 Santiago, Chile. TICCIH, 363-366.), offering an insight about the knowledge platform created within the framework of this doctoral research.

Summary

This paper presents an innovative online tool, which enables the review of Industrial Heritage Reuse practice internationally. The website ‘ReIH. Industrial Heritage Reuse in Europe’ is the product of 4 years of research, conducted within the framework of a PhD investigation titled “Control Shift. European Industrial Heritage Reuse in Review”. Being more than a conventional database, it includes both an extended digital registry with more than 250 case studies of transformed industries across Europe as well as background information about the development of Industrial Heritage Reuse practice in Britain, the Netherlands, Greece and Spain. An important feature of the website is its dynamic character, facilitating the processing and management of existing data while also allowing for the update and extension of the registry in a user friendly way. This online knowledge platform is a far reaching effort. In the short term, it is aimed at the extensive recording of reused industries, the dissemination of this information and the familiarization of both specialists and the public on this significant, widely employed practice. On the long run, through a collaboration network providing additional information, this project has the potential to become a comprehensive point of reference for Industrial Heritage Reuse on a European or global scale.

Introduction

Over the last forty years, adaptive reuse has been employed as one of the most sustainable and efficient ways of safeguarding Industrial Heritage. Today, there is a vast number of reuse cases globally that provide significant insights for the protection and management of our industrial legacy. Although extensive research has been carried out on the subject on a regional, national or industrial sector level, there is a limited number of scientific studies with a broader scope.

This paper presents the website “Industrial Heritage Reuse in Europe” <http://reindustrialheritage.eu/>, an innovative online tool which enables the consistent cataloguing, reviewing and analysis of Industrial Heritage Reuse practice internationally. This project provides an important opportunity to advance the understanding of the practice of Industrial Heritage Reuse in Europe in an easy and accessible manner, overcoming the limitations of previous studies.

The structure of this paper takes the form of four parts. The first part gives a brief overview of the existing literature on the subject. The second one, presents the research base of the website. The following part discusses the website's structure and content, its technical characteristics and usability. Lastly, the concluding remarks stress the social and scientific relevance of the venture, its limitations as well as its heightened potential to become a point of reference for the subject in question.

1 Research on Industrial Heritage Reuse: Advances and limitations

Since the late 1990s, a growing body of literature has been examining the issue of Industrial Heritage Reuse providing valuable evidence on various angles of the practice. Nevertheless, as it will be shown, the existing studies present certain limitations.

Analytically, a big number of studies on the subject have been mostly restricted to a limited geographical scope, covering only regional (Llordès and Pont, 2014, Asociación Vasca de Patrimonio Industrial y Obra Publica, 2001) or national territories (Bayer et al., 2015, Stratton, 2003, TICCIH-Municipal Centre for Historical Research and Documentation of Volos, 2007, et.al). Some studies with an international scope focus only on one industrial sector (Carr, 1999). A number of publications that overcome the previous limitations, have the form of illustrated anthologies giving a lot of emphasis on the aesthetical result of converted industries yet little information about their original function or the conversion process and its related challenges (Tagliaferri, 2006).

The limitations however are not only restricted to the scope and content of the existing research but also to the medium used for its dissemination. Despite the progress achieved by the open access movement (Suber, 2006, TU Delft, 2016) in the last two decades, there is still a big number of relevant studies available in hard copy only, or through a subscription business model or in a format inaccessible to the public.

A source disentangled from the aforementioned limitations is the online records of heritage. Yet, a review of a number of online national records of protected monuments, reveals their absolute disregard for the new life of the historic structures (Historic England, n.d., Rijksdienst voor het Cultureel Erfgoed, n.d.-b, Ministerio de Educación Cultura y Deporte, n.d., Ministry of Culture and Sports of Greece, 2012). In general, the new function and the subsequent multidimensional alterations on the listed complexes do not form part of the record cards.

At this point is important to present two cases of online registries that differ from the aforementioned practice in terms of scope and access. The first one is the website of ERIH project (https://www.erih.net/), starting in 1999 under the initiative of the association ERIH – European Route of Industrial Heritage e.V. The aim of the project was to implement a European network that would help to support the establishment of Industrial Heritage as a tourism brand. Today ERIH has established a network of 1633 Industrial Heritage sites in Europe, ranging from disused production plants to interactive technology museums.

"The project's most important communication tool is the ERIH website (Fig.01). *As the main promotion platform it presents the Industrial Heritage to the general public, thus encouraging people to visit the industrial monuments. Large scale information and a plethora of links to other websites, tourist offices and further organizations and initiatives help to attract visitors. With its comprehensive background information on Europe's industrial history the website can also be seen as a virtual library aiming at offering a forum to exchange experiences between experts and laymen with a strong interest in the topic."* (European Route of Industrial Heritage, n.d.).

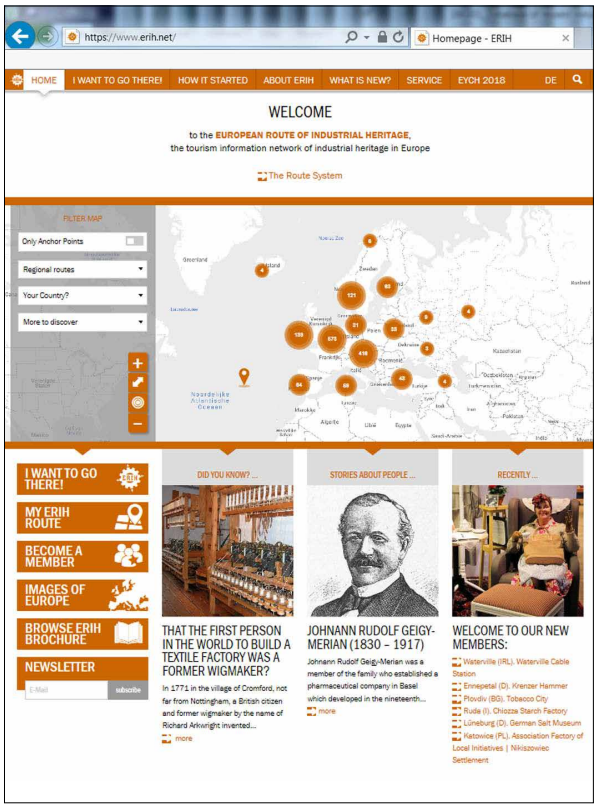

FIG. APP.7.1 The ERIH website homepage. (European Route of Industrial Heritage, n.d.)

ERIH's website is a valuable source of knowledge, presenting historic background information about a multitude of reused industrial sites in an accessible manner. However, as posed above its focus is quite generic while the offered information concentrate on the historic function of the presented sites and countries, giving very little insights about their regeneration.

The second case is entirely concentrated on reuse, yet its scope is not only focused on industrial sites. The Dutch National Program Herbestemming was a five year venture that started in 2010 under the initiative of the Cultural Heritage Agency of the Netherlands (RCE).Through a collaboration of 30 public and private bodies, the program aimed at the promotion of the reuse practice in the country. Within its framework, a website was created, presenting, among other information, cases of Industrial Heritage Reuse in the Netherlands in the form of a registry.

The originality of that registry was its focus in the new use of the historic sites. Its search filters, were facilitating the review of important data concerning the reuse of the sites while the interactive map used (Fig.02) was allowing an overview of the practice in the Netherlands. In 2017 the hosting of the website passed to the Nationaal Restauratiefonds (NRF, National Fund for Restoration). The background information on the registered cases of reuse is still accessible, however the interactive map is no longer available (Restauratiefonds, 2018).

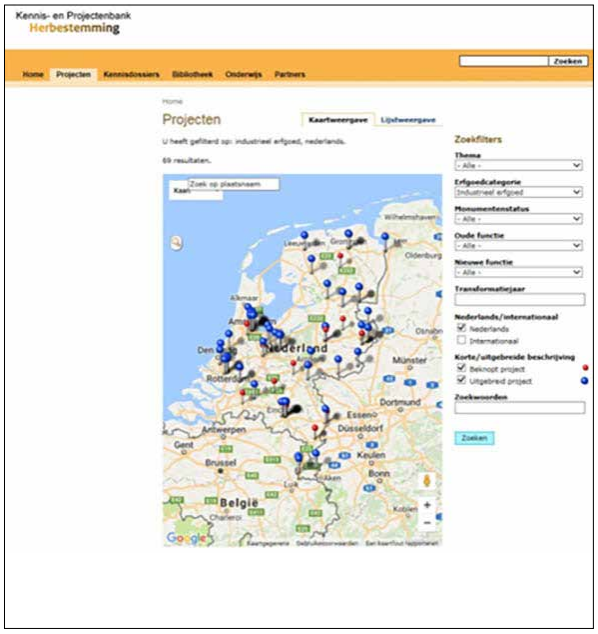

FIG. APP.7.2 The website of the Dutch National program Herbestemming. The illustrated interactive map, after the transfer of the hosting of the website from the RCE to Het Restauratiefonds organisation is no longer available online. (Rijksdienst voor het Cultureel Erfgoed, n.d.-a).

This brief literature review on the available relevant sources, illustrates that while there are important contributions shedding light to various angles of the transformation of historic industries, a broad systematic understanding of the practice is yet to be achieved due to their limitations. The new tool presented in this paper, backed by the author's PhD research, aspires to fill this knowledge gap and inform future initiatives, aiding the propagation of Industrial Heritage Reuse and preservation.

2 The research

The website presented in this paper is a product of the ongoing PhD research, titled: "Control Shift. European Industrial Heritage Reuse in Review", conducted by T. Chatzi Rodopoulou in the Delft University of Technology and the National Technical University of Athens. Focusing on the European Industrial Heritage Reuse, the aim of the research is fourfold.

— Firstly, to provide a broad and transnational picture of the development and the current state of Industrial Heritage Reuse practice, that will allow experience drawn from one country to inform future approaches on safeguarding via reuse on other countries.

— Secondly, to highlight the shifts that have been occurring into the reuse practice during the last 40 years, to explore possible patterns in Europe and their reasoning.

— Thirdly, to describe the evolving role and impact of the stakeholders involved with Industrial Heritage Reuse.

— Fourthly, to create awareness about the achievements that have been accomplished via Industrial Heritage Reuse and the challenges that both derelict and reused industrial sites are currently facing.

The methodology employed for the data collection is a mixed one, including historic, archival, case study, qualitative and field research.

The PhD dissertation, expected in 2019, will analyse in detail 20 case studies of 19th century reused industrial production sites in four European countries. (Britain, the Netherlands, Greece and Spain) For the selection of the posed projects an extended documentation of cases of Industrial Heritage Reuse was produced, drawing from all the sources analysed in the first part of this paper. The detailed catalogue resulting from this documentation, enriched with further information, constitutes the core of the presented website.

3 The website: A new online knowledge platform for the Industrial Heritage Reuse practice.

The ReIH website is an innovative web-based knowledge platform for the Industrial Heritage Reuse practice. Being more than a conventional database, it offers multiple advantages in terms of content and usability for a wide spectrum of users. Firstly, it provides a broad, international and updated overview of the Industrial Heritage Reuse practice. In detail, it presents a digital registry of more than 250 cases of transformed industries in four European countries (Fig.03).

For the description of each case an extensive set of documentary data elements is presented (Fig.04), following the standards of the Council of Europe (Council of Europe, 1992) and other registries of reused cases. This set includes the following elements:

- Name of the reused site
- Picture(s)
- Location
- Original use
- New use
- Original architect
- Reuse architect
- Construction year(s)
- Reuse year(s)
- Website URL
- Description
- Relevant literature
- Editor and date of compilation of the record

FIG. APP.7.3 The interactive map illustrating the documented case studies of Industrial Heritage Reuse in the ReIH website homepage (http://reindustrialheritage.eu/).

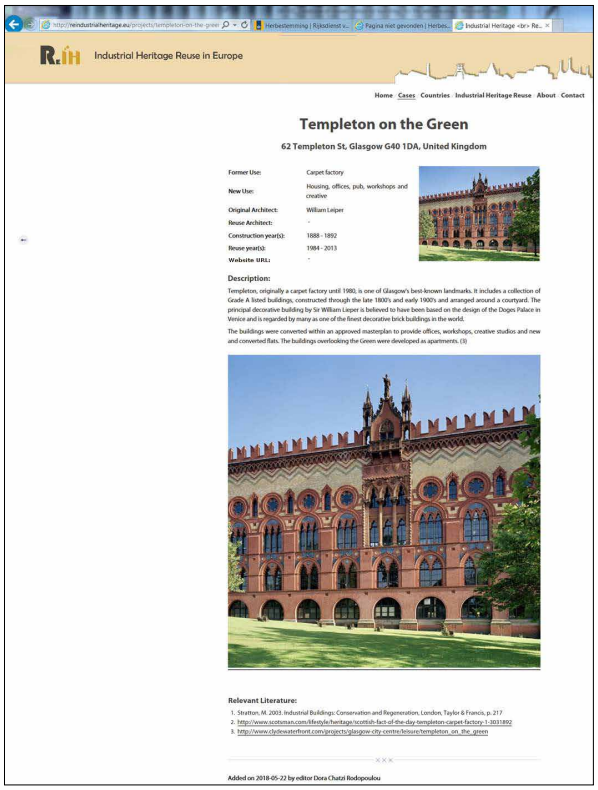

FIG. APP.7.4 A record sheet retrieved from the ReIH website homepage (http://reindustrialheritage.eu/).

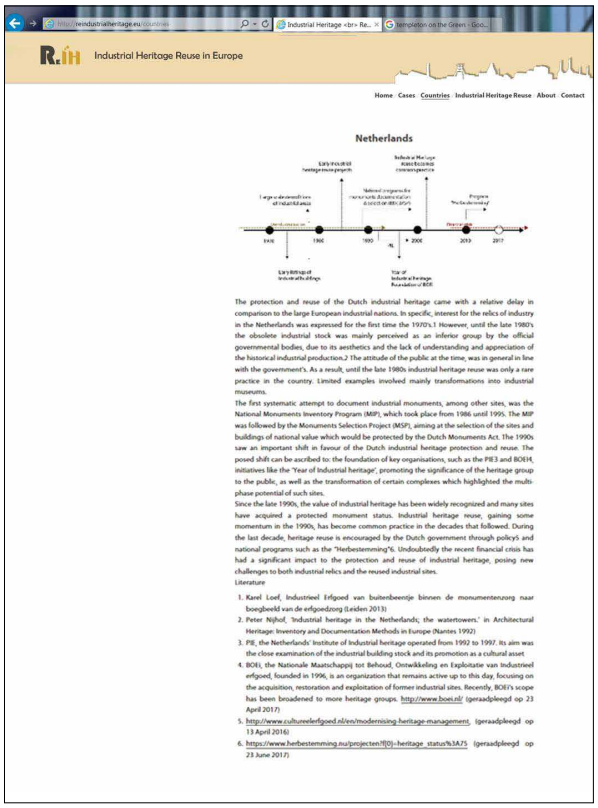

FIG. APP.7.5 The Dutch page in the Countries tab of ReIH offers an analysis of the developments related with Industrial Heritage Reuse practice in the Netherlands.

The cases that have been investigated in the author's PhD research are presented analytically, providing additional information about the historical development, the interim period between closure and reuse, the transformation process and the operation of the converted sites.

Secondly, the website presents additional information that facilitate the understanding of the practice from the users while extending their knowledge, by offering specific historic insights for every country (Fig.05). Specifically, the 'Industrial Heritage' tab includes the definitions of the heritage of industry and the reuse practice as described in the Dublin Principles (ICOMOS – TICCIH, 2011). Furthermore, it provides a glimpse into the preliminary results of the aforementioned PhD research, presenting briefly key shifts in relation to the legacy of industrialisation in the recent decades.

In the 'Countries' tab, a critical analysis of the development of Industrial Heritage Reuse practice is presented, from the late 1970s to this day, in Britain, the Netherlands, Greece and Spain. Important developments and changes that have occurred overtime are discussed along with the challenges Industrial Heritage is currently facing. This information, which is also product of the aforementioned PhD research, is presented both in text and graphically, in the form of a timeline.

The stratification of the offered information in various levels of complexity and detail enables the use of the platform by a wide audience. The website has therefore the potential to educate the general public, familiarising them with basic concepts and the key developments in the practice. At the same time, it can also serve as a valuable source of information for the specialists, providing both elaborate analyses per case and country as well as the broad picture of the practice on an international level. Furthermore, Industrial Heritage Reuse stakeholders, consulting the website, can be informed about good practice, related problems and challenges and in turn realise durable and sustainable reuse projects, avoiding past mistakes.

Besides the opportunities of ReIH offered to the public and the specialists, this website is also instrumental for the described PhD research and the composition of its results. The various content filtering options will be used for making multiple comparisons of case studies across Europe in a fast and systematic way. Moreover, the interactive map will provide a visual output of the geographical allocation of the filtered data by default, facilitating the drawing of qualitative results.

Thirdly, an important parameter of the project is the use of modern technologies for the presentation of the registry and the dissemination of the research results. In specific, the website is based on a flat-file Content Management System (CMS), which comes with several advantages over traditional database designs. Storing the data in a flat format has proven to be faster and more efficient, simpler to maintain, easier to migrate to another server and more secure.

Furthermore, special care has been taken in order to facilitate open access to the registry data providing a secure interface to the database. To this end an application programming interface (API) to the registry data has been developed, which outputs the data in the established and widely used JSON data exchange format (the API can be accessed via http://reindustrialheritage.eu/projects/api). This is an important point, since it enables other researchers to access the data in a structured way offering the opportunity to analyse it further by their own tools and methods.

Due to the constant and increased volatility of the building stock under investigation, the nature of the platform is fully dynamic in order to facilitate processing and management of existing and upcoming data. Building the website around a CMS allows for editors and site administrators with predefined permissions and access to the data. In detail, users can contribute to the content of the site adding information, as well as editing existing cases. This is achieved in an easy yet controlled way, via simple forms in a customized backend panel, which enables consistent user input and automates certain procedures, e.g. the geolocation task for the cases. As a result, managing the Registry will be an intuitive process that will not require any special training.

The publicly accessible part of the platform, provides also a usable and intuitive interface to the users. The display options of the website (interactive map and list) and the flexible search filters, facilitate the access to the information in an easy, direct and fast manner. Moreover, the visualization of the data on a map, enriches the registry with a geographical dimension illustrating visually its international scope.

Finally, what should be highlighted, is the innovative possibilities offered by the search filters of the website (country, new use, reuse year etc.). Focusing mainly on the new use of the converted sites, they allow new categorisations and insights on the subject, such as the development of the reuse practice overtime, the prevailing new uses, the range of the new uses per country etc. This platform therefore sheds new light into the practice, illustrating for the first time correlations that were impossible to investigate before.

Conclusions

This paper has presented ReIH, a new online knowledge platform for the European Industrial Heritage Reuse. This innovative system aspires to make a major contribution, complementing the efforts for research and documentation of Industrial Heritage Reuse in Europe while aiding future initiatives of Industrial Heritage conversion. Its originality lies in three key points. Firstly in its focus on the new use of the historic industrial sites , secondly in its international scope and finally in the use of modern technological means for the creation and enrichment of its content as well as the dissemination of the research output.

Over the past few decades, the social and scientific awareness of the multilateral importance of Industrial Heritage has changed profoundly. From a discredited building group, the historic industries have now become established in the collective memory as an integral part of our cultural heritage. At the same time, the socioeconomic conditions on a European level are increasingly pushing for a shift of the construction sector, from the erection of new buildings to the reuse of existing structures. Therefore, Industrial Heritage Reuse, appears to attract growing interest, not only by scientists of various specialisations and the public but also by professionals of the construction sector who are looking for a share in the labour market.

One of the main aims of the project is the response to the increasing interest, generated for this heritage category. Using modern technological means, a new dynamic online and open access knowledge base is made available to the scientific community and to local, national and international interest groups, contributing to the safeguarding, the reuse and the promotion of the rich industrial legacy of Europe.

This knowledge base has been forged within the framework of the PhD research “Control Shift. European Industrial Heritage Reuse in Review”, fulfilling a double purpose. It serves as a mouthpiece of the preliminary findings of the posed research while enabling the compilation of part of its results.

Albeit its heightened possibilities, ReIH has certain limitations, too, related mainly to the comprehensiveness of its registry. As it has been defined by the scope and timeframe of the aforementioned PhD research, it is not based on an exhaustive documentation of all reused assets of Industrial Heritage in the investigated countries. There is still a big number of converted sites to be included in the registry (e.g. transportation and extraction complexes, 20th century Industrial Heritage). Moreover, despite the website’s international scope, it currently discusses the Industrial Heritage Reuse practice of only four countries.

The long term goal of ReIH is the extensive recording of Industrial Heritage Reuse practice in all European counties, the dissemination of this special information and the familiarization and training of both the specialists and the public. This ambitious objective can only be achieved through a collaborative venture. The challenge is thus to formulate a network of bodies that will take this work to the next stage. TICCIH, as the only global organisation for the study, interpretation and preservation of Industrial Heritage that actively promotes international collaboration, can act catalytically for empowering such a development.

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Acknowledgements

Upon the completion of this lengthy doctoral research journey, there is a great number of people to whom I am grateful.

Firstly, I would like to express my sincere gratitude to my supervisors Prof. Dr. Marieke Kuipers, Prof. Dr. Nikos Belavilas and Assoc. Prof. Dr. ir. Hielkje Zijlstra for their valuable guidance and perpetual motivation. Their constructive advice, insightful comments and calculated provocations greatly advanced my work during the course of this research. Besides their wonderful supervision, I would like to thank them also for being so understanding and inspirational and for always trusting and supporting me in paving my own research path.

A special thanks goes also to my colleagues from the Heritage and Architecture Section, TUDelft and from the Urban Environment Laboratory, NTUA for our wonderful collaboration and fruitful interaction. I am also thankful to Véro Crickx for her important contribution to the formatting of this dissertation.

This research would have been impossible without the financial support of the Onassis Foundation, that fully funded my PhD programme. Its enabling role to my work is much appreciated. I would also like to acknowledge the financial help of the British School at Athens and the Stichting fonds Catharine van Tussenbroek for financially facilitating my field research in the UK and Greece, respectively.

A big part of my work relied on the insights of Industrial Heritage Reuse stakeholders, to whom I am truly indebted. I want to thank individually all 316 of them for taking part in my research and sharing their views and experience with me. I feel particularly honoured and privileged for the long, rewarding discussions with established experts of the heritage field. In specific, I would like to extend my gratitude to Aspasia Louvi, Axel Föhl, Christina Agriantoni, David de Haan, Erik Nijhof, Julián Sobrino Simal, Karel Loeff, Maria Mavroidi, Miguel Álvarez Areces, and Paul Smith for sharing their knowledge and taking part in the Delphi technique of this research. I wish also to express my sincere gratitude for the invaluable assistance and guidance of the experts Eusebi Casanelles, Giel van Hooff, Ian West, James Douet, Keith Falconer and Mark Watson who took the extra time from their busy schedules for walking me through the amazing world of Industrial Heritage, literally and figuratively. Their passion, commitment and openheartedness will always be an inspiration to me.

Along with the contributors of this work stated above, I am especially thankful to all my friends for standing by me in this journey and helping me through the hard days. A big thanks to my friends Dr. Xenofondas Floros and Kyriakos Paschalidis for their tremendous contribution in the development and hosting of the ReIH online Platform, respectively. I am truly thankful for their efforts and time, without which this important part of my work would have been impossible. Furthermore, I wish to thank my friends Angelos, Aurora, Betty, Dimitris, Eleni, Konstantinos, Kostis, Markella and Zacharias who opened their homes and hosted me, greatly facilitating my research in England, Scotland, Spain and Greece. I consider myself really fortunate to have friends who despite our extended time apart, imposed by my research, were always there for me upon my return. Areti, Giannis, Irene, Katerina, Kimonas, Nikos, Stavros and Tania thank you for making Delft feel like

home. Aristotelis, Gianna, Giannis, Joanna, Katerina, Marina and Olga thank you for making home worth returning to.

A huge and wholehearted thanks goes to my loving family for always supporting and believing in me. To my wonderful mother and father for raising me to become the person that I am today and for always encouraging me to pursue my dreams. To my amazing brother for his love and care and to my parents, brother and sisters in law for their moral support.

Finally, there are no words to express my gratitude to my husband, Petros, for his love, unconditional support, patience and care, during this work. A big thanks for all the practical help and especially for the proofreading of this voluminous dissertation. Most of all, thank you for growing up together, for not giving up on me, for being a great friend and the most amazing partner in life.

Curriculumn Vitae

Theodora Chatzi Rodopoulou (Athens, 1985) graduated as an Architect Engineer in 2008 from the National Technical University of Athens, after following the five-year programme of its School of Architectural Engineering. From 2010 to 2012, she followed the two-year Master's programme of the Faculty of Architecture and the Built Environment of the Delft University of Technology and graduated with honours, specialised in Preservation, Conservation and Reuse of Buildings.

In 2014, she started her PhD research on the European Industrial Heritage Reuse Practice. The research was conducted in the Heritage & Architecture Section of the Faculty of Architecture and the Built Environment in the Delft University of Technology in collaboration with the Urban Environment Laboratory of the School of Architecture of the National Technical University of Athens. While working on her PhD Research she wrote several conference papers and journal articles, published in Greek, Dutch, Spanish and international conference proceedings and journals. During her PhD programme she worked as a lecturer, teaching Bachelor's courses in the Delft University of Technology and as an assistant teacher, teaching Bachelor's and Master's courses in the National Technical University of Athens.

Between and during her studies, she also worked as an architect in various architectural offices in Greece and the Netherlands, on different kinds of projects, ranging from master-planning to historic building transformation and museological design. Between 2006-2010 and 2016-2018, she worked as an assistant researcher in the Urban Environment Laboratory in the Faculty of Architecture NTUA, where she was involved with projects related with the recording, preservation and reuse of Greek historic industrial sites as well as with projects related with urban planning and redevelopment. At present she works as a free-lance architect and as a researcher in the Urban Environment Laboratory in the Faculty of Architecture NTUA.

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Control Shift

European Industrial Heritage Reuse in review

VOLUME 1

Theodora Chatzi Rodopoulou

This dissertation focuses on Industrial Heritage Reuse practice in Europe, with special emphasis on the United Kingdom, the Netherlands, Spain and Greece. This vastly complex yet fascinating topic has not been studied holistically under the circumstances of the contemporary era. In the 21st century, Industrial Heritage Reuse is required to be more responsive, more sustainable, more inclusive and more value-driven than before. An enhanced approach for the transformation of industrial relics is therefore urgently needed.

The aim of this dissertation is to explore the potential of enhancement of the Industrial Heritage Reuse by identifying and analysing its influencing Aspects under the light of the contemporary theoretical conservation concepts, the current demands of the field of practice and the rising challenges of the 21st century context.

Drawing upon both theory and practice on an international level, this research gives a holistic and multileveled view on the subject under investigation. Industrial Heritage Reuse and its stakeholders are investigated in the setting of the four selected countries through the detailed analysis of 20 case studies of best practice.

Volume 1 introduces the research problem and explains the thesis' rationale; it presents the research methodology, the academic analysis and it finally offers the research products. Volume 2 presents the analysis and evaluation of the 20 selected case studies, varying from Ironbridge in Shropshire, to the Technological and Cultural Park of Lavrion and from Westergasfabriek in Amsterdam to the 22@ district of Barcelona.

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