THEORETICAL FRAMEWORK OF CRITERIA AND INDICATORS FOR INTERPRETING IMAGE AND IDENTITY IN ARCHITECTURE

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ABSTRACT

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Architecture has a significant role in the image and identity of cultural heritage, as it generates outstanding cultural values for a sustainable culture and its context. Meanwhile, contemporary architecture is the most potent agent to the missing local culture of a place. This is due to architecture trends have been rapidly increasing in worldwide and has transforms the image of cultural context into a global city. This scenario shall cause heritage risk when current redevelopment planning scheme has not provided the guaranteed in sustaining cultural image and identity in the new development of cultural context. To sustain the cultural values, it is important to establish criteria and indicators to guide and recommend preservation and incorporation of vital traditional features into new architecture images. This paper uses a critical literature review of previous studies to identify correlated items of image and identity indicators for the development of a new image and identity assessment framework. These indicators reflect the elements and features of the Traditional Malay House (TMH) which has been accepted as the most substantial image and identity character in the context of Kampong Bharu in Kuala Lumpur. Established under the Malay Reserve Enactment 1913 and the Land Enactment 1987, Kampong Bharu represents a significant heritage context in the city, and its cultural identity should be integrated into its new redevelopment strategy and plan. Content analysis of the literature has ascertained 2 general criteria and 55 indicators that are recommended for interpreting image and identity of the Traditional Malay House (TMH).

Keywords: *Image and Identity, Criteria and Indicator, Architecture, Cultural Value, and Design Principle*

INTRODUCTION

Architecture is the most valuable tangible heritage that portrays the image and identity of a culture. It comprises the inclusive assortment of skills and knowledge needed for sustainable culture. Architecture is the outward manifestation of culture's ingenuity (Alvesson, 1990). The image is sustainable because it interacts with others and the environment (Dumcke & Gnedovsky, 2013; Scheffler, 2011). Image may be focused in a specific behaviour and engagements, or in unseen symbols for culture interpretation (Alvesson,2001).

Few studies have addressed the specific roles of image and identity elements in architecture. However, new architecture in local areas with the significant history may contribute to the trend of annihilating the image and local identity**.** Surrounded by high profile buildings and urban pressure, Kampong Bharu with its new redevelopment plan is also affected by a new architectural image (APUDG, 2014). This may be due to limited research in identifying the vital design criteria and design tools needed to connect new architectural and traditional architectural principles (Ryberg-Webster & Kinahan, 2013; Reed, Bilos, & Wilkinson, 2009; (Hocine Bougdah and Stephen Sharples, 2010). Image and identity should not be neglected as it can bring significant sustainable benefit to the local context (Albert & Gauer-Lietz, 2006; Buhler & Ripp, 2009; Dumcke & Gnedovsky, 2013; Hall & McArthur, 1997; Karpati, 2007; Scheffler, 2011). The absence of cultural values from new

architectural trends could leads to cultural extinction (Adam, 2012). Identification of sufficient image and identity indicators can help designers to minimize the missing image and identity features and thus can help to revitalize cultural value in new architecture. Therefore, this paper sets out to provide an initial list of recommended image and identity indicators to be incorporated into new architecture while recognising the pressure of 21st century design constraints. It should be noted, however, that this research focuses specifically on residential architectural elements due to the substantial cultural value represented by the traditional Malay house (TMH).

ISSUE AND RESEARCH OBJECTIVE

Interpreting image and identity is challenging because some images can imply other meaning beyond the cultural principle (Curtin, n.d.; Pichedpan, 2011) In other words, images and objects can operate like signs, and the meaning and values attributed to a sign relates to cultural ideas that have been learned (Curtin, n.d.)

This research focuses on Kampong Bharu's future identity. A New Redevelopment Plan of Kampong has been drawn up as a strategy plan by *Perbadanan Kampong Bharu* (PKB), a government institution set up to resolve development issues of this culturally significant location. Preserving cultural identity in an urban surrounding faces critical constraints and needs a thorough study to refine ideas. This has led the secretariat of *Perbadanan Kampong Bharu* (PKB) to conduct numerous focus group discussions attended by a large number of representative respondents. This effort has adopted a new design guideline for the image of future architecture that will preserve cultural identity while also meeting the demands of 21st century design constraints. Broadly, this guideline reflects the view that design principles and features of TMH should be integrated into current design trends of the new architectural image.

However, interviews with experts in traditional Malay architecture reveal that they consider this general guideline to be an inappropriate guideline to preserve image and identity in new architecture. This is because the guideline is missing three important factors:

i) Insufficient analysis process has resulted in findings that are inefficient and not comprehensive, and guidelines that are impractical.
ii) The absence of any comprehensive study to identify important components of image and identity,
iii) No inclusive study to identify related architectural features and their weightage value to take into account the pressure of 21st century design constraints and, at the same time, reflect new buildings as part of local identity.

Different professionals within different design constraints will interpret inappropriate guidelines differently. This is because strategies responding to general guidelines will take many forms (Saradj, 2015). In the future, many new developments might not reflect to a sufficient level of acceptance as the guideline is missing the key features of assessing cultural values (Imam, 2013; Sotoudeh & Abdullah, 2013; Steven W. Semes & Chair, 2007). Based on established architectural assessment tools, criteria and indicators are the most important component for ensuring efficient and effective results (Adegbile, 2013; Fowler & Rauch, 2006; Khalil, Kamaruzzaman, Nawawi, Husin, & Hashim, 2015; B. K. Nguyen & Altan, 2011; Reed et al., 2009). Thus the objective of this paper is to identify related criteria and indicators for guiding recommended cultural values to preserve image and identity features in new architectural design.

THEORETICAL FRAMEWORK: CRITERIA AND INDICATORS FOR IMAGE AND IDENTITY IN ARCHITECTURE

This section covers two main areas of discussion: 1) general criteria for image and identity of architecture; and 2) indicators for image and identity of the traditional Malay house (TMH).

General Criteria for Image and Identity in Architecture

Criteria are defined (by the Oxford English Dictionary) as the general important items formed based on the necessity of the subject discussed. There are three important attributes that generate an established criteria: i) criteria are inclusive; ii) criteria present the basic principle of the subject; iii) criteria are formed by the integration of sub items (Blyth, Gilby, & Barlex, 2006; Khalil et al., 2015; Sadler & Sadler, 2010; Yue, Briand, & Labiche, 2011). Meanwhile, an indicator is a non-measurable key with specific features to distinguish established criteria. Construction of indicators and criteria are a common activity practiced by previous research and established rating tools (Ali & Al, 2009; Chen, Yang, & Lu, 2015; Fowler & Rauch, 2006; Lasalle, 2008; B. K. Nguyen, 2011; B. K. Nguyen & Altan, 2011; Reed et al., 2009). A list of significant criteria must be developed prior to establishing the indicators.

The image of architecture presents the visual integration of building elements. This integration of building elements is designed based on two important architectural component namely: i) zoning and layout; and ii) form (Plasma, 2011; Shiner, 2011; Venturi, 1977; Yaacob & Omar, 2007) These design symbols also contribute to the image expectation from the perspective of property value (Paul K. & Hachey, 2016) Similarly these two important items of architecture present the symbolic reputation of owner (Adam, 2012). Elements of zoning, layout and form have also been emphasised as the most significant elements during the early design phase by two famous principles: i) form follows function; and ii) function follows form (Gellerman, 1990; Kalay, 1999; Mcgoun, 2004; Nasar, Stamps, & Hanyu, 2005).

Zoning and Layout

Zoning and layout can be defined as an established plan for arranging spaces (Kent, 2001). This plan usually incorporates three sustainable design values based on its basic functions, namely: i) social value; ii) economic value; and iii) environmental value. From the perspective of a cultural heritage and historical study, zoning and layout of architecture very much represent the social and cultural activities (Paul K. & Hachey, 2016). However, the financial status of the building owner influences the design of zoning and layout (Asatekin, 2005; Hanafi, 2012). This means that the cultural principle might be threatened if the social cultural principle results in sizes of space and materials that are unaffordable (Bing-ming, 2004). Thus, the general space relationship reflects the status of the economic hierarchy and the general cultural principle of the owner, while climatic responsiveness is a common principle practiced by building designers to provide environmental value (Dili, Naseer, & Varghese, 2010; A. Nguyen, Tran, Tran, & Reiter, 2011).

These plan arrangements give rise to five types of general spaces, each with its individual design features that lead to the established sustainable design value based on its specific basic function. These five spaces are: i) transition space; ii) semi private space; iii) private space; iv)outdoor space; and v) space and volume (Francis, 2014; Hillier, 2007; Muthu, 2006; Norberq-Schulz, 1965; Read, 2000). Table 1 shows the general design value and design features derived from these five sub criteria based on types of space.

Form

Architectural form is defined as an essential physical appearance integrated from the composition of the components of a building envelope (Ching & Adams, 2012; Francis, 2014; Rapoport, 1969). Four important items that constitute the building envelope components are: i) structure, ii) roof, iii) wall, iv) decoration (Kosnya & Kosseckab, 2002; Sadineni, Madala, & Boehm, 2011; Taylor, Webster, & Imbabi, 1998). Numerous and complex functions should be performed by these four important items. Based on two underlying concepts of architectural preliminary design, i.e. 1) form follows function, and 2) function follows form, these forms are designed based on three important general factors, which are: i) basic function, ii) external appearance, and iii) design value (Gellerman, 1990; Kalay, 1999; Mcgoun, 2004; Nasar et al., 2005). These three design factors integrate the design values of social, economic, environmental, and aesthetic value. Figure 1 presents the summary of relationship among general components in architecture form. While Table 2 shows the general design value and design features derived from the four (4) sub criteria.

Table 1: General sub criteria and indicators from the perspective of zoning and layout

General Sub Criteria	Basic Function	General Design Value
i) Transition space	i) Focal point to control circulation between private and semi-private, or private and public spaces (Bertol & Foell, 1997; Donaldson, 2014)	Social Value
	ii) Act as a separation space between private and non-private for casual social interaction (Bertol & Foell, 1997; Donaldson, 2014)	Social Value
	iii) Used as welcoming area for guests (Lawrence, 1984; Pitts & Saleh, 2007; Ramasvamy, 2005)	Social Value, and Aesthetic Value
ii) Semi private space	iv) An area designed with essential elements to suit spatial and programme actions for both guest and owner (Jerry W.; Pearson & Richards, 2005; Zabawa-krzypkowska, 2013)	Social Value
iii) Private Space	v) An area designed with essential elements to suit spatial and programme actions for a specific person or specific group of people (Mallet, 2004)	Social Value
iv) Exterior space	vi) Exterior space or open area for outdoor activities (R. Ahmad, 2013)	Social Value
	vii) Act as separation space between building line and public space (Zakaria, & Rashid, 2013)	Social Value
	viii) Space for hardscape and soft scape (A. S. Ahmad, Abu Bakar, & Ibrahim, 2006)	Environment Value
v) Solid and Void	ix) Configuration of interior space to refine the quality of space with the help of exterior elements. The configuration usually involves the elements of space's height, and great opening. The integration of these physical elements shall provide an aesthetic look (Bertol & Foell, 1997)	Social Value, environment value, and aesthetical look

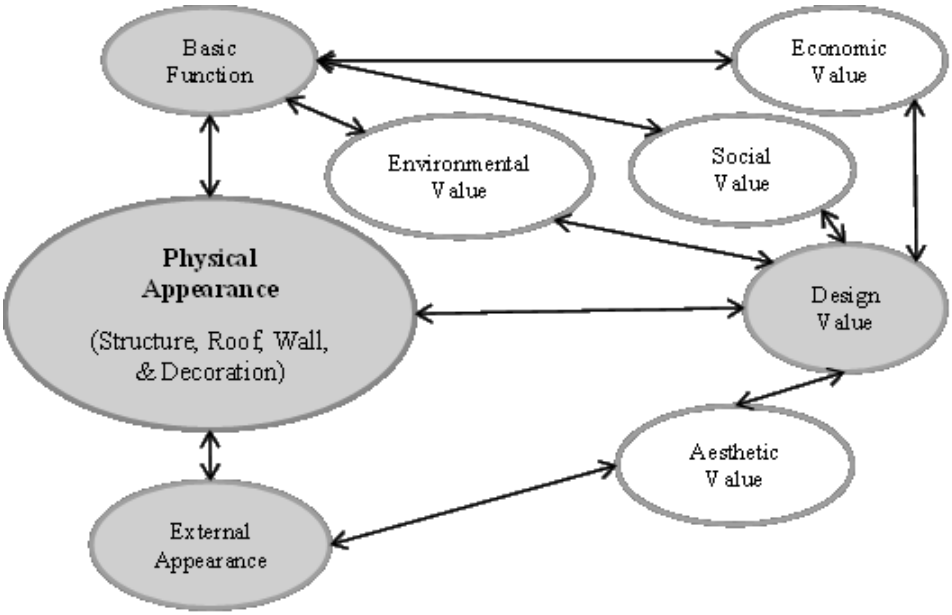

Figure 1: Summary of relationship among general components in architecture form

Table 2: General sub criteria and indicators from the perspective of form

General Sub Criteria	Basic Function and Basic Features	General Design Value
Structure	i) Usually comprised of the integration and arrangement of pillars and beam elements to carry static loads and dynamic loads (Brookes & Grech, 1996; Lovell, 1967)	Economic Value
Wall	ii) Element used to divide or enclose a space from the side part of the building (Masheck, 1994; Stroud, 1979)	Economic Value
	iii) This side element is used to protect space from weather, and other risks. However it also allows the space to be connected to exterior elements for space with better quality (Ching & Adams, 2012; Chudley, Greeno, & Roger, 2014).	Environmental Value
Roof	iv) Element used to divide or enclose a space from the top part of the building (Iano, 2014; Medan, Scarborough, & Walter, 2013)	Economic Value
	v)This top element is used to protect space from danger from weather, and other risks (Brookes & Grech, 1996; Masheck, 1994)	Environmental Value
Decoration	vi) An element which does not have a specific function but the aesthetic value brings emotional, spiritual value to the people. The aesthetic value shall increase the economic value as it marks up the owner's economic status (Poriau, 1986; Scruton, 1979)	Social Value, Economic Value, Aesthetic Value

Indicators for Image and Identity of Traditional Architecture

An indicator is a non-measurable key with specific features to distinguish established criteria. The construct indicators and criteria have been developed by numerous previous studies and established rating tools (Ali & Al, 2009; Chen et al., 2015; Fowler & Rauch, 2006; Lasalle, 2008; B. K. Nguyen, 2011; B. K. Nguyen & Altan, 2011; Reed et al., 2009). As mentioned earlier, the list of significant criteria must be developed prior to determining the indicator.

Unlike new architecture, traditional architecture presents comprehensive cultural values, which are derived from its special design principle. This is due to the design principle of traditional architecture provide the sustainability of a culture by performing its two significant roles: i) design principle brings comprehensive value for preserving the image and identity of local architecture, ii) design principle act important element in presenting the value of cultural identity (Chandler, 2007; Pichedpan, 2011; Tomaselli, 2009)

Meanwhile, secondary cultural values are all derived during the proses development of PV (Hasbollah & Hasif, 2014). The concept of Cultural Value was started with the development of 4 primary cultural values with it secondary cultural values; social, historic, aesthetical, and scientific. This was introduced by UNESCO's World Heritage Committee (2008) in 2008 for pillars of conservation development. While another 3 values namely; economic, political, ecological value were later implemented, which has been suggested by Lowenthal (1985), Piper & John (1948), Riegl (1982), Riganti & Nijkamp (2005). Later, ecological value was adopted into ICOMOS by referring to its harmonious bond value which can be found among the building and natural surroundings(Silva, A., & Roders, 2012) This ecological value was earlier implemented in Declaration of Amsterdam (Council of Europe, 1975). Table 3 shows all 8 PVs and 28 SVs together with its definition.

The benefits of cultural values are usually portrayed in specific design functions and features which interpret the image and identity of local design principles (Nasar et al., 2005). The importance of preserving the image and identity of traditional architecture lies in the fact that these design principles have contributed to a sustainable and comprehensive design value for the benefit of society and the surrounding environment. Five significant design principles, which have formed its identity, function, and features are; 1) Economic and practical construction; 2) Well adapted to weather and climate; 3) Blend with nature; 4) Social Practicality; and 5) Aesthetics. Table 4 shows the general function and elements derived from the traditional Malay house (TMH) and sets out eight cultural values of the traditional Malay house in relation to the five design principles.

Table 3: Culture Values of Traditional Architecture Concept. Source: Adapted from English Heritage, 2008; ICOMOS, 1999; UNESCO, 2015; cited by Hasbollah, 2014.

Primary Values	Secondary Values	Definitions of Secondary Values
Social	Spiritual	Belief, myths, religions (organized or not) legends, stories, testimonials of past generations
	Allegorical	Objects/places representative of some social hierarchy/status;
	Emotional, collective	Notions related to cultural identity, motivation and pride, sense of 'place attachment' and communal value;
Economic	Use	The function and utility of the asset, original or attributed;
	Non-use	The asset's expired function, which has its value in the past and should be retained for its (material) existence, option (to make some use of it or not) and bequest value (for future)
	Entertainment	The role it might have for contemporaneous market, mainly for tourism industry
	Allegorical	Oriented to publicizing financial property;
Political	Educational	The educational role that heritage assets may play, using it for political targets (e.g. birth-nations myths, glorification of political leaders, etc);
	Management	Made part of strategies and policies (past or present);
	Symbolic	Emblematic, power, authority and prosperous perceptions stem from the heritage assets;
Historic	Educational	Heritage assets as a potential to gain knowledge about the past in the future;
	Historic-artistic	Quality of an object to be part of a few or unique testimonials of historic stylistic or artistic movements which are now part of history;
	Historic-conceptual	Quality of an object to be part of a few or unique testimonials that retain conceptual signs (architectural, urban planning, etc.), which are now part of history;
	Symbolic	Fact that the object has been part/related to an important event in the past;
	Archaeological	Connected with ancient civilizations
Aesthetical	Artistic	Original product of creativity and imagination;
	Notable	Product of a creator, holding his signature;
	Conceptual	Integral materialization of conceptual intentions (imply a conceptual background);
	Evidential	Authentic exemplar of a decade, part of the History of Art or Architecture;
Scientific	Workmanship	Original result of human labour, craftsmanship;
	Technological	Skilfulness of techniques and materials, representing an outstanding quality of work;
	Conceptual	Integral materialization of conceptual intentions (imply a conceptual background);
Age	Workmanship	Craftsmanship value oriented towards the production period
	Maturity	Piece of memory, reflecting, the passage/lives of past generations;
	Existential	Marks of the passage of time (patina) present on the forms, components, and materials.
Ecological	Spiritual	Harmony between the building and its environment (natural and artificial);
	Essential	Identification of ecological ideologies on its design and construction;
	Existential	Manufactured resources which can either be reused, reprocessed or recycled;

Table 4: Eight (8) culture values of traditional Malay house (TMH) associated to five (5) design principle

Secondary Values and Definitions	General Function and Element
1st Primary Value: Social	
1.Spiritual:	Strive for beautiful look, motifs and hand carving, Landscape, Building Form (Design Principle: Aesthetic)
2. Allegorical:	Hierarchy is shown by roof layers, hierarchy of motif and hand carving, hierarchy of material chosen, hierarchy of skill of workers. The different elements in the hierarchy show different status of owner. Hierarchy of roof layer allows efficient ventilation and interior natural lighting for local context (Design Principle: Aesthetic, Climatic Response)
3.Emotional , collective:	Design that displays the skills, attitude, and knowledge of local people (Design Principle: Economic and Practical Construction, Well-adapted to climate, Blends with Nature, Social Practicality, Aesthetic)
2nd Primary Value: Economic	
1.Use:	Design manages to integrate all 4 principles; Climatic Response Blends with Nature, Social Practicality, and Aesthetic principles into economic and practical construction. Tongue and groove construction, natural material for construction, open concept design (Design Principle: Economic and Practical Construction)
2.Non-use:	
3.Entertainment:	The traditional Malay house fosters art as it integrates all social and economic needs; (Design Principle: Social Practicality, Aesthetic)
4.Allegorical:	Design with art gives better value (Design Principle: Aesthetic)
3rd Primary Value: Political	
1.Educational:	To embark on social status and power. Incorporate sustainable value for all local people. (Design Principle: Economic and Practical Construction, Well-adapted to climate, blends with nature, Social Practicality, Aesthetic)
2.Management:	
Symbolic:	
4th Primary Value: Historic	
Educational:	Overall architectural approach of social, economic, environmental, aesthetic elements promotes sustainable architecture and development. (Design Principle: Economic and Practical Construction, Well-adapted to climate, Blends with Nature, Social Practicality, Aesthetic)
Historic-artistic:	
Historic-conceptual:	
Symbolic:	
Archaeological:	
5th Primary Value: Age	
Workmanship:	The entire architectural approach to social, economy, environment, aesthetics promotes sustainable architecture and development. (Design Principle: Economic and Practical Construction, Well-adapted to climate, Blends with Nature, Social Practicality, Aesthetic)
Maturity:	
Existential:	
6th Primary Value: Aesthetic	
Artistic:	Design manages to integrate all 4 principles; Well-adapted to climate, blends with nature, social practicality, and economic construction principles into fine aesthetic look (Design Principle: Aesthetic)
Notable:	
Conceptual:	
Evidential:	
7th Primary Value: Scientific	
Workmanship:	Design that displays the skills, attitude, and knowledge of local people (Design Principle: Economic and Practical Construction, Well-adapted to climate, Blends with Nature, Social Practicality, Aesthetic)
Technological:	
Conceptual:	
8th Primary Value: Ecological	
Spiritual:	Design that integrates environment approach for human comfort, practical construction, natural concept. (Design Principle: Economic and Practical Construction, Well-adapted to climate, Blends with Nature)

In order to identify correlated indicators for image and identity of the TMH, the discussion is focused on the two significant criteria and five design principles of TMH which have been elaborated earlier. The following discussion is divided in two parts of significant criteria which are: 1) zoning and layout, and 2) form.

Indicators of Zoning and Layout

Two integrated secondary social values are found under space and circulation. These are spiritual and allegorical. These two values are shown in three types of general links connecting the main space to sub spaces, and main space to main space. These three general links are: 1) attached and linked semi-private space to semi-private space, 2) attached and linked private space to semi-private space, 3) attached and linked private space to private space (Hanafi, 2001, 2012; Yuan, 2002). These general links are a common mechanism in general architecture; however, the arrangement of these spaces shows a sequence of courtesy for a guest entering a Malay house. The sequence for a guest starts from the exterior semi-private space, into a transition space and end at an interior semi-private space (Hanafi, 2001; Hanafi, Yahaya, & A.Z., 2013; Rasdi, 2011) However, second option is also provided to allow female guests to proceed to the back of the house thereby avoiding male social interaction which usually occurs in the transition space and the interior semi-private space (Surat et al., 2010)

Table 5: Thirty (30) indicators for interpreting image and identity of the TMH associated with zoning and layout elements.

General Function	Special Features
Transition space	
Welcoming space and main entrance	1. Overall design gives note of welcoming space (aesthetic value, social value)
	2. Raised floor for natural ventilation and protection from bad weather (scientific, ecological value, economic value)
	3.Space that separates interior private space and exterior public space (social value)
Attached and link to exterior public space	4. Easy for the guest to identify the main entrance from exterior semi private space (social value)
	5. Allows for visual, and communication interaction with exterior public space (Ecological value)
Attached and linked to semi private space	6. Attached and linked to interior private space for family members (social value)
	7. Open access to interior semi private space for guests (social value)
	8. Allows for social interaction for a small number of people (social value)
Socializing space with air circulation	9. Open space concept with quality air circulation and landscape ambience (ecological value)
	10.Space is well covered from rain and direct sunlight (ecological value, economic value)
	11. Having outdoor view without unnecessary distraction (ecological value)
Semi Private Space	
Attached and linked to the welcoming space	12. An indoor semiprivate space without direct access from outside. Guest can only be accessed from the transition space (social value)
	13.Encourages the guest to move from transition space into semi private space (social value)
Attached and linked to interior private space	14. Can be accessed by family members from living hall (social value)
	15. Allows for minimum visual, and communication interaction with interior private space (ecological value, economic value)
Socializing space with quality air circulation	16. A space that encourages entertainment of guest (social value, economic value)
	17. Open concept design (ecological value, social value)
Interior Private Space	
Living hall	18. Provides high level of privacy (social value)
	19. Main space for family to socialize (social value)
	20. Attached and linked to private courtyard (social , ecological value)
	21. Allows for quality air circulation (ecological value, economic value)
	22. Blends with nature (ecological value)
Kitchen	23. Provides high level of privacy (social value)
	24. Attached and linked to garden (ecological value, social value)
	25. Allows for quality air circulation (ecological value, economic value)
Exterior Space	
Exterior semi private space	26. Provides a welcoming pathway to lead guest to transition space (social value)
Private Courtyard	27. Provides high level of privacy (social value)
	28. Attached and linked to living hall and kitchen (social value)
Solid and Void	
Form	29. Transition space, semi-private space, private courtyard, can be expressed as individual unit (ecological value, aesthetical value)
Hierarchy and Leveling	30. Interior and exterior private space provide highest level of privacy compare to public space and semi-private space (social, ecological value)

The design principle also allows a minimum visual disturbance for private activity. It incorporates the concept of different levelling for the privacy symbol. This design concept also contains significant ecological value by incorporating the principle of blending with nature into the entire interior space (Salleh, 2002). An efficient design of solid and void is also shown by expressing

main spaces as one block unit, thus providing significant ecological value and economic value by having unlimited interaction with natural lighting and ventilation (Zakaria, Salleh, & Rashid, 2014). Thus, based on the perspective of five design principles (DP) and five cultural values of zoning and layout design of the TMH, it was found that there are 30 features that correlate as indicators for image and identity of the TMH. These 30 indicators are shown on Table 5.

Indicators of Form

Form elements are usually battered for aesthetic value which are usually categorized under indirect economic use due to its features that can bring emotional value and spiritual value to people (Poriau, 1986; Scruton, 1979). However, from the perspective of image identity, numerous of the TMH are projected in the eight cultural values. Based on the general elements of forms, 25 features with 8 cultural values portray the design principle of the TMH. Table 6 shows the typical form features of the TMH.

Table 6: Twenty-five (25) indicators for interpreting image and identity of the TMH associated with form elements

General Elements	Special Features
Structure	
Material	1.The type of timber *(cengal, belian)* is easily constructed due to its fine texture, thus it gives minimum risk to the worker s(scientific value, age value, social value)
	2.Timber is a convenient source (economic value, scientific value, age value)
Jointing System	3.Tongue-and-groove technique with assembled, dissembled system for columns with beam, and beam with beam (economic value, scientific value, age value, social value)
Finishes and Colour	4. Convenience of source and long durable of rubber resin in preserving the timber's original colour for all elements using timber material (economic value, scientific value, age value)
Size	5. Available size based on timber size (economic value, scientific value); Column –4" x 4" or 5" x 5", or 6" x 6"; beam – 5" x 1 ½" or 6" x 2" or 6"x 1 ½"; roof beam – 4" x 2" 5"x 3"; trusses – 4" x 2"; batten -2" x1"; ridge – 3" x 3"; roof column – 5" x5" (economic value, scientific value, age value)
Roof	
Material	6. Timber is used for all structure elements; column, beam, batten, trusses, ridge (economic value, scientific value, age value, environment value)
	7. Use of natural material with low insulation; timber material OR palm leaves OR clay roof tiles for roof finishes (economic value, environment value, age value)
	8. Timber is used for Gable end (economic value, environment value, scientific value, age value)
	9.Timber is used for fascia board (economic value, age value)
Jointing System	10.Tongue-and-groove technique with assembled , dissemble system for column with beam, beam with beam, beam with trusses, and batten with trusses (economic value, scientific value, age value)
Pattern	11. Pitch roof form; layering, ventilated roof space, and gable end with opening (economic value, environment value, scientific value)
Sizes	12. Sufficient clear height from floor level to roof beam (economic value, environment value, scientific value)
Wall	
Material	13. Timber is used for all wall frame, door frame, window frame material. (Scientific value, economic value, environment value, age value)
	14. Timber is used for all exterior and interior wall panels, door frame, window frame material (Scientific value, economic value, ecological value, age value)
	15. Layout of internal and external timber wall allows for quality air circulation (Scientific value, economic value, environment value)
Pattern	16. Window panels are full height opening or half height opening with double swing panels; opening panels are embellished with adjustable louvre panel (Scientific value, economic value, environment value)
Composition	17. Presents the appropriate composition of the integration of solid and void to control sufficient quality of natural ventilation and natural lighting (Scientific value, economic value, environment value)
	18. Presents the appropriate composition of the integration of solid and void to control sufficient quality of air circulation and air movement (Scientific value, economic value, environment value)
	19. Presents the appropriate composition of solid and void for visual interaction (Scientific value, social value, economic value, environment value)
	20. Presents the appropriate composition volume and hierarchy of space function
Motif	
Material and Pattern	21. Timber fenestration carving with floral motif are found at gable end (social value, economic value, environmental value, scientific value, age value)
	22. Timber fenestration carving with floral motif are found at roof fascia board (social value, economic value, environmental value, scientific value age value)
	23. Timber fenestration carving with floral motif are found at wall fascia board (social value, economic value, environmental value, scientific value, age value)
	24. Timber fenestration carving with floral motif are found at wall panel (social value, economic value, environmental value, scientific value, age value)

25. Timber relief carving with floral motif found at door panel. (social value, economic value, age value)

Five cultural values are found under the Structure element: 1. Economic value, scientific value, age value, social value, and aesthetic value. Since TMH is located in tropical rainforest climate, timber is the efficient material and economic source for constructing building structure. This is due to the general scientific value which can be found from the timber, the ability to withstand for more than a decade. Meanwhile, the *cengal* and *belian* represent the significant timber type to construct the tongue-and-groove jointing in representing one of TMH's features (Hassan, 2010; Ibrahim, Liew, Nawi, & Yusoff, 2015; Mohamed et al., 2015; Zumahiran binti Kamarudin, 2008). The size of the structure constructed was based on the size of available trees and the appropriateness of scale and proportion. Natural rubber resin from the rain forest was used to protect the finishes and preserve the timber's appearance and colour (Abdullah, 2016; Myers, 1988). These techniques have created aesthetic value for the image of TMH, as well as social-emotional value to the community. These technique and features are generally found on other elements of form, such as roof, wall, decoration, thus accounting for five cultural values throughout the form elements.

Another significant cultural value found in the TMH is the environmental value of three important form elements; roof, wall, and decoration. Apart from its use in structural elements, timber is the most efficient material for tropical indoor thermal comfort due to its climate responsive features (Hanafi, 2001; Yuan, 2002). The material used is also enhanced by a few design techniques to reduce indoor heat gain and improve the quality of air circulation. Traditional roof design has adopted a pitched roof form with a few features to allow sufficient penetration of natural lighting and natural ventilation. These features include: i) layering, ii) gable end with opening, and iii) ventilated roof space.

The composition of wall elements provides two inclusive general techniques to control indoor thermal comfort. These general techniques are the adjustable window louvres and the composition of solid and void. Table 6 lists three general advantages contributing to the quality of air circulation which derive from the composition of solid and void. Unlike the walls and roof, motifs used in the TMH provide significant aesthetical value based on the community artisans' skills and the influence of religious beliefs. Focusing on natural flora, Malay motifs integrates the fenestration of hand carving on a few building elements to provide sufficient penetration of natural lighting and ventilation. These integrations of cultural values and techniques that occur in four general elements of form: 1) structure, 2) roof, 3) wall, and 4) motif, have also present the 3 SVs of political values of TMH as stated in Table 3: The 3 SVs are i) educational values, ii) management values, and ii) symbolic values. According to Hanafi (2007), design in every TMH is depend on hierarchy economic and social status of owner, thus it manage to give example of strategy to glorify the political leaders. Meanwhile management values are greatly shown in every TMH due to comprehensive and efficient technique and skills for the culture sustainability(Yuan, 2002) While every element of image and identity presents the wide-ranging symbolic values of Malay Cultural in TMH (Salleh, 2002).

CONCLUSIONS AND RECOMMENDATIONS

This review of the literature has identified two general criteria: i) zoning and layout, and ii) form and 55 indicators that have been utilised for interpreting the image and identity of the traditional Malay house (TMH). The identification of these image and identity indicators was carried out to: i) act as the conceptual framework of a more extensive study; ii) as the measurable items for selecting image and identity features of Malay architecture; and iii) as the initial parameters for the development of final rating tool to rate Image and Identity. These related criteria and indicators of image and identity of Malay architecture could contribute to the range of criteria and indicators to evaluate new architecture. The findings also support the contention of the authors that there has been a lack of proactive research to establish image and identity features as a means of incorporating image and identity features for new architecture, while conforming to the pressure of 21st century design constraints.

Thus, based on these findings, it is clear that a further stage of investigation should be undertaken to establish more conclusively the relevant indicators of image and identity for new

architecture. It is suggested that future research should explore the views of qualified and experienced professionals in order to identify reliable criteria and indicators for this task.

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