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13 & 14 SEPTEMBER 2018
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Towards Safe Cities & Resilient Communities
13 & 14 SEPTEMBER 2018 | IMPIANA HOTEL, IPOH, PERAK

eISBN 978-967-5741-63-0

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Faculty of Architecture Planning and Surveying

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Faculty of Architecture Planning and Surveying
Universiti Teknologi MARA, Perak Branch
Seri Iskandar Campus,
32610, Seri Iskandar,
Perak Darul Ridzuan, MALAYSIA

ICRP2018
3rd International Conference on Rebuilding Place

13-14 September 2018
ISBN 978-967-5741-62-3 eISBN 978-967-5741-63-0

**A REVIEW OF ASSESSMENT IN ADAPTIVE REUSE OF
HERITAGE BUILDINGS IN MALAYSIA**

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Abstract - Heritage buildings is one of the urban identities for the city and should be well-preserved not only because of the value and story, it also because of existing building stock. Reusing existing building stock can combat the environmental load significantly by reducing the material, transport, energy consumption and pollution in construction of new building. In recent years, adaptive reuse of heritage buildings is popping out so fast, compared to previous year whereby heritage building mainly suffers from dilapidated and poor building conditions. Adaptive reuse is converting the original function of existing buildings which services and technology are outdated to a new building purpose for a new need to meet the current development. However, the eagerness of owner and local authority in applying the adaptive reuse approach in heritage buildings, which this approach has been recently criticised for jeopardizing the authenticity of the heritage buildings. Hence, the aim of this study is to review previous studies on assessment method implement in adaptive reuse project based on the authenticity principle in conservation for heritage building. It is believed that this study can help increase the percentage of authenticity by creating an awareness between stakeholders. This study involved reviewing relevant research to embrace all information pertaining to assessment in adaptive reuse for heritage building. It is hoped that the outcome of this study will help organisation or individual who are interested in adaptive reuse for future references.

Key word - Authenticity, Adaptive reuse, Heritage buildings.

1 INTRODUCTION

Heritage buildings in Malaysia have their own value and story (Ahmad, 2006) and portray it through buildings styles (Sodangi, Khamidi, & Idrus, 2013). These buildings have a variety of interesting styles, influences as well as sign of the economy change (Toong & Utaberta, 2015) and become one of the urban identities for the city. Presently, heritage buildings preserved not only because of the value and story, but also because of the existing building stock. According to Rovers (2004), by using existing building stock, it contributes to combat the environmental load significantly within the next 20 years and this can contribute to sustainable development by mitigating the material, transport, energy consumption and pollution in construction of new building. Yudelson (2010) emphasized, 75% of all buildings expected to be operating in the year 2040 by reusing the existing building. This statement stressed that it is vital to conserve heritage buildings for our future development. As heritage buildings show a lot of significant as mentioned above, adaptive reuse approach will be used to retain the heritage buildings to extend the building's life and avoid demolition waste, encourage reuses of the embodied energy and also provide significant social and economic benefits to the society (Douglas, 2006; Yung & Chan, 2012).

2 HERITAGE BUILDING

Building is a structure with a roof and walls that is used as a place for people to live, work, do activities, store things, etc.: the act or process of making structures by putting together materials (Fitchen, 1999). Heritage means features belonging to the culture of a society such as traditions and languages. Heritage is something transmitted by or acquired from a predecessor (Baxter, 2014;

Harvey, 2009). In short, the definitions of heritage building is a building possessing architectural, aesthetic, historic or cultural values which are declared as heritage buildings by local authority or competent authority in whose jurisdiction where such building is situated (Baxter, 2014). Heritage buildings serve as cultural and heritage symbols and thus, act as a hub of individual and community life. In addition, heritage buildings have a variety of interesting architectural styles, influences, and become one of the urban identities for the city. For example, heritage buildings situated in Ipoh, Malacca and Georgetown (Raja Nazrin Shah, 2006; Sodangi et al., 2013; Wan Ismail, 2012).

Heritage buildings portray the character of the city in various time (Elnokaly & Jun Fui, 2014) as well as symbol of the economy development (Toong & Utaberta, 2015), heritage building should be preserved because they have their own emotional, cultural, and historical values (Ahmad, 1994; Fielden, 1995; Ahmad, 2006). Thus, the function of heritage building must change to fulfil the new needs of development with integration of contemporary design that can contribute to vibrant and visually exciting spaces that people want to live, work or play in today (Aly Shehata, 2014). However, failure to maintain the property can impair the structural integrity of the fabric and accelerate the decline in investment returns (Wan Ali, Ishak, & Ibrahim, 2016). One way in keeping the heritage buildings is by adaptive reuse them to contemporary uses which fit to the new development need. This was stressed by Wan Ismail (2013) indicating that the practice of adaptive reuse the heritage buildings could save them from being replaced by new buildings which will contribute to social, economy and environment purpose. Therefore, the best way to keep the minimum loss of heritage buildings authenticity and contribute to combat the environmental load significantly is by applying adaptive reuse in the right way.

3 ADAPTIVE REUSE

Adaptive reuse converted the old buildings function which services and technology were outdated into a new building purpose for new needs of the inheritors due to development by injecting new materials and ideas while at the same time retaining the original structure and fabric (Douglas, 2006). Adaptive reuse is beginning to receive widespread attention because of the economic, social and environmental benefits that can be espoused (Bullen & Love, 2011; Melis, 2010). This is supported by Tan, Olanrewaju, and Lee (2016) where they assert currently adaptive reuse of heritage buildings is popping out so fast, compared to previous year which mainly suffers from dilapidated, neglected (Al-Obaidi, Wei, Ismail, & Kam, 2017) and turned into corpses. Adaptive reuse is one of the conservation techniques which can save heritage buildings being replaced by the new building and preserve the identity of the place (Douglas, 2006; Shen & Langston, 2010). The reuse of heritage buildings enables future generation to appreciate the identity of the building (Burke, 2007) as the heritage buildings represents unique architectural, aesthetic, political and social features of a different time (Rashid, 2016). Therefore, the best way to keep the minimum loss of heritage buildings authenticity and contribute to combat the environmental load significantly is by applying adaptive reuse in the right way.

Adaptive reuse project of heritage buildings might compromise the authenticity to satisfy the development needs (Aydin & Yaldiz, 2010). However, presently the eagerness of the owner and local authority applying the adaptive reuse has been recently criticised for compromising the authenticity (Ab Wahab, Mohd Hamdan, Lop, & Mohd Kamar, 2016; Fernando, 2001; Jasme, Othuman Mydin, & Sani, 2014b; Wan Ismail, 2012b), which continue to harm and has resulted great impact on the heritage building. They want to conserve the heritage buildings but at the same time ruin the authenticity (Tikhonova & Alho, 2015). If no tremendous effort is thrown in adaptive reuse approach, it can jeopardize the precious heritage building life, value and story. As mentioned earlier, adaptive reuse is one of the conservation techniques (Douglas, 2002), to perform adaptive reuse in the correct way, authenticity principle in conservation are used to slow down the heritage building property erosion process as well as to retain the authenticity. This paper aim to review previous studies on assessment

method implement in adaptive reuse project based on the authenticity principle in conservation for heritage buildings. The assessment of authenticity is important to make sure all the adaptive reuse projects in compliance with the guidelines to retain their authenticity.

4 AUTHENTICITY IN CONSERVATION

Authenticity in conservation principle is a process to expose the true nature of an object based on the historical evident (Harun, 2011) and help to slow down the heritage property erosion process. As a way forward to balance the need to continue development without ignoring the responsibility to care the authenticity of heritage building in adaptive reuse whilst creating economical prosperous places for generation to live and work. Byreferring to Table 1, there are four important principles that are emphasized in authenticity principle in conservation for heritage building to retain the authenticity of heritage building, consist of material, design, setting and workmanship(Jabatan Warisan Negara, 2012). This principle does not hinder development, but in fact acts as a catalyst to the development and well-being of a town (Burke, 2007).

The adaptive reuse is an approach of changing the building function when the original purpose of the building is no longer viable with minimum intervention and maintain as much as possible the original building fabric to harmonize with the new demand of development(Aly Shehata, 2014; Harun, 2011). This statement stressed in applying adaptive reuse, the stakeholder can change the authenticity of heritage building to parallel with the demand for development as long as the fabric is maintained. Without the ability to change, this building turned into corpses and would die. (Boussaa, 2010). Heritage building function must change to fulfil the new needs of development with integration of contemporary design which can contribute to vibrant and visually exciting spaces that people want to live, work or play in today (Aly Shehata, 2014). As mentioned earlier, adaptive reuse approach has been recently criticised for compromising the authenticity.To make sure this adaptive reuse approach is done in the right way, authenticity in conservation principle are applied in adaptive reuse. Hence, the aim of this study isto review previous studies on assessment method implement in adaptive reuse project based on the authenticity principle in conservation for heritage building.Thus, itcan increase the percentage of authenticity and create an awareness among stakeholders.

Table 1 Authenticity in adaptive reuse based on conservation principle

Attributes	Views toward authenticity in adaptive reuse
Material	Stressed by researcher Ahmad (2001); Harun (2011); Ahmad (2006) authenticity in material refer to the building materials, properties of materials, exterior features including color of materials, appearance, and texture of materials.
Design	Maintain the original design of heritage building as it was first built. It is a combination of elements that create the form, plan, space, structure, architecture style, proportion, scale, technology and the building environment (International Institute for Conservation Canadian Group, 1989; Scotland, 1998; Urban Redevelopment Authority, 1991)
Setting/layout	According to (Warren, Worthington, & Taylor, 1998), authenticity in setting represents physical environment of a historic property situated and it relates to surrounding features and open space. Setting or layout it portrays daily activities done in the building.
Workmanship	Workmanship is referring to the details in making every inch of the buildings by artisan labour and skill in constructing a building to make these building have their own aesthetic values. It denotes the physical evidence of the crafts of a culture or people during any given period in history or pre-history (Warren, 1999).

5 PROBLEM IN ADAPTIVE REUSE OF HERITAGE BUILDINGS

People nowadays are paying greater attention about adaptive reuse, but the issue appear now is regarding the authenticity of the heritage buildings as stated in Table 2. Previous studies have

discussed on the improper conservation of the heritage building that diminishes the authenticity of heritage buildings. Owner of building reuse and adapt all sorts of buildings in spontaneous (Plevoets & Sowińska-Heim, 2018). According to Fernando (2001), 8% of the early heritage buildings in Malacca are still in the original form while 51% had been renovated and 41% had either perished or lost in originality due to renovation works in adaptive reuse. Wan Ismail (2012) reported only certain heritage building in the row to be preserved, the rest were subjected to the hideous conservation works that totally destroy the authentic value. Jasme, Othuman Mydin, and Sani, (2014) added there are still many buildings that have been adaptively reused without following the regulations. Thereby, losing the building's authenticity and historical significance. This statement is in line with Ab Wahab, Mohd Hamdan, Lop, & Mohd Kamar, (2016), most of the walls in adaptive reuse of heritage buildings lose their authenticity of material and design. This shows that lack of authenticity in heritage building is a serious issue and need to combat due to the negative effects happened to the heritage buildings value as well as the environmental significance. From this issue, the lack of authenticity may be influenced by many interrelated factors as stated in Table 3. Most of the researchers agreed that there is no effective legal protection and control pertaining to authenticity within the local authority in adaptive reuse (Al-Obaidi et al., 2017; Omar & Ishak, 2009; Zahari, Harun, Ahmad, Zawawi, & Agus, 2016) and the stakeholders were unable to follow most of the guidelines due to incomplete information and details for each component of the building element regarding authenticity in adaptive reuse approach (Aly Shehata, 2014; Jasme et al., 2014b) that have contributed to this issue.

By viewing into the problem, improper guideline could be tricky among stakeholders which can give tremendous impact to the authenticity of the heritage building. Obviously, the local authority needs to take action to ensure that proper guidelines are sufficient among stakeholders to facilitate the authenticity assessment in adaptive reuse. The local authority contribution is necessary in attaining the authenticity in adaptive reuse of heritage building because at the end it may give the benefit to economical dynamic of society. Therefore, most of developed countries are being proactively minimizing the issues of authenticity in adaptive reuse of heritage building. It is vital to review previous studies pertaining to assessment in authenticity of adaptive reuse of heritage building as to highlight any lacking procedure in overlooking the implementation of adaptive reuse of heritage building. For that reason, it is suggested to review previous studies on assessment method implement in adaptive reuse project based on the authenticity principle in conservation for heritage building as well as it can help author to fill the loophole in applying this approach.

Table 2 Issue in implement adaptive reuse of heritage building.

Authors	Issue
(Fernando, 2001)	8% of the early heritage buildings in Malacca are still in the original form while 51% had been renovated and 41% had either perished or lost in originality due to renovation works in adaptive reuse.
(Wan Ismail, 2012b)	Only certain heritage building in the row to be preserved, the rest were subjected to the hideous conservation works that totally destroy the authentic value
(Jasme et al., 2014b)	There are still many buildings that have been adaptively reused without following the regulations, thereby, losing the building's authenticity and historical significance
(Ab Wahab et al., 2016)	Most of the walls in adaptive reuse of heritage buildings lose their authenticity of material and design.

Source: Researcher 2017

Table 3 Problems contribute to the adaptive reuse issue.

Authors	Problem
(Al-Obaidi et al., 2017; Omar & Ishak, 2009; Zahari et al., 2016)	There is no effective legal protection, neglected to the point, and control pertaining to authenticity within the local authority in adaptive reuse.
(Aly Shehata, 2014; Jasme et al., 2014b)	The stakeholders unable to follow most of the guidelines due to incomplete information and details for each component of the

	building element regarding authenticity in adaptive reuse approach.
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Source: Researcher 2017

6 RESEARCH METHOD

To obtain the aim, the essential stages of methodology were performed in several stages. This research began with the completion of literature reviews from publication and current issues. Information gathering stage of the study area was divided into two parts; the first one is a study of the background of heritage building, adaptive reuse, authenticity in conservation and the problem faced in execution of adaptive reuse project. The second part is to review the assessment method from previous researchers in assessing the adaptive reuse project for heritage building. Besides, comparative analyses were used as the approach to review previous studies on assessing the method used in implementing the adaptive reuse projects based on the authenticity principles in conservation for heritage building. A review and a series of analysis is on the four previous researchers in assessing the adaptive reuse projects for heritage buildings with different building functions and locations. A detail study on the previous research and the success research that had been conducted, the assessment method implemented in adaptive reuse projects are identified at the end of the stage.

7 REVIEW CURRENT ASSESSMENT IN ADAPTIVE OF HERITAGE BUILDING

Highlighting the above issues, the author selected four previous researchers who did the assessment in adaptive reuse of heritage building. All the selected researchers in this study have their own approach and building types to assess the adaptive reuse heritage building. Assessment is the act of judging or deciding the amount, value, quality, or importance of something, or the judgment or decision that is made (Dictionaries, 2017). In conservation, assessment of authenticity is important to make sure all the adaptive reuse projects are in compliance with the guidelines to retain their authenticity.

7.1 Jasme, Othuman Mydin, & Sani

This study was done in Core or Buffer Zones of George Town, Penang. Investigations were conducted at four heritage buildings consist of Penang State Museum, Batik Painting Museum, The Camera Museum and Sun Yat Sen Museum. All buildings in this study have changed their original use and, after the adaptation process, a visual inspection was conducted to check whether the buildings' elements followed the Guideline for Conservation Areas and Heritage Buildings. During the site inspections and observations, pictures were taken to record and analyse the changes made to the case study buildings as per items stated in the guidelines. The interviews were also done with each building's owner or administration staff to gain information about the background of the buildings as well as any previous restoration work that had been done. As a finding in this study, most of the buildings did not undergo major restoration projects and mostly followed the Guideline of Conservation Areas and Heritage Buildings provided by the Municipal Council of Penang under the Draft George Town Special Area Plan but not for Batik Painting Museum. Many parts of the Batik Painting Museum have been restored rather than maintaining the original materials, and all the buildings have undergone major changes by using flooring timber for plastering. The authors stressed that, the contractors and building owners were unable to follow most items stated in the guidelines. In this paper, the author suggested that a more complete information and detailed requirements be drawn for each element of buildings as a guideline to guarantee that the authenticity of the cultural landscape and the outstanding universal value of the heritage site will be preserved.

7.2 Mydin, Keling, Sani, & Abas

This study focuses on the compliance of adaptive reuse of historic shop houses for sleep lodging with reference to the Guidelines for Conservation Areas and Heritage Buildings by Majlis Perbandaran Pulau Pinang (MPPP). In this study, a case study research methodology was used. The

case study consists of six historic shophouses around Georgetown, which adaptive reuse applied was investigated and evaluated. The buildings are Red Inn Heritage, Red Inn Penang, Rainbow Hotel at Pintal Tali Street, Ryokan Hotel at Muntri Street, Syok Hostel at Lebu Chulia and Red Inn Court at Masjid Kapitan Keling Street. After the observation and investigation, the authors made a few conclusions. None of these six case studies have fully followed the requirements stated in the guidelines, most of the building owners were simply concerned with the exterior part of the building, but when it came to the interior, many important things were ignored. The author stressed that some of the owners wanted to make the building with traditional looks on the outside, yet modern for the interior part. However, the modern elements eventually ruined the traditional features. All this can diminish the authenticity of the heritage buildings. The authors added that for the sake of doing business, owners have endangered the guests' lives with faulty and hazardous design. The authors also claimed that there are lack of active fire protection and overemployment of passive fire protection in these buildings. This study does not only increase awareness of heritage shophouse conversion practices but has also revealed a number of faults in the process that require serious attention in adaptive reuse heritage building project.

7.3 Aminudin

Unlike other author who chose heritage building in Penang as a case study, this author chose heritage buildings in Ipoh as a case study. Adaptive reuse of heritage buildings as a café were chosen to identify the compliance of adaptive reuse of common building elements affected in adaptive reuse approach. Three adaptive reuse cafés involved in this study consist of HOBÓ café, Plan B and El Negra Deli and Studio. The author also stated that building elements affected have the tendency to increase the aesthetic and authentic value of a heritage buildings. Only the structures are maintained. It also discovered that most common building elements affected in adaptive reuse project are front façade, external wall, internal wall, door, window, roof, ceiling finishes, wall finishes, floor finishes and building facilities. The author said building elements affected are potential to increase the aesthetic and authentic value of a heritage building.

7.4 Ab Wahab t. al.

In this study, the authors conducted the study to gather the true picture of applied adaptive reuse principles that has been done on heritage hotels available in Melaka and George Town World Heritage Sites. This research started with an inventory that led to the discovery of 35 hotels which applied the principle of adaptive re-use of historic buildings. Based on this finding, 4 historic hotels from adaptive re-use applications have been selected as the case studies. Results of the case studies carried out show that the level of conservation of heritage hotel is moderate and measures of control should be taken into consideration to ensure the privileges of heritage hotel. The authors stressed that most of the wall in adaptive reuse of heritage building lose their authenticity.

8 RESULTS AND DISCUSSION

After reviewing and analysing all mentioned researchers above, to date, the researchers only focus on descriptive assessments, not on numerical assessment as shown in Table 4. In this table, most researchers have discussed on the diminish authenticity in adaptive reuse in building component on heritage building using descriptive assessment with different building types without mentioning the percentage of authenticity retained. The previous researchers only mentioned whether or not the building is compliance with the guidelines. Conversely, in the context of accurateness it is vital to have numerical assessment to get the precise data pertaining to the authenticity value in adaptive reuse approach. Furthermore, with numerical assessment the results are more structured and reliable. With numerical assessment, stakeholders can determine the percentage of authenticity of adaptive reuse in heritage building project. Besides, harmonising with the new demand of development, numerical assessment in adaptive reuse can minimise intervention of building and maintain as much as possible

the authenticity of heritage building fabric and structure which acts as a catalyst to the development and well-being of a city.

Table 4 Previous studies in assessment in adaptive reuse of heritage buildings.

Author	Finding	Analysis
(Ab Wahab et. al., 2016)	Most of the wall in adaptive reuse of heritage building lose their authenticity.	Assessment in adaptive reuse of heritage building to hotel in Georgetown.
(Aminudin, 2015)	Most of the outer layer and wall of heritage building affected in adaptive reuse. Only the structures are maintained	Assessment in adaptive reuse of heritage building to cafe in Ipoh
(Mydin et al., 2014)	None of these six case studies have fully followed the requirements stated in the guidelines.	Assessment in adaptive reuse of heritage shophouses to sleep lodging in Penang.
(Jasme et al., 2014b)	Many buildings that have been adaptively reused without following the regulations.	Assessment in adaptive reuse of heritage building to museum in Penang.

Source: Researcher 2017

9 ACKNOWLEDGEMENTS

The author would like to thank the main supervisor, Dr. LilawatiAb.Wahab for her exceptional patience, encouragement, guidance, counsel, and advice throughout all the stages of this paper. Special thanks go to my second supervisor, Dr. Dzulkarnaen Ismail, for his comments and suggestions given during the completion of this paper. It was a great pleasure for me to undertake this research under their supervision.

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