TÉCNICO LISBOA

Adaptive Re-use of Architectural Heritage

Transformation of the Belgian Industrial Heritage into Learning Spaces

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Extended Abstract

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1. Extended abstract

EXTENDED ABSTRACT

"The rise of the industry was spectacular in its speed and extent, and its contraction was equally rapid and traumatic. Its heritage is both unrepresentative and fragmentary and what does survive is problematic and vulnerable."

Palmer *et al*. in *Industrial Archaeology*: *A Handbook*

ABSTRACT

Key words:
Conservation
Adaptive Re-use
Belgian Architectural Heritage
Industrial Heritage
Industrial Archaeology
Industrial Typologies
Learning spaces

Due to its proximity to the United Kingdom, Belgium acknowledged one of the first industrializations in the world. As a result, this country has a rich set not only of the remaining evidences of uncharacterized industrial structures, but also of buildings that have been adapting themselves to the passage of time and reached our time in relatively good conditions. These important constructions are imbued with significance, as the result of a common collective memory that identifies them as part of its legacy and cultural heritage. Awareness to its preservation has been raised in the past decades. This position was further reinforced by economic factors that bolster the need for a maintenance of built heritage through a sustainable recycle of buildings. For this reason, there is an urgent need for Architecture practitioners to realize the potential of this often forgotten constructions and to act proactively and knowingly to its reintegration – sometimes just by minimal surgical operations. This dissertation, framed by the mobility program carried out by the author in Belgium, intends to explore and deepen the study of this theme in this country. Its main objective is to understand the impacts, transformations, strategies and constraints allusive to the adaptive re-use of these buildings to learning spaces.

IN SEARCH FOR A CRITICAL ANSWER

To attain accurate answers to the proposed issue, one should focus on finding the right questions. To do so, a set of **FIVE** objectives was defined. Its purpose is to emphasize the focus of the study on certain parameters in order to be very precise in the answers delivered. This requisite arises from the realization that the industrial heritage in Belgium comprises a substantial amount of objects built up over the centuries:

(1) Historical and Legal contextualization of the industrial heritage in Belgium;

(2) Identification of the existent industrial typologies in Belgium from the 19th century and early 20th century;

(3) Historical, morphological, and constructive characterization of the said typologies;

(4) Definition of case-studies based on industrial buildings located in Belgium, from the 19th century and early 20th century, which were adapted to learning spaces;

(5) Analysis of the impacts, transformations, strategies and constraints from such actions on the pre-existing structure.

METHODS

The process of investigation to achieve the proposed objectives was divided in **FIVE** stages which contemplate: (1) identification and collection of information; (2) definition of selection criteria for the case-studies; (3) identification and collection of information concerning the case-studies; (4) systematization, analysis and treatment of the information gathered and (5) considerations and conclusions.

STAGE 1: Identification and collection of information.

This phase intended the gathering of documents and bibliographical references in order to understand the Belgian context. Descriptions and drawings regarding the different industrial typologies were also collected during this phase. A range of archives, museums, libraries, scholars and professionals were contacted to accomplish this purpose.

STAGE 2: Definition of selection criteria for the case-studies.

An assembly of case-studies was gathered by querying periodic publications in Belgium and Architecture teachers at the KUL. This stage is deeply interlinked with the fourth objective, previously described. Its purpose is to extend the theoretical content gathered in the previous step by referring to contemporary and real interventions.

STAGE 3: Identification and collection of information concerning the case-studies.

This stage is connected with the need to obtain information regarding the case-studies. It led to new bibliographical research, photographic surveys and collection of descriptions and drawings related to them. Architecture firms (complementary to the previous database) were contacted during this phase. Ultimately the quantity and quality of the information provided led to the selection of the case-studies: **Belle-Vue Malt House** and **J. de Hemptinne Spinning Mill**.

STAGE 4: Systematization, analysis and treatment of the information gathered.

Linked with the fifth objective previously defined: recognition of the rehabilitation actions undertaken for switching the use, their constraints and weaknesses.

STAGE 5: Considerations and conclusions.

CONCEPTUAL SETTING

Observing the title of this dissertation – *Adaptive Re-use of Architectural Heritage: Transformation of the Belgian Industrial Heritage into Learning Spaces* – we rapidly find ourselves in the dire need of defining certain concepts which are of recurrent use in this study. Despite of being part of common knowledge, notions such as **typology**, **heritage**, **archaeology** and **adaptation** are not always clear in architectural terms. For this reason, we should found their meaning (applied to the industry) on acclaimed international documents – the *heritage charters* for example – to guarantee the unambiguously universality of the definitions. With that being said, we realize the increased importance of documents such as **the Nizhny Tagil Charter for the Industrial Heritage (2003)**, **the Burra Charter (1999)** and **the Charter of Krakow (2000)** to the definition of the said concepts – indeed if we search in them the meanings we intend to apply in this study we will rapidly obtain the definitions needed. **Industrial heritage** is outlined as "*the remains of industrial culture which are of historical, technological, social, architectural or scientific value. These remains consist of buildings and machinery (…) as well as places used for social activities related to industry*" (Nizhny Tagil Charter, 2003) and **industrial typology** in its turn is defined as the *study of the morphological characteristics of the industrial constructions with the objective of establishing its type*[1]. An important distinction should be made between industrial heritage and **industrial archaeology**, due to the common misconception of mixing both the terms, in fact the second is defined as a *"interdisciplinary method of studying all the evidence, material and immaterial (…), human settlements and natural and urban landscapes, created for or by industrial processes"* (Nizhny Tagil Charter, 2003). Returning to the title of this dissertation, we identify the concept of *adaptive re-use* as the other central theme in this study. Again resorting to the heritage charters in the search of meaning, we obtain **conservation** as the "*complex of attitudes of a community that contributes to making the heritage and its monuments endure (…) achieved with reference to the significance of the entity, with its associated values*" (Krakow Charter, 2000) and **adaptation** as the action of "*(…) changing a place to suit the existing use or a proposed use* (with) *minimal impact on the cultural significance of the place*" (Burra Charter, 1999). **Adaptive re-use** results from the intersection of both concepts, meaning the *conservation* by *adaptation* to a new use of a building or site that, without its former function, is targeted for abandonment and destruction. Finally, **learning spaces** are flexible and connected spaces where formal and informal activities of learning take place (Oblinger, 2006).

[1] Defining **type** accordingly to Quatremère de Quincy as *"the word type doesn't represent the image of an object that can be copied or perfectly imitate, instead it represents the idea of an element which will serve himself as the rule of a model, which understood as the practical execution of art, is an object that will be repeated just how it is. On the contrary the type is an object according to which anyone can conceive art works that are absolute different from each other. Everything is precise and given in the model, everything is a little bit vague in the type"* (*Dictionnaire Historique de l'Architecture*: 1832).

EXPANDING THE CONCEPTUAL SETTING

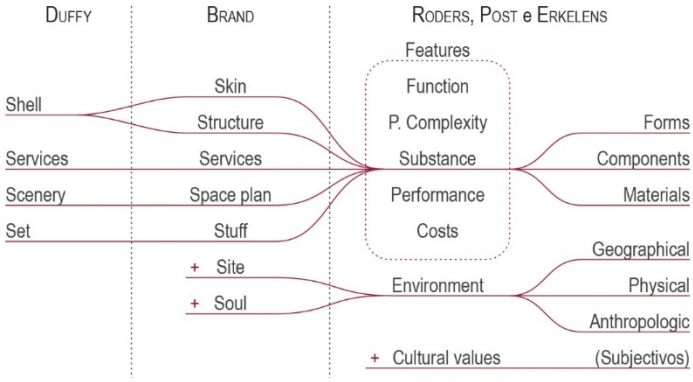
The conceptual setting formerly synthesized is supplemented by the historical, legal and typological context in Belgium. Although it is frankly impossible to include all the developments in an extended abstract – a consultation of the full study is necessary due to the super-descriptive nature of this subject – some aspects and conclusions are worth noting because they bring certain consequences to the way Belgium deals with its past.

The first point worth mentioning is the geographical position of Belgium. In consequence of the relative proximity to the United Kingdom, father of the Industrial Revolution, Belgium met one of the first industrializations worldwide. This was supported by the intervention of British engineers and by the import or theft of technologies. However, the antagonistic influence of different kingdoms in this country – Spain, France and Austria to name a few – led to a divided and competitive development between the regions: Verviers-Liège, Mons-Charleroi, Ghent, Antwerp and Brussels as the five great poles of the Belgian development. Such fact led to a social, historical and cultural departure between the regions (Flanders and Wallonia) that somehow extends until the present days. It was without surprise that in the 1990s the country evolved to a federal state, compromising the administrative regions of Flanders, Wallonia and Brussels. But in which extend does this apply to the Belgian action towards its industrial heritage nowadays? The answer is immediate: the existence of overlapping institutions (VVIA, PIW and SIWE) and legal instruments commonly leads to a chaotic approach to the built heritage due to the lack of specific rules. On the other hand the passionate action of some scholars, professionals and institutions is meritorious, since there is a genuine preoccupation in maintaining – through reutilization or adaptation – and sharing this heritage, but Belgium is still in dire need of concrete legal instruments and theoretical developments, to which I hope to contribute with this dissertation. Regarding the existing industrial typologies, as was mentioned, there was a continuous effort to import British technology – fact observable by the existing industrial relics in Belgian soil. The publication *Industrial Archaeology: A Handbook* (Palmer *et al*., 2012) was very important in the historical, morphological, and constructive definition of those buildings, dividing the buildings into types accordingly to their characteristics – *processing the products of agriculture, power for industry, extractive industries, manufacturing industries* and *utility industries*. The description of each typologies took into account its adaptability to a new use. This was essential to understand the sometimes not apparent fragility of the industrial heritage. Indeed this constructions are many times limited by constraints such as *building-machine* configurations, and their adaptive re-use should take the compatibility into account. An intervention should try to respect the compatible-use and the collective memory (defined by Choay) during the whole process of adapting to a new use. The interconnection between adaptive re-use, memory and compatible-use led to the definition of important conception guidelines.

CASE-STUDIES

After achieving a substantial amount of information regarding the concepts, the context and the operation of adaptive re-use, the knowledge gathered was then applied to the case-studies previously defined: **Belle-Vue Malt House** and **J. de Hemptinne Spinning Mill**.

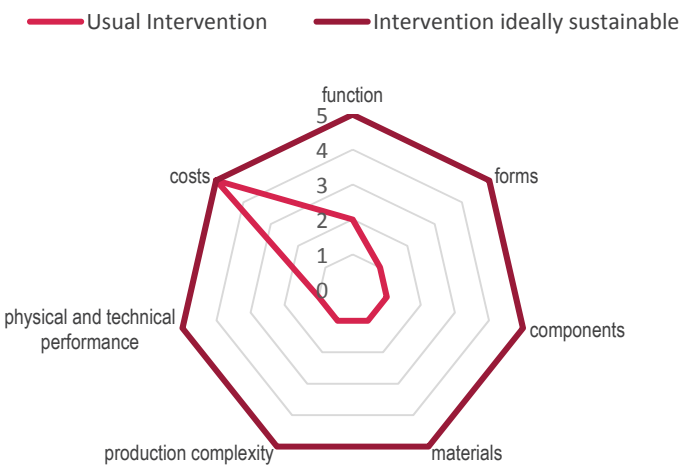
This analysis started by the recognition of certain principles, with the ultimate objective of creating an evaluation tool for the case-studies. Extremely important for this development was the theory of the *shearing layers* by Duffy (1990). By crossing it with latter improvements (Brand in 1994 and Roders *et al*. in 2005) it is possible to obtain a base-structure that identifies the contents of a building and deconstructs it in basic elements that can be evaluated separately.



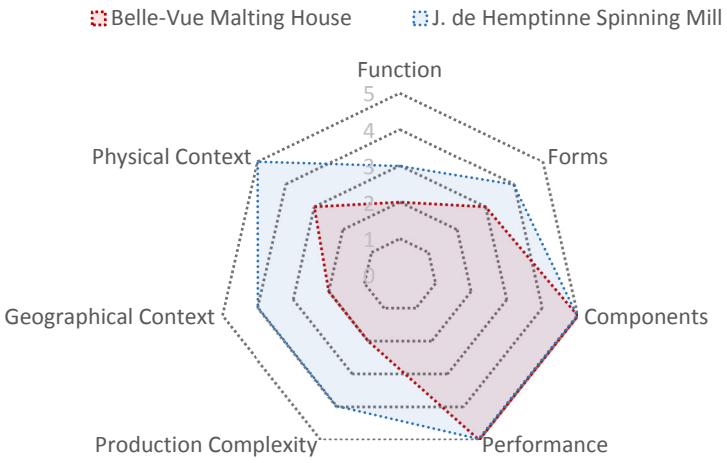
Function, production complexity, substance (forms, components, materials), performance, costs, environment (geographical, physical, anthropological) and cultural values appear as the elements worth evaluating in a building before and after intervention.

Roders *et al.* go even further by proposing their own evaluating model, based on the sustainability scale of the intervention, as its observable in the next figure:

					Scale
Features	V	IV	III	II	I
Function	use	re-use (upgrade)	readapt (compatible)	readapt (incompatible)	not-use
Substance forms	use	re-use (upgrade)	partial additions or subtractions	partial additions and subtractions	global mutation
Substance components	arrest decay, repair, consolidate or reinforce (compatible)	partial substitution (compatible)	total substitution (compatible)	partial substitution (incompatible)	total substitution (incompatible)
Substance materials	use	demount and re-use in a different situation	demount, recycle and use	demount and recycle	demolition and waste
P. Complexity	very easy	easy	reasonable	difficult	very difficult
Performance	improve	maintain	recover	decrease	replace
Costs	profit immediate	profit short term	profit mid term	profit long term	no profit



Based on this, after removing the *costs* and *materials* variable and adding the *geographical and physical context* by the author, an evaluation method was finally attained. The next figure shows its appliance to the case studies. Every major group was decomposed in some minor elements to help the readability of each unit. Each minor element was then evaluated in a scale from **I** to **V** according to the previous figure and after an exhaustive search and description of how each of them was changed in the re-utilization process. The overall grade of the unit results from the arithmetic mean between all the sub-elements on that unit.



From the analysis of this figure, one can conclude the difference between interventions methods. With the final classification o 4.28 the J. de Hemptinne Spinning Mill project is much more conscious and careful than the Belle-Vue Malting House one with 3.29 points. In both of them is observable a clear concern in updating the building to the last technical necessities and comfort parameters, maintaining also the components – exterior walls, interior finishes, structure. But then

they diverge in the other aspects. This is due to the fact that the Belle-Vue project plays with the transformation of the whole area – and not only the building – and tries to explore visual and physical crossings that ultimately result in partial demolitions in the building (thus the low classification in the other variables). On the opposite side, the J. de Hemptinne Spinning Mill was limited by legal constraints. They forbid the deliberate demolition of building parts and a solution had to be arranged to harmonize with the pre-existence, granting differentiation at the same time, which led to a very controlled intervention with very low impact.

CONCLUSIONS

The conclusions of each section were already somehow discussed during each sub-topic in this extended abstract. Either way, there are still some important topics that need discussion.

The previous analysis reinforced the conception preciously mentioned that the industrial buildings are subject to constraints that raise problems to the free choice of design options. In fact, it is important to mediate the sustainability scale of the intervention with eventual limitations to the original construction – such as *architectural peculiarities of the typology*, *state of the pre-existence, heritage value, developer conditions and the new program necessities*. It is important to state that sometimes the more impactful intervention leads to a better answer to this questions, balancing the problem of sustainability with outlooks for the building future. This was also applied to the case-studies. After identifying a set of human-centered design guidelines by Oblinger (2006) they were applied to the case-studies to see how many of them were actually respected by both interventions. A surprisingly classification of 8.5 / 11 in both cases leads to the conclusion that this program was flexible enough (remembering the concept of learning spaces referred at the very beginning of this study) to adapt to both types of interventions. In fact, neither of them had many problems in inserting the new program. This is impressive in the case of the Belle-Vue Malting House but it is even more on the limitative case of the J. de Hemptinne Spinning Mill. Either way, not only the flexibility of the learning spaces is of important mention, but also the search for a compatible use. Industrial buildings can be very adaptable and variable if the right use is found for them. This is again shown in the case-studies – the insertion of learning spaces in the Malting House led to the demolition of volumes to allow the interior illumination, while in the Spinning Mill no further transformations were needed in this aspect. For example, a museological function would be more compatible with the Malting than a learning spaces function, due to its huge interior spaces and the benefit of the controlled ambient.

A last note should be made about the role of the architect. As widely mentioned, many of the design decisions come from the sole will of the designer – due to the lack of legal instruments – therefore he or she should have the right knowledge and means to a successful intervention.

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