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INTERVENTIONS IN BUILT HERITAGE: MANAGING WHICH RISKS AND FOR WHOM

Ana Pereira Roders

Faculty of Architecture, Building and Planning, Eindhoven University of Technology, NL
a.r.pereira-roders@bwk.tue.nl

James Douglas

School of the Built Environment, Heriot-Watt University, UK
J.E.H.Douglas@sbe.hw.ac.uk

ABSTRACT

This paper aims to illustrate the fundamental dichotomy involving interventions in built heritage. On one side, the influential factors; and on the other side, the resultant risks. Both researchers have decided to join the knowledge acquainted in the last years of research and present to their field of expertise an essential state-of-the-art on which are presented the risks that normally require management when intervening in built heritage, as well as, the respective beneficiaries.

This literature survey allowed the researchers to verify that even if most frequently risk management is directly related to 'financial losses' and 'human being losses', there are also other fundamental losses which deserve equal attention. Those are 'heritage losses' as well as 'material losses'. Further research should be undertaken, so that it is better understood per fundamental factors what and who exactly could contribute to the reduction of uncertainty and probability, together with the risks that normally require management.

KEYWORDS: interventions, built heritage, risk management, cultural values

INTRODUCTION

The built environment is dividable in two groups: built heritage – previous generations; and built newness – current generation. Just as any other tangible property, built heritage is found varied in significance, as well as, in condition. Unlike built newness, built heritage is more often target of interventions in order to bring it into higher rates of significance and/or condition.

The more significant built heritage is often found listed in safeguard institutions, while the less significant is often condemned to indifference. In some countries such as Portugal, periodical activities of preservation, conservation and restoration are still a myth for most unlisted buildings. Consequently, they are the first ones to reach obsolescence and the first ones to be chosen for higher scales of intervention, such as demolition.

Curiously, their condition does not seem to play such a considerable role. Particularly, some features, such as performance and costs, do seem to bring higher risks of demolition in higher interventions. Currently in the Netherlands, lifespan is found playing a fundamental role together with performance, towards energy efficiency. In the UK, however, the role of health and safety as well as energy efficiency is becoming more and more important.

There is one very fundamental aspect to consider in risk management, which often is overlooked; and that is, whom are the risks being managed for exactly, when intervening in built heritage? Often, risks are tendentiously oriented towards the actors and respective

achievement of individual aims, rather than towards the buildings and respective impact on the environment.

This paper shall start by defining the eight fundamental factors influencing interventions in built heritage. Next, the relation between risks and uncertainty shall be explained; so that finally the resultant risks which are more frequent found referenced to be managed adequately when intervening in built heritage will be explored. Last, some preliminary conclusions shall be taken, together with few recommendations for further research.

INTERVENTIONS IN BUILT HERITAGE

Before explaining the resultant risks from the eight fundamental factors influencing interventions in built heritage, it is very important to clearly understand their particular role in the whole system (see Figure 1). The eight fundamental factors are respectively, 'object', 'values', 'tools', 'aims', 'actors', 'action', 'time' and 'site' (Pereira Roders, 2007a).

'Object' refers to the building (or buildings) being intervened and respective condition. Such condition regards its performance towards the environment, within its physical (substances; forms, components and/or materials), functional (functions), technical (performances), economic (costs), lifetime (lifespans) and potential (adaptabilities) dimensions (Pereira Roders, 2007b).

The cultural values which are identified in every 'object' and that normally establish the distinction between listed and unlisted buildings, within built heritage, are here referenced as 'values'. Mason (2002) defined a provisional typology for cultural values, considering 'the kinds of value most often associated with heritage sites and conservation issues, but it does not assume that every heritage site has every type of value'.

According to Mason, there were two major groups: the socio-cultural values (historical, cultural-symbolic, social, spiritual-religious and aesthetic) and the economic values [use (market), non-use (non-market), existence, option and bequest]. Pereira Roders (2007b) has chosen to structure them differently. Accordingly, the eight primary cultural values are the social, economic, political, historic, aesthetical, scientific, age and ecological values.

Instead, the 'actors' are all individuals directly or indirectly involved with the 'action' of intervention, shaped by their 'aims'; and consequently, when making use of 'tools' particularly chosen to design or perform the 'action'. 'Actors' has been earlier referenced by Brand (1994) as 'souls'; nevertheless, only as a possible seventh 'layer of change', added to: 'site', 'structure', 'skin', 'services', 'space plan' and 'stuff' (see Figure 2).

Brand (1994) also identified 'site', progressing from Duffy's "several layers of longevity of building components" (1990), mainly focused on the lifespan fragmentation of the building. In this case, Pereira Roders (2007a) defined site as all natural and built environment having directly or indirectly influence on the 'object', excluding the particular 'actors'. Last, 'time' regards the period when the design or perform of the 'action' of intervention is taking place.

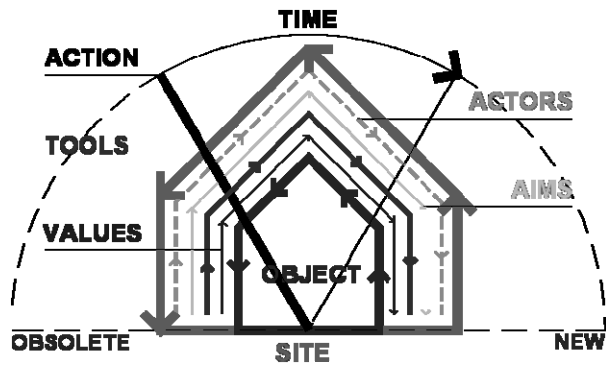


Figure 1. The eight fundamental factors (Pereira Roders, 2007a)

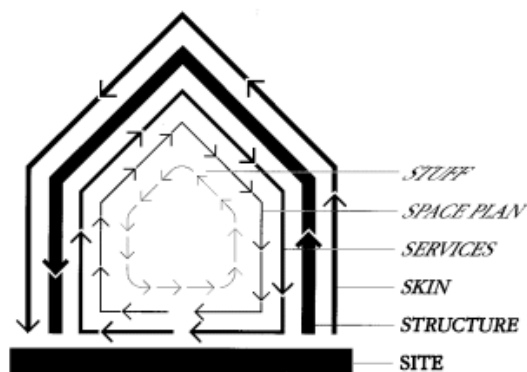


Figure 2. The shearing layers of change (Brand, 1994)

RISK VERSUS UNCERTAINTY

All interventions in the built environment incur risks. According to Douglas (2008), other scales of intervention, than urban reconstruction / building new, incur even more risks. Basically, such raise of risk is related to its increase of uncertainty. Thus, before going through each fundamental factor and understand its intrinsic risks, it is essential to understand what both risk and uncertainty signify.

‘Risk’ has also been defined as the combination of the possibility of an event and its consequence (BSI 2002). However, Douglas (2008) pointed out the risk has generally a negative connotation and usually involves some form of financial loss. Alternatively, risk should be seen as the chance that an actual outcome will deviate from that forecast or intended, and not exclusive on the economic perspective.

Closely related to ‘risk’ is ‘uncertainty’. The main difference between them is that the former is something that is considered to be reasonably objective in nature and thus quantifiable (e.g. statistical assessments), whilst the latter is more subjective but generally unquantifiable (e.g. subjective probability). Risk always involves an element of uncertainty, but uncertainty does not always involve risk (Douglas, 2006).

Therefore, the more uncertainty, the more risk interventions in built heritage can achieve. Table 1 illustrates the relation between risk and uncertainty, adapted from Raftery (1994), Bowles and Kelly (2005) and Douglas (2006). There, it is also possible to verify that the information available plays a fundamental role to decrease uncertainty and consequently, the risk to be managed when intervening in built heritage.

Table 1. Risk versus Uncertainty

Risk	5 Very High	4 High	3 Reasonable	2 Low	1 Very Low
	Unknown Unknowns		Known Unknowns		Known Knowns
Building-related Information					
Documentary Inventory	no documents (environment, building construction and previous interventions)	partial documents (environment)	partial documents (environment and construction)	partial documents (environment and previous interventions)	full set of documents (environment, building construction and previous interventions)
Oral Inventory	no oral testimonies (environment, building construction and previous interventions)	partial oral testimonies (environment)	partial oral testimonies (environment and construction)	partial oral testimonies (environment and previous interventions)	full oral testimonies (environment, building construction and previous interventions)
Physical Inventory	no access to outside the building (surroundings)	no access to inside the building	full access to inside the building: superficial inventory (e.g. photos, sketches)	full access to inside the building: partial inventory (e.g. photos, sketches, in- situ measure- ments, notes)	full access to inside the building: detailed inventory (e.g. photos, sketches, in- situ and lab measure- ments, notes)
Uncertainty	5 Very High	4 High	3 Reasonable	2 Low	1 Very Low

RISK MANAGEMENT AND THE DIRECT BENEFICIARIES

According to UK Health & Safety Executive's website, 'risk management is the process by which an organisation reaches decisions on the steps it needs to take to adequately control the risks which it generates or to which it is exposed, and by which it ensures those steps are taken' (HSE, 2007).

Douglas (2008) defined five main constraints affecting interventions in built heritage: 'financial', 'spatial', 'temporal', 'legal' and 'personnel'. Moreover, he considered risk as the result of the 'condition' and/or the emerging 'set of circumstances'. So, Douglas added the 'existing building's condition and performance' to 'basis of estimates or budget costs', 'design and logistics', 'objectives and priorities', 'project organisation'; earlier identified by Ward and Chapman (1999).

Returning to the eight fundamental factors, it is possible to verify few more additions were made to what can be established as the 'risk profile', as well as, identify the most referenced risks related to each fundamental factor that are normally managed when intervening in built heritage and the respective beneficiaries (see Table 2). In some particular cases, there are not only beneficiaries but also injured factors.

Objects

Every "object" is different. Bowles & Kelly (2005) already mentioned that perhaps with the exception of some housing estates, no two buildings have exactly the same orientation, performance, accessibility, etc. Or even if originally they had, probably with time, this homogeneity disappeared during its use period and/or respective interventions.

Douglas (2008) stated that full code compliances might be more difficult to achieve because of physical restraints, probably because full code compliances are normally written for new buildings. There are always many different ways to cope with the full code. Therefore, depending on the actors involved in the intervention (e.g. developers and architects), to comply with the full code might vary from minimal to maximal intervention.

When its condition is condignly assessed, there shall be less room for uncertainties and probabilistic diagnosis, which too often results in a considerable amount of 'resources losses' e.g. time, finances, materials, etc. In fact, from building to building, involved actors can start creating their own 'action patterns', reducing the risk of doing repetitive and time-consuming activities. That would certainly reduce the risks to be managed.

Values

Every "object" is perceived differently. Some are considered exceptional and become listed, other remain unknown and are commonly considered as "valueless" by the current generation. As the cultural values are in constant evolution, there is a serious risk that future generation accuse current generations of being active promoters of 'heritage losses'. In fact, there are no "valueless" buildings.

"Valueless" built heritage were simply not condignly assessed. The ignorance on its lifespan: past and future, makes present generations determine the destiny of such buildings on base of the present. Therefore, a condign assessment shall reveal exactly what is valuable, taking into

consideration not only the most common historic and aesthetical values, but also the social, economic, political, scientific, age and ecological values.

Actors

There are many different actors involved with interventions in built heritage. Depending on the building and environment, the risks to manage as well as, the respective actors vary. According to Bowles & Kelly (2005), ‘personnel compositions and levels are never the same, and the forms of contract used are often adapted with variations and amended clauses, all of which can militate against standard forms of contract’.

Interventions in built heritage, rather than building new, can be very labour intensive and require skilled workers. Bowles & Kelly (2005) have earlier argued that ‘despite being more labour intensive refurbishment contracts may have fewer operatives on site at any one time than a comparable new-build scheme’. Therefore, these interventions require less but skilled workers to accurately implement the envisaged construction activities.

Consultants are both important for both reducing both strategic (e.g. project justification) and tactical (e.g. property location) risks. In fact, the strategic risks are mainly related to the quality of the feasibility and design stage, e.g. funds/financing, definition and justification of a project, the stakeholder interest and building availability. Consequently, the direct actors involved are the clients, consultants, approving authorities, etc.

Aims

The aims are quite fundamental to the risk management. They are the ones that shape the action and make the new existence more or less adequate than the pre-existence of a building target of intervention. In fact, Ward and Chapman (1999) and Douglas (2008) have all referenced the importance to manage the risks related to the uncertainty about objectives and priorities.

Whenever, the ‘aims’ are unsustained to its building and environment, they can lead ‘actors’ into very lifespan unconscious ‘actions’. Consequently, when intervening in built heritage the risks to be managed regarding several other factors can increase considerably. Inadequate aims can direct or indirectly risk the ‘object’ target of intervention, its inherent ‘values’, the involved ‘actors’ and/or its ‘site’.

Actions

The ‘actions’ of intervention and respective scale are naturally related to the previous fundamental factor, but should also be much related to the building and respective environment. Otherwise, the ‘actions’ being taken to fulfil the overestimated aims of few involved actors (e.g. client, developers, etc) are lifespan unconscious and consequently, the risk to be considered incompatible to the building and respective environment is much higher.

Often, they reveal two patterns: higher ‘actions’ of intervention are eminent when there are finances available and lower ‘actions’ of intervention are eminent when there are less finances available. In fact, Douglas (2008) emphasised that ‘funds for refurbishment and other similar work might be more restricted as part of an organisation’s cost-cutting exercise. So, they might not represent ‘financial losses’, but shortage of ‘financial’ resources.

Tools

Similar to the 'object', also the universe of 'tools' – methods, technologies and substances – available to be used when intervening in built heritage, is wide and varied. However, what normally occurs is that the 'actors' and respective 'aims' steer the chosen categories of 'tools'. For example, unsustainable 'actors' are not expected to choose 'tools' that can lead them into sustainable 'actions' (Pereira Roders, 2007c).

The risk to manage does not stop if the adequate method is chosen to steer the chosen 'action' of intervention. Instead, when following the adequate method, the 'actors' can actually end up choosing for inadequate technologies e.g. due to time and financial constraints. Similarly, the chosen substances have three levels of risk profile. The first regards the chosen forms, the second regard the chosen components, and the third regard the chosen materials.

Site

After the 'actors', the 'site' can be considered as one of the factors which should require more attention when managing the risks of an intervention in built heritage. Not only is the 'site' one of the most predictable responsible for the decrease of a building's condition, as unpredictably can be also responsible for enormous 'resources and cultural losses' (e.g. natural catastrophes, etc).

Inversily, depending on the degree of compatibility between the building and the site, the building can either promote or denigrate the site. Buildings can help solving problems, but can also create problems, not only for its involved actors, but also for the 'site'. Again, when both building and site are assessed condignly before taking any other decision, all most fundamental points of attention shall in due time emerge.

Time

'Time' is one of the most important factors to be well managed in order to reduce serious planning risks. It can not only determine the category of 'tools' available for being used e.g. informatics in the end of the XX century, as it can influence 'actors' choosing for the specific 'actions' of intervention. 'Time' is also the most probable fundamental factor. Independent of what 'actors' might decide, 'time' is unstoppable and that can contribute e.g. to considerable delays on the planning, when comparing the actual results with forecasted times.

The reaction of both building and environment to time is far more improbable. Therefore, even if there is lifecycle data to guide all actors involved in the construction industry, one should not take immediate conclusions and consider such data as the imperative truth. These values were reached taking in consideration the worst possible conditions; which is not always the case for every built heritage. Otherwise, the risks to be managed would raise and the contribution of interventions in built heritage to the environment drop.

CONCLUSION

Interventions in built heritage have several risks to be managed as well as different beneficiaries. However, with this literature survey it was possible to verify that to reduce uncertainty and the resultant risks to be managed, more information is required to sustain accurate surveys that shall lead into condignly assessment. The three inventories (documentary, oral and physical) can be fundamental for achieving it.

Moreover, this literature survey allowed the researchers to verify that even if most frequently risk management is directly related to 'financial losses' and 'human being losses', there are also other fundamental losses which deserve equal attention. Those are 'heritage losses' as well as 'material losses'. Together, they insure that both natural and built environments remain preserved for the future generations, without undervaluing the current generation.

Further research should be taken on risk management when intervening in built heritage, so that it is better understood per fundamental factor what and who exactly could contribute to the reduction of uncertainty and probability, together with the risks that normally require management. Together with all other involved actors (e.g. architects); facility managers can actively contribute to a raise of lifespan consciousness when intervening in built heritage.

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