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**Article:**

Dogan Stewart, H.A. (2019) Assessment of the perception of cultural heritage as an adaptive re-use and sustainable development strategy. *Journal of Cultural Heritage Management and Sustainable Development*, 9 (3). pp. 430-443. ISSN: 2044-1266

<https://doi.org/10.1108/jchmsd-09-2018-0066>

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# **ASSESSMENT OF THE PERCEPTION OF CULTURAL HERITAGE AS AN ADAPTIVE RE-USE AND SUSTAINABLE DEVELOPMENT STRATEGY: CASE STUDY OF KAUNAS, LITHUANIA**

## **Abstract**

### **Purpose**

The purpose of this research is to develop a model which can measure the effect of perception on the assessment of cultural heritage by analysing the façades of buildings for adaptive re-use and sustainable development strategy.

### **Design/methodology/approach**

This paper focuses on the correlation between adaptive re-use and sustainability of cultural heritage, by analysing the invisible social context which has an impact on the establishment of adaptive re-use strategies. The method adopted included literature review and applied experiments for extending the methodology of Langston on the Adaptive Re-use Potential Model in order to establish a new tool which can be applied to cultural heritage. The assessment process followed the Integrated Cultural Heritage Management Approach to identify the indicators which can be implemented on cultural heritage, and furthermore, for the sustainability of the environment.

### **Findings**

The results demonstrate that the perception of the society can rely on different indicators which affect people to assert an artefact as cultural heritage. Furthermore, these indicators can have an impact on the adaptive re-use strategies regarding the interaction with society. Societies' perception should not be omitted, and they need to be integrated while evaluating and developing the strategy of adaptive re-use. Therefore, a holistic approach to this process can bring continuity and sustainability to the environment.

### **Originality/value**

No similar prior studies on the perception of cultural heritage as an approach to adaptive re-use strategies have been carried out. Therefore, it is hoped that this model can lead and guide, and furthermore be adopted in other similar situations in the assessment and decision-making process of adaptive re-use.

**Keywords:** Adaptive Re-use; Sustainability; Cultural Heritage; Perception; Refurbishment Potential

## 1.Introduction

The original function of a building can become obsolete because of various reasons, such as changes in economic and industrial practices, demographic shifts, increases in maintenance costs, moreover, because it is no longer suited for the original function, and a new use has not been identified. When this situation occurs, the building might need refunctioning, which can be achieved by the adaptive re-use. However, as Perez de Arce states, adaptive re-use is not a new phenomenon, although, previously it was more pragmatic in many cases without heritage preservation as an intention (Perez de Arce,1978). The reason behind adaptive re-use in earlier periods was more about providing a new function to an existing building and considering the economic benefit of it. However, in contemporary perspective, adaptive re-use is an important strategy which is applied for preserving the value and the perceived meaning of the cultural heritage which helps the continuity and sustainability of the environment, and furthermore the genius loci.

The impact of the buildings on the environment and the genius loci diminished as the language of the Modern Movement emerged as a common architectural language in the 20<sup>th</sup> century. Depreciation which is arising from the obsolescence of the materials and functions of these buildings blended with the lack of appreciation on the appraisal of them as cultural heritage by the society and non-experts. Nevertheless, one of the essential attributes which keep the meaning of heritage is people's perception, and this can be affected by different indicators. Therefore, for understanding the process of perception, it is important to identify the indicators for evaluation. In that regard, examining the Modern Movement can help to comprehend how people are evaluating heritage, and furthermore, determine the indicators which are perceived to influence the appraisal of cultural heritage, which can be adopted in adaptive re-use strategies for sustainable development.

In order to identify and test the indicators which have an impact on people's evaluation of heritage, this research develops a conceptual framework for the assessment of building façades by the model of Cultural Heritage Perception Potential (CHPP). The paper begins with the literature review on the definition of cultural heritage and its value, sustainability and adaptive re-use. In the following section, it gives brief information about the context of the study and proposes a tool for estimating the cultural heritage perception potential. In chapter four, it explains the performed experiments, which are part of prior research (Doğan, 2018) and analyses the methodology of Langston on Adaptive Re-use Potential Model for the creation of the new tool (Langston, 2012). The paper then applies the model to a segment in Kaunas, Lithuania as a potential validation tool for establishing adaptive re-use strategies related to its social context. Finally, the paper discusses the application of the model.

## 2.Literature Review

According to the Faro Convention, cultural heritage is defined as *a group of resources inherited from the past which people identify, independently of ownership, as a reflection and expression of their constantly evolving values, beliefs, knowledge, and traditions* (Faro Convention, 2005). Therefore, it is possible to state that one of the essential characteristics of cultural heritage is the reflection and interaction of it with people. Cultural Heritage is a representation of life for societies, which they have developed over time and passed from generation to generation by customs and practices. In that regard, the impact of people on the evaluation of heritage is essential, because heritage can be meaningful as long as people attach a meaning to it. As Smith states, there is no such thing as heritage and heritage had to be experienced for it to be heritage

(Smith, 2006). Therefore, heritage only stays alive if it is performed and practised on a daily basis and perceived and acknowledged by society.

However, as Paszkowski states, values in heritage have a diverse character, and the criteria for assessing them are variable. The rapid change in the natural and cultural environment has an impact on architecture and architectural heritage that affects the functional, spatial and aesthetical needs (Paszkowski, 2011). Therefore, all these changes give rise to the question of the value, treatment, and preservation of heritage, furthermore, these changes establish different approaches and divergent norms for evaluating heritage.

Over the centuries, the concept and the treatment of heritage and approaches to conservation of it changed as values changed. As Vecco states, in the contemporary concept of heritage studies, the monument is considered in its context. Furthermore, while initially, the historic and artistic value was the only selection parameters for heritage, other additional ones have now been added (Vecco, 2010). One of the first people who worked on values of cultural heritage is Riegl, who defined the theoretical aspects of the issue and distinguished three main groups of values: commemorative value (age value and historical value), intentional commemorative value, and present-day value (use value and art value) (Riegl, 1903). However, even though these values appear to be accurate, some of them might be relative. Specifically, the historical value might occasionally depend on the nation. Furthermore, an artefact might not fit in the criterion of the understanding of aesthetics in the contemporary meaning, but it might still be unique in the period it was established, which would give it artistic value. Therefore, in some ways the values which have been given to cultural heritage can be contingent; furthermore, they can only be understood by the reflection of them in the societies. Buildings, artefacts, environments, and the meanings they represent are often integrally tied to the identity and the memories of the society; therefore, while analysing the value of the heritage, it is important not to omit the invisible social context and memento value.

However, heritage by itself can rarely hold its intangible peculiarities if it is not properly managed, moreover, if it is not perceived as cultural heritage by the society. In most cases, the impact of the invisible social context while considering cultural heritage evaluation has been given lower priority since it is hard to measure. Therefore, in the evaluation process, what is considered valuable by society and what is protected might occasionally not be equivalent. Nevertheless, one of the most important elements which define the cultural heritage is the perception of people. In that regard, the perception of people is important to preserve the continuity of the cultural heritage which results in the sustainability of the environment.

As Manenti states, sustainability is based on the need to preserve the natural resources so that earth could provide them for future generations (Manenti, 2011). Therefore, sustainability establishes a balance between the environment and nature which can be transferred to the posterity. Nevertheless, it is also possible to implement the same idea not merely for the natural environment, but also in architecture. Sustainability can be applied to building design and can be adopted in the adaptive re-use of cultural heritage. The characteristics of architecture, which contains the ability to communicate memory and identity, can generate the capability of communicating values and sense of a place which fulfils the requirement of sustainability on the continuity for future generations. Furthermore, as Pearson and Sullivan state, heritage conservation can contribute to ecologically sustainable development (Pearson & Sullivan, 1999). Therefore, in a broader context, cultural heritage can become evident in sustainable development in various aspects.

As Tanguay *et al.* assert, the concept of sustainable development began in the 1970s with the growth of the environmentalist movement and with the Brundtland report the concept started to be discussed in the international and political sphere (Tanguay *et al.*, 2014). In this report, sustainable development is defined as; *a development that meets the need of the present generation without compromising the ability of the future generations to meet their own needs, in regard of harmonious development, concerning environmental, economic, and social dimensions* (Brundtland Report, 1987). Therefore, the main aspects of sustainable development are: society, environment, and economy. However, according to Hawkes, sustainable development also contains a fourth pillar, which is the culture (Hawkes, 2001). The main concern of sustainability and sustainable development is the protection and continuity of the resources which are irreplaceable. In that regard, cultural heritage is also irreplaceable when it vanishes. Therefore, cultural heritage also involves all the other aspects of sustainable development and one of the ways which can help to achieve the continuity of cultural heritage is adaptive re-use.

Adaptive re-use is one of the interventions that can be implemented to a building when the building loses its original function, and there is the need to provide a new function to the building, so that it can continue its life. As Pimonsathean states, adaptive re-use helps to extend the life of a historical building by adapting its function in response to contemporary needs (Pimonsathean, 2002). Furthermore, adaptive re-use can affect the environment by promoting the neighbourhood, it can affect the economy by promoting tourism, and it can help recycling materials. Moreover, it can create an impact on the cultural memory of the people.

According to Plevoets and Van Cleempoel, in contemporary conservation theory and practice, adaptive re-use is considered an essential strategy towards conservation of cultural heritage (Plevoets & Cleempoel, 2011). However, it is an ambiguous issue because the new function which is given to the cultural heritage might affect the values that the artefact contains. As Bullen and Love states, the most successful adaptive re-use projects are those that respect and retain a building's heritage significance as well as add a contemporary layer that provides value for the future (Bullen & Love, 2011). Therefore, while considering the new function of a heritage building, it is essential not to disregard the characteristics which makes it valuable. Furthermore, as Pearson and Sullivan state, compatible re-use is re-use that will not damage a place or its cultural significance (Pearson & Sullivan, 1999). Therefore, cultural heritage and architecture should not just respond to the needs and the functions that people require, but it should also involve cultural and relational aspects. In that regard, when the strategy of adaptive re-use is implemented to heritage, it should be sensitive towards the meaning and the identity of the society. As Tveit *et al.* state, landscapes which contain both past and present can provide integrity and quality to the communities who live in that environment (Tveit *et al.*, 2006). Therefore, buildings tend to convey their distinct character to the environment. Furthermore, they do help to provide a tangible connection to the past by their intangible elements. In that regard, considering the impact of the building on the environment and on the perception of the people should not be omitted.

### **3. Study Context**

While the cultural significance of an artefact is objective and commonly decided by experts, the meaning people attach to these artefacts and their perception of the same object might be different. As Salingeros states, people establish a personal relationship with physical objects by the intense degree of connectivity regarding their perception. Therefore, people need to rely upon their own perceptions rather than any physical measurements when they are observing an artefact or object (Salingeros, 2013). However, the studies which focus on people's perception

and judgement are still ambiguous due to the methods which are used in surveying. In most of the research, visual materials are used because of cost reasons, as it is generally more expensive to bring significant numbers of interviewees to various sites. However, as Lange points out, there are questions of validity in the use and interpretation of responses to photographic images (Lange, 2001). However, it is still possible to use photographic images as stimuli, in order to allow interviewees to express their own perception and interpretation of the image without being imposed by researcher-based opinions. Nevertheless, in the process of measuring the data of perception, it is crucial to understand and analyse the indicators, which affect the perception of people.

While measuring the adaptive re-use potential of cultural heritage, an approach involving identifying and ranking the perception of cultural heritage and cultural significance of buildings is essential. In order to understand and test the indicators which affect people's evaluation of cultural heritage, and furthermore induce people to qualify artefacts as heritage, a model can be designed by contextual analysis. Therefore, in this research, the research and methodology of Langston on Adaptive Re-use Potential Model were analysed and extended while creating a new model (Langston, 2012). However, first of all, the indicators required to be identified by different approaches. In that regard, experiments were performed for this purpose.

## **4. Materials and Methods**

### **4.1 Determining the indicators**

A prior experiment by Doğan involves analysing and identifying the potential indicators of the perception and attitudes of people towards the cultural heritage of the Modern Movement (Doğan, 2018). In this prior research, the focus was to determine the relationship between façade elements and impression, furthermore, how they affect perception. The experiment was designed to be implemented by interviews to investigate the determining components which have an impact on discernment. In the design of the experiment, a qualitative approach and non-probability sampling were adopted. The goal was not making generalisations or preparing statistical inferences from the sample being studied to the wider population of interest but identifying the indicators which can be implemented in the model. Therefore, the experiment was a pilot study.

A total of 70 participants selected by the purposive and convenience sampling technique took part in the experiment through personal interviews. The participants were requested to answer a questionnaire either via an online form or face to face interview. Participants were heterogeneous regarding age, which ranged between 20–60, and heterogeneous regarding where they are from. However, the criterion of age was found not to be relevant to the experiment. Thirty participants out of the total 70 were selected from people who are living in Lithuania, and who have had prior exposure to the Modern Movement heritage of Kaunas. Another 30 participants were selected from Turkey, who are acquainted with the Republican period dialect of the Modern Movement, Ottoman Architecture and cultural heritage. The final 10 participants out of 70 were selected as a test group from different countries. Only 10 of the participants were chosen from the field of architecture or fields related to cultural heritage since the main aim of the experiment is to test the perception of non-experts.

The experiment followed three main methodologies. The first methodology was the methodology of Salingaros which he established for measuring the perceived quality of life in buildings and urban spaces by the analysis of geometry. According to Salingaros, quality of life comes from geometry, and how that geometry connects to individuals. Therefore, the easiest way to measure this quality of life is to compare pairs of objects or settings and judge

intuitively which one has more life in them (Salingaros, 2013). In that regard, for measuring the perceived indicators on the appraisal of cultural heritage, the same comparison method was adopted.

The second methodology was the methodology of Galindo and Rodriguez on environmental aesthetics and psychological well-being, where they implemented the extensive use of photographs to test respondents' awareness of their environment and the main effective responses that established their judgement (Galindo & Rodriguez, 2000).

However, in the current research, the awareness of heritage and the perceived notions which assess the judgment on heritage were investigated by demonstrating pictorial material and asking open-ended questions. As Coolican states, any predetermined options or suggestions might have an influence on the subjects' imagination and perception (Coolican, 1994). Therefore, this approach was used as the third research methodology.

According to the main three methodologies, a set of 30 colour photographs of Modern Movement buildings and buildings of various other architectural styles were demonstrated to the participants in fifteen pairs, in which each pair aims to examine the perception of people about cultural heritage and the specific indicators and components they contemplate in their decision. The indicators which were tested in the experiment were: ornament, material, patina and the prior knowledge about buildings in the specific region. In 8 of the pairs, Modern Movement structures were compared to other structures with varying architectural styles. In the other 7 pairs, Modern Movement structures were collated, and the pairs contained different dialects, except for one of the pairs. Different façade materials were chosen across the set of pairs, such as wood, stone, and plaster. Furthermore, buildings with patina and buildings with ornaments were used in the comparisons. In every pair at least one of the building reflected the expression of the Modern Movement. The pictorial material was selected from a collection of photographs which were taken by the author or from online resources. All pairs of photographs were presented to the participants one by one, and the participants were asked to choose the ones which they would identify as cultural heritage in their own perception. The options of choosing which were given to the participants were: A is cultural heritage, B is cultural heritage, both A and B are cultural heritage, and neither of them is cultural heritage. After the participants made their decisions, they were asked why they chose that/(those) building(s) as cultural heritage. According to the selections and answers of the participants, a list of indicators was identified for adopting in the model.

According to the experiment results, people responded to various indicators while evaluating cultural heritage. One of the main indicators is ornament. On 8 of the pairs, ornament was used to test the reaction of people, however, on 4 of the pairs, the ornamented buildings did not have any architectural value. Nevertheless, 97 percent of the participants considered ornamented buildings as cultural heritage. Furthermore, patina also has an impact on the perception of people. Participants determined the buildings which have patina on their surfaces as cultural heritage when they were compared with buildings which do not have patina. Moreover, when the results are being analysed related to the use of traditional materials on the façade, such as wood or stone, people had the tendency to choose wooden façades rather than plastered ones as being cultural heritage. Additionally, according to the results, people from Lithuania identified the Modern Movement heritage in their environment better, presumably by the impact of the prior exposure to the structures, and furthermore, by the education and the information given to them prior. In 2 pairs the demonstrated buildings were lesser-known buildings of the Modern Movement in Kaunas, and the scores on these buildings to be chosen as cultural heritage were lower than the buildings the participants were more informed about.

Moreover, as Goral states, according to research which was implemented by the Polish Ministry of Culture and National Heritage Department on the perception of Polish people towards cultural heritage in 2012, the participants of the study identified cultural heritage as both material and spiritual achievements of a particular social group, and a part of the past, which is a testimony to people's identity, mostly associating the concept with historical monuments (Goral, 2014). However, this perception is not limited merely by the Polish society, but most of the people have the tendency to relate heritage with monumental architectural objects. As Güngör states, the vertical lines in the design provide a monumental impression on the buildings (Güngör, 2010). Furthermore, Ocvirk *et al.* assert that, while the horizontal direction of a line could indicate serenity, spirituality, and stability, the vertical direction of a line could express poise and aspiration (Ocvirk *et al.*, 2013). In that regard, artefacts which have more vertical elements establish the effect of monumentality and this peculiarity can have an impact on people's perception to identify an architectural artefact as cultural heritage.

As a result, the indicators which have the most substantial impact on people's perception of the building as heritage according to the experiment and literature review are:

1. Material/Texture 2. Ornament 3. Patina 4. Colour 5. Lines (Vertical and Horizontal)

#### **4.2 Suggestion of the extension for the Adaptive Re-use Potential Model**

According to the Adaptive Re-use Potential Model that Langston established, it is possible to identify and rank the adaptive re-use potential of the buildings (Langston, 2012). He explains that the model requires an estimate of the expected life of the building and the current age of the building both reported in years (Figure 1). Furthermore, it requires an assessment of physical, economic, functional, technological, social, and legal obsolescence. Likewise, in his further research, he added political obsolescence (Langston, 2012). Thereby, the useful physical life of the building can be calculated, and it can be used for ranking structures according to the potential they offer for adaptive re-use. The formula he applies for calculating useful life is:

$$\text{Useful Life}(L_u) = \frac{L_p}{(1 + \sum_{i=1}^7 O_i)^{L_p}}$$

$L_u$  = Useful life     $L_p$  = Physical life     $O_i$  = Obsolescences

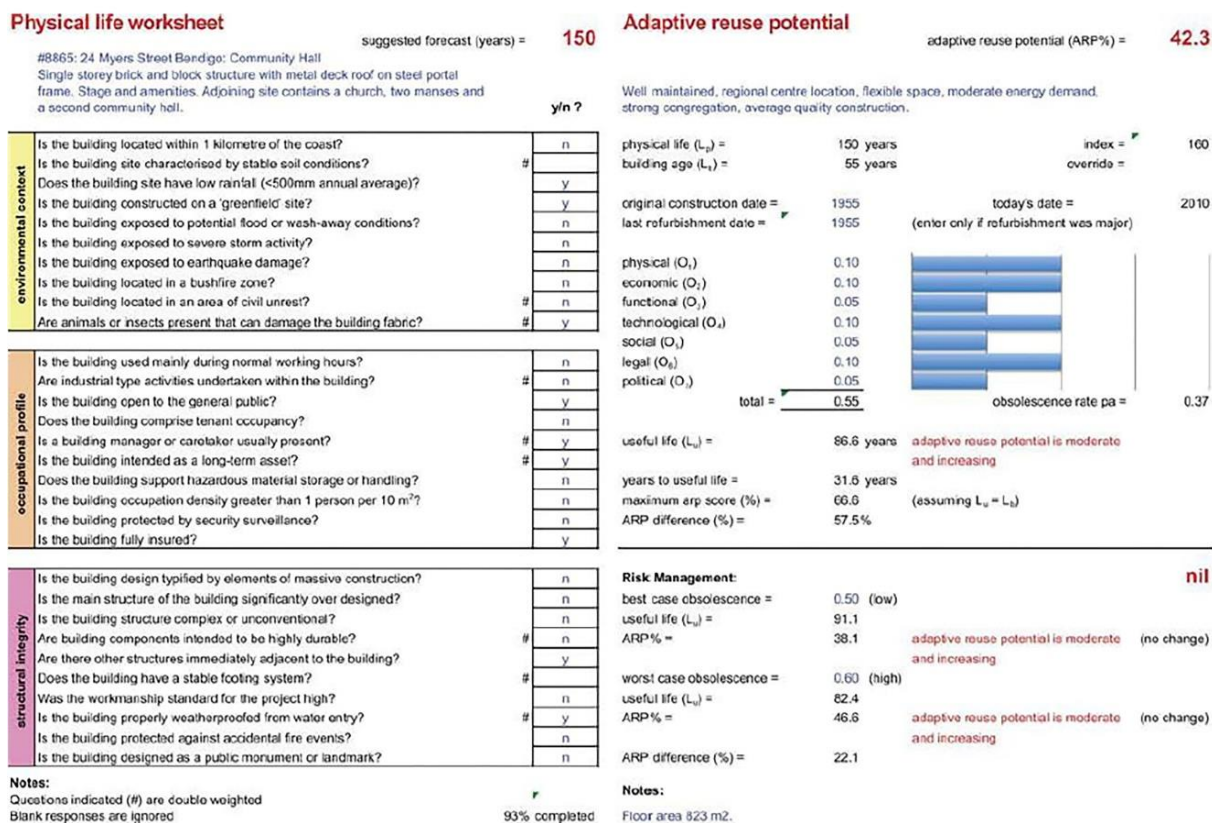


Figure 1: Spreadsheet template of Langston [Taken from Langston, 2012]

However, except for the social obsolescence of the building which can be measured by the relationship between the building function and the marketplace, there is also an invisible social context which is the perception of the building. The image of the building that people form related to the impressions the building gives can also have an impact on the useful life. As it has been emphasised in the Madrid Document of the ICOMOS Scientific Committee in 2011, the methodology for the 20<sup>th</sup> century cultural heritage should include comprehensive historical research and significance analysis in the development of policies to conserve, manage, and interpret the identified cultural significance (ICOMOS, 2011). Therefore, while calculating the adaptive re-use potential of cultural heritage, an approach for identifying and ranking the Cultural Heritage Perception Potential and cultural significance of buildings can improve the Adaptive Re-use Potential Model by including the social aspect in it. Therefore, a new model has been designed for measuring the invisible social context by CHPP (Cultural Heritage Perception Potential) which can be added to the formula as  $O_8$ . Therefore, the new formula will be:

$$\text{Useful Life}(L_u) = \frac{L_p}{(1 + \sum_{i=1}^8 O_i)^{L_p}}$$

#### 4.3 Description of the CHPP Model

The CHPP model requires analysing the indicators which establish the impression for people to evaluate buildings as cultural heritage by contextual analysis. The model can be implemented in different countries and different buildings with various architectural expressions, although, in the process of this research, it has been performed on buildings in Kaunas.

The same methodology that Langston used in his research has been employed with the idea of implementing it on cultural heritage and its perception. According to the five indicators of the impressions, the score will be defined by the reduction of 20 percent 10 percent and 0 percent from the total 100 percent depending on the presence of the feature. (Figure 2).

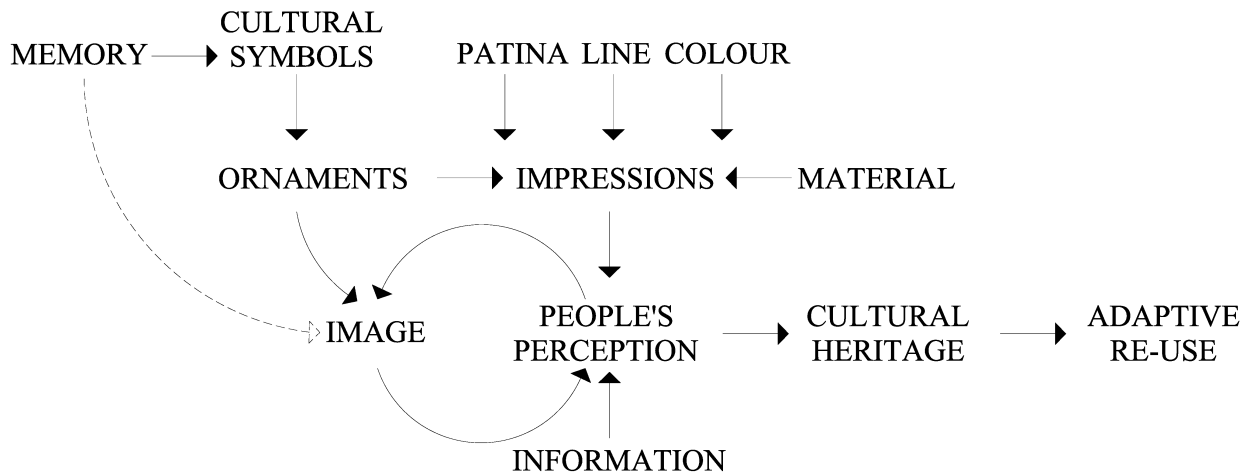


Figure 2: Indicators of the impressions and people's perception [Prepared by the author]

A scale for the usage of material is developed such that the buildings which have traditional materials (wood, stone, brick) on its façade received 0 percent, the buildings which have stone imitation formed by plaster on the façade received 10 percent, and the buildings which have plaster received a 20 percent reduction.

Ornaments of the buildings have been measured by the ratio of the façade surface covered by ornaments related to the proportion of the overall façade of the buildings. A scale is developed such that buildings with the ratio of ornament to the proportion of the whole façade more than 15 percent received 0 percent, a ratio which is less than 15 percent received 10 percent, and buildings with no ornament received 20 percent reduction. The bandings on the plaster, porthole windows, and curves are calculated as ornaments since they are decorative elements, and furthermore, they are not related to structural integrity.

According to the experiment which was implemented, people tend to choose the buildings which have patina on their façade as cultural heritage. Therefore, a scale is developed such that the buildings which have more than 30 percent of patina received 0 percent, the buildings which have less than 30 percent of patina received 10 percent, and the buildings which do not have patina received 20 percent reduction — the term "*patina*" used for referring to the layer which develops over time on the façades of the buildings by a various range of factors such as weather conditions, pollution etc.

Moreover, people also tend to choose darker colours over brighter coloured buildings. Therefore, a scale is developed such that the buildings with darker colour received 0 percent, the buildings which have neutral or interim colour (including white) received 10 percent, and the buildings with brighter colours received 20 percent reduction. The buildings which have two different colours also received a 10 percent reduction.

The lines on the façade have also been measured by the ratio of them to the proportion of the façade, which has an impact on giving the building a vertical or horizontal impression. The ratio has been calculated by the comparison of the multiplication of quantity and the length of both horizontal and vertical lines. A scale is developed such that buildings with the dominant

characteristics of vertical lines received 0 percent, buildings which have interim domination received 10 percent, and the buildings which have dominant attributes of horizontal lines received 20 percent reduction. Maximum 15 percent difference between the vertical and horizontal lines was regarded as interim.

To analyse the cultural heritage perception potential, the defined parameters have been implemented on buildings. The score for each building would be defined as follows: if the CHPP is less than 50 percent, the building will get the score 0, however, if it is 50 percent, the building will get the score 1 (Chart 1).

Therefore, it can be formulated as;

$$0 = \Sigma_{\text{CHPP}} = 100 - \Sigma_{\text{R}}$$

$$\Sigma_{\text{R}} = R_{\text{M}} + R_{\text{O}} + R_{\text{P}} + R_{\text{C}} + R_{\text{L}}$$

$$\text{Scale}_0 = \Sigma_{\text{CHPP}} < 0.5$$

$$\text{Scale}_1 = \Sigma_{\text{CHPP}} > 0.5$$

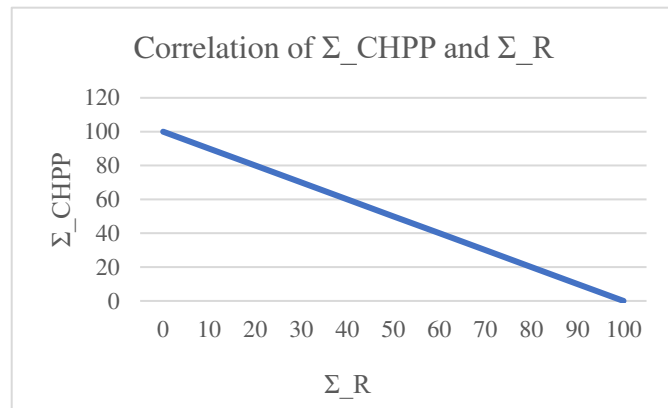


Chart 1: Correlation of CHPP and Total Reduction

[Prepared by the author]

#### 4.4 Testing the Indicators

For testing the reliability of the indicators and accuracy of the model, a second experiment was performed. In this experiment, the buildings, which were demonstrated to the participants, were chosen from Germany, Turkey, and Lithuania which have different expressions of the Modern Movement. However, there are also other structures used in the experiment which do not represent any architectural style, although the selected buildings contain most of the indicators ascertained by the first experiment. The scores of the buildings were calculated by the model regarding the different reduction rates that the structures received and regarding the properties of the buildings.

In this pilot experiment, 31 buildings in total were demonstrated to the participants through an online survey method (Figure 3). Therefore, this experiment also adopted a qualitative approach and non-probability sampling. A total of 274 participants selected by the convenience sampling technique, who were willing to participate, took part in the experiment. Participants were heterogeneous regarding age, which ranged between 15–70, and heterogeneous regarding their gender. Furthermore, they were heterogeneous regarding their nationalities. Seventy-seven participants were people who are living in Lithuania. One hundred seventy-five participants were from Turkey, and the final 22 participants were from other countries.



Figure 3: The buildings which have been demonstrated in the online survey [ Photographs taken by the author except 8,10,21 and 26 which were taken from online sources\*]

As in the first experiment, the goal of this experiment was also not achieving objectivity in the selection of samples or attempting to make generalisations (i.e. statistical inferences) from the sample being studied to the wider population of interest. The goal of this experiment was testing the indicators which can be implemented in the model. Therefore, this experiment was also a pilot study. The assessments of the results can be seen in Table 1.

ID	LOCATION	MATERIAL	ORNAMENT	PATINA	COLOUR	LINES	CH	TOTAL REDUCTION	CHPP	SCORE	QUESTION SCORES	O <sub>0</sub> FOR ARP	QUESTIONNAIRE RESULTS
1	DE	0%	10%	10%	20%	20% V:30, H:90	1	60%	40%	0	0	0.08	YES 36% NO 64%
2	LT	0%	20%	0%	0%	0% V:20, H:180	1	20%	80%	1	1	0.16	YES 76% NO 24%
3	DE	20%	20%	20%	10%	20% V:24, H:48	1	90%	10%	0	0	0.02	YES 14% NO 86%
4	LT	10%	0%	0%	10%	10% V:30, H:72	1	30%	70%	1	1	0.14	YES 20% NO 80%
5	DE	20%	20%	20%	20%	10% V:36, H:40	1	90%	10%	0	0	0.02	YES 87% NO 13%
6	TR	20%	0%	20%	0%	0% V:30, H:108	1	40%	60%	1	1	0.12	YES 13% NO 87%
7	TR	20%	20%	10%	20%	20% V:9, H:37	1	90%	10%	0	0	0.02	YES 55% NO 45%
8	TR	10%	0%	20%	10%	0% V:96, H:32	0	40%	60%	1	1	0.12	YES 76% NO 24%
9	LT	20%	10%	0%	0%	0% V:266, H:96	1	30%	70%	1	1	0.14	YES 54% NO 46%
10	TR	10%	0%	20%	10%	0% V:145, H:26	0	40%	60%	1	1	0.12	YES 40% NO 60%
11	LT	20%	10%	10%	10%	10% V:36, H:88	1	60%	40%	0	0	0.08	YES 32% NO 68%
12	DE	20%	20%	20%	20%	0% V:54, H:13	1	80%	20%	0	0	0.04	YES 37% NO 63%
13	LT	20%	10%	10%	10%	10% V:102, H:108	1	60%	40%	0	0	0.08	YES 48% NO 52%
14	DE	20%	20%	20%	20%	0% V:36, H:40	1	80%	20%	0	0	0.04	YES 84% NO 16%
15	LT	20%	0%	10%	10%	0% V:152, H:45	1	40%	60%	1	1	0.12	YES 39% NO 61%
16	TR	20%	10%	10%	0%	20% V:20, H:88	1	60%	40%	0	0	0.08	YES 45% NO 55%
17	TR	0%	10%	20%	10%	20% V:24, H:96	0	60%	40%	0	0	0.08	YES 63% NO 37%
18	LT	20%	10%	0%	0%	0% V:60, H:225	1	30%	70%	1	1	0.14	YES 78% NO 22%
19	LT	0%	0%	10%	10%	20% V:27, H:52	1	40%	60%	1	1	0.12	YES 23% NO 77%
20	TR	20%	20%	10%	20%	20% V:24, H:41	1	90%	10%	0	0	0.02	YES 43% NO 57%
21	TR	20%	0%	20%	10%	10% V:67, H:69	0	60%	40%	0	0	0.08	YES 16% NO 84%
22	TR	20%	20%	10%	0%	10% V:102, H:87	0	60%	40%	0	0	0.08	YES 19% NO 81%
23	DE	20%	20%	20%	10%	10% V:54, H:51	1	80%	20%	0	0	0.04	YES 44% NO 56%
24	LT	20%	10%	10%	0%	20% V:100, H:360	1	60%	40%	0	0	0.08	YES 64% NO 36%
25	LT	20%	0%	0%	10%	10% V:102, H:99	1	40%	60%	1	1	0.12	YES 95% NO 5%
26	TR	0%	0%	20%	0%	0% V:99, H:51	1	20%	80%	1	1	0.16	YES 28% NO 72%
27	DE	20%	20%	20%	20%	10% V:67, H:70	1	90%	10%	0	0	0.02	YES 16% NO 84%
28	LT	20%	10%	20%	20%	10% V:75, H:73	1	80%	20%	0	0	0.04	YES 17% NO 83%
29	LT	20%	10%	10%	10%	10% V:102, H:13	1	60%	40%	0	0	0.08	YES 30% NO 70%
30	DE	20%	20%	20%	10%	20% V:36, H:90	1	90%	10%	0	0	0.02	YES 51% NO 49%
31	LT	20%	0%	10%	0%	0% V:179, H:68	1	30%	70%	1	1	0.14	YES 16% NO 84%

Table 1: Assessment of the buildings by the CHPP model [Prepared by the author]

According to the results of the second experiment, the indicators validated the similar results when it is used in the model. Therefore, the model has been implemented on a site in Kaunas.

### 5.Implementation and Analysis

The model was implemented by a pilot study on 8 buildings on Kestucio street in Kaunas, Lithuania which is one of the main streets in the city centre and has a significant concentration of Modern Movement buildings (Figure 4, Figure 5).



Figure 4: The view of the segment of Kestucio Street [Prepared by the author]



Figure 5: The buildings on the selected segment of Kestucio Street [Photographs taken by the author]

According to the assessments of the results which can be seen in Table 2, buildings in the pilot study area achieved different reduction rates according to their properties. Building number 1 managed to obtain the highest score on the CHPP model by receiving 30 percent reduction. On the other hand, building number 2 achieved the lowest score by receiving 80 percent reduction. Building number 3 and 4 received 70 percent total reduction. Therefore, they had 30 percent of CHPP. Building number 5, 6, 7, and 8 had 40 percent reduction. As a result, in accordance with the model, 3 of the buildings out of 8 attained score 0, which suggests that these buildings are less likely to be perceived as cultural heritage by the people.

ID	LOCATION	MATERIAL	ORNAMENT	PATINA	COLOUR	LINES	TOTAL REDUCTION	CHPP	SCORE	O <sub>8</sub> FOR ARP
1	LT	20%	10%	0%	0%	0%	30%	70%	1	0.14
2	LT	20%	10%	20%	20%	10%	80%	20%	0	0.04
3	LT	20%	20%	10%	10%	10%	70%	30%	0	0.06
4	LT	20%	20%	10%	20%	0%	70%	30%	0	0.06
5	LT	20%	0%	0%	20%	0%	40%	60%	1	0.12
6	LT	20%	20%	0%	0%	0%	40%	60%	1	0.12
7	LT	20%	0%	10%	10%	0%	40%	60%	1	0.12
8	LT	20%	0%	10%	10%	0%	40%	60%	1	0.12

Table 2: Assessment of buildings by the CHPP model [Prepared by the author]

## 6. Conclusions

Adaptive re-use is an essential strategy for the sustainability of cultural heritage, and furthermore for preserving the image of the city. However, it can become a problematic issue when there is a paucity of participation of society in the evaluation of cultural heritage which might result in heritage buildings not being appreciated by the people. Therefore, while making the decisions in this process, it is important not to disregard the requirements of society. A holistic approach can derive continuity and sustainability to the environment. Furthermore, it is also essential to work on strategies, which can expose the potential of buildings. To this end, various models are used by the experts.

The CHPP model, which is presented in this research, provides a straightforward method for calculating the conceivable perception of society towards cultural heritage. It is possible to invent different frameworks to address this matter. However, the one proposed in this research produces results that are considered reasonable and reflective of practice. It works with a range of indicators within identifiable limits which enables to establish a score for buildings. The buildings which received the score 1 have a higher potential for the perception of cultural heritage by the society. Therefore, by combining this model with the ARP model of Langston, adaptive re-use potential of buildings and their useful physical life can be calculated by including their invisible social context. Even though the decision-making process for adaptive re-use can be influenced by other factors, which are related to financial issues, contemplating the social context might be able to provide a prediction on the usage and appreciation of a structure after the adaptive re-use has been initiated. Furthermore, it can have an impact on the adaptive re-use strategies concerning the interaction with society.

In this regard, the CHPP model is a conceptual framework for determining the potential and the capacity of buildings which can be qualified as cultural heritage by society. When people perceive a building as worth preserving, it is more likely that they would be involved in the process, and furthermore, the buildings would attract people, which would provide status and sustainability. Therefore, the information which reflects the perception of the society should not be omitted in the consideration and decision-making process, and furthermore, it needs to be integrated while evaluating and developing the strategy.

On the other hand, the model can serve for the heritage institutions to prove the value of buildings that are already listed as cultural heritage and for the inclusion of new buildings to those lists. The model can work as a tool which can estimate the perceived value of heritage buildings by members of the society. Moreover, the knowledge gained by the model can also inspire the adaptive re-use process. If the CHPP level of the structure is lower than expected, the strategy of planning excursions to the building or promoting events and exhibitions which demonstrate the importance of the building might establish an impact on people's perception and trigger the community to take part in the action.

In conclusion, CHPP is an attempt which is applied by a pilot research to provide information on the perception of society and how perception is affected by various indicators. As the first experiment demonstrated, the prior knowledge can have an impact as well. Therefore, it should be possible to accumulate more indicators to the model and it should be possible to extend it according to the different characteristics of various societies, and furthermore to expand towards different architectural styles. In that regard, the model can be applied to bigger samples and it has potential for improvement.

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Figure 3-Photograph 8: [www.ehil.com/firmalar/istanbul/beykoz/antik-yapi-prekast-elemanlari](http://www.ehil.com/firmalar/istanbul/beykoz/antik-yapi-prekast-elemanlari) (accessed 14 April 2018)

Figure 3-Photograph 10: [www.ehil.com/firmalar/istanbul/beykoz/antik-yapi-prekast-elemanlari](http://www.ehil.com/firmalar/istanbul/beykoz/antik-yapi-prekast-elemanlari) (accessed 14 April 2018)

Figure 3-Photograph 21: [www.mavibeton.com.tr](http://www.mavibeton.com.tr) (accessed 27 February 2018)

Figure 3-Photograph 26: [www.arkitera.com/haber/14101/gecmisin-modern-mimarisi--ankara--2](http://www.arkitera.com/haber/14101/gecmisin-modern-mimarisi--ankara--2) (accessed 6 March 2018)