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Sustainable and Resilient Cities: The Way Forward

PROCEEDINGS

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PREFACE

In line with UTM vision of "Being Center for Academic Excellence and World Class Technology through Creativity", this 2nd international conference aims to be an international platform for sharing the latest ideas and technology between industry and universities. This conference hopes to improve an understanding and research in the field of sustainable urban design and livable cities as well as from other related themes. Hence, this conference will establish the superiority of UTM as a university that pioneered the field related to urban design and urban planning, sustainability and architecture in Malaysia. Five sub themes of the conference are; 1) Sustainable urban design, planning and development; 2) Safe and liveable cities; 3) Resilient and healthy cities; 4) Sustainable architecture and design, and; 5) Asset and facilities management.

With the line of invited distinguished keynote speakers, and paper presenters, the conference will become the platform to gather experts, researchers, academicians, and students in various fields involving sustainable urban design, architecture and urban planning as well as other areas in the built environment.

It is our hope that through the presentation and discussions during the conference, participants will gather new knowledge and discover latest updates and development on the issues and topics related to sustainable urban design, planning and development, as well as on other aspects of liveable and resilient cities agenda. All papers which have been included in this proceeding were subject to a blind peer review process to ensure good quality papers and presented in the conference as well as in this proceedings.

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Editors
Proceedings of "the 2nd International Conference on Sustainable Urban Design for Liveable Cities (SUDLiC) 2017"

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Theme: Safe and Liveable Cities

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SD 3 - BONUS ZONING AS ZONING REGULATION TOOL TO PROVIDE PUBLIC SPACE IN BANDUNG

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ABSTRACT

Despite the common practice of Bonus Zoning in other countries, it is still relatively new in Indonesia. Bonus Zoning is a zoning regulation tool that allows developers to get more density in exchange for public facilities improvement or provision. Bandung in particular has already set it out within their Local Regulation No.10/2015 on Detailed Spatial Plan and Zoning Regulation. However, the mechanism of Bonus Zoning application in Bandung is not yet clear. This research aims to investigate: a) The rationale behind application of Bonus Zoning in Bandung; b) Assessment of the carrying capacity of the area to be applied for as well as the consequences of implementation in said area; and c) Requirement for Bonus Zoning implementation and calculation method for the accompanying compensation. A qualitative method will be used to review literatures, legal documents regarding planning and development in Bandung as well as related issues such as heritage/conservation building and tourism for each matter has its own legal consideration. This is an on going research that expect to see result on which area are actually suitable to implement Bonus Zoning and its compensation in order to become the basis for sustainable planning in Bandung that is not only benefit the developers but also the public as user.

Key words: zoning regulation, bonus zoning, public space

INTRODUCTION

Bonus Zoning is one of the alternative of Bandung zoning regulation tools that is contained in Local Regulation No. 10/2015 on Bandung Detailed Spatial Plan and Zoning Regulation, in addition to other regulatory techniques namely transfer of development rights, growth control, and overlay regulations. In that Local Regulation, Bonus Zoning is listed in Article 310 which directs its application at City Centres (Pusat Pelayanan Kota/PPK), Sub-City Centres (Sub Pusat Pelayanan Kota/SPPK), City Strategic Area based on economic interests, integrated area with transit oriented development (TOD) concept, public service center with functions comprising traditional buildings and other functions, as well as the construction site of public housing flats for low-income communities constructed by private parties or in cooperation with private parties. Bonus Zoning or in some literature referred to as Incentive Zoning is a preventive measure of development and improvement provided to the developer with provision of public facilities such as arcade, plaza, pedestrian ways,

loading and unloading space off the street to avoid congestion, etc in accordance with applicable regulations. The practice of Bonus Zoning has been formally done in New York USA since 1961 where public plazas were built by the developers in exchange for supplementary Floor Area Ratio (FAR) for buildings in high-rise areas (Smithsimon, 2008). Although there are some drawbacks in its practice, incentives like this can be a beneficial alternative for the public and the developer because it can meet the needs of both sides that will support the development of the city.

MAIN RESULTS

When analyzed in more detail according to the, the status of land carrying capacity for urban development is spatially uneven. Based on the study of Bandung Carrying Capacity in 2012, it showed that in 2010 most of the sub-districts have experienced deficit of land carrying capacity. Among 30 sub-districts, only 7 surplus sub-districts (Lengkong Subdistrict, Gedebage, Panyileukan, Cinambo, Sumur Bandung, Bandung Wetan and Cidadap). Later in 2031, all districts are projected to experience deficit except for Bandung Wetan Sub-District whose ratio is still surplus. This means that intensification of land use needs to be done in all sub-districts, in addition to urban development expansively in the suburbs of Bandung especially in the eastern part.

Even though there are 23 designated area for Bonus Zoning has been set out in the Local Regulation, there are still limitations to consider in order to grant Bonus Zoning which are:
1) Conditions carrying capacity of Bandung city leading to the development of the eastern part of the city; 2) Main infrastructure conditions such as road network and road class; 3) The objection of development; 4) Designated area for flight safety operation (KKOP); and 5) The impact of development such as traffic generation, air and sound pollution, waste, etc. Based on these concerns, we rank the priority level for Bonus Zoning application with green indicates the highest priority and red being the lowest priority for additional development intensity.
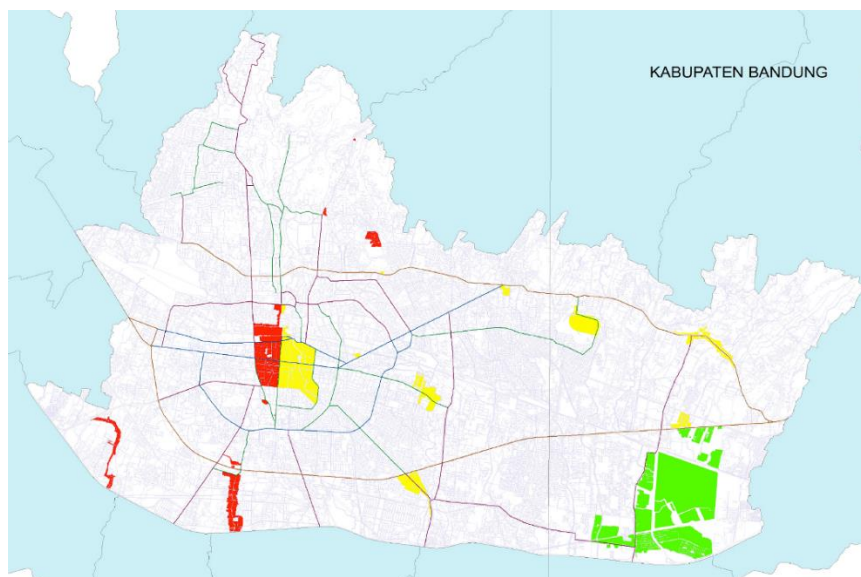
Figure 1. Bonus Zoning Priority Level

CONCLUSION

In addition to the proposed development site to obtain additional density, the location of the compensated public space is also important to take into account. Conditions of the compensated public space must: a) Meet the area carrying capacity; b) Not located within heritage conservation area/building; c) Not violate any established Zoning Regulations on Local Regulation; d) Not reduce the minimum Green Coverage Ratio; e) Consider the availability and capacity of public infrastructure and utilities; f) Consider the standards for public facilities and infrastructure needs; g) Not located within allocated protected green area. As this is an on going research, further output are still being investigated such as how to calculate the compensation based on priority level shown on **Figure 1**. We also expect to discover the index based on this priority level.

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SD 7 - COMFORT CHARACTER FOR TRADITIONAL STREET USERS, A CASE STUDY OF RAINBOW STREET, AMMAN

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ABSTRACT

Comfort in an urban environment includes pleasant state of physiological, psychological and physical harmony between a human being and the environment, it is about the users' satisfaction of the place. Fast expanding of urban development changes the street function and gives priority for vehicles, which effects in the urban fabric and cultural life of the city. It makes the walking environment in the street difficult and uncomfortable. Hence, the main aim of this paper is to explore the appearance of physical elements that contribute towards the comfortable character of a successful traditional street environment. The case study was conducted on Rainbow Street in Amman the capital city in Jordan. Mixed-method was used in this study which involved direct observation (visual and behavioral) and user perception (questionnaires and in-depth interviews). The result shows that physical elements that contribute the comfort character can be categorized into two main categories: landscape (pedestrian amenities and sidewalk) and building (building condition and building opening), therefore these elements must be taken into account in designing new street to increase the level of comfort for the street users.

Key words: Comfort character, Traditional street, Public spaces.

INTRODUCTION

Streets described as the main significant part of the urban open space they also defined as the bones of the city (Rahmana et al., 2015; Alfrey, 2010). Streets serve as a venue for social interaction via different types of human behavior, including talking, playing, observing, and lingering. They are a gathering space for families and friends and sometimes a living room or a dining room for city dwellers (Oranratmaneea & Sachakul, 2014). According to Carr et al (1992), there are five major reasons why people go to public places. The reasons include comfort, relaxation, passive engagement with the environment, active engagement with the environment and discovery (Carr et al., 1992). Rahmana et al (2015) identified comfort as the most basic of needs and the most important design criterion for a livable street as it has a direct

effect on place satisfaction (Rahmana et al. 2015). Comfort is not just offering protection from the sun, the wind, and rain, but also providing a physiologically suitable setting at the street environment to support a convenient environment where various activities and outdoor culture events can occur in open public spaces (Hajmirsadeghi, 2015; Mehta, 2006). It's about providing safe, accessible, convenience and pleasant place for people to spend their time and having their social activities (Zakaria & Ujang, 2015). Thus, it's the pleasant feel for people when they interact with the environment.

In this regard, the level of comfort could be determined by the length of time people would spend in the public space (Carmona et al., 2003; Essoh, 2010). Consequently, comfort is a characteristic that should be considered when designing a convenient, safe, and friendly street environment which is one of the basic human needs in urban spaces (Rahmana et al., 2015; Carr et al., 1992; Carmona et al., 2003; Jacobs, 1996). Thus, comfort is defined as the pleasant state of physiological, psychological and physical harmony between the human body and the environment (Zakaria & Ujang, 2015). In modernist urban planning, more attention is paid to requirements of cars rather than pedestrians' needs. (Jalaladdini & Oktay, 2012; Ja'afar et al., 2014). According to Gehl (2015), Public spaces as street become unattractive, unwelcoming and uninspiring, it's discouraging people from using it, enjoying their surroundings or having social activities. These changes can be observed in newly designed buildings and landscapes that transform discouraging people from using public spaces.

Thus this paper is focused on the physical elements (landscape and building) that contribute towards comfort on the traditional street. Rainbow Street in Amman capital city of Jordan was chosen as a case study according to its cultural and historical value identities and characters (Essoh, 2010), also it's described as prime spots for socializing especially from mixed-use and place for different activities (Essoh, 2010).

MAIN RESULTS

The study shows that building and landscape are the main elements that contribute toward comfort character when walking on the traditional street as shown below in (Table 1).

Table 1. Elements that contribute towards comfort in street

Elements	User perception		Visual survey
	Interview n =21 Yes No £	Survey n=330	
Building			
Building openings	20 1 21	200 (60%)	/
Building condition	18 3 21	218 (66%)	/
Landscape			
Pedestrian amenities			
Public toilet	21 - 21		/
Seating	18 3 21	175 (53%)	/
Sidewalk	14 7 21	194 (58%)	/

Building
The analysis of qualitative and quantitative data of this study revealed that building is one of the main elements that contribute towards comfort character in the traditional street. The

analysis shows that building elements that influence comfort character in street are divided into building condition and opening of a commercial building illustrated as follows:

- Building condition: the condition of the building is essential in the traditional street in contributing to the comfort and safe environment to pedestrians when walking because it creates visual aesthetic, safe feeling and thus, creating a sense of comfortable welcoming characters.
- Opening of a commercial building: the opening design of the ground floor for commercial buildings is very important to generate activities, enjoyable and comfortable atmosphere. It also generates interactions between activities inside and outside the building which contribute to the comfort character of the traditional street.

Landscape

The analysis of qualitative and quantitative data of this study revealed that landscape features contribute towards comfort character in the traditional street. These features divided into pedestrian amenities and Sidewalk illustrated as follows:

- Pedestrian Amenities: pedestrian amenities according to this study include public toilet and seating described as follows:
  I. Public Toilet: toilet facilities are essential to provide a comfortable environment. Hence, the facilities should be clean, well maintained and accessible for all type of users.
  II. Seating: seating is intended to ensure the comfortable environment through the (1) location of seating along the street, (2) suitability of the location e.g. oriented towards interesting point and shaded area, (3) variety types with different designs such as benches with backrests or changeable benches to meet all users' needs and (4) sufficient number of seating.
- Sidewalk: comfortable sidewalk should have a clear distance with sufficient minimum width to meet the pedestrians' needs, and this would contribute to the comfort character of the traditional street. These characters must be taken into account in the design of the new street through the following approaches: (1) The design of the pedestrian sidewalk with a minimum size (1.8 m) (2) The sidewalk must be free from any holes or obstacles to ensure the safety of the pedestrian.

CONCLUSION

This study found that building condition, opening of commercial building, pedestrian amenities (public toilet and seating), and sidewalk should be taken into account in the design of the new streets in order to create a comfortable environment for street users because if streets are alive, comfort pleasant and exciting spaces can attract more people (Mehta, 2006). As in modernist urban planning, more attention is paid to requirements of cars rather than pedestrians' needs. So providing comfortable environment helps in giving back the main role of streets as it described as "*river of life of the city, the place where we come togethe*r" (Whyte, 1960, Shahideh, 2013). Future research should focus on the influence of cultural activities by observing pedestrian of Rainbow street. Hence, it will provide a more comprehensive understanding in designing streets.

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SD 9 - THE VIABILITY OF AN INTEGRATIVE FRAMEWORK FOR URBAN DESIGN AND REGIONAL ENVIRONMENTAL JUSTICE

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INTRODUCTION

The purpose of this paper is to critically evaluate the factors that have contributed to the development of urban design importance for Malaysia‟s key urban population, and how local role players have essential roles in establishing stronger environmental justice by encouraging adoption of green technologies and urban liveability concepts. To discuss this complex issue from architectural, economic, educational, social, ecological and sustainable design perspectives, the framework of policies guiding global sustainable development strategies will be reviewed (Nassauer and Raskin, 2014; Washburn, 2013; Wolch, Byrne and Newell, 2014). Urban design is the interdisciplinary fields incorporating systematic scientific inquiry, research and practices to observe, identify, validate and solve issues and problems relating to urban planning, environmental sustainability and cultural landscape development (Carmona, 2013; Dovey and Pafka, 2016).

Inevitably, ideological clashes occur within urban design scope of practice: political and economic investment priorities, extent of natural resources and energy dependence, and the appropriation of cultural capital representing diverse socioeconomic, sociocultural and ecological interests, makes urban design a natural site of place-making discussions and in particular, the environmental justice movement.   Theoretical validation of urban design consists of a breadth of literature debating the viableness of empirical assessment of urban design quality (Carmona, 2013), while subjective interpretations of urban design functions have provoked equally fierce debates in academic and practical domains (Dovey and Pafka, 2016).

In between these argumentations, the question of equity for the uses and allocation of public spaces in terms of economic viability, environmental impact and diversity inclusion and how they affect the broader social environment, remains a contested concept. By weaving a range of interdisciplinary fields from architecture, construction, designing, engineering, environmental and geological sciences, finance, surveying, technologies, and politics, urban design is intended to provide cities and townships a sustainable thrust in equitable place-planning, since diversity of various stakeholders‟ views is important: affected citizens are invited to debate, review, critique, state objections and present alternative opinions to planning guidelines (Washburn, 2013). The process of designing spaces in urban centres is seldom acknowledged as explicitly just: design itself, being often "slippery in nature", features considered the best solution for the greater good could merely be advantageous and convenient

for state planners, land developers or other dominant stakeholder parties (Carmona and Tiesdell, 2007: pp. 348-9).

The policies and mechanisms applicable in Malaysia's urban development strategies including long term initiatives to promote conservation and sustainability agendas, as well as industries" and consumers" access and participation in initiatives such as low-carbon technologies, renewable energy, urban farming and place planning diversity will be examined to understand how local communities, planners and institutions of policy research work collaboratively to contribute necessary knowledge in urban preservation and the creation of liveable cities.

METHODOLGY

The research offers a uniquely Malaysian insight on the concept of environmental justice, one that has evolved from localised, community-based sustainability initiatives, all claiming to align to the framework of objectives as stated under Malaysia's National Green Technology Policy (KeTTHA, 2009). These goals aim to inculcate widespread commitment of local stakeholders to sustainability by reducing energy dependency, promoting ecological awareness, and encouraging the adoption of green technology innovations in four key areas: energy, buildings and infrastructure, water and waste management, and transportation. This paper examines these four aspects through descriptive analysis of three Malaysian case studies: (i) Low-Carbon Community, (ii) River of Life Project, (iii) Local Agenda 21 Petaling Jaya. The qualitative mapping of urban design concepts such as adaptiveness, resilience, wellbeing, security, and liveability enables better understanding of urban phenomena such as randomness and emergence of urbanisation as this process frames practical components of knowledge, where assessments of current urban design practices enable further inquiries in the science of design thinking in urban identity management, as a complementary component of empirical studies (Dovey and Pafka, 2016).

MAIN FINDINGS

Results of these descriptive case exemplars of urban design planning in Malaysia's urban communities significantly demonstrate the importance public-private sector collaborative dimensions in improving environmental justice outlook for the medium and long term. Specific focus of urban design analysis is the Iskandar Low-Carbon Blueprint 2025, the River of Life Project (RoL), and the implementation of Local Agenda 21 (LA21) in the urban transformation of Petaling Jaya city in the state of Selangor. Qualitative analysis found that several urban design characteristics which indicate liveability of urban cities fulfil the basic concept of resilience and adaptive living, but while the understanding of sustainability has increased in the Malaysian public domain, conflicting questions of socioeconomic and sociocultural value to stakeholders, linger on. Despite the existence of national policies fostering socially sustainable, ecologically sound options, an integrative framework that facilitates the growth of liveable urban cities with socioeconomic and cultural development fundamentals, is still under-implemented and weak.

For Malaysia, this was found to be due to several reasons, including a lack of support from local businesses, prohibitive costs of sustainability investments, a lack of awareness about the value of ecological resources and customary cultural attitudes towards heritage preservation. The difficulty is compounded with over-urbanisation that creates haphazard infrastructural aesthetics, resulting in attitudinal dichotomies, indifference and a sense of disconnect between

the goals of larger national economic development agenda, and the preservation of artefacts of community heritage value.

CONCLUSION

Environmental justice goals can be integrated into urban sustainability frameworks through design planning equity, but these goals will not be achievable without the involvement of action groups and both public and private sector participants on decision making. Analysing prevailing or established attitudes and perceived expectations about cooperation in sustainability planning is crucial as civic engagement and community input assures authorities that sustainability should be the core to enhancing environmental conditions, but the final decisions for urban development plans must integrate more community friendly and valuable heritage features (Mohammad, 2014). Efforts to reduce environmental injustice to low-income and minority groups must provide mechanisms which promote social equity goals by using taxation systems linked to energy efficiency initiatives (C40, 2016). Aside from regulatory considerations, training and awareness for officers and taskforces will be required to build stronger social capital networks and links between authorities, local community stakeholders and the media. Proper, decisive and rigorous enforcement of existing urban planning laws and anti-pollution policies would ensure communities are responsible for their own urban lifestyle management in aiming for better personal health and social wellbeing.

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SD 13 - PRELIMINARY EXAMINATION OF DESIGN CHARACTERISTICS OF A PEDESTRIAN FRIENDLY SHOPPING STREET IN KUALA LUMPUR

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INTRODUCTION

Urbanisation has a tremendous influence on urban spaces, generally, and streets, particularly. One of the influences, according to Shamsuddin et al. (2010) is the erosion of the street as a public space, which also influences the relationship between the urban users and social space's, especially the streets. Streets are a vital component of the urban form and in the city centres (Rahman, 2014). According to Tibbalds (1992), streets are where the greatest amount of human contact and interaction takes place. Streets have traditionally served three main purposes i.e. for mobility, commerce and social interaction (UN Habitat, 2013). The street, normally defined as a public space with residential houses, commercial buildings and other structures on one or each side, therefore, has social and economic functions that are integral to urban life (UN Habitat, 2013). Streets are public spaces for people as well as corridors for movement, marking a shift away from a functional classification of streets categorized only according to their ability to move traffic and provide vehicular access (NACTO, 2013).

However, in Malaysian cities, it is hard to find examples of street environments that are friendly and accommodating to pedestrian users especially in the advent of motorised transportation (Rahman, 2014). The unfriendly street environment for pedestrian in urban spaces is mentioned as one among the most critical urban issues addressed in the Kuala Lumpur City plan 2020 (DBKL, 2004). This statement was supported by Shamsuddin (2011) that mentioned one of the dilemmas in the Malaysian townscape today is that the streets are overrun by vehicles and unfriendly to pedestrians. The effect of rapid urbanization in Kuala Lumpur city centre has compromised the priorities of pedestrians in the city centre to depend on both private and public transportation (Shamsuddin *et al.*, 2010). According to UN Habitat (2013), Kuala Lumpur has low to moderate level of land allocated to street - Between 15% and 20%. In this light, this review paper will examine the design characteristic of pedestrian friendly street and the extent to which these characteristics may be implemented in shopping streets of Kuala Lumpur and making it more pedestrian friendly and sustainable.

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REVIEW OF CONCEPT OF PEDESTRIAN FRIENDLY SHOPPING STREET

Streets are the main public space in urban areas (Lynch, 1960; Krier, 1992; Moughtin, 1992). Streets constitute a significant part of the public open space and are seen as the most important symbols of the public realm (Jacobs, 1961; Appleyard, 1981; Carmona *et al.,* 2003). Streets are the most important part of the towns and cities where the greatest amount of human contact and interaction take place (Tibbalds, 1992). Streets not only act as access but also an important arena for social expression (Moughtin, 1992). Therefore, streets are important public place in urban centre that need to be designed to allow all users with different abilities.

Lynch (1960) defines street as a path enlivened by a series of nodes where other paths meet it or where activities intensity to such extent that places and rest for dominance with function pathways and movement. In a latter definition by Moughtin (1992), a street can be defined as an enclosed, three-dimensional (3D) space between two lines of adjacent buildings. From an engineering perspective, street is a walkable, low speed (25mph) in urban areas primarily serving abutting property (Institute of Transportation Engineer, 2006). The role of the street in urban design as a public place need to consider the way in which they are arranged, designed and detailed. Moughtin (1992) suggests the primary function of streets is to provide access to abutting properties and for a street to function as a place; it must possess the qualities of enclosure like a square. The success of pedestrian areas is dependent on the variety of the attractions they offer so that pedestrians in large numbers have a reason for remaining and good access from both private and public transport (Moughtin, 1992). There are three functional types of street which are great civic streets that nominated by public institution, commercial streets with their commercial establishment and residential street (Sulaiman, 2000). For many urbanites, it is the streets that represent the outdoors (Jacobs 1993). People depend on streets for functional, social, and leisure activities; for travel, shopping, play, meeting, and interaction with other people; and even for relaxation (Jacobs, 1961; Carr *et al*., 1992).

Davies (2000) in the Urban Design Compendium suggests that if the street is a shopping street, the design should enable the users to get to the shop, to cross the road and have other static and leisure activities such as chatting and lingering in front of the windows. According to Mehta (2007), commercial street is a physically well-designed street for people, with generous sidewalks, ample seating and other street furniture, tree cover and other landscape elements. Furthermore, articulated street façades of buildings built to the sidewalk should become much more useful and meaningful for people when there are community gathering places and a variety of activities-supporting stores and other land uses at the street, and vice versa (Mehta, 2007). Therefore, concept of pedestrian friendly street is important in commercial street to support activities embracing all forms of the purchase and sale of goods and services which involved social relations and exchange of opinions or attitudes.

The traditional commercial street in Malaysia is unique where Shamsuddin (2011) discussed in the character of the streets in Malaysian town is much influenced by the type of retail activities that occur on the street and the ethnicity of the groups engaged in such trading. That activity is the most influential quality that attracts shoppers to the traditional street in Kuala Lumpur (Norsidah, 2010). The shopping streets in Kuala Lumpur city centre are identified and characterised by name, location, the people or users who mostly use and occupy the street, the user's cultural background and the main uses and activities held in the area (Shamsuddin *et al,* 2004). One of the major attractions in Kuala Lumpur traditional commercial street is the street activities that create a sense of festivity due to the nature of trading operations, where bargaining is still practiced. During festive seasons, crowds of shoppers are seen patronizing the shops along the street. On the older part, the streets still respond to the tropical climate where the outdoors is being used as part of the spill over space for displaying the merchandise. Besides, there are sidewalks that provide the opportunity for pedestrians to perform their activities in a safe and comfortable environment. Their presence encouraged people to walk to do their shopping routine and increase pedestrian freedom in the city centre and contribute to the sense of vitality in the townscape (Shamsuddin, 2011). Therefore, the traditional commercial street that reflects the culture and climate is the best street to represent Kuala Lumpur. The study on pedestrian friendly element in

commercial street is important to enhance the built environment for the users' needs and furthermore contribute towards sustainable development.

Proposed Design Characteristics of a Pedestrian Friendly Shopping Street

Review of literature suggests the following characteristics of pedestrian friendly street on physical design factors that aim for the quality improvement (Table 1).

Table 1: Proposed design characteristics of a friendly pedestrian shopping street by literature review

	Proposed design characteristics
1	*Linkages to a variety of land uses / regional connectivity* - Pedestrian circulation and access are provided to shopping malls, transit, downtown, schools, parks, offices, mixed-use developments and other community origins and destinations
2	*Continuous systems/connectivity* - A complete system of interconnected streets, pedestrian walkways and other pedestrian facilities will increase pedestrian travel
3	*Shortened trips and convenient access* - Connections are provided between popular origins and destinations, between dead-end streets or cul-de-sacs or as shortcuts through open spaces
4	*Continuous separation from traffic* - Minimised or eliminated street and driveway crossings are provided and well defined. Buffers from motor vehicles and separation of uses are provided
5	*Designated Space* - Pedestrian facilities should be well delineated, signed and marked
6	*Security and visibility* - It is important to design a safe and secure environment for pedestrians. Lighting increased visibility, open sight-lines, access to police and emergency vehicles and locating pedestrian facilities adjacent to businesses can increase safety
7	*The automobile is not the only consideration* - Streets are designed for all modes of transportation. Parking supply is reduced or managed using methods that encourage walking
8	*Traffic calming* - Narrowed streets lined with trees, traffic circles, curb bulbs, neck-downs and other techniques that can lower vehicle speeds and create safer conditions for pedestrians
9	*Accessible and appropriately located transit* - Siting of transit facilities adjacent to work, residential areas, shopping and recreational facilities encourages pedestrian trips. Transit stops and centres should typically be located in areas of supporting densities. Development of adequate pedestrian facilities to access transit is essential to the success of pedestrian travel as an alternative mode
10	*A lively public space* - Secure, attractive and active spaces provide focal points in the community where people can gather and interact such as pedestrian pocket parks and plazas
11	*Character* - Preservation of important cultural, historic and architectural resources strengthens community heritage and character
12	*Scenic opportunities* - Attractive environments and scenic views encourage pedestrian use, particularly when facilities are oriented toward them
13	*Pedestrian furnishings* - Providing amenities such as benches, restrooms, drinking fountains, artwork and other elements that creates a more attractive and functional environment for pedestrians
14	*Street trees and landscaping* - Street trees bring human scale to the street environment. Landscaping and flowers in planting strips, containers and other areas soften surrounding hard edges of buildings and parking lots and add life, colour, and texture to the pedestrian's field of vision

Source: adapted from Georgia Department of Transportation (GDT) (2003)

As stated in the above table, the concept and physical characteristics of pedestrian friendly streets is very broad. Gehl (2007) argues that in many cities, the qualities of the streets for pedestrians in many cases are unpleasant. The qualities of pedestrian movement, such as free of obstacles, sidewalk interruptions, curbs appalling of street crossing, fences are left on the narrow sidewalk (Gehl, 2007). Therefore, the concept of pedestrian friendly which have been proposed by various scholars and development agencies refers to the quality of the street that provides safety and comfort to its users.

CONCLUSION

This paper reviews the literature relevant to the physical design characteristics of pedestrian friendly shopping street and pointed out in brief how the proposed characteristics may be applicable to revitalise shopping streets in Kuala Lumpur to becoming more pedestrian friendly in future. The significance of

this study aims to create a better understanding on the theories and principle of pedestrian friendly streets which are safe, comfortable and creates a healthy living environment. With Kuala lumpur aiming to be World class city, it is of prime importance to analyse the existing infrastructure, understand the existing problems and issues to build a city which is on par with cities across the world.

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SD 14 - REVITLISATION OF THE ROLE OF MOSQUE AS NODE IN URBAN AREA

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INTRODUCTION

In designing a city, there are core elements to be taken into consideration. One of these core elements, as mentioned by Setiadi (2015) and Hiller &Hanson (1984) is the cultural elements, in particular religion elements which plays an important role in the foundation of human existence. It shapes moral code, ethic, perception, spirit, and institutions for human life (Setiadi 2015). Other than being the most important element in a city design, religion not only as a course or source of faithful messages, but also as a foundation for a civilization, or as stressed by Setiadi (2015) and Polanyi (1968), city is also a product of civilisation. Within the context of a Muslim majority country and majority of Muslim population, religion places particularly a mosque (in this context of study) should be strengthening its role as a node or central of the city or any urban area. In an urban elements theory, a node is one of the factors that contributed towards the legibility of the urban area (Lynch, 1960). Legibility means the extent to which the cityscape can be 'read' (Lynch, 1960). Therefore, the role of node is very important as the legibility of an urban area will lead to a better environmental image of the city (Lynch, 2009). Lynch (1960) argues that people in urban situations orient themselves by means of mental maps. The role of mosque in majority Muslim community is very important, as it is the unity element of the surrounding community. Therefore, a mosque should become a node of an urban setting as it would lead to the generalized mental map among the people who move through the city as they engage the way-finding (Lange, 2009).This review paper will examine issues related to forgotten function of mosque as node in urban area. Followed by brief explanations of the concept of node and the extent to which a mosque in urban area could be strengthening its physical elements to becoming an urban node.

FORGOTTEN FUNCTIONS OF MOSQUE AS URBAN NODE

This section briefly discuss two main issues relating to forgotten functions of mosque as urban node as gathered from review of literature. These issues are: (1) mosque which is not strategically located to become a node in urban area and; (2) misconception of role of mosque in urban area.

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Location of Mosque in urban area often not strategic to become a node

Mosque as defined by Dictionary of Dewan Bahasa dan Pustaka (2016) is "a gathering place for the Muslim to perform prayer and other Islamic activities". Spahic (2013) on the other hand, stated that the first urban element introduced by the Prophet (p.b.u.h) to the city of Madinah was the mosque institution which functioned as a centre of community development. A frequently occurring formula that was used by the Andalusian geographer i.e. Abu Obeid al-Bakri (d. 487/1094) is that in a large city, or city, or a large town where one can find a Mesjid al-jami - a Khotba mosque and a Suq (jamiwa- aswaq) (Hakim, 1986).Hence, it shows that the mosque play an important role in Islamic city and become the main node of the city as the mosque is used to defined the city and a public realm of the Islamic urban area. Nangkula (2015) when discussed on the issue of position and location of mosques in Malaysia emphasised on the issue facing by users i.e. distance for commuting between residents' house or working place to the nearest mosque. Most of the mosques today are especially placed in towns, which are far from places where people are gathered or they are far from residential areas. For mosques, which are built far from residential areas, transport is needed so that people can get transport for them to go to such mosques. This situation can be observed in relation to Sultan Abdul Samad Mosque or more popularly known as KLIA Mosque which is built far from locations frequented by people and the inhabitants of the surrounding area; it is built rather close to the highway (Field observation in 2017). As for mosques which are situated in university campuses, for example the Universiti Kebangsaan Malaysia Mosque, it is strategically close to the faculties and the main road of the campus hence giving its extra merits of always be a focal point for students to gather for various activities apart from going there for their spiritual devotions. Apart from being visited by students and staff of the university, the mosque is also visited by the general public and communities from surrounding area especially during Friday prayers (Field observation in 2017). Since the function of mosque varies depending on its location – like mosques built in non-Muslim country is to symbolize Muslim existence whereas mosques in a Muslim country functions as a tool to represent the identity of Islamic nation to the world, hence it is vital to design and position a mosque that can function as node in urban area.

Misconception of role of mosque in urban area

Abu Dhar reported the apostle of Allah (May peace be upon him) as saying: He who separates the community within a span takes off the noose of Islam from his neck (al-Sijistānī,1952.) Jabir (Allah be pleased with him) reported Allah's messenger (May peace be upon him) as saying: Never a Muslim plants a tree, but he has the reward for charity for him, for what is eaten out of that is charity; what is stolen out of that, what the beast eat out of that, what the birds eat out of that is charity for him. (In short) none incurs a loss to him but it becomes a charity on his part (Siddiqui, 1990). Nangkula (2015) explained that from the two Hadiths above described Mosque is but one expression of communal responsibility in Islam. Evidence for this statement can be derived from the life of Prophet (peace be upon him) and his actions right after the migration from Makkah to Madinah. On his arrival at Madinah, the first thing Prophet (peace be upon him) and his companions did was to mark out and build the mosque of Madinah i.e. the Prophet's (peace be upon him) mosque. This was the first communal activity that took place among the Muhajir (migrants from Makkah) and the Ansaar (helpers at Madinah) (Spahic, 2013). Apart from other aspects, it clearly illustrates how important the role of mosque in the establishment of a Muslim community.

Baharudin (2014) and Rasdi (1998) claimed that, mosque in the present Muslim country is widely misinterpreted. Baharudin (2014) and Omer (2010) discussed, mosque is not only serving as a holy place for worship solely, but also meant for communal purposes with multiple functions. It becomes as a catalyst to the development of the surrounding area within the aspects of physical needs (Baharudin 2014; Hamid 2012). This was proven based on how the Prophet's mosque became dominant reason for the rapid development in Mecca and Medina in which through mosque as Islamic Symbols transforms and attracts the surrounding community (Baharudin 2014; Hamid 2012).In Malaysia context, the Federal

Town and County Planning, FDTCP (2003) introduced The Universal Planning Development Doctrine with noble purpose to integrate between the urban structure and relationship between human and God, human and human, and human and nature. Each community must be developed in reflect the concept of 'Taqwa' (good governance). 'Taqwa' is an arabic word and translated as Good Governance which associated with close relationship between human and nature. However, the current role of mosque in Malaysia, not just misinterpret the role of mosque, in Malaysia city context, the mosque does not reflect the concept of 'Taqwa' as established by FDTCP as it is did not comply and implement the order of creator, does not meet the human welfare and living condition and does not demonstrate the care to creatures and environment.

REVIEW OF LITERATURE: BRINGING BACK THE ROLE OF MOSQUE AS NODE

Based on review of literature, this section should discuss in brief suggestions for bringing back the role of mosque as node in urban area.

Strengthening the location of mosque to become a node
Saoud (2004), explained that based on his study of the urban morphology of the Muslim North African City, he described that the organization and land use of the city reflected its Islamic social and cultural values. As shown in Figure 1, the city is ordered around the main mosque.
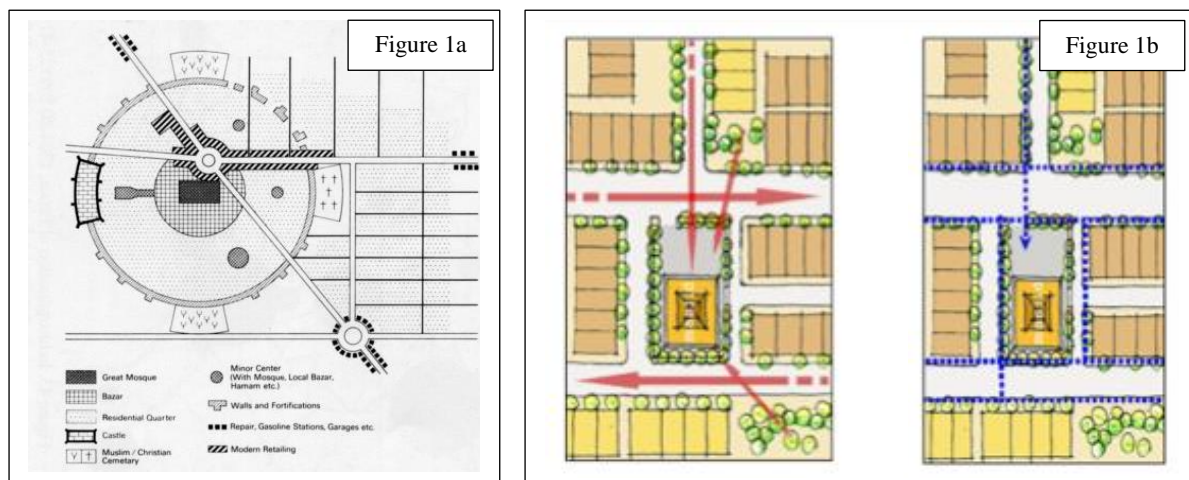
Figure 1a: Model of modernized Islamic City. Source: Saoud (2004)
Figure 1b: Mosque position and orientation. Source: Garis Panduan Perancangan Masjid danSurau (2011)

Mosque in Malaysia, play an important role as stated by Planning Guideline for Mosque and Musholla2011 (FTCP, 2011). In a new development, the height of the minarets also be used as a landmark of an area where height control must be imposed on buildings around the mosque so as not to exceed the height of minarets. Lynch (1960), explained that landmarks are another type of point reference. They are usually a rather simply defined physical object: building, sign, store or mountain. Landmarks, the point references considered to be external to the observer, are simple physical elements which may vary widely in scale (Lynch, 1960).

Improving the design components of the mosque
The influential factors for mosque to become the node in urban area related to the components within the mosque plaza itself and how it is respond to the urban context. Kahera (2009) explained that the term 'urban mosque'refers to the representative religious edifice constructed by Muslims who reside primarily within urban locales in the western world; often described as an Islamic center (*markaz*), it is where the faithful gather to engage in communal worship, spiritual retreat, matrimony, education, and other significant socio-cultural activities.One of the primary design objective as proposed by Kahera

(2009) to help establish the quality and character of an urban mosque is "if you build it they will come" – i.e. the urban designer should create a master plan with a controlled variety of uses and flexibility allowing for future expansion in relation to the mosque site context. Furthermore, the urban designer should establish a clear pattern of land use and urban forms, which includes the prominent placement of entrances, ancillary structures, and parking to heighten the contrast of the urban setting. Kahera (2009) explained in his research on urban mosque, listed criteria for a smart design and site planning urban mosque as follows:

- Create opportunities for mixed land uses.
- Take advantage of compact building design.
- Create design opportunities and choices for the larger community.
- Create walkable opportunities for social spaces for gathering.
- Make design decisions that are predictable, fair, and costeffective.
- Create opportunities for social spaces for gathering adapted from Environment Protection Agency guidelines for smart growth.

CONCLUSION

As a conclusion, this review paper explains thatthe key factors in designing an urban mosque that might potentially become a node is very much depending on our (urban designer) interpretation of the broad range of aesthetic, liturgical requirements and site planning considerations, hence to be coexist or co-substantiated within a given urban setting. Bringing back the function of a mosque as the major node of an urban setting in the other hand, would be best to be within majority Muslim community resident area. In Malaysia context, Mosque does not meant for public utilise as for public urban spaces including for interaction and recreational activity. Therefore, the challenge would be to first establish the definition of urban mosque and to improve its role and physical elements to enable mosque for becoming a node particularly in urban area.

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SD 18 - SUSTAINABILITY ASSESSMENT FOR HIGHER EDUCATION INSTITUTIONS (HEI): A LITERATURE STUDY

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ABSTRACT

Sustainability assessment for Higher Education Institutions' assessment progressively famous with increasing number of universities had shown their initiative in addressing sustainability. A number of higher education institutions need get to be included over embedding reasonable advancement under their academic framework. However, the preservation of international university ranking system remains controversial and under-utilized due to the subjective and objective concept of sustainability to higher education institutions and less broadly acknowledged framework and criteria ranking. Thus, the purpose of this paper is to present a conceptual framework to aid in understanding and explaining the conceptual element of Higher Education Institutions assessment. İt analyses if such duty prompts more maintainable advancement execution inside the academic institutions. Those investigate might have been performed by using a survey about 20 relevant peer-review papers.

Key words: Higher Education institutions, sustainability assessment, and sustainability framework

INTRODUCTION

The attaches of the reasonable advancement particular idea utilized within Brutland Report to be followed back in 1974 when the concept of Sustainable Societies, in view of equitable distribution, was first used in World Council of Church (Lozano R., 2008; Reid 1995). Those fundamental accomplishment of the Brutland Report have been on bring maintainable advancement of the standard universal political agenda, and straightforward meaning that get broadly cited world-wide (Lozano R., 2008; Reid 1995). There are two main issues in Higher Education Institutions relating to the environmental factors; which are reducing energy consumption and waste and turn the curriculum into green syllabus (Roy et al., 2008). According to Ritzen (2006), there are many countries starting to attempt and improving their competitiveness of macro policies particularly in education components this its due to Higher Education Institutions it's the most insignificant indicators of global competitiveness (Schwab, 2013).

Universities play a vital role in conducting and promoting sustainability principles and should contribute to a paradigm shift towards a more sustainable society (Christian R. et al, 2015). A

growing interest in sustainability (or SD) and, more recently, the approaches regarding strategies, cleaner production, pollution control, eco-efficiency, environmental management, social responsibility, industrial ecology, ethical investments, green economy, eco-design, reuse, sustainable consumption, zero waste among many other terms (Lukman, 2007). The emergence of sustainable development as a political and social project of humanity has promoted the orientation of efforts in order to find ways for sustainable societies (Salas Z. et al., 2011). Since then, there has been lot of literature devoted to the subject, and no doubt a blurring of focus.

But before universities can really promote and drive sustainable development, their sustainability activities must extend a still prevailing narrow perception of sustainability, limited to environmental issues or the simple integration of sustainability topics into existing curricula (Wals 2014; Leal Filho 2009). To incorporates sustainable development into daily practices in universities, sustainability has to become mainstream and cannot be simple implemented without serious planning. According to Lozano (2006), the mainstreaming or institutionalizing only can be achieved when the idea's of sustainable development fully accepted and integrated with universities' daily routine of management. Without a whole approach in universities, the aims of real change and approach, universities are caught in green washing, reductionist models and the increasing demand to produce knowledge (Christian R. et al, 2015).

This paper is divided into the following section; Literature review to provide an underpinning understanding of how higher education has been assess to fulfill the sustainable approach. Next sections proceed into the conclusion of the topic with recommendations for refining the university sustainability assessment framework.

LITERATURE REVIEW

Higher education institutions (HEIs) are uniquely positioned in the society to nurture and to prepare the leaders of the future society. Therefore sustainability is not limited to the demonstration of a sustainable campus but also a cornerstone in the education practice for HEIs (Dawe et al., 2005). The ultimate objective of university sustainability is to infuse sustainability literacy into both academic programs and daily campus operations. In this context, a growing number of declarations, charters, and networks for sustainable development of HEIs were established with the aim to advance sustainability over the last two decades (Lozano et al., 2013). The first official statement made by university presidents and chancellors on the commitment is the Talloires Declaration signed in Talloires, France in 1990 (ULSF, 1990). It is a ten-point action plan for incorporating sustainability and environmental knowledge in teaching, research, operations and outreach at HEIs. 440 university leaders in over 50 countries as of May 2012 have signed the Talloires Declaration. Despite an increasing number of universities having embraced their vital role in fostering the society to become more sustainable since the publication of the seminar Brundtland Commission report in 1987, most HEIs remain conservative, slow to incorporate and institutionalize sustainable development (Lozano et al., 2013). To change the slow uptake of sustainability in universities worldwide, a few HEI networks of sustainable development have championed the application and extension of university sustainability ranking systems given the profound impact of university ranking practices on the strategic direction and transformation of the HEIs as a whole. According to Vettori and Rammel (2014), the process of mainstreaming sustainable development could be enhanced by bridging the quality culture concept and reframe sustainability principles as part of a university's overall quality goals and procedures.

Sustainability in HEI – conceptual understanding

Generally sustainable assessment in higher education starts from the assumption that if sustainability cannot be measure, can neither manage nor improve (Christian R. et al, 2015). But the principle understanding of sustainability, which shall be implemented by higher education institutions should largely, determines the process, direction, and outcomes in the sustainability assessment. Despite the growing of the concept of sustainability, facing a wide range of conflicting ideological, conceptual and terminology aspect which is already discusses in abroad scale before (Christian R. et al, 2015; Sneddon et al. 2006; Rammel and van den Bergh 2003; Folke et al. 2002). To highlight one among many definitions, Velazquez et al (2006) define a sustainability university

Higher education institution, as a whole or as a part, that address, involves and promotes, on regional or global level, the minimization of environmental, economics, societal and health negative affects in the use of their resources in order to fulfill its main functions of teaching, research, outreach & partnership, and stewardship among other as a way to helping society make the transition to sustainable life styles.

Since 1972, a linkage between sustainable development and higher education has been created and it's gradually led to a formation of a new trend and studies. The definition of a sustainable in HEI always refers to environment, economic and social concerns as per always stated in literature. Table 1.1 explains the conceptual definition of sustainability in HEI.

Table 1.1 conceptual definition of sustainability in HEI.

Authors	Definition
Velequez et al., 2006	A university should minimize the negative environmental, economic, and societal and health effects generated in the use of their resources.
Cole, 2003	A university has the responsibility of protecting the health and well being of humans and ecosystems and to use the knowledge produced on the university to address the ecological and social challenges that we face now and in the future.
Alshuwaikhat and Abubakar, 2008	The effort of energy and resources conservation, waste reduction, promotion of social justice and the notion of equity need to be transferred to society.
Cortese, 2003	The university as a four-dimensional system – education, research, campus operations and community outreach (Figure 1).
Lozano-Ros, 2003	Beside four-dimensional stated by Cortese (2003), the fifth dimension has been added claiming that the four-dimensional system needed to be assessed and reported.
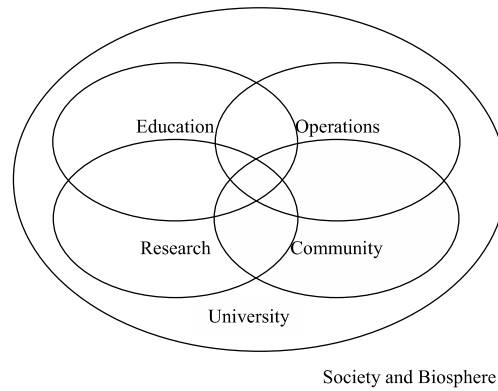
Figure 1. University's system and its four dimensions
Source: Adopted from Cortese (2003)

A numbers of declarations and treaties highlight the conceptual principles of sustainability in the context of HEI (Lozano et al. 2013, Disterchief et al. 2013). In 1992, more than 100 heads of countries met in Rio de Janeiro, Brazi for the United Nations Conference on Environment and Development (United Nations Conference, 2013). In this context, HEI is developed and signed array of declaration, charters and initiative (DCIs) to provide guidelines or framework for HEI to demonstrate their commitment and better embedding sustainability HEI concept in their system (Calder and Clugston, 2003; Wright, 2004; Lozano et al., 2013). The declaration its importance in order to fostering transformation and as evidenced stated more 1000 universities' head who declare their commitment towards this concept by committing into DCIs (Calder and Clugston, 2002; Cole and Wright, 2005).

Figure 3. Sustainability in HEI system- literature comparison

Model Description / Author	Alonso-Almeida et al., 2015	Alsuhuwaikhat & Abubakar, 2008	Boman & Andersson, 2013	Bremer & Lopez-Franco, 2006	Cantalapiedra et al., 2006	Ceulemans & De Prins, 2010	Chalker-Scott & Collman, 2006	Chalker-Scott & Tinnemore, 2009	Crofton, 2000	Harpe & Thomas, 2009	Desha & Hargroves, 2010	Ferrer-Balas et al., 2004	Ferrer-Balas et al., 2009	Ferreira et al., 2006	Fisk & Ahearn, 2006	Gao et al., 2006	Geng et al., 2013	Goodnough et al., 2009	Gudz, 2004	Heart, 2000
Institutional Framework					✓							✓	✓					✓	✓	
Campus Operation		✓			✓							✓	✓	✓			✓	✓		
Education		✓	✓	✓		✓	✓	✓	✓		✓	✓		✓	✓		✓	✓	✓	✓
Research		✓										✓	✓				✓	✓		
Outreach		✓						✓					✓			✓		✓		
On-Campus Experiences												✓								
Assessment and Reporting	✓	✓	✓									✓	✓							

By referring to figure 3, based on the literature review from 20 different authors, the highest or the majority focusing on education element and follow by campus operation. Less focusing and reviewing for on-campus experiences and institutional framework element for HEI sustainability where these can be use as focus for deep-study towards these two elements.

CONCLUSION

Higher Education Institutions should play a vital role in turning society sustainable through their power to producing and education the heirs' generations. Broadly speaking, the capability ad a research center should be enhancing in regards to sustainability agenda. The conceptual and philosophy of sustainable should be teach to the student so that the student can embrace their knowledge once they are start their career life. And in organizational perspective, sustainability concept should be embrace within daily routine task in organizational management. Furthermore, it was seen that as sustainable HEI should refer to four-dimension

system –education, research, community outreach and campus operation, therefore, as a sustainable HEI all dimension must be fully adopted even the fifth dimension recommended by Lozano, as sustainability performance should be assessed and reported. The all three main pillars of sustainable development (economics, social and environmental) should be implemented and in line with sustainability in HEI concepts. Basically, to acknowledge the implementation of this concept, the higher management in HEI itself must walking on adoption and embedded in their management, even sometimes economic its one of the crucial issues need to be considered. The concepts of sustainable development and sustainability offers an alternative way to understand and perhaps this concept still unfamiliar or misunderstanding by many people and societies worldwide, especially when its to narrow down into sustainability in HEI. Modern ideologies perhaps may helped all the relevant parties whom involve directly and indirectly in HEI to be clearly understand to sustain their HEI and how to practices sustainability in their organization.

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SD 19 - EXPERIENTIAL VIRTUAL URBAN ENVIRONMENTS: A PRELIMINARY INVESTIGATION

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ABSTRACT

Virtual reality (VR) technologies enable users to be virtually immersed in reconstructed cities and streets from around the globe. Immersive technologies could provide users a suggestive sensation of "being there" in a reconstructed virtual urban environments (VUE). Disseminating suitable contents through a VR platform is crucial to provide an experiential walkthrough in a VUE. The aim of this paper is to analyse and compare the relevant methods from relevant VUE projects to seek the practicality and functionality of the offered interactions and user experience via its contents. This paper examines three virtual urban environments (VUE) case studies that offer real-time navigation via a 3D virtual environment platform. Although preliminary investigations have shown some promising results in real-time virtual city walkthroughs, there are still some issues that still need to be addressed. Findings from the case studies would assist and identify specific elements suitable for future development of more meaningful and experiential VUE in the Malaysian context.

Key words: virtual reality, virtual urban environment, experiential, urban design

INTRODUCTION

This paper examines three virtual urban environments (VUE) case studies that offer real-time navigation via a 3D virtual environment platform. The examination of the case studies was conducted to analyse the relevant methods in VUE contents and developments. A comparative case study method was employed for the purpose of the investigation. The aim of the case study is to analyse and compare the relevant methods from published VUE projects to seek the practicality and functionality of the offered interactions and user experience via its contents. A qualitative review and analysis method were adopted for the case studies analysis. Findings from the case studies would assist and identify specific elements suitable for future development of VUE contents in the Malaysian context. Relevant issues and limitations of current published VUE are also identified to support future developmental phase. The case

studies are selected from various publically accessible projects consisting of 3D representations of cities and streetscape from around the globe. The projects selected are; Virtual Old Prague, Barcelona in Gothic and Mysteries of Notre Dame de Paris.

MAIN RESULTS

The qualitative review focuses on the structure of the VUE that was used to represent and visualize the city's streets. The elements selected for the review are extracted from studies in virtual environment (VE) design, virtual place and presence, and game-style interactions. The selected elements are adapted from a related study by Bostan and Ogut (2011) based on the design requirements for presence in computer games.

The selected review elements are:

1. Contextual setting: This would be a significant aspect of all VUE contents as this would signify the level of authenticity of the city's model based on how the virtual representation recreates the actual city and street environment. It includes representations of the location and place of the architectural elements and ambience.

2. Navigation: The navigational factors would determine the fluidity of the virtual walkthrough and will be reviewed on its flexibility, easiness, and others.

3. Interactivity: An important aspect of the VUE contents as it would influence the user's attentiveness in the VUE especially those that seek to disseminate specific knowledge or to trigger cognitive interactions.

Some of the issues identified from the case studies are the lack of animated and interactive avatars. Dynamic and interactive avatars could add an extra liveliness factor in the VUE especially for VUE contents that represent places with cultural heritage importance.

CONCLUSION

Preliminary findings from the case studies have provided some insights on the current trends in VUE contents particularly those that offered real-time walkthrough experience. One of the common findings is the use of game engine for its content development. There has been an increase in popularity and preference towards game engine based development especially those related to mobile applications content dissemination. Further development is necessary to suit the current VR hardware for an enhanced urban experience.

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SD 20 - DEVELOPMENT OF URBAN MARKET SPATIAL FOR HIGHEST AND BEST USED OF LAND PRODUCTIVITY AND SUSTAINABILITY

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ABSTRACT

No less than 40% of the approximately 70 traditional retail markets in Surabaya are located in the downtown area. Although the market location has high economic value as a commercial property area but its existence has not been utilized optimally. The concept of sustainable planning of a region can be achieved if the area is not only able to stand and grow by itself but also contribute to the economic growth of the region and the surrounding trade sector. Based on its potential, then in the planning of urban spatial development and market area, the most appropriate land use analysis is needed to produce the highest property value in the area and its surroundings. This research develops adaptive and collaborative concepts on spatial configuration design and market economy value in urban area, so it is found the best regional planning concept to support sustainable economic achievement. These objectives can minimize the failure of market development in urban areas in support of the success of the process of structuring the city. Triangulation method is applied through qualitative and quantitative approach, and using Highest and Best Use (HBU) analysis technique. The analysis process begins with an explorative study of the determination of alternative types of land use. The five stages of the analysis are carried out resulting in a model of land productivity to meet the best land use criteria that include determination of alternative use, regulatory compliance and permits, the possibility and affordability of construction, financial feasibility and maximum productivity of land.

Keywords: Urban, market, highest and best use, productivity, sustainability

INTRODUCTION

The scope of market services has a significant impact on the decrease in the quality of space and the carrying capacity of the surrounding environment. These impacts, among others, are caused by the increasing number of traders and agricultural commodities that are unloaded and then impact on the occurrence of congestion. The condition has been partially addressed by the Surabaya City Government in the 1980s by standardizing the design and market modernization

that is oriented on the quantity of supply of stalls without looking at the behavior and character of traders and consumers in the market location which resulted in a large number of empty traders stalls and did not complete Spill problems of merchant activity on the road and border.

The existence of the urban market as a traditional market plays an important role as part of the logistics distribution network in the city of Surabaya, especially for the fulfillment of food needs of the citizens of the city. Noting that the relocation effort is not a wise step that can be taken by the City Government. The solution that can be taken is to make efforts to revitalize urban markets. Because in general there is no balance between the ages of the building, physical condition and not maximal building function with a strategic location. The goal is to increase the value of land and buildings as well as is expected to solve problems in urban market areas to support the development of the region and the development of the property sector in the region.

METHODS

This research uses quantitative method with the principle of highest and best use (HBU). Determination of alternative building functions through stakeholder analysis that begins with the determination of key stakeholders, among others Representatives of Property management, Surabaya City Government, urban experts and 20 traders Traditional Market set randomly as sample research.

FINDINGS AND ARGUMENT

Stage 1: Determination of Alternative Use
The analysis phase for determining the alternative of this type of land use is done through interviews and questionnaires to stakeholders directly involved in the utilization of traditional market land. From the result of stakeholder analysis, it is found that stakeholder who have influence and interest to traditional market development plan (Property management, Government, Urban Observer) and stakeholders who actively and actively engaged in traditional market choose alternative of market development with building parking, market with diversification or market with affordable rental housing as an alternative development of the traditional market.

Stage 2: Legal Acceptance Analysis
The legal acceptance test is a selection process for all possible use alternatives involving requirements that are in principle the prevailing regulations in the area whether they are and still apply or temporary regulations are planned. These criteria are private restriction, zoning, building codes, environmental regulation. Table 1 shows the result of legal aspect

Table 1. Result of legal aspect

No	Legal aspect criteria	Alternatives		
		Market and diversification	Market and affordable housing	Market and building parking
1	Private restriction	Allowed	Allowed	Allowed
2	Zoning	Allowed	Allowed	Allowed
3	Building Codes	Allowed	Allowed	Allowed
4	Environmental regulation	Allowed	Allowed	Allowed

Stage 3: Physical Acceptance Analysis

A selection process for alternative land use involving requirements related to the physical condition of the soil. This physical characteristic will greatly influence the highest and best use of a plot of land. A piece of land may reach its highest and best use on a particular usage alternative but not suitable for other alternative uses. The range of physical characteristics that must be considered include size, shape, terrain, and the availability and capacity of public facilities. With the KDB (Building coefficient) is 60% and the KLB (Coefficient of building floor) is 300% or equivalent to 5 floors, so the total area of the effective building floor allowed is 19,770.39 m2, subsequently minus the main activity development plan on the effective floor space in the market plan of 9,478.23m2 (Without calculation of effective building floor space) the effective floor area of the building that can be used for the development of alternative facilities to be combined with the market (market diversification facility, rental housing, parking building) is 10,292.16m2. Based on the results of physical tests with the land area ± 7537.9 m2 and with the KLB / effective floor area ± 19,770.39 m2, then the three alternative plans for traditional market land development is physically possible to be developed (Table 2).

Table 2. Result of physical aspect

No	Physical aspect criteria	Alternatives		
		Market and diversification	Market and affordable housing	Market and building parking
1	Size, shape, contour of the land	Possible	Possible	Possible
2	Accessibility and public facilities	Possible	Possible	Possible

Stage 4: Financial Acceptance Analysis

Analyze the investment by taking into account the cost of land preparation, construction costs (building costs and fixed equipment costs), professional service fees, administration fees, and other costs. From the calculation on the financial feasibility test is obtained internal rate of return (IRR) value of 44% which can be used as capitalization rate of own capital. The capitalization rate of loan capital equal to 10.75%. It is assumed that the basic lending rate does not increase every year. The results of financial revenue analysis are presented in Table 3.

Table 3. Result of financial aspect

Alternatives	Criteria of Capital Budgeting			Priorities	Feasibility
	BCR	NPV	IRR		
Market and diversification	2.41	IDR 6.7 Billion	28%	1st	Feasible
Market and affordable housing	1.87	IDR – 18.4 Billion	22%	2nd	Feasible
Market and building parking	1.59	IDR – 29.3 Billion	19%	3rd	Feasible

Stage 5: Maximum Productivity Analysis

Based on the analysis of the determination of the highest and best land use type, the market value for traditional property if it is developed without the addition function is equal to (+) Rp.2.910.294,57/m2, while if there is addition of market diversification function, the property value is Rp.10.528. 379.68/m2.

CONCLUSIONS

The long-term goal of this research is to develop the application of adaptive and collaborative concepts on the design of spatial configuration and market economic value in urban areas, to obtain the best planning and development concepts of the region that support the achievement of economic value of sustainable urban development. These goals can minimize failures in preserving and developing urban markets. This research is based on the need of developing

approaches that can be applied in support of the process of planning, development, and structuring the city.

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SD 35 - IDENTITY, SUSTAINABILITY, AND THE CITY: DICHOTOMIES AND REALITIES OF CREATING AN URBAN LANGUAGE OF THE MALAY PALACE

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ABSTRACT

The paper reports on the progressive research into the evolution and development of an urbanized grammar and language on using traditional forms to instigate sustainable urban design and green city goals. The case study is the Istana Negara Palace; based on the issues triggered within the design process, and alternatives from the South East Asian area, issues were explored as a basic forerunner and form giver, yet the final design language was taken from Arab Islamic vocabulary. There exist difficulties and realities of transmuting local intentions into configuring urban buildings and several key elements eventually reverted to an Arab Islamic language rather than projecting a strong Malay tectonic form. As an icon for the city, the palace must reconcile the scale and masonry nature of large buildings with clear vocabulary in order to execute the symbolic nature of palatial design. Attempts were made to express and infuse Malay identity traditional vocabulary. Architectural design conflicts and dichotomies encountered included three major aspects: 1) Islamic dome vs. pitch form as the iconic impact for the city (from afar) of the roof silhouette 2) the lack of local grammar and language in the architrave vocabulary and pedestal/ plinth elements 3) the difficulty of proportionate design to fulfil national objectives and agenda. The research points to the necessity and urgency of developing a set of compositional rules and elements of language of Malay urban architecture derived from the essences of traditional form.

INTRODUCTION

In his critique of the monuments of Putrajaya, (King 2007) observes that '…*there is nothing identifiably Malay in the styling and its antecedents. There is no trace of the (Malay) Southeast Asian Great Mosque tradition with its tiered pyramidal roof forms, open walls and preoccupation with air movement'*. King was an external observer that a local modern city and master plan at the heart of the Malay world, had no discernible,dominant and recognizable identity and language characteristic in a South East Asian city - particularly in this large master development. As the core of Malay settlements and as part of its manifestation of tropical cities of the past, the Malay palace is, as described by (Yuan 1997), '… *the heightened refinement of Malay cultural form, traditions and language and the 'urban' and monumental*

version of the Malay vernacular house, being the first building built before the settlement grows.' In the past, the palace represents both the ruler's domain and the administrative building for the people of a region or area. It is the expressive aesthetic derivation of the Malay house archetype;with 'distillations' of traditions and efflorescence's of space, form, along with embellishments. The rich variations of the Malay identity are a representation of Malay cultural conditions hence the palace reflects distinct rules of space and order, based on a generic archetypical form – which has represented the notion of the *kampong* in Malay literature and nationalist discourse.

<table>
<tr><td>🟥 (red)</td><td>Arab / Islamic Architecture Style</td></tr>
<tr><td>🟦 (blue)</td><td></td></tr>
<tr><td>🟩 (green)</td><td>Classical/ Neo Classical/ English Style</td></tr>
<tr><td></td><td>Malay Architecture Style</td></tr>
</table>
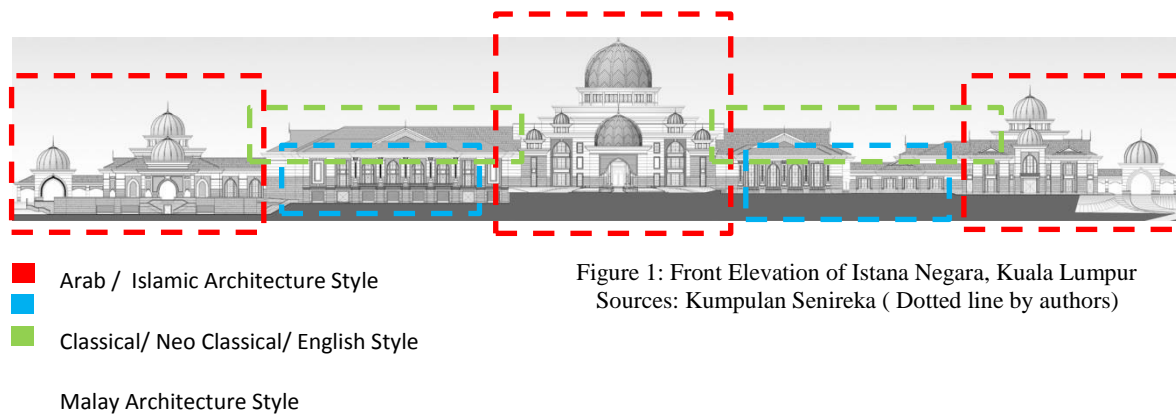
Figure 1: Front Elevation of Istana Negara, Kuala Lumpur
Sources: Kumpulan Senireka (Dotted line by authors)

While Malay palaces have a richness of language, meanings, and styling of columns, roof styles, decorations of facades and ways of being lifted up from the ground, the universal language and rules of the order have yet to be established. The difficulty is in defining universal rules due to the complexity and variation due to the influencing factors such as neighboring countries, through trades, origins of the owner or influences the character of the different states. The multivariate characters of the traditional palace are complex with the present scenario of translating this element in large and complex modern scale of essentially masonry elements. The National Palace (Jalan Duta, Kuala Lumpur) (Figure 1) is such an example where difficulties were found based on morphological (frontage) and stylistic analysis. The difficulties arise in the essential elements of architectural language such as 1) roof form, (2) architrave and (3) base or pedestal.

FINDINGS AND ARGUMENT

The Istana Negara – dichotomy and design process
While the common expectation is to surmount the masonry body with an iconic Malay pitch roof, there were essential dichotomies in a symmetrical domed structure exposed in the middle due to the scale and size of the Istana Negara, the official residence of Yang Dipertuan Agong As quoted in (Sherif 2015), '…The systems of proportions governing the elevation of this building…dimensions of the building elements are all governed by simple division of the basic grid.' Rescaling the roof would make it disproportionately large as the scale and size must be proportionate to the body. Hence ultimately a series of Arab-Islamic domes was used to express the symbolic nature of the roof for National Palace too. Refer to *Figure 2*.
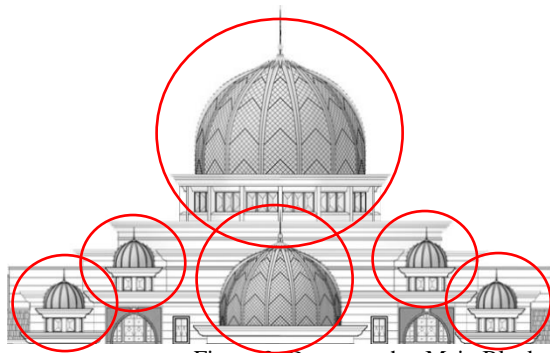
Figure 2: Domes at the Main Block
Sources: Kumpulan Senireka (circle by authors)
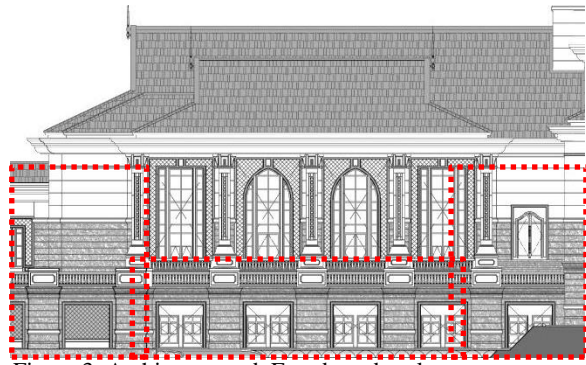
Figure 3: Architraves and Façade pedestals
Sources: K, Senireka Sdn. Bhd. (dotted lines by authors)

Similarly, as there is no immediate resource of architrave and pedestal designs and motifs, -pedestals are particularly crucial in façade design as they make the façade look less 'empty.' (*Figure 3*.) Hence while many have criticised the Arab-eclectic nature of the Istana Negara, similar to Ross King's criticism of Putrajaya monumental buildings, there is an essential difficulty in the direct translation, transposition, and transmutation of Malay-based vocabulary onto modern construction and materials and the rescaled composition is not immediately apparent and resolvable due to the size of the project.
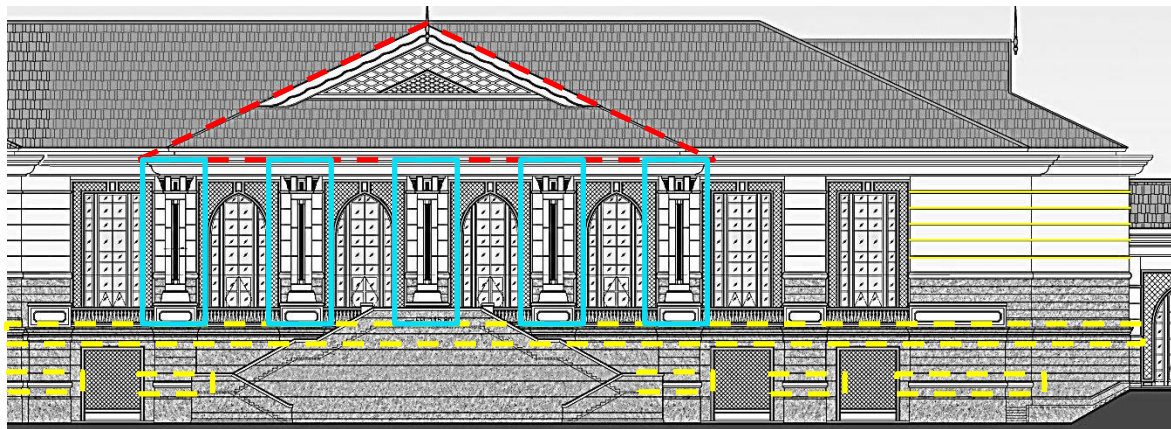
Figure 4: Infusion of Classical, and Palladian Language of Architecture of Istana Negara

- 🟥 Triangular Pediment
- 🟦 Pedestal
- 🟩 Classical Orders

These dichotomies are related to the formality needed and in this case, these are resolved through the infusing Classical, Neo Classical and Palladian Language of architecture. *Figure 4* shows how 1) the triangular pediment was fused with Malay roof language (to adorn the roofscape), 2) to embellish the frontage the use of Classical 'orders' was slightly mutated but based on the tripartite system of the base, column, and capital. A distinctly organized and compositional system was cultivated.
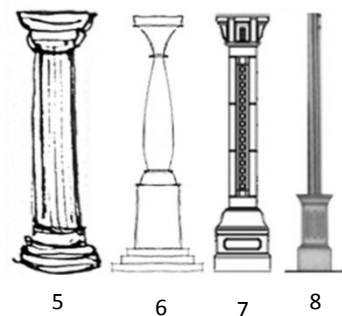
Figure 5 : Classical Column (8th- 9th B.C)
Figure 6 : Column of Istana Jahar, Kota Bharu (1855)
Figure 7 : Column of Istana Negara, Kuala Lumpur (2013)
Figure 8 : Column of Istana Baitul Rahmah, Perak (1911)

5   6   7   8

The distillations of Malay architectural language are urgently needed as these would eventually affect urban buildings, language, and form, without which, there is a tendency to evoke Western or Arab elements in administrative buildings. This tendency (Moser 2012), was apparent in Putrajaya '...*rather than vernacular design traditions, the state recently adopted a fantasy Middle Eastern style for secular national buildings in Putrajaya.*' There is no immediate Malay-based vocabulary for masonry elements like pedestals, yet local vocabulary can found in theMalay-Classcical form and functions known as 'lapik tiang' in 1800's era at Istana Jahar, Kota Bharu and Baitul Rahmah, Perak. Figure 5, 6, 7 and 8 compares the different columns - which illustrates how designers Istana Negara attempted to evoke tradition by mutating a variation of the column.

CONCLUSION

As summarized, there is still a gap that exists in the context of an urban language derived from traditional Malay palatial architecture, and its principles and vocabulary. Some may think that the traditional Malay architecture rooted in timber may not be relevant or fashionable enough to the modern world. Hence, there are examples related to the urban language and sustainability which requires an in-depth study of tectonic elements and the intrinsic values of traditional architecture in urban contexts. Secondly, efforts of deriving national identity at national and international levels should be studied and understood. The issues for Malaysian architects, clients and government bodies are the application of Malay architecture values and design in contemporary administrative buildings. More analysis needs to be done on masonry elements of traditional palaces such as to pave the path forward. The resolution of Malay architecture language is crucial for the stability, identity, socio culture development and maturity of the nation.

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SD 38 - SENSE OF COMMUNITY AND SOCIAL SUSTAINABILITY: THE ROLE OF PUBLIC OPEN SPACES

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ABSTRACT

Although there is a growing interest in how the sense of community impact on sustainability, little empirical study has been done regarding the sense of community and local facilities relationship, especially urban public open space in promoting sustainability. The study, therefore, seeks to determine the contribution of public open space in promoting sustainability through a sense of community in developing countries. Two public open spaces – the traditional and modern - in Kano metropolis, Nigeria, were selected, primarily based on their physical and functional characteristics, and historical significance. It is a comparative analysis and data were collected using questionnaire survey and analysed quantitatively using linear regression. The study revealed that the perceived quality of public open spaces such as crime, safety and security, community involvement and, interaction were significant. However, the study findings revealed that sense of community is positively associated with the traditional open spaces. The findings indicate that sustainability especially social can be promoted by enhancing the sense of community. This is believed will be achieved through the design of public open spaces based on the enduring traditional concepts and values. The study will serve as important settings for the promotion of social sustainability in developing countries.

Key words: Sense of Community, Social Sustainability, Public Open Space

INTRODUCTION

Sense of community defined as "a feeling that members have of belonging, a feeling that members matter to one another and to the group, ... " (McMillan & Chavis, 1986, p. 9), has been associated with the concept of social sustainability, such as crime, safety and security, community involvement and interaction, stability and well-being (Bramley et al, 2006). Several studies have lent credence to these assertions that there exists a relationship between sense of community and social sustainability (Wilkerson et al, 2012). For example, Kuo et al. (1998) posit that common space usage by the community promotes social ties, while Coleman & Iso-Ahola, (1993) indicates that leisure activities especially social facilitate the development of social networks or group. According to Mesch & Manor, (1998), community social involvement is "the most consistent and significant source of attachment to place" (p. 507).

and that the existence of strong social networks promotes community involvement (Warde, et al, 2005). While Kuo & Sullivan, (2001) relate fewer crimes, violence and intra-family aggression with high quality green open spaces; these criteria reflect those of many established theories, which propagate that sense of community has a profound influence on social sustainability.

Although the theoretical and phenomenological overlap between social sustainability and sense of community (Middleton, 2010) has been gaining momentum within the wider urban built environment (Healey, 1996), there is dearth of empirical research that examine how sense of community enhances social sustainability through Public Open Space (POS) especially those of developing countries like Nigeria. This paper is an attempt in that direction. It is a comparative analysis, that seeks to investigate how the quality of two different POS (the traditional and modern POS) enhance social sustainability.

These POS types differed in their physical, socio-functional characteristics, and historical significance. While the traditional POS, found within the traditional neighbourhood, developed organically without planning intervention, the modern POS was the outcome of modern planning found within the planned urban neighbourhood. The main focus is on the effects of POS on sense of community. Regarding method, the mixed method was adopted for the study. Specifically, data were obtained and analysed quantitatively through numerical measures but the interpretation of the analysis is qualitative. Data for the analysis were obtained through the use of questionnaire survey and POS audit. Both the physical and social environmental factors of POS were examined. Although the study is mainly on subjective aspects, the objective aspect of POS was also considered to enhance study reliability.

MAIN RESULTS

The study revealed that the quality of POS in terms of both physical and social environmental factors is an important correlate of sense of community and that social interaction, correlate more with the quality of the public space than size and number. It also revealed that perceived POS characteristics such as crime reduction, safety, security and sense of community are more positively associated with the traditional POS. Though the sense of community is statistically associated with the presence of high-quality POS, as the study indicates, traditional POS was more correlated than modern POS, especially with social environmental factors. The study means score was 8.59 with a standard deviation (SD) of 2.46. In terms of demographic factors, the study indicates that mean score was higher for traditional POS, especially among married and self-employed participants. Education appears to be less significant with an overall p-value of 0.11.

Among the physical environmental factors, both subjective quality (positive associations) of, and distance (negative associations) to POS were found to be significantly associated with sense of community. The study also revealed that it is the perceived distance (proximity), rather than the frequency of usage of POS that is relevant. Mean score for a sense of community as regards to proximity was higher for the traditional than the modern public open space, with R ¼ 0.22 and p < 0.001 values for people living within less than 5 minutes from POS respectively.

As regards the social environmental factors, sport and recreational activities appear significant within the modern public open space while perceived neighbourhood crime and involvement in neighbouring activities were found to be significant for the traditional public open space. Though all the POS quality were moderately correlated with a value of R ¼

0.12 and p < 0.001, they were significantly associated with a sense of community. However, using POS for social recreation indicate that mean score was higher for traditional POS participants (p < 0.05). This is due to the fact the traditional POS can be adapted to a multiple of functions (commerce, social gathering, a variety of children activities etc) all involving some form of social interactions, unlike its modern counterpart.

CONCLUSION

The study examines the potential of two different POS in promoting social sustainability, with emphasis on the quality and attributes of POS. The enhancing of social sustainability by encouraging a stronger sense of community through POS are numerous, such as increased community participation and social networks, community stability through a reduction in crime and place attachment. The aforementioned POS have been developed with different sets of priorities and yet still share certain viable and vital characteristics that are fundamental to sustainability. Therefore urban planning and design policies that support a strong sense of community by providing high-quality POS are desirable if sustainable development is to be promoted, the study recommends. The fact that the study findings indicate that traditional POS were more significantly associated than modern suggest that traditional POS was more relevant to participants' lifestyle. The study posits that urban sustainability, especially its social dimension, can be promoted by enhancing the sense of community promoted by traditional POS. This can be achieved through the design of POS that reflect traditional concepts and values. Nevertheless, the study concludes by advocating for further research on the possibility of incorporating the concept and principles (governing the success of the traditional POS in promoting a stronger sense of community) in planning and designing of urban neighbourhoods.

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SD40 - MORPHOLOGICAL PATTERNS OF THE SHADED URBAN SPACE: AN EVOLUTION OF PRE- TO POST-COLONIAL CONFIGURATIONS OF MALAY URBAN TROPICALITY

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ABSTRACT

Urbanists have long expressed concern how the traditional conceptualisations of urban spaces have been slowly eroded in modern cities as modernisation continue its rapid course. In tropical Asian cities, urban policy have emphasised shaded spaces such as the five-foot ways to infuse identity, yet the situation can be improved by cultural mapping of past urban forms in terms of shaded spaces. Tropical regions, historically, have nurtured its own forms and 'mutation' of public open spaces in the form of shaded structures and its morphological extensions. Amidst an intense climate , these shaded spaces are 'socio-economic' and 'socio-cultural' activators and hence the analysis geometric shapes related to shade – founded upon Rob Krier's morphological studies - represents a resource of cultural forms of urban design which often constitute,as seen throughout history, the seeds and nexus of 'activated' urban life,. Shaded extensions include open-air unshaded squares, walkways, pathways and spiritual spaces are part and parcel of the tropicality of the Malay world –which engenders its own syntax with 'mass-to-void' relationship of socio-cultural 'charged' urban spaces. Through an exploratory reviews of shaded urban spaces of the Malay world, their morphologies highlight the dynamism of their forms and their contributiob to the urban-architectural and aesthetic form of the city.

Key words: shaded spaces, cultural-mapping, figure-ground abstractions, walkability, tropical urban regionalism

INTRODUCTION

Publicly accessible open spaces are crucial to the city, Campos (2000) in his PhD, had investigated key spatial properties that make successful public urban spaces, and had linked the vibrancy and active character of public spaces to key factors such as the permeability of surroundings and visual connections. Leotandis (2011) in her research proposal, highlighted the significance of urban syntax which can be characterized by a boundary and the feeling of enclosure. However, these are studies primarily sited in cities and urban centers in temperate climates, while in the hot, humid context, Lepawsky and Jubilado (2014) show that in the 'geohistories' of the street in tropical Malaysia, other elements

becomes crucial – the shaded walkway- which is not only a functioning part of city but which is increasingly linked to the notion of the authenticity of a city. There is an increasing realization of such public shaded spaces are crucial in evoking cultural familiarization and climatic comfort that is crucial as the source-activators of a tropical city, and its significance to initiate, sustain and affect the patterns of vibrancy and 'static distribution' within the tropical urban spaces. Campos (2000) had concluded, in a temperate climate, that crucial key spatial properties that make successful public urban spaces can be found in traditional historical urban squares. Hence Krier (1979) in 'Urban Space' had analyzed and compiled a resource of morphologies and typology using simplified standard figure -ground conventions (see Figure 1).

Locally, such mapping in South-East Asian tropics has yet to be significantly achieved , but Yeang (1987) highlighted potential shaded urban language in the modern tropics while Talib and Ariffin (2000), show the extent of cultural mapping of forms (of Perak Kutai architecture) can unearth categories of typologies. Such analysis of form is useful as it visualises the typological and morphological character of urban spaces and thus, urban designers and design processes can grasp quickly and manipulate the relationship between mass and void, to generate character of urban spaces and create a localized and potentially activated 'fabric'. Yet Krier's diagrams relate to the climatic character of temperate climate, in which the 'void' or the 'empty' parts are linked to climatic comfort in a region in which sunlight and daylight is welcomed outdoors and indoors. In the tropics, open space are 'dead' in the heat of the day, while open, unobstructed space, mainly consisting of squares and streets is desirable in a temperate climate, in tropical climates, such manipulation and insertion of empty, open air spaces produce urban spaces that are unable to function as generators of activity and increased static distribution in the middle of the day. In this study, a cultural mapping and analysis based on a figure-ground or mass to void that emphasizes shade is utilized. Using historical documents, lithographs and visual evidence, spaces under shade are represented as the 'mass' while the buildings themselves appear as 'voids' and empty. These abstracted forms and patterns that can be used to induce a walkable and shaded city, ultimately reducing potential long term carbon emission from private vehicles, and create zones for walking and socializing while in the long term, creating a healthy urban society.

METHODOLOGY

The literature was drawn from research articles published in old manuscripts, books and journal papers accessible through online databases. The scope of the review is limited to international and local articles that were published between 1979 and 2016. The criteria for inclusion in the review include the articles that relate particularly to the topics on traditional open spaces like gardens, orchards and palace gardens, traditional Malay urban design and architecture. A critical assessment on the existence of urban spaces and shaded devices recorded from the 15th century to 19th century of the Malay world by focusing on the urban and garden description by examining nine selected well-known classical Malay manuscripts that were written during the blossoming of literary period in the 13th century until 17th century. The main manuscripts reviewed are *Sulalatus al-Salatin* (Malay Annals), *Bustan al-Salatin* (The Garden of Kings), *Hikayat Merong Mahawangsa, Hikayat Hang Tuah* (The Myth of Hang Tuah) and *Hikayat Inderaputera* (The Myth of Inderaputera).

The aim of the analysis is to expand understanding on the plethora of research that explored this relationship. The topic is transdisciplinary in nature. The articles were analysed and

categorised based on key parameters and significant themes. They are presented in a table format, and the discussions are further elaborated in the result section.

RESULTS

The findings revealed that the typology of urban spaces and shaded devices of traditional Malay towns can be classified into nine categories presented in Table 1.
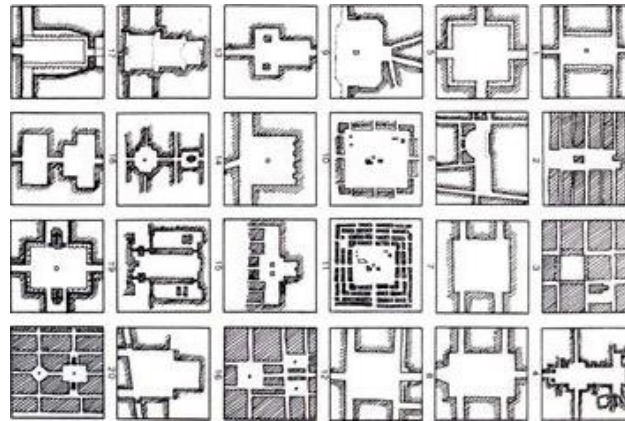
Figure 1. Rob Krier's visualization of urban spaces using the conventional figure gorund abstract analysis.

These categories prove that the Malay cities existed with their own distinctive identities and had dynamically evolved throughout eras. The analysis of typology of Malay open-shaded spaces and surrounding buildings also include   extensions of public buildings such as palaces and public official houses , which are used as public gathering space and extend into pavilions and bazaars centered around the river. Malay civilization is known for its economic activities surrounding rivers which thrived from the 15th to late 19th century and for symbolically-charged fields between the palace and the mosque.. Before the Colonialist inserted a road to break the urban 'padang' in early 20th centuries, many towns such as Kedah and Kelantan, during the 18th to 19th century, had the river, mosque and Audience hall (Balai Besar) as one continous symbolically –charged public zone with shaded extensions facing each other. These held functions related to government, and were centers of quasi-urban life exhibiting traditional archetypical forms of open-air squares and shaded porticos courtyards (Figure 2). The folowing table presents the profiles of a series of shaded forms begining with a 16th century open air pavillion the Melakan empire - which borders the bridge and had functioned activated nodes near river connections, of the 16th century (which had been eventiually burnt down by the invading Portuguese). The 'shade-to-void' analysis include a 'waqf' structure   of 'aristocratic houses ' which saw this pavilion at the center of an   open space with an   overlooking 'serambi' acting as a community focus in the heyday of Perak's history.
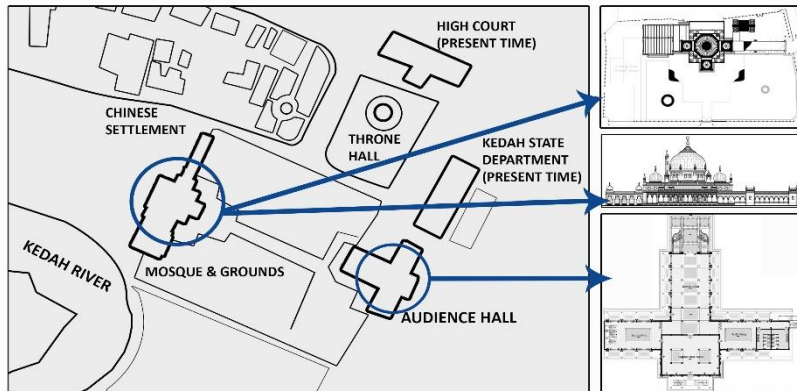
Figure 2. Shaded open air extensions of public spaces into an open 'padang' before Colonial incursion

The impact of the colonial British, Dutch and Porteguese forces, eventually led to the erasure of such memory of urban shade yet some cases, these cultural symbols remain (Figure 2ª) , e.g Sultan palace in Alor Setar still has its public halls were in fact, public extensions of community spaces in the past Such public halls, heightened the role of open air structures, which then linked to the symbolically charged open space with that of the mosque on the opposite side of a field. The Ruman Penghulu Ghani, Melaka, and its shaded extensions had served as a magistrate court and townhall of community from the 18th centuries.
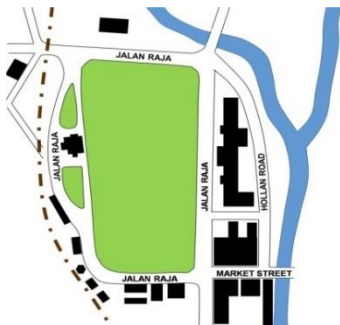
Padang between administrative buildings

Extended open space in front of palace

Pavillion

Portico of a mosque

Verandah/porticos

Royal jetty

| Timber wakaf | Tower/ minaret | Open court |

Table 1 : Anatomy of the typology of built shaded areas and devices in the tropical Malay urban setting

CONCLUSION

The study concludes that at different stage of history, we may have seen different types of urban spaces and tropicalized version of mass to void elements in the Malay twons all of which enhance the quality of life experiences, spatial planning techonology and development. Both are essential part of urban heritage which is of ecological and social significance. Not only it has important role in providing leaisure for the community but also administrative needs amongst the rulers and administer. Analysis using a 'tropicalised' version of the mass- to void relationship inverts the typical figure ground analysis which consider shade as the activated open space and which represent social and economic potential. These can create a rich resource of urban language , but such diagrams of solid and void can better depict socially active spaces and can be manipulated and used as a basis of different urban morphologies of the city, and if the 'shaded hatch' mass is greater than the internal 'void'spaces, it could be lquantified with other urban indices such as walkability index, low urban heat island and carbon emission index and energy index. A higher shaded index will mean a mixed-use environment that will foster social cohesion, vibrancy and pedestrian activity and the morphology of shade from past to present, support in creating a richer topical urban experience, which are culturally and climatically indigenized.

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SD 22 - GOVERNANCE OF URBAN HERITAGE – A REVIEW ON ADAPTIVE REUSE OF HERITAGE BUILDINGS

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ABSTRACT

Heritage sites and buildings are currently facing a great threat from new urban development particularly in developing countries as a result of population growth, physical development, as well as economic growth and this including Malaysia. The scarce of land supply in the heart of Kuala Lumpur city for instance has exposed this modern heritage cities to severe from commercialization pressure because of its land price. Whether to preserve or not are still in great debate among the policymakers, stakeholder and academician. The notion of economic value of conservation has been outlined by the government on its document namely economic transformation programme indirectly. The values lies on the conservation site offers important recognition not only to the people of the community and country concerned, also income regeneration from tourism. The importance of conservation comprised a significant impact on the 3 pillars of sustainability namely; social, economy and environmental. This research will examine the gap in between Rancangan Malaysia ke-11 (RMK11), Rancangan Fizikal Negara 3 and 2, Dasar Perbandaran Negara and relating current by-laws to interpret the hindrance to built heritage conservation activity in Malaysia. Hence, the focus of this paper is to review and identify the present governance and legislations weaknesses to protect such buildings from being demolished and destroyed. Subsequently, the paper will identify several best practice strategies towards better governance of urban heritage and adaptive reuse of heritage buildings.

Key word: Built Heritage, Conservation, Governance, Framework, adaptive reuse, heritage buildings

INTRODUCTION

Built heritage conservation can move from a passive and aesthetic component, to a move active and assertive one, proposing visions and strategies for future development that combine conservation and 'modernity'. It provides a continuity lesson from scientific and technology to human survival skills as a sustainable form of development offering cohesive social relationships, human scales and successful adaptation to the physical environment, such as by vernacular buildings that use local materials and technique. Built heritage conservation also

increasingly considered as a resource supporting economic development, social welfare and of course environmental.

Even though conservation has largely become a positive option among stakeholder as new development approach, unfortunately according to Robiah (2016) that there are enormous numbers of historic buildings falling and neglected because of deterioration after conservation. On the other hand, the value of historical building is not something that can be defined directly into a number or price. So that the threat of new development take place as the land value increased in the prime area particularly in Kuala Lumpur (Bavani M, 2017). From these scenarios, there is lack in enforcement and policy outlined by the government and related bodies regarding this issue. Current legislation; National Heritage Act 2005 need to be completed by the certain by-laws or guidelines as a manual to the related parties involved (Harun, 2011). The post-conservation works has become a major issue as maintenance practice among the Malaysian come to second in priority and leave a gap as good maintenance management strategies (Mohd-Isa, 2011; Bavani M, 2017). The lack of understanding and awareness among Malaysian particularly on the related legislation can be seen recently on the issue of revocation of one heritage site status in Kuala Lumpur. The revocation notification in the New Straits Times on 28 December 2016 was from Jabatan Warisan Negara (JWN). The existing law on National Heritage Act 2015 does not provide any provision regarding the revocation of heritage site which is means the current legislation need to be amended (Cardosa, 2016). Jabatan Warisan Negara was the government agency which is responsible for exploring and preserving heritage treasures in Malaysia as identify and economic regenerations.

DISCUSSION

This study expected to gain local context understanding with regards to the regulations, implementations and enforcements of conservation particularly on adaptive reuse of built heritage. This research will adopt a mixed method (qualitative and quantitative method) to answer each of the research objectives. In-depth interview as primary data will be conducted among the stakeholders i.e. architects, conservator, planner and policymakers to capture information and the gap within. Data from secondary sources as government publication i.e. national policy document, reports and current conservation project will be evaluated and observed. The main government's physical planning document; Rancangan Malaysia ke-3, 2 and 1 was a continuity doctrine to spur national physical planning and strengthen the physical, social and economic development system. RFN3 emphasizes on 4 main attributes of spatial and physical development namely, growth, liveability, resiliency and sustainability. According to RFN3, the sustainability of land management and development control are crucial for economic, social, culture and environment including heritage area as stated in its 3 main cores. Even in Dasar Perbandaran Negara ke-2 (DPN2) heritage site or buildings has come to picture as liveability and resiliency character for urban planning. Yet none of these documents highlight specifically regarding how the operation and maintenance activity take place particularly on heritage site or buildings. However, there are a provision in National Heritage Act (NHA) 2005 (Act 645) which is mentioned the needs of conservations works and maintenance activity to be done as compulsory process for the landlord to safeguard the heritage asset or buildings. Local authority such as Kuala Lumpur City Hall (DBKL) play role as an implemental agency has outlined its own policy and regulation to enforce and carry out conservation work. The questions rose whether the current DBKL or others local authorities practice specifically to safeguard the heritage buildings is adequate compared to UNESCO heritage site practices such as Malacca and Georgetown. As mentioned by Bavani M (July 11, 2017) heritage buildings

required a regular upkeep and constant inspection to keep it as close as possible to its original state. And in Kuala Lumpur itself, heritage building facing a great threat from our ignorance and slowly deteriorating. Improved regulation and enforcement helps in protecting the heritage buildings from vanished to the next generation as it written in history.

CONCLUSION

Malaysia aspires to become a developed country by the year 2020, which it plans to achieve in 3 years through a set of 5-year strategic plans namely; Rancangan Malaysia ke-11 (RMK11) tentatively started 2016 till 2020. This research examines the current legal / policy behind protection of built heritage sites in Malaysia that lacked the qualities of world heritage sites. This research seeks to explore legislation through a desk-based analysis complemented and the establishment of framework and guideline to help the government and stakeholder for making decision and improve current practice. In the end, it helps to understand the integration aspects of heritage law, as well as the degree of community involvement that is necessary in the protection of heritage.

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SD 41 - THE URBAN RIVER AND THE HISTORIC RIVERFRONT TOWNSCAPE OF KUALA LUMPUR

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ABSTRACT

This study examines the relationship of the urban river of Kuala Lumpur as a significant geographical setting in the often-neglected historic townscape; the notion of the river being the genius loci that determines the townscape's image, identity and sense of place. For a city with a direct reference to its riverine origin, its rivers for far too long have been dirty, polluted, an open sewer for pollutants and effluents and in a state of neglect. The city in return, backs onto the river, refusing to address it and this sets the quest for "a world class city" back a few decades. The Malaysian government acknowledged that rivers are natural, untapped assets and over the years has been keen to revive the dead rivers back to life, the latest of which is the River Of Life launched in 2012 as one of the nine Entry Point Projects under the Economic Transformation Plan. The River of Life project is the government's recent effort at cleaning and beautifying the river after many nationwide campaigns which have failed miserably, such as the 'Love Our Rivers' campaign. Having faced with such challenges, this study aims to propose the urban design of a historic riverfront district via two objectives; firstly to identify what causes the failure of the Kuala Lumpur historic townscape to integrate with its urban rivers, and secondly to establish the urban design factors to be proposed to contextually integrate such river and townscape so as to retain its sense of place through identifying the applicable theories and principles.

Key words: urban riverfront, historic townscape, contextual integration, sense of place, River Of Life.

INTRODUCTION

Kuala Lumpur or "muddy river confluence", has a name that identifies with its geographical setting. It began as a tin-trading post at the confluence of the historic Klang and Gombak Rivers and later, in 1919, became the seat of the British administration (Gullick, 1983). Instead of

being the dominant geographical identity of Kuala Lumpur, both rivers are dirty, polluted, an open sewer for storm water run-offs and effluents; neglected at every single turn and in turn, setting the quest for "a world class city" (KLCP2020) back a few decades. The Malaysian government's reform agency, PEMANDU acknowledged the challenges besetting the city and listed both rivers as "natural assets remain untapped...deliver(ing) little of their potential, either commercially or as destinations that can add to the city's vitality." (ETP Handbook, 2010:128). In an effort to counter such challenges, the River Of Life project waslaunched in 2012 under the Economic Transformation Plan whereby the Klang and Gombak riverfronts are identified and recognised as Kuala Lumpur most under-utilised natural assets (ETP Handbook, 2010). The ROL, a tripartite mission of river cleaning, beautification and land development to spur economic investment (ROL Master Plan Report, 2014), is work-in-progress coming under a lot of scrutiny due to its huge budget amounting to RM4.4 billion which has met with scepticism, as many large-scale nationwide efforts to clean up Malaysian rivers over the decades failed to take off such as the 'Love Our Rivers' campaign, 1993 which was declared a total failure as it did not meet its objectives of being sustainable and pollution-free (AFP, 2007). Ong (2015a) observed from a kayaking expedition carried out, that while river cleaning is work in progress, large amounts of solid waste from connecting monsoon drains being discharged into the rivers by factories and other large scale polluters have resulted in the ROL to be a questionable exercise, despite its expensive budget. Ong also observed that the ROL master plan is still undisclosed, with public access to riverfronts not made into a priority. In light of the cleaning process, the effectiveness of the beautification strategy remains to be seen. The threat of undisclosed, market-oriented private land development and its apparent lack of transparency may have the conflicting effect of further restricting "public access and enjoyment" to the riverfronts (Ong, 2015a).

Nearly all major cities in Malaysia lack contextual integration of river and townscape (Latip et al, 2011; Shamsuddin et al, 2013), with certain infrastructure development blocking physical and visual access altogether to the riverfront. A sad fact indeed, considering many early Malay peninsular towns grew up along rivers, river valleys or coastal areas with 11 out of 13 state capitals in Malaysia having great proximity by river or seafronts (Shamsuddin et all 2013, Andaya & Andaya, 2016). The lack of contextual integration continues to threaten the fabric of our historic townscape because the river, the place where all the cities began, is in a state of perpetual decline. Borrowing from the textile metaphor of the urban fabric (Tibbalds, 2002; Cullen, 1961), our rivers, as it were, are in a state of 'unwoven' from their respective historic townscape. These scenarios described above would probably have suggested a lack of river policies and guidelines. The truth is, Malaysia is not short of them; but that they are used in isolation of each other, ungazetted, very general, not specifically focused on the riverfront and yet to be revised (Latip et al 2010). Latip et al (2010) conclude that with all the various laws, policies and guidelines notwithstanding, waterfront developments were still not contextually integrated with the river, let alone piecemeal in nature. Latip asserts that the success of waterfront regenerations are not because of the design end product, but rather, the incremental, balanced and comprehensive development process involving communities. At present, there is an apparent absence of a single body with overall responsibility for devising, coordinating and implementing the much-needed urban design policies yet to be adjusted by the authorities which are variously divided among the architectural, landscaping, conservation and urban transport departments (Latip et al, 2010).

There are tremendous pressures for speculative development that may not only threaten the historic urban fabric, but also displace the original community affecting both physical and social aspects of Malaysian townscape. Shamsuddin (2011) identified factors such as the lack of

design guidance, skilled personnel, political will, and inadequate conservation policies or guidelines, all combine to displace the historic riverfront townscape with "totally unsympathetic development". As locals are unwittingly being driven away, old city centres are either fast turning into historic theme parks, (Shamsuddin, 2011:141-142) or fast regressing into neglected havens for foreign workers (Cheng, 2015). All these have translated the historic riverfront district into an image of townscape in disarray, a large part of which is due to planning policies and guidelines, or rather, the lack of it (Latip et al, 2010); and should townscape be likened to a piece of fabric (Cullen, 1961), all the elements in it would have been in tatters and unwoven.

METHODS

Having faced with such challenges, this study aims to propose the urban design of a historic riverfront district via two objectives; firstly to identify what causes the failure of the Kuala Lumpur historic townscape to integrate with its urban rivers, and secondly to establish the urban design factors to be proposed to contextually integrate such river and townscape so as to retain its sense of place through identifying the applicable theories and principles. A case study approach in which a qualitative method in data collection and analysis is adopted through three techniques; firstly, a literature review that evaluatively reports information found in scholarly, expert opinions and current knowledge based on substantive findings on the historic riverfront. These are found in esteemed literature in order to establish a theoretical base of what is already known in determining the design nature for the master's project (Fink, 2013).

Secondly, a field observation documented and conducted through two main techniques firstly a visual survey; an analysis of the city structure and framework, and secondly a townscape appraisal; an analysis of the visual and experiential content and fabric of the town and the art of relationship between elements of urban form that gives the town its personality and character (Relph, 1987; Spreiregen, 1964; Shamsuddin, 2011). Thirdly, a content analysis of a body of communicated materials analysed to gather in-depth knowledge (Rosengren, 1981) on existing design policies and guidelines regarding the historic riverfront. The scope of research is limited to firstly, the physical and functional character of historic riverfront and less on its psychological depth and meanings. Secondly, the historic riverfront concerns only urban rivers and thirdly, the focus on the application of contextually integrative theory and principles on a selected area of case study with the aim to retain the sense of place.

FINDINGS AND ARGUMENTS

Using the Integrative Theory (Sternberg, 2000), the main findings revealed that the largest contributor toward contextual non-integration between river and townscape is the utter lack of the comfort factor in the walkable environment, as referred to in fig.1 below. This is attributable to the lack of design coherence, poor physical linkage and spatial characters due to poor connectivity between key focus areas, the lack of structural clarity where poor pedestrian permeability and the lack of clear physical direction to the river affects navigation, orientation and interconnectivity of the nodes and paths of the city's imageability all of which contribute to poor river legibility in the townscape. Finally, the Klang River as an urban form and element in townscape fails to become a setting for activities to allow for any kind of possible water-related or -dependent human activities, simply because there aren't any form of activities in the water body nor are there settings for such activities to help incite greater vitality to create contextual integration.

Based on the concept of context, the other set of findings from the study reaffirms the role of the mosque and the Klang River together as the genius loci or spirit of place (Norberg-Schultz, 1980) in the Masjid India Riverfront (please refer to fig.2 below). As contexts, they need to be rewoven and reintegrated into the townscape fabric (Cullen, 1961). Evidently, there exist contextually-integrated focus areas displaying a high level of navigability, orientation and interconnectivity to the river. These areas achieve high contextual integration as they are distinctive, recognisable, navigable, orientable, and interconnected with very clear nodes and paths. On the other hand, the least contextually integrated focus areas register very low legibility factor as they either back the river, are completely obscured from river, block other elements in townscape from river, therefore adversely affecting the vitality of other focus areas. It is also revealed that the Klang River divides the three distinctive districts which confirms the divisive aspect in the theory of river as a distinctive barrier i.e. "important organising features, particularly in the role of holding together generalized areas". What is not observed is the unifying aspect of river as seams, "lines along which two regions are related and joined together" (Lynch, 1961). The phenomenon of duality where edge as barrier and unifier is unfortunately, not apparent, as referred to in fig.2 below.

Fig.1: Objective 1- Findings and Conclusion.

Fig.2: Objective 2- Findings and Conclusion.
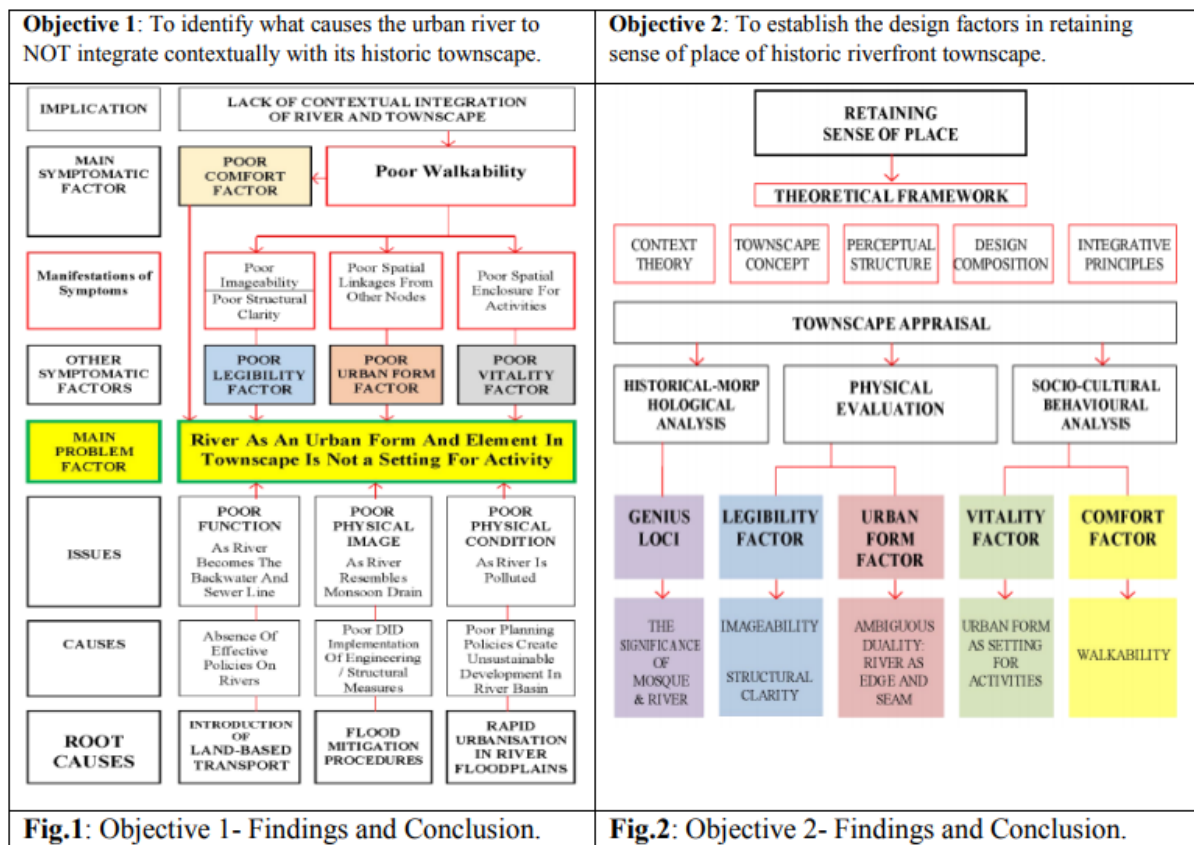
CONCLUSIONS

The case study confirms that only less than a third of the Klang River is contextually integrated with Masjid India riverfront townscape. It is safe to conclude that the key to contextual integration of neglected rivers and historic townscape such as the Masjid India Riverfront is to revitalise the urban forms and elements in townscape as settings for human behaviour, so that activities can happen and achieve the vitality so needed (Jacobs, 1961). This confirms the theory

put forward in the canon of classic urban design about settings and human behaviour (Tugnut and Robertson, 1987; Appleyard, 1969; Rapoport, 1990; Transik, 1986). By making the environment legible and comfortable, walkability -the reason and the acid test by which townscape and cities are contextually integrated- must be made to happen. All these findings confirm the integrative theory (Sternberg, 2000). Likewise to design in order to contextually integrate the city with its genius loci -which were lost in plain sight after years of neglect- will very much likely be done in the same manner; by applying the integrative principles which are unsurprisingly, already inherent as part of the canon of classic urban design (Carmona & Tiesdell, 2007).

From the study carried out, walkability is the factor to consider to make cities better integrated. To enhance it by creating purposes for people to walk will help integrate the city to its context. Making the walkable city a step more legible, more comfortable is, in effect, making one more bold step, towards the vision of a world class city. Ultimately, it is imperative to acknowledge that the right decision must be based on the right reason; and achieving sense of place is right there at the top of that reason. In retaining its sense of place, a proposed recommendation for the design of the Masjid India Riverfront through a more integrative urban design framework is seen as necessary in producing a master plan that will ensure the 'art of weaving' is applied onto the urban fabric with varying pattern, grain and texture (Cullen, 1961). Five major goals are identified in achieving contextual integration based on this study. The first goal is to establish a vision of a contextually-integrated river and mosque as genius loci in a walkable, heritage riverfront townscape for everyone. Secondly, to increase legibility factor of river to the mosque and strengthen its centre of meaning with river presence. Thirdly, to establish the river as a living element of townscape and a legitimate setting for activities. Fourthly, to create comfortable walking environment throughout the entire townscape; and finally to create unique focus areas around the river and unify them with the interconnectivity of the river as both a barrier and a seam.

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ABBREVIATIONS
1. PEMANDU Performance Management and Delivery Unit
2. KLCP2020 KUALA LUMPUR CITY PLAN 2020
3. ROL River Of Live Project
4. EPP Entry Point Projects
5. ETP Economic Transformation Programme

SD 2 - THE IMPACT OF FREIGHT VEHICLE ACCESS RESTRICTION ON THE SUSTAINABILITY OF JAKARTA INTRA URBAN TOLL WAY SYSTEM

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ABSTRACT

Freight vehicle access restriction policy in 2011 has had an impact on the performance of Jakarta Intra Urban Toll way (JIUT) system. The purpose of this study is to analyze the impact of the policy on JIUT system before and after its implementation and to analyze the impact that occurs without the implementation of this policy by using the sustainable transportation indicators as the research parameters. The assessment results of the parameters (speed, amount of fuel consumption, cost of fuel consumption, fatality rate, cost of accident victim, amount of CO_2 emissions, cost of carbon pollution, and noise level) indicate that freight vehicle access restriction policy has a positive impact on traffic smoothness and safety but does not support overall urban sustainable transportation in JIUT system. In addition, if the policy was not implemented, its impact was worse than the current condition. It implies that the implementation of the policy is a right decision though some parameters should be improved to attain sustainable transport system.

*Keywords***:** Freight vehicle, access restriction, sustainable transportation, toll way system.

INTRODUCTION

The increase of truck traffic has a large impact on highways transportation in many cities. In congested cities, increased truck traffic worsens the delay, safety, energy use, and emissions. Local transport authority of some cities has proposed a number of strategies to overcome these problems, including combinations of infrastructure, regulatory, and economic mechanisms [1]. From different viewpoint, Munuzuri et al [2] classified the strategies into those related to public infrastructure, land use management, access conditions, traffic management, enforcement and promotion.

Restricting truck traffic to off-hours is one commonly used strategy in many cities all over the world. It provides a methodology to remove truck traffic from the rush hour periods through a co-operative approach amongst road operators and the industry [3]. From several studies it is shown that this strategy has a positive impact on some of the parameters studied. Aschauera [3]

who simulated trucks schedule who can save time and costs and also reduce emissions argued that off-hour delivery has made more efficient use of road capacity, and capital expenditure for road construction can be avoided or at least postponed. Furthermore, the elimination or bottlenecks lead to competitive advantages for industry, business parks, and the entire urban area and also benefits the environment. Shi Qiu [4] prove that nighttime-only truck traffic regulation would produce less pavement distresses and better pavement performance due to the contribution of the lower temperature at nighttime.

Dablanc [5] studied the implementation of this regulation in some northern European cities (Amsterdam, Copenhagen, Stockholm, Goteborg), which apply truck access restrictions based on environmental criteria. It is found that only recent trucks, or fully loaded trucks, are permitted to enter the city centre. These new standards tend to replace former weight and size restrictions, which are now considered quite irrelevant [5].

Even though this strategy has been adopted in many cities worldwide, it still needs supporting policies to foster the shifting of urban freight delivery traffic to the off-hours [6],[7]. The implementation of the off-hour delivery regulation still has some problems to be solved to come to the optimal results to the all stakeholders of city logistics, namely shippers, receivers, carriers, administrators, and impactees [8].

As the increased activity of truck trips in Jakarta, the access restriction policy for the trucks was implemented in June , 2011 on part of the Jakarta Intra Urban Tollway (JIUT) system, where trucks are prohibited to access the Cawang–Tomang–Pluit segment (as statutory segment) during 05.00 am to 22.00 pm (Figure 1). JIUT is a ring road in the central of Jakarta, which connects the intercity highway from the south, east and west. The alternative segment for trucks movement during this access restriction time is Cawang–Tanjung Priok–Pluit segment (as advisory segment). As a result of this access restriction, the advisory segment suffered severe congestion at the time of restriction, while the statutory segment improved its speed performance.

In terms of JIUT as a whole system, this policy needs to be evaluated whether this access restriction has a positive impact on the JIUT system as a unified system rather than each segment individually, especially with respect to the sustainability of the urban transport system. Evaluation is needed since JIUT is located in the central of Jakarta and becomes the main road connecting the movement of people and goods to / from east, west and south of Jakarta. This paper discusses the impact of truck access restriction regulation in part of JIUT on important parameters that representing the sustainability of JIUT system.
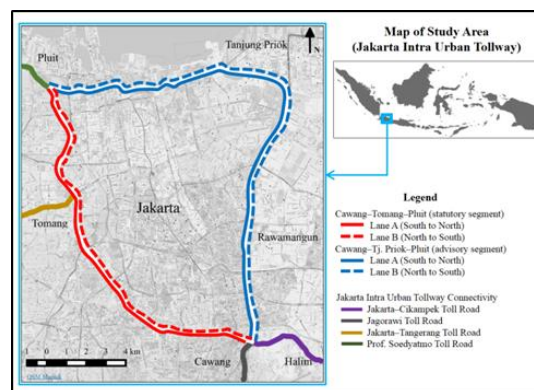

Figure 1. Jakarta Intra Urban Tollway System

METHODS

Sustainable transportation should provide resources for a safe and satisfying future for all people. Some of the definitions adopted reflect that sustainable transport systems must be effective and efficient in providing safe and fair access to basic economic and social services, promoting economic development and supporting environmental integrity [9]. In this context, development must be characterized by the definition of economic, environmental, and social sustainability [10].

Based on this concept, in this study the parameters used to represent sustainability of JIUT system are: speed and fuel consumption (for economic indicators); fatality rate (for social indicators); CO_2 emissions and noise level (for environmental indicators). To integrate these parameters the integrated cost is applied, and it incorporates fuel consumption costs, the accident cost and the costs of carbon pollution. The impact of truck access restriction regulation is illustrated in terms of changes in these parameters before and after the implementation (represented by 2010, 2011, and 2012), as well as the differences in the parameters between the conditions of with and without the policy (represented by 2011 and 2012). Each is calculated for the statutory segment and advisory segment, as well as a whole system. The latter is to describe the overall performance of the JIUT system, while the former ones described the performance of each segment individually.

The data are obtained from the operator of JIUT system, i.e PT Jasa Marga (Persero) Tbk and PT Citra Marga Nusaphala Persada Tbk. They include data road length, the average speed, road capacity, traffic volume, the number of accidents and accident victims. Calculation of the fuel consumption and its associated cost is using Guidelines for Calculation of Vehicle Operating Cost [11] and Indonesian Highway Capacity Manual [12]; the costof casualty victims refers to the Guidelines for the Calculation of Traffic Accident Cost [13]; CO_2 emissions refer to the Guidelines for the Implementation of National Greenhouse Gas Inventory [14]. The noise level prediction uses the empirical equations of Hajek and Krawczyniuk [15] and Guidelines of Ministry of Public Works [16]. To estimate the parameters of 2011 and 2012 in case of the access restriction policy is not implemented, the regression technique is applied on data of traffic volume in 2008-2010.

RESULT AND DISCUSSION

Table 1 indicates the change on sustainable transport indicators of before and after the implementation of the truck access restriction regulation.

TABLE 1. "BEFORE AND AFTER" ASSESSMENT

Indicators	Parameters	Assessment	Segment	% Change	Description
Economy	Speed	**Positive**	Statutory	Increased (41.3%)	• Increased the average speed at statutory segment to 53.95 km/hr in 2012.
	Fuel consumption	**Negative**	Statutory	Decreased (0.1%)	• Increased amount of fuel consumption at advisory segment to 12% in 2012 when compared to 2010. • Increased amount of fuel consumption at JIUT system to 5.9% in 2012 when compared to 2010.
			Advisory	Increased (12.0%)	
			JIUT system	Increased (5.9%)	
Social	Fatality rate	**Positive**	Statutory	Decreased (22.5%)	

			Advisory	Decreased (4.8%)	• Decreased fatality rate at statutory segment to 22.5% and advisory segment to 4.8% in 2012 when compared to 2010.
			JIUT system	Decreased (16.8%)	• Decreased fatality rate at JIUT system to in 16.8% in 2012 when compared to 2010.
Environment	CO_2 emission	**Negative**	Statutory	Decreased (2.2%)	• Increased amount of CO_2 emission to 13.1% at advisory segment to 13.1% in 2012 when compared to 2010.
			Advisory	Increased (13.1%)	• Increased amount of CO_2 emission to 13.1% at advisory JIUT system to 5.4% in 2012 when compared to 2010.
			JIUT system	Increased (5.4%)	
	Noise level	**Negative**	Statutory	Increased (2.0%)	• Increased noise level to 2% at statutory segment and 4.1% at advisory segment in 2012 when compared to 2010.
			Advisory	Increased (4.1%)	
			JIUT system	Increased (2.9%)	• Increased noise level to 2.9% at JIUT system in 2012 when compared to 2010. • Noise levels at statutory segment and advisory segment always exceed 65 dBA during 2010-2012.
Integration	Cost of fuel consumption, cost of accident victim, cost of carbon pollution	**Negative**	Statutory	Increased (0.2%)	• Increased integrated cost to 0.2% at statutory segment and 12.5% at advisory segment in 2012 when compared to 2010.
			Advisory	Increased (12.5%)	
			JIUT system	Increased (6.4%)	• Increased integrated cost to 6.4% at JIUT system and 12.5% at advisory segment in 2012 when compared to 2010.

From Table 1 it can be seen that there is a decrease in the speed required to travel statutory segment in 2012 compared to 2010. This condition can occur due to a decrease in the number of freight vehicles passing through the statutory segment and it is replaced by the increase of non-truck vehicles, given the characteristics of large trucks seen as slow-moving vehicles and impeding the movement of traffic, especially during peak hours. This indicates that the policy has a positive impact on the speed at statutory segment and decrease its fuel consumption. As consequence, freight vehicles switchs their route to the advisory segment. It results in the contrary situation at the advisory segment, at which its fuel consumption increased. As a total system, JIUT faces the increase of fuel consumption.

In term of traffic accident, the fatality rate at both segments decreased, and it may be caused by the establishment of the National Road Safety General Plan in 2011 which has a mission to make road safety a national priority. The analysis of CO_2 emission shows that the CO_2 emissions at statutory segment decreased, but it is not occurred at the advisory segment. As a whole system, JIUT faces the increase of CO_2 emissions. Surely, it is caused by the direct relationship between the amount of CO_2 emissions and the amount of fuel consumption.

Analysis of noise level parameters in safe noisy area shows the increase in noise level at statutory segment, the increase at advisory segment, and an increase in total JIUT system. Safe noisy area is an area of 30 meters wide from the edge of the road pavement that has noise levels of less than 65 dBA [17]. The noise level at both segments in 2010-2012 are always above the recommended value of 65 dBA. Overall, the policy has negative impact on the noise level on

the JIUT system. Overall, in term of integrated cost, the policy negatively impacts the overall sustainable transport indicators represented by the integrated cost of each indicator (economic, social, and environment), namely the cost of fuel consumption, the cost of casualties, and the cost of carbon pollution on the JIUT system.

Furthermore, Table 2 indicates the difference on parameters for the condition of with and without the truck access restriction regulation in 2011 and 2012.

TABLE 2. "WITH AND WITHOUT" ASSESSMENT IN 2011 AND 2012

Indicators	Parameters	Assessment	Segment	% of Difference		Description
				2011	2012	
Economy	Fuel cunsumption	**Positive**	Statutory	Smaller (3.1%)	Smaller (3.6%)	• Fuel consumption at statutory segment was 3.1% smaller in 2011 and 3.6% smaller in 2012 compared to without implementation of policy.
			Advisory	Greater (0.6%)	Greater (1.0 %)	
			JIUT system	Smaller (1.2%)	Smaller (1.2%)	• Fuel consumption at JIUT system was 0.6% smaller in 2011 and 1.0% smaller in 2012 compared to without implementation of policy.
Social	Fatality rate	**Negative**	Statutory	Smaller (51.8%)	Greater (220.5%)	• Fatality rate at statutory segment was 220.5% greater in 2012 and fatality rate at advisory segment was 57.4% greater in 2012 compared to without implementation of policy
			Advisory	Smaller (69.4%)	Greater (57.4%)	
			JIUT system	Smaller (60.4%)	Greater (144.0%)	• Fatality rate at JIUT system was 144.0% greater in 2012 compared to without implementation of policy
Environment	CO_2 emission	**Positive**	Statutory	Smaller (4.2%)	Smaller (5.8%)	• CO_2 emission at statutory segment was 4.2% smaller in 2011 and 5.8% smaller in 2012 compared to without implementation of policy.
			Advisory	Greater (1.1%)	Greater (2.0%)	
			JIUT system	Smaller (1.5%)	Smaller (1.8%)	• CO_2 emission at JIUT system was 1.5% smaller in 2011 and 1.8% smaller in 2012 compared to without implementation of policy.
Integration	Cost of fuel consumption, cost of accident victim, cost of carbon pollution	**Positive**	Statutory	Smaller (3.2%)	Smaller (3.8%)	• Integrated cost at statutory segment was 3.2% smaller in 2011 and 3.8% smaller in 2012 compared to without implementation of policy.
			Advisory	Greater (0.6%)	Greater (1.1%)	
			JIUT system	Smaller (1.3%)	Smaller (1.3%)	• Integrated cost at JIUT system was 1.3% smaller in 2011 and 2012 compared to without implementation of policy.

From Table 2 it can be seen that the application of policy has more positive impact on total fuel consumption than if the policy is not implemented. It is in contrary with the accident analysis

result that shows that the application of policy impacts on the decrease of fatality rate in JIUT system in 2011, but increased fatality rate on JIUT system in the 2012. Overall, the implementation of the policy in 2011 has a more negative impact on the fatality rate than if the policy is not implemented.

The analysis of CO_2 emission shows that the CO_2 emissions at advisory segment with the application of policy is bigger compared to the absence of policy. While the amount of CO_2 emissions at statutory segment, as well as JIUT system, is smaller compared to the absence of policy. Overall, the policy has a more positive impact on the amount of CO_2 emissions compared to if the policy is not implemented.

Analysis on the combined parameters of fuel consumption costs, casualty costs, and carbon pollution costs (i.e. integrated cost indicator) shows that the integrated cost at advisory segment by the application of policy is bigger compared to no application of policy. While the parameter at statutory segment and whole JIUT system is smaller compared to no application of policy. Overall, the implementation of the access restriction policy has a more positive impact on the overall sustainable transport indicators as represented by the integrated cost of each indicator (economic, social and environmental) on the total JIUT system compared to the situation of the absence of the policy.

CONCLUSION

Based on the trend of changes in sustainable transport indicators associated to the implementation of freight vehicle access restriction policy on JIUT, it is important to note that prior to implement certain restriction policy it is required to well prepare the advisory routes that the freight vehicles can be taken in order to control the impact of the policy to the whole system, not only to the statutory system. Moreover, the regulator should also consider the other sustainable transport indicators rather than only the travel time as a single determinant.

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SD 36 - THE IMPACT OF ROAD GRADIENT AND TRUCK COMPOSITION ON THE TOLL ROAD TRAFFIC PERFORMANCE

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ABSTRACT

Jakarta Outer Ring Road (JORR) is a toll road system that circles the outskirts of Jakarta, where the purpose of this road is to reduce congestion on the streets of the city center of Jakarta. However, the high composition of trucks in JORR resulted in congestion, and it is hypothesized attributed to the gradient of this road. This study aims to evaluate the impact of road gradient on truck and the overall traffic performance. Using the data obtained from 24-hour traffic recording on selected JORR section, a VISSIM model was constructed to simulate traffic performance on some combinations of traffic and gradient conditions. In term of macroscopic view point of traffic stream, the simulations show that road gradient affects the truck speed, as well as the overall traffic speed insignificantly. The trucks composition has more effect on the traffic speed rather than the gradient. Certain composition of trucks does not make significantly different effects on the traffic speed in different gradients. It implies that any policy to restrict the truck access to toll road should depend mainly on the composition of truck itself, not the gradient of the road.

Keyword: Road Gradient, Heavy Vehicle, Vissim, Toll Road

INTRODUCTION

Toll road is generally built to provide a service that is better than the arterial road. Jakarta Outer Ring Road is a toll road system that circles the outskirts of Jakarta, where the purpose of constructing JORR is to reduce congestion on the city center of Jakarta. In fact, due to the increasing volume of JORR, its current level of service is less satisfactory. As an alternative toll road circling the city of Jakarta, JORR currently becomes the main road of freight transport to and from southern, western and eastern part of Jakarta. Therefore, the composition of heavy vehicles in JORR is quite high throughout the day. With the increasingly poor performance of JORR, heavy vehicles (i.e. trucks) are deemed to have an enormous share on such condition due to their large dimensions and their relatively slow speeds. Therefore, JORR operator is planning to restrict trucks to use some segments of JORR for certain time window. At the other side, the logistics users are aggrieved and the aim of constructing the toll road, namely to improve the efficiency of goods distribution becomes questionable. Prior to enforcing the

access restriction system to trucks to use JORR, a review should be conducted to look into other causes of the congestion to find the better solution to solve the problem. Theoretically, one thing that can degrade performance of JORR is vehicle composition, where high heavy vehicle composition can reduce overall speed of the traffic, especially when it is coupled with steep slopes conditions.

Review on the traffic performance associated to the road geometry condition, particularly the road gradient, has been widely done. Bornes et al [1] developed a model for calculating speed profile for a heavy vehicle uphill in a grade. It is mainly used to decide start and end of passing lanes depending on speed difference between a typical heavy vehicle and passenger cars, and to estimate the influence of grades on the speed and travel time for heavy vehicles on rural roads for use in navigation systems, cost-benefit analysis etc. The model is based on utilized engine power needed to overcome the total running resistance for a specific vehicle. The model is in principle based on physical laws, but there are several factors which make a theoretical description different from real life. The calibration and validation process was carried out using detailed observations of instrumented heavy vehicles where all input data were known. Habtemichael et al [2] studied that the speed profile will always contain some noise depending on driver behavior, power utilization, engine specifications, road geometry, accuracy of observations, etc. Driver behavior concerning choice of speed, gear, torque, rpm, etc will usually be difficult to model in a realistic way.

Most of prior studies are based on the microscopic observation on the performance of individual trucks in a traffic flow in passing through a certain road gradient. On the other hand, the presence of trucks in traffic flows may have different effects on traffic performance due to the gradient of the road. In this case the composition of trucks in traffic flows may have different effects on the performance of the overall flows in different gradients. This research is intended to investigate the impact of road gradient on the traffic performance in JORR in macroscopic way. This research is expected to get a rationale of route shifting or climbing line for the truck to avoid a steep gradient that can cause disruption to the overall traffic performance.

METHODS

Using the data obtained from 24-hour traffic recording on selected JORR section, a preliminary VISSIM model was constructed. VISSIM is a microscopic simulation software package which can be used to simulate traffic [3]. In order to test the validity of the model, traffic performance measure results of the model were compared with the observed results which came from the data recording [4]. In this study, the traffic performance measures were the flow along segment under consideration. Hence, GEH statistics were applied to compare two sets of traffic volumes with the criteria shown in Table 1. Using the valid VISSIM model, simulations were done to 5 (five) conditions of road gradient and 2 (two) types of truck composition to estimate the average speed of the overall traffic, non-trucks and trucks for some combinations of those three variables.

Table 1 GEH Criteria

Criteria	Decision
GEH < 5,0	Model accepted
5,0 ≤ GEH ≤ 10,0	Model is possibly error or poor quality of data
GEH > 10,0	Model rejected

RESULT AND DISCUSSION

To validate the Vissim model, the data is grouped into 5 (five) sets with various randomly selected conditions. Table 2 shows the results of validation test with GEH method.

Table 2 GEH of validation test

No.	Time	GEH							
		Vehicle Total				Average Speed			
		LV	MHV	LB	LT	LV	MHV	LB	LT
						km/hr	km/hr	km/hr	km/hr
1	3:00	0.50	2.08	0.65	0.08	0.11	0.02	0.09	0.03
2	6:00	1.13	1.13	0.70	0.07	2.07	1.87	1.60	1.08
3	12:00	1.17	0.96	0.96	0.24	3.41	1.62	1.95	1.37
4	15:00	2.79	1.59	0.20	0.10	3.49	1.90	2.13	1.42
5	18:00	6.30	1.80	0.35	0.55	2.35	2.37	2.72	1.96

From calibration and validation process it was found that most of GEH values were less than 5, hence it implied that the driving behavior parameters that were applied in our model could represent the actual condition of JORR traffic.

In order to see the effect of gradient on the speed of both trucks and non-truck, simulations were done on 10 (ten) sets of traffic conditions for 5 (five) types of road gradients, i.e. 0%, 2%, 4%,6% and 8% with two conditions of truck composition, namely 0% and 20%.
Figure 1a shows the result of simulation on truck speed in which all the inputs related to traffic condition for each of simulation are similar but the gradient. Figure 1b shows the result for non-truck speed. They indicate that the speeds tend to decrease as the road gradient increased. The effect of gradient on speed seems more stable on non-trucks rather than trucks.
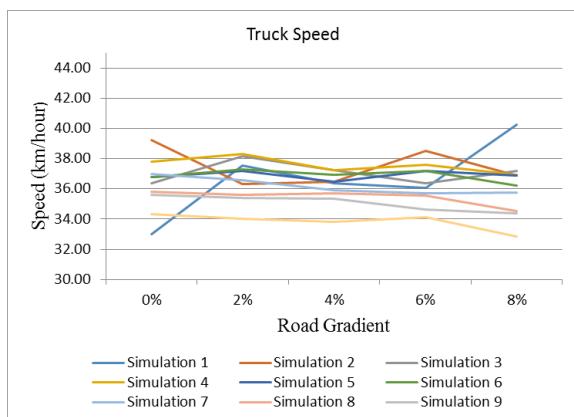

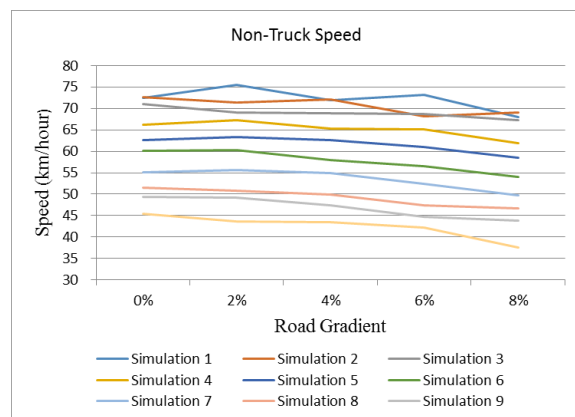Figure 1a Truck Speed on various gradients

Figure 1b Non-Truck Speed on various gradients

Furthermore, Figure 2 shows the speed-density diagrams derived from simulation. Regression technique was applied to find the best-fit speed-density model for 0% of truck and 20% of trucks. Table 3a and 3b shows the mathematical model as well as its coefficient of determination.
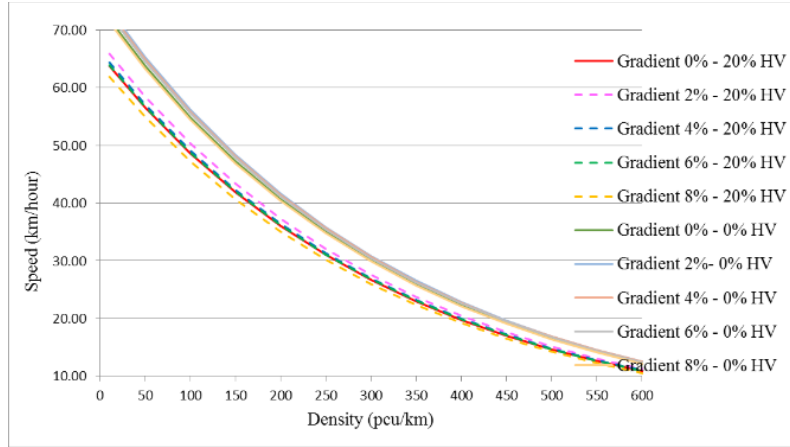
Figure 2 Speed-Density Model for various gradients and % of truck

Tabel 3a Speed-Density Model for various road gradients and 0% of Trucks

Gradient	Speed-Density Model	R^2
0%	$u = 74.05e^{-0.003k}$	0.9790
2%	$u = 75.78e^{-0.003k}$	0.9874
4%	$u = 75.36^{-0.003k}$	0.9965
6%	$u = 74.96e^{-0.003k}$	0.9855
8%	$u = 73.53e^{-0.003k}$	0.9919

Tabel 3b Speed-Density Model for various road gradients and 20% of Truck

Gradient	Speed-Density Model	R^2
0%	$u = 65.646e^{-0.003k}$	0.9913
2%	$u = 67.924e^{-0.003k}$	0.9915
4%	$u = 66.301e^{-0.003k}$	0.9937
6%	$u = 65.831e^{-0.003k}$	0.9847
8%	$u = 63.755e^{-0.003k}$	0.9901

In order to assess the significance of the difference among the models, Pearson correlation test was done with a significance level α=0.05. The test indicated that there was very strong correlations among the models, and there was almost no difference of the models for various types of gradient. It implied that the gradient have no effect on the traffic performance, namely speed-density relationship, for both low and high composition of trucks. In addition to the statistically correlation test, the mathematical difference among the speeds of various gradients and various densities was done and the results are shown in Table 4a and 4b.

Those simulations confirm the law of relationship of speed-density at which the higher the density, the lower the speed is. They also confirm that the more trucks on traffic stream, the lower the speed of the overall traffic. Regarding the road gradient, the simulation indicated that for certain density the higher the gradient (the steeper the road) the lesser the speed is, and it is valid for low and high composition of trucks. However, the effect of gradient on speed seems not significant. It may be caused by the view point of this Vissim simulation, that is macroscopic viewpoint of traffic stream rather than microscopic one. The results of simulation represent the characteristics of the overall traffic rather than individual or group of individual vehicles.

Table 4a Speed differences for various densities and road gradients and 0% of truck

Density (pcu/km)	Speed Difference (compare to speed of 0% gradient) (km/hr)			
	2%	4%	6%	8%
10	1.677	1.274	0.879	0.509
100	1.280	0.973	0.671	0.389
200	0.948	0.721	0.497	0.288
300	0.703	0.534	0.368	0.213
400	0.521	0.396	0.273	0.158
500	0.386	0.293	0.202	0.117
600	0.286	0.217	0.150	0.087
700	0.212	0.161	0.111	0.064

Table 4b Speed differences for various densities and road gradients and 20% of truck

Density (pcu/km)	Speed Difference (compare to speed of 0% gradient) (km/hr)			
	2%	4%	6%	8%
10	2.211	0.636	0.180	1.835
100	1.688	0.485	0.137	1.401
200	1.250	0.359	0.102	1.038
300	0.926	0.266	0.075	0.769
400	0.686	0.197	0.056	0.570
500	0.508	0.146	0.041	0.422
600	0.377	0.108	0.031	0.313
700	0.279	0.080	0.023	0.232

CONCLUSION

In term of macroscopic view point of traffic stream, the Vissim model simulation results show that the road gradient affect the speed of groups of truck, as well as speed of the overall traffic insignificantly. The trucks composition has more effect on the traffic speed rather than the gradient, particularly on low to medium density situation. Certain composition of trucks does not make significantly different effects on the traffic speed in different gradients. It implies that any policy to restrict the truck access to toll road should depend mainly on the composition of truck itself, not the gradient of the road. .

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SD 37 - INVESTIGATION ON THE WILLINGNESS TO WALK AND ACCESSIBILITY TO BUS STOPS IN PENANG

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ABSTRACT

This study was conducted to investigate the walking accessibility of pedestrian toward the Rapid Penang bus services in Penang Island. Several parameters such as socio-demographic, walking distance, time travel and satisfaction level of users were examined to determine the significant factors that influence the walking accessibility toward public bus services. Within two weeks period, the questionnaire surveys of 400 respondents were recorded. The collected data were analysed using descriptive analysis and statistical analysis through Statistical Package for the Social Science (SPSS). Multiple regression analysis was used in statistical analysis to determine factors that significantly influenced pedestrian willingness to walk to access the public bus services according to current and future improvement environmental and infrastructure condition. From the results acquired through the multiple regression analysis, type of bus stops, socio-demographic, distance of walking, time of walking, the satisfaction level of users and trip purpose were factors that contribute to pedestrian willingness to walk to access the public bus services. The outcome of this study also had identified the maximum, minimum and average distance walked by the pedestrian to reach the bus stops as well as the time travel taken.

Keywords: pedestrian, accessibility, walking distance, public bus

INTRODUCTION

A study on walking accessibility to public transport in Penang is carried out to identify factors that affect the willingness to walk to access public transport in Penang that is Rapid Penang buses and to determine the level of satisfaction of public bus users toward current public bus services. SRS Consortium had outlined an integrated transit network with the appropriate long-term capacity to increase public transport adaptation in Penang. The proposed transit lines are; Bayan Lepas LRT, Ayer Itam monorail, Tanjung Tokong monorail and tram services in Georgetown heritage area. Parallel links between the future development of Bayan Lepas LRT and Rapid Penang bus routes are investigated and the most parallel route is route 303 from Weld Quay Port to Persiaran Mayang Pasir. Hence, the study of walking accessibility to public transport was done on route 303.

The objective of the study is to identify the acceptable walking distance to the bus stops. The walked distances were measured from origin location of respondents to their destination. Secondly is to evaluate the walking accessibility to the bus stops including the surrounding environment of the bus stops and the pedestrian walkway. The evaluation is based on the condition of bus stops whether the bus stops are shaded and benched or otherwise. Type of pedestrian walkways such as roofed and paved walkway is observed as well as its surrounding environment. Thirdly is to analyse the factors that are affecting bus users' willingness to walk to the bus stops. The factors affecting bus users' willingness to walk to the bus stops are analysed based on observation and evaluation conducted. The factors are socio-demographic of respondents such as age, gender, and income, the trip purpose of respondents and level of satisfaction of respondents toward condition of bus stops and pedestrian walkway. Socio-demographic of Rapid Penang bus users is one of the factors that affect the mode choice. Daniels and Mulley (2013) claimed that the impact of socio-demographic factors has mostly been studied in the context of differentiating factor in the choice of travel behaviour. Gender, age, marital status, income, the level of education and vehicle ownership are the factors included in socio-demographic. Corpuz et al. (2005) found that in Sydney females walk more than male, older and younger age groups walk more and people with low car ownership walk more. Moreover, in research conducted by Freeland et al. (2013) in the United States, people are more likely to transit walk if they are from lower income households, are non-White, and live in large urban areas with access to rail systems.

MAIN RESULTS

The data collection was conducted during weekdays of Tuesday, Wednesday, and Thursdays within working hour from 8 o'clock in the morning until 6 o'clock in the evening. The questionnaire was designed parallel to the aim that is to determine the willingness to walk of public bus users to the nearest bus stop in term of distance travel and time travel. The respondents were also asked about their perception toward the condition of bus stops and the pedestrian walkway that they took to arrive at the bus stop. The data collected were computed into Microsoft Excel and analysed using SPSS software.

The frequency of respondents using the Rapid Penang buses were identified with a frequent usage of everyday (45.4%), only 4 to 6 days a week (19.6%), less than 4 days a week (14.5%), only a few days in a month (15.1%) and others (5.4%). The others' frequency due to unexpected situation happened to the respondents such as their vehicle broke down, there was no taxi available or they want to avoid driving in heavily congested traffic. The farthest distance walked by the respondents to reach the bus stops was only for 200m to 400m (37.2%) or less. This is because the distance between the bus stops with the area at which people lived or worked at was only 100 m to 500m apart. It is a short distance to walk to reach the bus stops. Besides that, most respondents only took 10 minutes to 20 minutes (47.2%) to arrive to the nearest bus stops to access the public bus services in Penang.

Based on Table 1, the minimum willingness distance to walk by respondents is 50m while the maximum distance is 2000m (2km). While the shortest willingness time taken for them to walk to the nearest bus stops is 3 minutes, and the longest is 90 minutes with an average time of 13 minutes. A multiple regression analysis was conducted to understand whether the distance walked by the respondents to access the public bus services and the time travel to reach the bus stop can be influenced by the socio-demographic factors.

Table 1. Descriptive Statistic of Willingness Distance and Time travel to Walk to Bus Stops

Infrastructure Condition	Current Condition		Future Improvement	
	Willingness distance to walk (m)	Willingness time taken to walk (min)	Willingness distance to walk (m)	Willingness time taken to walk (min)
Mean	423.04	13.24	543.62	17.58
Std. Deviation	314.150	10.105	348.449	11.285
Minimum	50	3	50	5
Maximum	2000	90	2000	90

The dependent variable used for the multiple regression analysis is the respondents' willingness to walk to reach the bus stops in present condition, while the independent variables for the analysis are the socio-demographics; age, gender, nationality, race, status, level of education, monthly income, vehicle ownership, license ownership, weightage of satisfaction level, frequency of using bus, distance from home to bus stop, time travel from home to bus stop, existence of pedestrian walkway and home based trip purpose. Walking distance, nationality, bus stop signage and home-based trip purpose are the independent variable that affect the dependent variable the most based on the significant value of 0.000, similar to the constant value. Thus, these variables affect the willingness to walk to the bus stop. Whereas, shaded bus stop, walking distance, nationality, pedestrian walkway, bus stop signage, status, and weightage satisfaction level toward pedestrian walkway are the independent variable that influence the dependent variable the most based on the significant value of and nearest to 0.000, similar to the constant value. Thus, these variables affect the willingness of time travel to the bus stop.

CONCLUSION

The average walking distance accepted by respondents to walk to bus stops to access the public bus services is 600m while the average time travel is about 20 minutes. The factors that affect the willingness to walk of respondents to reach the bus stops are the type of bus stop either shaded or unshaded, bus stop signage, gender, nationality, status, walking distance, walking time, the existence of pedestrian walkway and home based trip purpose. Several recommendations are suggested to further enhance the data obtained for better analysis in the future. Firstly, to investigate human perception, opinion and decision, a frequent survey should be conducted to determine and understand the pattern of a person thinking. This is because each individual has their own unique way of thinking and it changes from time to time. Next, it is recommended to apply a method of using global positioning systems (GPS) to get a more accurate measurement of distance walked by respondents. Besides conducting survey to collect data, a more approachable and easier method such an online survey might be more effective. This method can reduce human error and makes it easier and faster to organize and analysis the collected data.

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SD 24 - THE INFLUENCE OF WALKABILITY TOWARDS URBAN STREET DESIGN IN KUALA LUMPUR

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ABSTRACT

Automobiles have been the main driving factor of urban planning in recent decades. As a result, the automobile has started to become an ironic icon of travel pattern within the city centre. This has caused a lot of issues, but the main issue covered in this research paper is to examine the physical characteristics which contribute towards the walkability of a street in Kuala Lumpur. Streets in Kuala Lumpur have been prioritized for automobiles and this causes issues in the general walkability of the city. For the research to gauge the perception of walkability, a case study was conducted in a district that provided an opportunity to analyse the walking behaviour of pedestrians in a variety of urban built environment. Kampung Baru, one of the districts of Kuala Lumpur, Malaysia was taken up for a primary case study as it functioned like an urban laboratory with both traditional and modern settlements in the same vicinity. The street selected for the research is a minor one, however it acts as a shortcut between two of the main roads within the district. The selected street is based on usage by pedestrians was studied through behavioural observation and public surveys to understand the underlying factors that led to how a street should be designed. The results showed that the most important factors affecting pedestrians' perception of walkability were related to the built envelop on either side of the streets. Factors relating to urban morphology like enclosure block length and edge conditions were found crucial in creating perception of a walkable street.

Key Words: Walkability, street design, behavioural observation, social life, public domain

INTRODUCTION

Walking is the oldest form of urban transport, and until the advent of major transformations in transport technology in the nineteenth century, most cities were structures in ways that support walkability (Newman et al., 1999). As individual private car transport became widespread during the twentieth century (Siti Fatimah Ilani Bilyamin, 2014), public transport and urban walkability became less apparent as major

priorities of transport planning and urban design. As concern for future urban sustainability increases, walking is again being recognised as an important mode of urban transport. Much of the renewed attention on urban walkability is associated with concerns that car dependent cities will not be sustainable in the future, due to energy costs, fuel availability, congestion, air pollution and other environmental impacts. The reported benefits of walking are not new; it is common knowledge that people benefit physically when they are active. It is a free activity that can increase personal well-being and longevity of good health.

According to Rafiemanzelat et al., (2016), walking is generally recognised as a movement which is one type of transportation. Generally in the urban context, walking is defined as short distance movement from one point to another point. Walkability is a concept which is known as a measurement of the pedestrian-friendly degree of a certain area. The Victoria Transport Planning Institute (VTPI) stated "walkability reflects the overall conditions in an area" (VTPI, 2005). This takes into consideration the quality of pedestrian facilities, road conditions, land use patterns, community support, security and comfort of walking (VTPI in Hanani, 2009). At the same time, Southworth (2005) defined walkability as the extent to which the built environment supports and encourages walking by providing pedestrian comfort, convenience and safety, connecting people with varied destinations within a reasonable amount of time and effort, and offering visual interest in the journeys throughout the network. This term has recently been focused by urban designers and planners to make a sustainable environment for communication, recreation, and shopping by pedestrian base.

Leyden (2003) has stated that pedestrian oriented neighbourhoods also increase individual and collective social capital. Social capital is an umbrella term that measures things like involvement in local government and community trust. Greater social capital has been linked with better community health, decreased crime rates and even increased economic activity. In pedestrian oriented communities that are highly walkable, residents are likely to walk to places such as corner markets, restaurants, schools, places of worship, public parks and other establishments necessary for life. While walking about their neighbourhood, residents can interact with their surroundings more regularly and thus feel more connected to and responsible for their physical community.

Furthermore, residents will also interact more frequently with their neighbours, creating a denser community network which can increase individual peace of mind, community trust and may decrease crime rates (Zhu et al., 2008). In the traditional settlements buildings opened out directly on the streets as there were no major setbacks. People took the ownership of the whole street on which they lived. All the windows looked on to the streets making it even safer. As Jane Jacobs (2016) said it, putting "Eyes on the Street." This morphology acted like a catalyst in promoting street activity (Hanson et al., 2016). Through literature review and also through empirical study, this paper is to investigate the concept of walkability by trying to understand the different ways the built environment influences walking. The knowledge that this paper is to produce is not only whether or not, but more on how and why the built environment influences walking behaviour.

Walking in an urban place level is considered as walking between communities in an urban place that makes a walkable city. Walkable urban place measures through density, connectivity, land-use mix and net retail area to examine the association between neighbourhood walkability. Christopher and Leinberger (2007) stated that walkable in

urban place is most prevalent on per capita basics, located within the metro area and extent to which rail transit service is associated with urban development. Walkable urban place is located in high density (0.8-40.0 floor area ratio) area which is mixed use (residential, office, retail, cultural, educational at regions or international level) and assessable for multiple transportation including walking, car, transits and bikes. The function of walkable urban place includes local serving (for daily needs such grocery) and regional serving for higher service such as retail, medical, entertainment and education (Christopher and Leinberger, 2007). The higher levels of mixed land-use, residential density, street connectivity, accessibility to recreational facilities, and aesthetic attributes are more conducive to walking and, hence, more 'walkable'.

Therefore, this study focuses on walking in urban place that considers the physical factors which are influencing the walkability towards urban street design.

MAIN RESULTS

According to a study conducted by Shamsuddin, et al., (2013), which included Kampung Baru as an area of study, the results show that more than half of the respondents would prefer to use their vehicles to move from one place to another, and would only walk to their destinations if it is inconvenient for them to use their vehicles with factors like road construction or maintenance, crime or the cost of using public transportation compared to paying for the parking of their vehicles. This can be supported by Arvidsson et al., (2012), which showed that individuals in neighbourhoods with objectively assessed high walkability and who also perceived it to be high maintained their level of walking to a higher degree than those who perceived the walkability to be low. This means that when an area is perceived to be highly suitable for walking, then walking to their destinations would be the best choice.

According to a public opinion survey by Seranta Awam (2014), "Greater KL/KV is not a pedestrian-friendly city, as it currently has inefficient design, poor maintenance and poor accessibility. Locals and visitors often find that there are no linkages between buildings, poor continuity in pedestrian walkways and lack of access for the physically challenged and elderly".

This can be observed as that some parts of Kuala Lumpur city are yet to be designed as more pedestrian friendly streets, these problems may hinder the opportunity for visitors to experience the city with a greater sense of enjoyment and ease by walking (Ujang, 2015). However, providing a comfortable pedestrian environment in the city centre is a challenge due to the problems of traffic congestion and limited spaces for pedestrian movement. As such, it has affected the development scenarios as there are no integrated functions between the physical elements through permeability and legibility in the city. The higher the permeability and legibility, the more continuity and connectivity the city offers in terms of walkability (Carmona, 2003). This also indicates that without human scale activities that are oriented to human needs and streets filled with people, the large blocks in the city will face problems with high traffic volume, and heavy pollution that destroys the connectivity needed to be a walkable city.

The approach done by the Urban Transportation Department of Dewan Bandaraya Kuala Lumpur, which leads EPP 8, upgraded 12.7km of non-covered pedestrian walkways in Kuala Lumpur, exceeding the annual KPI of 12km. The upgraded walkways include those

along Jalan Tun Ismail, Jalan Tun Razak, Changkat Bukit Bintang and Changkat Raja Chulan. However, the end goal of the pedestrian network EPP is to create a barrier free, handicapped friendly pedestrian network that also encompasses the safe city concept for 42km pedestrian network within Kuala Lumpur 2020.

Kampung Baru in the centre is not without problems of walkability. As with most other parts of Kuala Lumpur, the streets in case study are dominated by cars and is a hazard for pedestrians who use them, although in some areas motorists give priority to pedestrians given the situation of the street (Kampung Baru Comprehensive Development Plan, 2016).

CONCLUSION

A good pedestrian network with ease of access to public transit, linkages between buildings, priority given to the pedestrians, and also a concern given towards the human scale will ensure a city to be walkable. In relation to that, this study will be focusing on addressing the issue of walkability in the city centre area, followed by the determination of the characteristics of walkability to overcome the problems faced by pedestrians. With such information, the physical aspects of walkability in a city can be harnessed to suit the proposed plan by the Local Authority.

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SD 26 - PHYSICAL CHARACTERISTICS OF A PUBLIC SQUARE IN MALAY ROYAL TOWN

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ABSTRACT

In a time of rapid development and urbanization, many cities are threatened with an irreversible transformation of their form and character and perhaps in turn, with loss of identity especially public squares in urban areas. In Malaysia, most prominent public squares are located at the town centers and they in addition, happen to be in the historic areas which were designated by the local authority. Medan Bandar in Alor Setar, Kedah is one of the examples of an urban square which has a vibrant image, but getting to lose their function in meeting people's needs towards the places. However, being the vibrant square as it is, Medan Bandar also had undergone to a certain extent a transformation. The transformation has changed the overall look of Medan Bandar to make it completely unfamiliar. With all the changes and transformations, the issue now is whether image, identity and function of Medan Bandar Alor Setar can withstand the process of change and transformation but need to remain the character of Malay Royal town itself. Medan Bandar in Alor Setar is not fully utilized as a meeting and gathering space. Public open spaces have to succumbed to a new projects, which this results in the loss of their social and cultural functions. In fact, the loss of public open spaces in the city centers stigmatizes place identity and characters of the city that negatively affects people's. In light of all mentioned above, issues concerning about the public square and the current studies mainly objective to investigate the design factors of public square in a Malay Royal town that is not attractive to the public and to propose design public square in Malay Royal town.

Key words: Malay Royal town, public square

INTRODUCTION

A city without old places is like a man without memory. Many cities have quarters that confer on them a sense of place and identity through the historic and cultural associations they provide. They are often an integral part of the city's charm and appeal, and their visual and functional qualities are important elements of the city's image and identity (Ayob. 2010). The quarters which are also defined as historic areas are evidences of our past civilization and act as living museums. Since a historic area is a part of the economic dynamism for the city, it should be able to maintain even be more interesting with the rest of the city. Public squares, urban parks and public open spaces are common elements in Malaysia's urban form and development (Ayob, 2010). The emergence of urban squares, urban parks and public open spaces draw back since the Colonial era. One of the most notable features of British Colonial towns was the padang, a large field set against a backdrop of imposing administrative buildings.

Historically, it is proven that the padang (square) can have strong features or elements in shaping the image of the cities. Urban public open spaces have been of a prime importance in the urban development in Malaysia ever since the colonial era (Melasutra, 2004; Ayob, 2010). Undoubtedly, an outstanding element of British Colonial towns in Malaysia was 'Padang' or square that historically proven has been influencing the images of cities (Ayob, 2010). This signifies the important place of public open spaces in urban design and planning to the extent that such spaces might strikingly be influential on the structure of cities. Calhoun (1986, p. 341) asserted that one of the most socially magnificent features of a city is the creation of public open spaces where various groups of people socialize, 'interact and observe each other, debate and learn politically, and grow psychologically from diverse contacts' (as cited in Aurigi & Graham, 1997). Public squares, within the context of public spaces, are essential components of cities because they provide spaces for social interaction. This helps to sustain the humanization of the society through gathering, lingering, wandering through and engaging together into various human activities and can make significant contributions to the cultural development of communities.

Public square play a major role as a catalyst for social change and provide a place for gathering different community groups (Hajjari, 2009; 1998). A public space is an urban form that draws people together for passive enjoyment (Jackson JB, 1994). Public square is intended as an activity focus, at the heart of some intensive urban area. Typically, it will be paved, enclosed by high density structures, and surrounded by streets, or in contact with them. It contains features meant to attract groups of people and to facilitate meetings (Lynch, K. 1984). This study will show the importance of a public square in a Malay Royal town where the primary concern is to identify the physical characteristics in a public square that will contribute to the successful public square in the heart of the city. This chapter presents the research problems, research questions, research aim, research objectives, the scope and limitation of the study and the research design process to establish the physical characteristics of a public square in Malay Royal town.

Parks, streets and squares are typically considered as public open spaces and generally accessible to all people. Public open spaces are the bed in which human activities are formed, and human social and cultural relations are established. Urban spaces are part of cities, open and public areas that are somehow the identity crystallization of collective life, where citizens attend. The social importance of a public open space that defines it as a meeting space for people has been aggravated time by time (Sieverts, 2003). The reason why parks, street and squares have been downgraded, abandoned or disappeared might be due to the heavy rapid development and urbanization in most cities around the world. This rapid development has caused public open spaces to turn into leftover spaces in cities all over the world (Pasaogullari and Doratli, 2004). In fact, this causes public open space to lose their function in meeting people's needs towards the places (Özsoy and Bayram, 2007). In certain area, unrecognizable has become main issues to the public spaces such as parks, street and squares. Not just losing natural and physical attributes, major effect has led to the changes on the loss of traditional urban form and localized identity (Mohammad, 1998).

Green (1999) and Rogan et al. (2005) have found out that once the character of a town has been threatened, the sense of attachment, continuity, identity and permanence may also be lost.   Medan Bandar in Alor Setar is not fully utilized as everyday meeting and gathering space. Harun and Said (2009) asserted that in most cities in Malaysia, public square have succumbed to new projects, which this results in the loss of their social and cultural functions. In fact, the loss of public open spaces in the City Center stigmatizes place identity and the characters of city that negatively affects people's life (Harun and Said, 2009). In light of all above mentioned issues concerning about the public square, the current studies mainly objective to enhancing the quality of public square through upgrading and redesign the existing Medan Bandar and to make Medan Bandar as a successful public square in Malay royal town.

METHODS

The method of the study is case study which adopted a qualitative and quantitative method in data collection and analysis that been derived by the research objectives and research questions. Literature review that discusses, published current information by accredited scholars and researches on the subject matter of public square and a sense of place to establish a theoretical framework that would be used to propose a design scheme for public square that creates a sense of place. Meanwhile field observation will involve a visual survey and townscape appraisal to record visual elements such as quality of views, fabric and space that contributes to the physical characteristics of a public square in Malay Royal town. Visual survey consists of a photographic record, annotations and sketches during the field observations. Questionnaire survey will be carried out during the data collection period. An open-ended questionnaire survey will be used in this study to discover physical characteristics in the chosen public square that it become so importance and influences in their perceptions.

FINDINGS AND ARGUMENT

Findings of this study reveal that the design factors of public square in Medan Bandar Alor Setar are not attractive to the public on the physical linkages. The findings also shown that Medan Bandar is not having a good connectivity and continuity to the other elements that influence the identity of a Malay Royal town itself. Each have their own contributions to the urban fabric and form of the Malay Royal town. On the physical barriers aspect, it is discovered that Medan Bandar Alor Setar is not a user friendly. Major factors such as of less public amenities, insufficient width of sidewalk on a certain area and bad quality of surface along the pedestrian and pavement at Medan Bandar that influence to the unuser friendly at Medan Bandar. This shows that Medan Bandar does not apply the universal design concept that considers a wide range of people with different abilities and remove or reduce the physical barriers. The finding on the amenities also shows that Medan Bandar Alor Setar is not friendly in terms of lack of seating and rest areas, inadequate public toilet, insufficient lighting during the night and no clear signages for legibility that raised by JPBD (2011) on the user friendly public amenities at accessible location.
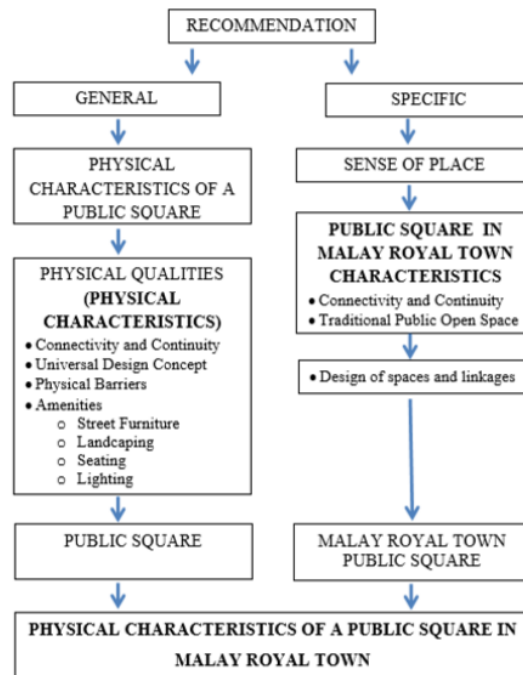
Figure 1 : General and specific recommendation.

Another finding also demonstrates that users agree to the current unpleasant design factors of the Medan Bandar Alor Setar. Majority of them agreed that the current public square has no physical barriers, not enough seating, rest areas and public toilet, does not have a clear signages and lighting for easy accessibility in the day and night, and also the current private parking space are not sufficient. However, when finally it is brought to their attention, the findings show that they acknowledge on the unpleasant design factors of public square. This suggests the theory of environmental numbness by Gifford (1976) where the adaptation and familiarity with certain environment make the users lack of awareness. This may happen because the users are exposed to the environment and are very responsive to unfriendly

environment. It is discovered that the difference of personal characteristics such as gender, age and experience contribute towards different perception on the environment that are suggested by Carmona et al. (2003).

CONCLUSIONS

In achieving the aim to to propose design public square in Malay Royal town, this study has looked into the literature on the concept of Malay Royal town, concept and theories of public square and also assess the response from the users in the Medan Bandar Alor Setar. From this study, it is discovered that there are several design factors in the Medan Bandar Alor Setar that is not have a connection to Malay Royal town which are the connectivity and continuity, factors of barriers and obstruction, universal design and change of level. In addition, it reveals that the users in Medan Bandar are exposed to the environment and are very responsive to unfriendly environment. This may due to the usual condition of Medan Bandar Alor Setar where people just get used to whatever they have but in the same time they care what is going around them. However, when the concept of public square in Malay royal town is brought to their attention, they actually acknowledge on the unpleasant factors. Therefore, if the government takes this issue seriously and provide a better built environment in terms of friendly public square and inject some character of Malay Royal town inside, the users will feel the difference and increase the awareness towards the concept and appreciate it. Besides, it will contribute to users' sensitivity towards how they perceived and concern for the built environment. Accessibility in a public square environment is the concept for all parameters that influence human functioning in the environment that suggest by Preiser and Smith (2011) and accessibility for everyone will increase the existing proposed whole citizens' quality of life (Evcil, 2012). Therefore, the implementation of public square in Malay Royal town will provide better quality of life towards all the users which will contribute towards a Malay Royal town of Kedah.

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SD 32 - REGENERATING PUDU MARKETPLACE AND URBAN IDENTITY

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ABSTRACT
Recent rapid development in through urban regeneration in Kuala Lumpur has transformed places into new setting thus changing the meaning and identity of an area. As a city, Kuala Lumpur needs to create a distinctive city identity and image with a unique character if it is to achieve its bigger goal of becoming a World-Class City by 2020. Within the Kuala Lumpur City Centre, in particular, there is a rich diversity of identity areas, and it is important that these should be knit together into a vibrant, coherent and high imageability of city form. Today, urban marketplaces that have aged are vulnerable to the threats of gentrification and modernization. At some point in time, the existing urban marketplaces will eventually be renovated or redeveloped in parallel with the city growth. The process of regenerating existing urban marketplaces should be considering the components that make them special, as not to lose the delicate characters that give each marketplace distinctive identity and sense of place. The identity of a place is closely related to the presence of distinct elements, and the character is recognised and remembered by people. Areas with an attractive character and strong sense of identity must be maintained and enhanced and, where practicable, other areas are upgraded to provide an improved sense of identity and place. This paper focuses on the identifying and evaluating of an urban marketplace by reviewing the definitions and concept of physical characters and the experiential qualities in attributes to the identity of a place. As the identity of a place is closely related to the presence of distinctive elements, this characteristic must be identifiable, recognised and remembered by people.

***Key words*:** regeneration, urban marketplace, identity of a place, physical and experiential qualities

INTRODUCTION

The rapid development which has left Kuala Lumpur, in many respects, disjointed and lacked in visual and physical coherence. The street level has been neglected with inconsistency and piecemeal development has adversely affected the quality of streetscapes that is the overall physical character and continuity of streets as represented by pavements, building frontages, street lighting and other forms of street furniture. (KLCP2020, 2008: 667 Urban Design & Landscape). Consequently, there has been a decrease in the legibility of the city structure together with a certain loss of historical continuum and sense of identity. The character and distinctiveness of districts and local precincts are important in providing interest, texture and structure to the urban form as well as increasing the sense of belonging. Recent development in through urban regeneration has transformed places into new setting thus changing the meaning and identity of the area (Norsidah et al, 2014).The lack of harmony and awkward juxtaposition of buildings is particularly noticeable at street level and currently in suppressing the image and identity of the place in city centre.

This paper focuses on the evaluating of an urban marketplace by reviewing the definitions and concept of physical characters and the experiential qualities in attributes to the identity of a place. As the identity of a place is closely related to the presence of distinctive elements, this characteristic must be identifiable, recognised and remembered by people. To achieve the study aim, two objectives have been formulated as follows: to identify the physical characteristics and the experiential qualities that defined the urban marketplace and to outline the design criteria for a distinctive, recognisable and meaningful identity for an urban marketplace. The scope and limitation of the study will be based on the following aspects of the suitability of the study, time and the availability of the information. The identity of the urban marketplace will be evaluated based on the town structure, the urban pattern, the townscape and the human activities and behaviour.

Marketplace
Throughout history, cities have been founded and exist for many reasons, and the diversity of urban forms can be traced to the complex functions that cities perform. Cities also grew up around marketplaces and it is considered as one of the fundamental urban typologies. Qamaruz-Zaman et al. (2014) advocates that a city without a marketplace might function, but still lacking in the platform where layers of the community could gather and socialise where tangible and intangible culture could be felt in its sense of place. It is vital, healthy, diverse place where all the most valued dynamics of an urban life untold. A successful and vibrant marketplace is the heart and soul of the city itself as it infused new energy and social and economic activity as according to Shuhana (2011), it has more to offer to the urban environments. Marketplaces are where rich cultural ideas were displayed in the activities of the peoples and are the best place where social interaction to happen.

Identity
Identity means to distinguish an object from other objects and accept that one as a part object (Lynch, 1960). In other words, the identity is the completeness of the characteristics separating or combining the individual or the society from others, the identification of an identicalness or dissimilarity. The identity of a place is closely related to the presence of distinct elements, and the character is recognised and remembered by people (Shuhana, 2011). A strong image and identity of a place depend on the careful design and interaction between the three elements; districts, streets & square and that space, where life occurs, are places and these places are the result of relationships between actions, conceptions and

physical attributes. A place must have its identity as meaning create a sense of attachment (Norsidah, 2009). Ahmad Bashri et al., (2007) asserted that a place (city/town) must have a strong character and identity so that it is known to the people. Places play a vital role in developing and maintaining self-identity and group identity of the people as the place is an experiential process that forms the identity and distinctive place character (Norsidah and Zakariya, 2014).

Case Study Area
A single study area has been selected to represent an urban marketplace in the city. The selected case study area is based on one of the oldest surviving marketplaces in Kuala Lumpur city centre. Pudu or previously known as Pudoh is one of the earliest districts in Kuala Lumpur. The development of the area started as a small village and Pudu Road was built as a part of a linkage to all the different mines in Kuala Lumpur stretching from Jalan Ampang to Jalan Petaling. Based on the morphology, the formation and the development of Kuala Lumpur have been supported by the nearby districts such as Pudu, where tin mines are the prime asset of the place. Pudu once holds a few important and historical place markers are now losing its importance due to the wrong reason and bad perception. In 1890, Kuala Lumpur had three markets, namely Central Market, Pudoh Market and North Market Street (Mohd Rus, 2005). The marketplace activities in the study area have been around for more than a decade as it started as a small outdoor open market until the existing market building which was built in 1956. The market building was complete on the 7th January 1957 and was identified as Pasar Road Municipal Market.

METHODS

According to Ahmad Bashri and Shuhana (2005), in the "*Typology of Cities in Malaysia*", there are three elements that contribute to the main city form. The three elements are the structure of the city, the urban morphology and the townscape as the appearance of the city. The five elements which had been used by Kevin Lynch (1960) as the path, edge, district, nodes and landmark will also be used to determine the structure of the place through visual survey method. Visual studies through townscape appraisal technique is an art into establishing links between the elements that make up the urban fabric (Cullen, 1961). The attributes of the physical characters are based on the physical qualities and the experiential qualities. The physical qualities are studied based on the distinctiveness and recognisable elements, and the experiential qualities are based on meaning and association of the place. The distinctiveness of physical qualities can be identified through six criteria namely; the urban structure, the urban form & pattern; the building; the street and urban street block; the spaces between and the landscape & natural element. The recognisable of physical qualities are identified as familiarity; historical significant; nostalgic memory; affinity; special quality of a place; dislikes; and association. The meaning and association of experiential qualities are measured by the vista; the human scale; the activity on the ground level; the mixture of activities; the historical significance; the aesthetic appreciation of kinesthetic experience; and the quality of the view.

FINDINGS AND ARGUMENT

As in describing the identity of the place, the presence of distinct elements must be recognised and remembered by people (Shuhana, 2011). Human activity is the second component of the identity of the place. Physical environment provides the setting for the

activity to take place. Thus this leads to how people response physically and mentally in term their behaviour pattern towards the activities within the area.

Physical and Experiential Qualities

The *paths* within the marketplace must be universally accessible and fully connected to increase the permeability. The physical character of the edges and district must be distinctive to create the character of sameness within the marketplace thus resulting in a clear legibility of the area. The physical setting of the marketplaces which are the *nodes* of the area need to be improved as the robustness of the area will support the main activities of the place. The setting of variety activities wills increases the vibrancy and vitality to the marketplace. The existing *landmark* needs to be an increase of its legibility as it will enhance the marketplace identity. Installation of portals to clarify the legibility of the marketplace area can also help in structuring the area by increasing the visibility and create a sense of welcoming.

The variety of user within the community of the marketplace will also foster the sense of belonging or place attachment of the area. The existing old significant shophouses, the place of worship and civic buildings that have distinctive and recognisable character need to be retained, and upkeep as the local community have memory and association with them. Increasing the permeability, legibility and robustness of the physical setting will eventually support the marketplace activities. A better physical setting is needed to add robustness and richness to the marketplace as it will support the variety of activities for social interaction day and night. The legibility of the streets around the market square needs to increase by having a distinctive character as it contributes to helps people to recognise and remember the areas within the marketplace. The hierarchy of the street layout is also will be improved by having the distinctive unifying character of streetscapes. The unique *"kaki-lima"* elements are one of the recommendations as unifying elements for the marketplace area. The networking of side lanes and back lanes is identified as an alternative place of activities on ground level as increasing the permeability within the marketplace. The legibility of the marketplace will be influenced by the solid and void character. A new open public space will increase the vitality of the area in supporting the alternate activities. Nevertheless, new activities within the different time frame will add vibrant to the marketplace. The new activity will create a new small node in supporting to temporary activities on a temporal pattern that can give a distinctive character to the marketplace.

The building facade within the marketplace helps in creating visual appropriateness and distinctive character in creating the identity. The differences of building frontage will create variety and redefined the grain. The building height must be improved to compose the visual quality of the marketplace 'skyline and focusing to the market square. The roofscapes, façade treatment and material usage of the existing building can be used to increase the harmonic visual experiences by applying the sense of rhythm and pattern. The sensitivity to the harmonic relationship which concerns the relationship between the parts and how the material fit together to form a coherent whole that can create a strong identity of places. The visual orientation can be used in achieving a visual balance of the elements within the marketplace. Colours are one of the syntheses of unifying elements that increase the distinctive visual identity. Unity within variety needs to be addressed in identifying the sameness in character. The effect of visual experience of place recognition is very important for identification of an area. A visual stop will be introduced within the marketplace area by promoting vista on architectural detailing. The selected building will be the visual stop for cultural, place of worship and community function and these building carry meaning and association to the place. The sense of enclosure of marketplace area needs to increase as to

enhance the spatial volume of the square which can determine the quality of perspective view of the area. The unique character of the deflection effect on Jalan Pasar needs to be emphasised as the curvature softens the gridiron of the urban fabric. Distinctive streetscapes elements and landscaping of the *"Angsana"* will enhance the deflection effect and increase the imageability of the street. The streetscape and natural elements of trees can be used to facilitate the legibility of the marketplace with distinctive unifying character. The selection of planting can be used to maintain and improve the visual continuity and also contribute to the tropical setting.

The familiarity of people's perception regarding Pudu is the marketplace activities. The old market building and its surrounding place act as a frequent sighting of physical elements and carry along the historical significance strata. As the familiarity with physical elements in the area is closely related to the historical significance of the surrounding building within the marketplace is considered distinctive, and places become recognisable. The distinctiveness of streets is increased with the presence of old buildings where these buildings are a reminder of old and/ past time even though not because of its physical characters just of their presence will evoke the nostalgic memories. As people tend to have an affinity towards those place due to their special role in the past lives. As meaning is evoked by the physical form, the visual simulation in experiencing the place needs to be highlighted in the design recommendation. The creation of vista and emphasising on visual stimulation and appreciation will increase the visual memory of the place. The visual continuity of the activities between buildings and spaces will increase the sensory experience.

The main criteria that determined the experiential quality are how the activity occurs within the physical setting. The unique character of the street or square can be enhanced by introducing a high degree of sensory experience and the transparency of the activities. The physical setting for the temporal activities also must be able to support as in result will increase vitality and add vibrant to the marketplace. The increase in permeability within the marketplace and creating spatial zoning of activities will also influence in vitality and vibrant as the successful place is identified if there are a steady flow of people, a high degree of visibility and mixture types of activities and different age groups of people. The interplay of physical elements in human kinesthetic sense and exploitation of levels can be created by maximizing the impact of views and emotions in moving to space within the marketplace area. The marketplace activities that relate to what is happening in the place are an element which is associated with the town centre's identity as people remember a place due to the activities that occur in the place. The name has a strong influence in identity as it can lead to the loss of identity if the name is changed. According to Shuhana (2011), when names and cognitive schemata coincide with its physical equivalents, the environment becomes particularly clear and forceful. The model of experience can be enhancing if the original physical elements are a presence within the place. The name of *Pudu* was originally known as *"Pudoh"*; means in the Hokkien dialect is a practice describing the ancestral worship of the Chinese while in the Cantonese dialect "*Pudoh*" describes the fruit scientifically from "*Artocarpus integer"* or locally known as *"chempedak"*. The usage of indigenous planting that relates to the origin of the place name will add the sensory experience and create historical linkage.

The marketplace activities will be more prominent when the physical forms and character of sameness eventually enhance the manifestations of these activities. People's participation and involvement within the physical setting of the marketplace is limited due to lacks of physical setting that can support the alternative community or public related activities. The

sense of the vitality of the marketplace can be increased by improving the physical setting for the intended activities to take place base on the different timeframe. This study through the townscape appraisal, historical, morphology and content analysis, has acknowledged that the presence of the old market building is one of the elements that can foster and strengthen the identity of Pudu Marketplace as shown in Figure 1 and Figure 2.
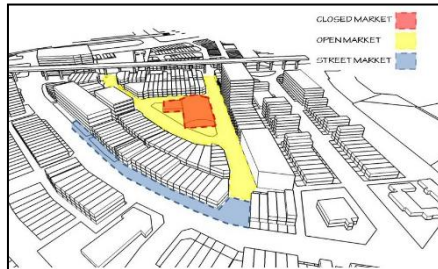

Figure 1.   The Pudu Marketplace's identity is defined

Figure 2.   Regenerating the Old market building as by regenerating the visual structure of the a square in enhancing the identity of Area.

CONCLUSIONS

In defining the identity of a place, urban designers are mainly focusing on appearance and imageability of the physical elements but fall short in integrating place meanings as indicators for place distinction. The social value of urban public spaces makes them significant within the cities due to people needs (Norsidah and Zakariya, 2014). Identity is the sameness of character that can be seen from the physical and experiential qualities of a place. As the identity of a place carries the image of what people perceived; the visual and other senses stimulation through the physical and experiential qualities of the place is being evaluated to create meaning and association to the place. Without an identity, the place is "*placelessness*" (Relph (1976).

Marketplace holds a significant importance in an urban area as it helps to develop the three corners of sustainability. The marketplace can balance the act of economic, social and environmental aspect. Marketplace reveals that a successful urban place is more than its building and its bottom line is the interaction between people and a place. The process of regenerating existing urban marketplaces should be considering the components that make them special, as not to lose the delicate characters that give each marketplace its identity and sense of place. Therefore, the identity of the marketplace will be emphasised through the quality of physical and experiential elements for marketplaces.

As most of the areas in Kuala Lumpur embrace the longing for latest development, the master plan of the Pudu Marketplace should be the datum and the balancing the act of preserving the place's identity for any reasons either for historical or for a sense of attachments. Pudu Marketplace locates in one of the earliest settlement; directly involved in the making of "Kuala Lumpur".   The area that is presently locked with attractive characters and a strong sense of identity is waiting to be enhanced; to increase the legibility of the place and need to be knit together into a vibrant, coherent and highly imageable city form through the regeneration of urban marketplace's identity.

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SD 23 - PHYSICAL DESIGN OF STREET THAT AFFECT SAFETY PERCEPTION

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ABSTRACT

Increasing and expanding of c are significant where many new buildings and mega project are concentrated in the city centre due to accessibility and connectivity to public transport. In developing new buildings or structure, the creation of street as public spaces should be part of the agenda. In order to achieve a sustainable city, many aspects of urban design need to be consider not only for new development but also the existing urban landscape. Streets are important for public life, social coherent and economic value and it's design should consider user's comfort and safety. Feeling safe is important for human wellbeing especially woman where they are vulnerable group in the society. Feeling unsafe will affect behaviour as well as quality of life. This study is focusing on safety perception on the street in Kuala Lumpur. A mixed methodology study were conducted with questionnaire survey and structured observation to obtain an in-depth scenario of the problem. 120 respondent were selected randomly on the case study area. Finding shows that the design of the street and spatial structure of the cities is effecting on safety perception. Therefore it is crucial to create a safe urban environment.

Key words: safety perception, street design, urban design, sustainable urban design, behaviour.

INTRODUCTION

The scope of this study is focusing on physical design of street that affect safety perception from women's perspective on the streets of Kuala Lumpur as perception is important due to its effect on behavior. The objective is to explore the relationship between manmade built environment, psychological and behavioural aspect of human being on the street especially women.

Historically, public spaces are important spaces in the city for many activities from economic, social and political. Public space is an outside space that people should be able to enjoy and express themselves. It should be able to enhance quality of life. In order to

achieve this objective, public space needs to perceive as safe especially for women. Development in the city centre are led by economic pressure (Mellor, 2010) in Buckingham (2013). Due to this, public space creation become thoroughfare rather than public realm. A space that belongs to pedestrian now dominated by vehicular. The overall setting of public space especially the street are affected by the design and planning of the building, landscape, maintenance, activities as well as social aspects which is the demographic changes.

There are global concerns and effort at international level pertaining to urban users in public spaces at local context, concern over safety is increasing with the incremental crime rates statistic. Malaysia's ranking in the order and security sub index of the World Justice Project (WJP) Rule of Law Index to improve from 16th position out of 97 countries in 2012/2013 to 12th position out of 99 countries in 2014. However, based on the Safety Perception Index survey series under the National Key Result Area, the number of respondents who felt safe decreased from 47.5% in 2011 to 39% in 2014.

Safety perceptions are decreasing especially in the city where lifestyle and pattern are different from rural area. City spaces are occupied day and night, therefore it should be safe enough as safety is fundamental of human rights (UN, 2005) & Roberts (2013). With the rapid urbanization, crime rates are increasing and safety is a major concern especially for women. Women are vulnerable group of user and their needs and expectations are different compared to men. The way women perceive the environment are also different, therefore it is important for urban development to consider gender planning.

There are several research carried out at international level that focused on the factors that influenced safety perception in public spaces. Brown (2013) measured the perception, gendered fear of crime in public spaces and the relationship of built environment as well as situational crime prevention. Her research findings shows that there had been some but not full integration of crime prevention through design principles in the design. Brown suggested that there is a need to extent a research on the effect of safety perceptions on user among women or general public. Sideris (2013 & 2008) measured how physical elements affect safety perception among women traveller and suggested that gendered view need to be adopt at design stage. Hong et al (2014) studied the role of the environment on perceived safety from crime and walking.

Public spaces comprises of street and square, and street is more significant in local context. The word 'street' is derived from the Latin *sternere*, to pave, and so relates to all Latin-derived words with the *str* root that are connected with buildings, with construction (Rykwert, (1978) in Anderson 1978). The very word street, as its etymology suggest, denoted a delimited surface-part of urban texture, characterised by an extended area lined with buildings on either side (Rykwert, 1978). Street has been considered as a 'symbol' of public space and always been the centre of attention. Jacobs (1961) recognised the important of street and according to Jacobs (1993) the best streets are comfortable to walk along with leisure and safety.

Physical design of street is an important aspect to explore and to make it safe as it is the backbone of a city and a space where people use on daily basis. Poorly design and maintain street might affect safety perception as well as creating a negative environment and stimulate negative behavior which leads to crime. There are eight elements of street that was studied which are; visibility, mixture of land use, lighting, accessibility, orientation, signage, vibrant activities and provision of CCTV.

METHODS

In order to evaluate the phenomenon, a mixed method study was conducted. A combination of both quantitative and qualitative method is to strengthen and to get an in-depth view of the problem. A case study approach were employed with questionnaire survey and structured observation. 120 respondent were selected in the case study area and were randomly selected. Structured observation were conducted at interval time for seven days to explore the pattern of behaviour of the pedestrian in the area. Data from both methods were combined and analysed in order to verify the analysis and to improve accuracy and validation. Triangulation has vital strengths and encourages productive research and to develop a comprehensive understanding of phenomena (Patton, 1999). Triangulation also has been viewed as a qualitative research strategy to test validity through the convergence of information from different sources. This approach is adopted as it offer a better understanding of the research problem than either method on its own (Plano & Creswell, 2007 in Xerex (2011).

Figure 1. Case study area covering four street (source:google.com)

MAIN RESULTS

Findings from both data shows that physical elements does affect safety perception. Data from questionnaire shows that respondents agree that physical elements affect their perception of safety. Physical elements are important towards women's safety where majority over 70 percents agree on all variables that has been asked in the questionnaire.

Table 1. Matrix of physical elements

Elements/ Location	Jalan Melayu	Jalan Melaka	Jalan Tun Perak	Jalan Benteng
Visibility	Obstructed	Fully visible	Fully visible	Obstructed
Mixture of land use	Variety of uses	Less variety	Variety of uses	Less variety
Lighting	Poor	Good	Fair	Poor
Accessibility	Accessible	Accessible	Accessible	Accessible
Orientation	Fair	Good	Good	Poor
Signage	Lack of signage	Lack of signage	Lack of signage	Lack of signage
Vibrant activities	Vibrant	Less vibrant	Vibrant	Less vibrant
Provision of CCTV	Lack	Moderate	Lack	Lack

The above table shows that two street are obstructed and low visibility and both streets are also poor in terms of lighting and lack of signages. Visibility is important when walking on the street especially at night. The situation is worst when the street is obstructed and there is not enough lighting provided.

Figure 2 Jalan Melayu   Jalan Benteng

Visibility at both street are obstructed by activities and at Jalan Benteng due to it's design where blank wall is facing the street. Due to this condition, it creates and attract social incivilities such as homeless and mentally ill people.
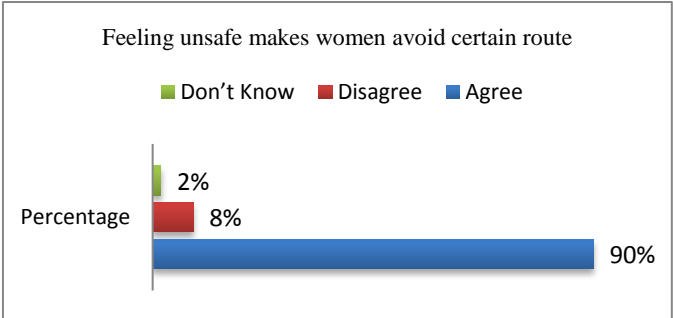


Figure 3. Jalan Melayu   Jalan Benteng

The above photos from observation shows poor lighting at both street. Women were found using this street at night heading to the nearest LRT station and other public transportation.

Figure 4. Modification of behaviour by changing walking route

According to survey, 90 percents of respondents agree that they will change their route whenever they feel unsafe in certain area, followed by 8 percents who remain walking on the same street as their route because they do not want to let their fear overcome or disturb their routine. The above findings reveals that the built environment does affect safety perception among women.
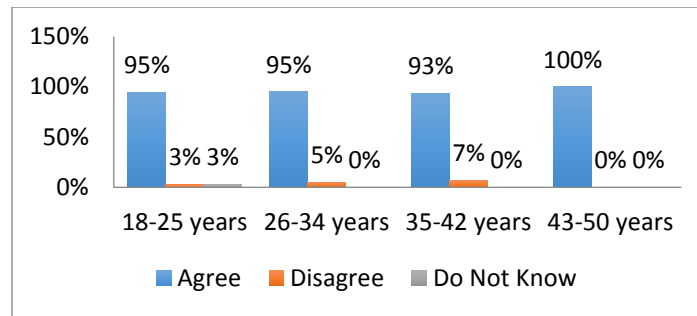
Figure 5. Cross tabulations of respondent's age on safety perception towards incivilities

The above findings shows that women in general perceive incivilities as affecting their safety perception. Older women tend to have greater fear of incivilities in the area where all of them feel that incivilities affect their perceived safety. Older women feel more vulnerable being in public places. This is strongly relevant with other research done in Australia where older women feel more insecure in transport setting. The older the women age the more vulnerable they feel due to the perception of defend less.

Base on the observation survey, it shows similar result where physical elements affect their perception. This is strongly relevant with findings from Sideris *et al* (2008). This result shows that the theory of relationship between physical incivilities and fear are related. As mentioned earlier that women tend to perceive the environment differently compared to men, the feeling of unsafe is also affecting their baheviour. Results from this study shows that most women will change their route when they feel unsafe.

CONCLUSION

This study reveals that the environment does affect safety perception especially among women. Findings from both data shows that design of the street are depending and related to buildings around it and it's treatment as well as maintenance. Built environment need to be design not only to cater for economic pressure but also the psychological aspect as whatever we design, will give long term effect to human being. This study reveals that the way we design our street and buildings around it affecting not only psychology but also behaviour where user need to change their route due to unsafe perception. Further research need to explore the effect of unsafe perception towards women in the city.

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SD 33 - THE KEY TO BE A WALKABLE CITY

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Abstract:

For more than half a century, most countries have experienced rapid urban growth. The process of urban growth has slowly changed from fineness to coarseness of urban form. Unfortunately, this has also changed the travel patterns from the traditional mode of transportation to automobile mode of transportation. Widespread ownership of automobiles has transformed with a range of environmental, social lifestyle and economic consequences. Therefore, the travel pattern had to change from automobile mode of transportation (vehicle-oriented transportation mode) to sustainable transportation approach (people-oriented transportation mode). People-oriented transportation mode is also known as walking. Walking is the most sustainable mode of transportation and one which has the least impact on the environment. It is also function as one of the major contributing factor to the creation of successful urban space for human interaction. The 'tsunami' from numbers of vehicles has destroyed the pedestrian. Lack of pedestrian is identified as one of the urban design issues concerning the city of Kuala Lumpur. Hence, this paper investigates the factors that influence people choose to walk in the city centre of Kuala Lumpur. The city centre of Kuala Lumpur is chosen as a case study because it plays a significant role and function as a major activity setting in Kuala Lumpur. This study adopts mixed method approach through questionnaire survey, combined with the qualitative method through field observation to investigate the phenomena in the study area, and content analysis of written documents. The findings show that the psychological factor is the main influential factor towards those who walks in Kuala Lumpur city centre. However, the physical factor also plays a pivotal role in moulding the urban environment to become more walkable. As a conclusion, the Kuala Lumpur city centre will achieve the concept of "walkable city" when these two influential factors are applied.

*Keywords***:** Psychological Factor, Physical Factor, Walkable City

INTRODUCTION

Urbanization refers both to a condition at a point in time and to a process occurring over time. The condition of urbanization, referred to as the level of urbanization. It is indicated by the percentage of a population that is living in urban areas (United Nations, 2015). These include migration from rural areas to urban areas, absolute growth in the urban population (urban growth). Urban growth that is faster than rural growth. Globally, more people live in urban areas than in rural areas. In 1950, 30 per cent of the world's population was urban, 54 per cent of the world's population residing in urban areas in year 2014, and by year 2050, 66 per cent of the world's population is projected to be in urban areas (refer Table 1). Locally, 67 per cent of the population in Malaysia live at the Kuala Lumpur city centre area in year 2020 (ETP, 2012). Kuala Lumpur is one of the world's key hubs for Islamic finance and has one of the faster growing economies in the world in the Asian city (Business Insider, 2016). It is shows that Malaysia has a steady increase in GDP per capita (United Nations, 2015) as people moved to Kuala Lumpur city centre. City centre plays important role especially in generating economic activity. The accessibility component is a main factor in achieving a successful economic development, population growth and others activities. A good accessibility in city centre can develop a more high-quality economic development in the city centre.

Table 1. Percentage of World's Population Residing in Urban Areas

Year	World's Population Residing in Urban Areas (%)
1950	30
2014	54
2050	66

Reference: United Nations, 2015

Since the 19th century, streets in Malaysia give more priority to the automobiles circulation (ETP, 2010). Instead of more people utilising the public transport in city centres, the opposite is true when compared to the use of personal cars (Shuhana *et. al*, 2012). People started to become dependent on the car or automobile as an alternative to move in the city centre. In the 20th century, travel patterns have changed from the traditional mode of transportation to automobile transportation. The travel patterns in most developed countries are increasingly dependent on the car (Banister, 2005; Shuhana, 2011; Shafii and Shareh Musa, 2011). As a result, in the mid-21st century, the automobile has started become an ironic icon travel pattern in the city centre. Walking is our oldest and most basic form of transportation which is now being forgotten. Recently, people seem to prefer to drive rather than walking even for short distances. Currently, Kuala Lumpur City Plan 2020 has promoted to be walkable city in the future. This is because the increased population in the cities create traffic congestion, negative impacts on the quality of life. At the same time, Kuala Lumpur has also committed to achieve a 'World Class City" through a walkable city.

There are several problems that are important to highlight on the significance of walkability in cities, such as (1) rapid urbanisation creates city centre design that gives little priority for pedestrian; (2) pedestrians being deprived of having walkable streets; and (3) lack of understanding of the factors that influence walkability. The Victoria Transport Planning Institute (VTPI) stated "walkability reflects the overall conditions in an area and this takes into consideration the quality of pedestrian facilities, road conditions, land use patterns, community support, security and comfort of walking (VTPI, 2005). Southworth (2005) defined walkability as the extent to which the built environment supports and encourages

walking by providing pedestrian comfort, convenience and safety, connecting people with varied destinations within a reasonable amount of time and effort, and offering visual interest in the journeys throughout the network. Meanwhile, according to World Bank (2009), "there are many different ways to consider 'walkability'. In many developed countries, walkability discussions focuses on encouraging mode shift from motorized to non-motorized vehicles for short trips, walking is often considered in terms of providing mobility for low income resident. Some urban planners tend to think of walkability in terms of a city's spatial land use arrangement, favouring mixed-use zoning over segregated uses. Despite all of these possibilities, the project would consider walkability only at its most basic sense: the safety, security, economy and convenience travelling by foot". Litman (2011) mentions the walkable principle is slower modes such as walking continue to be important even as faster modes are developed based on automobile travel such walk + train + bus + car + airplane + walk again to make more trips over longer distance by a combination of walking and public transport. There are different interpretation definitions of walkability. However, this paper considers walkable city as a walkable urban environment has encouraged public to walk in the city centre.
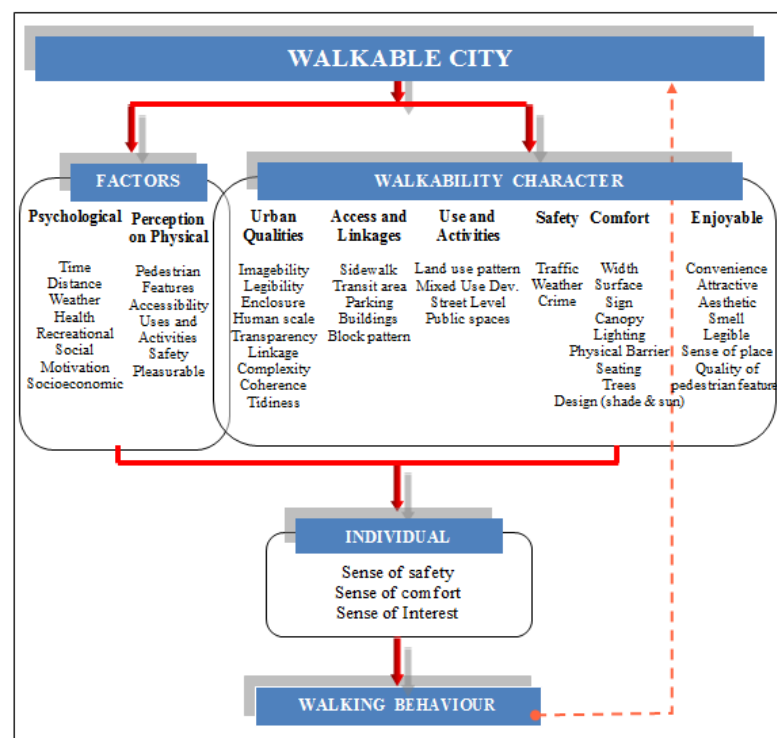

Figure 1: Theoretical Framework on Factors Influencing the Walkability Characteristic
Source: Alley (2005), World Bank (2009), Weller (2008), Krambeck (2006), NZ Transport Agency (2009)

Case Study Area
The study area is located in the city centre of Kuala Lumpur. It is chosen as the setting of investigation. Kuala Lumpur is the capital of Malaysia. According to the Kuala Lumpur Structure Plan 2020, the population target in the year 2020 is 2,200,000 populations with 243km2 land area. The Kuala Lumpur City Hall has defined Kuala Lumpur into six areas which are known as strategic zones as shown in Figure 1. The strategic zones are; City Centre (Study Area), Wangsa Maju – Maluri, Sentul – Manjalara, Damansara – Penchala,

Bukit Jalil – Seputeh and Bandar Tun Razak – Sungai Besi. The main focus of the case study is the City Centre strategic zone with 1,813 hectare of land area and the target population by 2020 is 245,600 people. With the significant number of population and employment rate which are, 438,000 employees by 2020, traffic congestion may become a major problem if the walkability aspects are not taken into the development consideration. Due to the KLCP 2020, the vision to become a developed country by the year 2020 as liveable environment that could balance all development aspects will also serve as a factor in contributing to the success of the country.

The Selection Criteria of Study Areas
The case study area is located in the city centre of Kuala Lumpur. The place is selected based on the physical, functional and social-cultural characteristic that present the character of Kuala Lumpur city centre. According to the theoretical study, these places commonly share the following characteristics: (a) Located within the main commercial nodes within Kuala Lumpur city centre; (b) Located within diverse economic activity (commercial or land marks or shopping area/historical area/ mixed use development); (c) Located within transportation transit area; (d) Receive concentration of pedestrian, shoppers and tourists.; (e) Population increase in three times in year 2020; (f) Pollution in Kuala Lumpur is polluted by vehicle movement or travel pattern; and (g) Main development impact on urban environment.

METHODS

This study adopts mixed method approach through questionnaire survey, combined with the qualitative method through field observation to investigate the phenomena in the study area, and content analysis of written documents. This study applies 4 series Likert-scale from 'strongly disagree' to 'strongly agree' (National pedestrian Survey, 2002); Chua (2008); Norsidah (2008); and Norafizah (2011). It is important to describe the factors that influence respondent to choose to walk. Based on Table 4.6, there are scale and measurement that will be analysed into analysis part.it is because, according to Chua (2006), odd numbers will increase the reliability than using even numbers that will force the respondent to agree or disagree. It is important to avoid bias from the researcher. Therefore, Likert-scale with 5 points is used to grade the scale of their perception. However, Chua (2006) stressed that Likert-scale with 5 points results mostly pointed to neutral point. The result is unreliable. In this study, the target group of respondent is public or main user within the Kuala Lumpur (KL) city centre area. The main user in this study includes the static users who are involved (daily) office workers and mobile user involving pedestrian in weekday was selected as the sample. Based on the issues highlighted, therefore the subject in this research is the public mostly, who use and whose lifestyle is exposed directly to the impact of development. This study involved probabilistic sampling involving randomly chosen sample with a certain characteristic to represent a large population (Creswell, 2007). Besides, National Survey of Pedestrian (2002) used this technique to conduct the survey. It is because the random approach also can reduce the biasness from researcher (Chua, 2006).

Therefore, this study applied stratified of the population with the character and then select randomly the respondent from the proportioned characters based on the types of respondent. this study also used the cluster sampling in the case of multiple setting so that each sample area has the same sample size (Norsidah, 2008). Cluster sampling is almost similar to stratified sampling except that the clusters are normally divided on geographical basis. According to Norsidah (2008), each cluster or sub-division in cluster sampling is able to represent the population for each place chosen as representative sample for the city centre

of Kuala Lumpur. Besides, the sample represents the same sample size in each cluster and is broadly divided into the static and mobile users so that multistage stratified (proportioned) cluster sampling was adopted to ensure that the resulting sample would be distributed in the same way as the population in terms of the stratifying criteria (National pedestrian Survey, 2002; and Bryman, 2001).

The research is concerned with the publics' problems, factors and walkability characteristic that influence them to choose to walk in the Kuala Lumpur City Centre. In this case, multistage stratified (proportioned) cluster probability sampling procedure will ensure that the selection respondents reflect the dominant characteristics of the users of the study area. Since the population involved is varied, the key users of the public need to be identified within clustered as samples to represent whole population of Kuala Lumpur City Centre. Therefore, the survey is divided into five zones within Kuala Lumpur City Centre which are Ampang Zone, Bukit Bintang Zone, Kampung Baru Zone, Pudu Zone and Raja Laut Zone. There are 80 respondents (20%, static user; 80% mobile user) within each zone (refer also Figure 4.4).

FINDINGS AND ARGUMENT

The majority of respondents in this research are employed but not residing in the Kuala Lumpur City Centre area. It shows that there is a need to travel almost every day in the city centre. Nevertheless, the respondents prefer to travel using private transport to get to the office because they prefer to travel in a comfortable condition i.e. do not have to crowd with other passengers. The situation happens when they are influenced by the psychological factor to choose to walk in the centre area. This study suggests that the majority of respondents have negative impression to walk in the Kuala Lumpur City Centre and practice less active lifestyle. They prefer to depend on private transport to travel in the city centre. The respondents are able to walk for less than 5 minutes which limits their ability to walk long distance and able to keep practices less active life style. Rapid urbanisation creates a city centre design that gives little priority for pedestrian will be extended as an issue in the future. Based on the findings, streets in Malaysia today give priority to vehicular circulation and no longer function as an urban space for human interaction. Indeed, the respondents also depend more on private vehicle compared to the public transportation. Yet, the psychological factor is also interpreted by the physical factor. As mentioned earlier, there are strong relationships between the psychological and physical factors. The people are motivated by a hierarchy of needs at different group levels. These are also related to the psychology and physical environment factors that people consider when making decision on whether to walk.

It is not one way but two-way consideration of factors. The key factor that influences the public to choose to walk in the city centre is the psychological factor. The physical factor is influenced by the psychological factor and the physical factor shapes the walkable environment that encourages walkability to the level of walkable city. As stated before, there are two main factors that influence the public to choose to walk in the city centre. However, in order to identify and examine the psychological and physical factors in choosing to walk in the city, there must also be 'upgrading' in the publics' awareness (psychological or motivation) and perception (physical factors) towards a walkable city. Therefore, there are six (6) factors that consist of psychological factors and six (6) physical factors identified from the theoretical framework. These constraints are attributed to various factors that are

summarized under the 6 key factors outlined. The main problem is that the public has no motivation to walk in the city and awareness at the individual level.

Lack of motivation to walk
Even though the majority of respondents agree that walking is a meaningful routine, the majority of respondents prefer to drive to get to the office. It is also discovered that the respondents are able to deal with traffic congestion during peak hours along with the long journey time. This preference is also because there are good facilities to park private transport and the willingness to spend an amount of money for parking facilities compared to the lack of pedestrian facilities. Other than time, the respondents also prefer to drive private transport to get to the office in the KL city centre. This relates to the public motivation or self-awareness, where the respondents state that walking makes they tired, sweaty and they do not consider it as light or recreational activity. The respondents also choose to walk within 5 minute walking duration. The result shows that the respondents are lazy to walk as life is made easier to depend on machines and people do not need to move. It is certainly an issue when passive lifestyle dominates and obesity level increases. As mentioned in the problem statement, it is not only the Health Ministry or doctor's responsibility to address this issue but this role is also shared by the urban designer to design proper urban space.
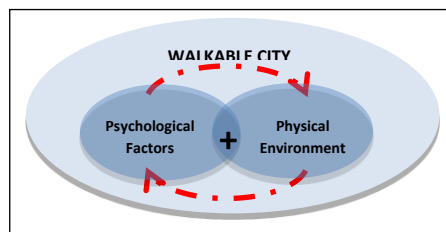

Figure 2: Factors İnfluencing The Public to Choose to Walk in The City Centre

CONCLUSIONS

This paper provides integrative theoretical and experiential approaches that are crucial to the practice of walkable city that consist of the problem, factor and characteristics of the public in the Kuala Lumpur city centre. There are two factors that influence the public to choose to walk in the Kuala Lumpur city centre. The main factors that influence the public to choose to walk are the psychological factors that are perceived as the components of the physical factor. However, there are significant factors to each other. In promoting walking and the aspiration to become a walkable city stems from the recognition that attractive and economically thriving cities are those that encourage public life and recreation. Kuala Lumpur City Centre has many attributes which contribute to making a city walkable. One of the most important attributes is the quality of public and physical environment, the way it contributes to character, promotes pedestrian activity and connectivity and encourages people to spend time within the city centre. Consequently, a walkable city comes when the public and walkable urban environment are readily to walk.

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SD 39 - THE CHALLENGES OF URBAN DEVELOPMENT IN IRAN, FOCUSING ON THE CITY OF KERMANSHAH

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ABSTRACT

After Industrial Revolution and changes in the world's manufacturing connections, the relationship between human and environment has dramatically been changed. Being in a strategic status, the rural population met the proper capacity to be placed in another concept of living called "the city". Like many other developing countries, the changes in Iran's urbanization process were formed after the land reform and emergence of assembly industries, particularly with the increasingly prominent role of the oil industry which fundamentally changed the rural-urban relationships and caused an unbalanced distribution of urban-rural revenues and pushed more the rural-urban migrations. Kermanshah, as one of the provincial cities in the western part of Iran, has been selected as the case study of this research to study the challenges of urban development in Iran through documents analysis. The results show that Kermanshah faced major challenges of spatial inequality in urban development as the results of rapid urbanization, rising urban poverty and lack of well-governed and managed urban areas

Keywords: Challenges of Urban development, Urbanization, informal settlements, Iran, Kermanshah

INTRODUCTION

Today, the largest urban agglomerations in the world are mainly in the South. More importantly, based on the UN-Habitat, cities in the developing world will absorb 95% of urban growth in the next two decadesi. This growth is mainly in line with large and megacities, where major consumers of energy and generators of pollution were resided. Within these cities, the major problem of developing countries is the division between rich and poor which continue to widenii. One in six people live in disgraceful conditions in overcrowded urban slumsiii. Like many other developing countries, the changes in Iran's urbanization process were initiated by modernization policy adopted under Reżā Shah (1925-41) and later on by the land reform and emergence of assembly industries, particularly with the increasingly prominent role of the oil industry which fundamentally changed the

rural-urban relationships and caused an unbalanced distribution of urban-rural revenues and pushed more the rural-urban migrations. This transformed the urban areas to the engines of growth and beacons of opportunity and, thus, they account for the vast majority of economic output. The apparent outcome of this change was the extension of urbanization, a trend is still rapidly continuing in Iran.

Kermanshah, as a provincial city in the western part of Iran had been a city of considerable historical importance (figure 1). Due to its location along the Silk Road, the city has had a strong link with Iranian plateau and the plains of Mesopotamia. However, this situation and its role have been diminished due to the course of time and changes happened in the last century with the advent of modernization in Iran. After the Islamic Revolution of 1979 and particularly the eight-year war with Iraq, Kermanshah suffered from major challenges of migration and rapid population growth caused by the war and its proximity to the border of Iraq. In addition, it faced with investment recession and high rate of unemployment which still suffers from it. Although Kermanshah is now a metropolitan city in Iran and the main hub for southwest and west migrants, especially new arrivals, it is also a city of emigration to more economically vital cities in Iran. The result of these changes particularly high rate of migration to the city has been an inability of urban services to keep pace with the population growth and the consequent spread of informal settlements and spatial inequality. Considering these points, this article aims to identify the key forces and processes underlying the economic, social and physical changes happened in the course of time and to examine the major challenges of contemporary and future of urban growth of Kermanshah. To do these, the article first review the city's historical development, an account of contemporary conditions, and then a critical review of its socio-spatial challenges through document analysis, and finally the concluding remarks.

HISTORICAL BACKGROUND

The Zagros region, as the geophysical context of Kermanshah, had been an area for the development of multiple human communities and different lifestyles due to its geographical conditionsiv. Most "historians and archaeologists attribute the origin and foundation of Kermanshah city to the Sassanid era" (224–651 AD)v. After Islam, "Kermanshah was still military and economically important because of its location at the intersection of the great highway linking Baghdad to Khurasan with trade route to Tabriz and Ardabil"vi. Due to the Mongol invasion in the 12th century, the city was heavily damaged and its habitants massacred and "what had been a medium-size town was merely a village"vii. In the later centuries of the Islamic era, Kermanshah suffered from frequent ups and downs and the city was destroyed and re-established many timesviii. In the Qajar period (1785 to 1925), Kermanshah experienced a relatively flourishing time due to its location along the road from Tehran to Karbalaix. In this period, the city wall was enlarged by new fortress, and it contained caravansaries and houses for merchantsx. In Pahlavi period (1921-1941) a series of political, economic and social changes such as the settlement of the tribes (Takhteh Qapu), the development of infrastructures, the formulation of new laws including the Law of Compulsory Military Service and the familiarity of rural young people with urban life, the development of governmental centers, the formation of industries significantly influenced the process of urbanization. Beside all the difficulties the city faced, the decade from 1956 to 1966 can be considered as the years of urban rapid growth. Nowadays, the city of Kermanshah has become a metropolis in the west of Iran that faces with a variety of socio-spatial problems and issues, particularly the growth of informal settlements.

DEMOGRAPHIC CHANGES

In the first population and housing census in 1956, the population of Kermanshah city was recorded as 125,439 people and in the last census in 2011, this reached to 851,405 (table 1). In the period 1956-1966, it experienced a highest rate of population growth which was 6.5 per cent (table 2). This rate can be linked to the rural migrations from the region and war refugees from the border areas. On the contrary, this population rate reduced to 2.14 per cent in the period 1985-1995. Based on the population and housing census of 2011, the city of Kermanshah as the largest population center in Kermanshah province contained 43 percent of the total population of the province. Also considering the last census, Kermanshah city is the second most populous city in the West and North West of Iran after Tabriz, and is ranked eighth in Iran's population ranking.

Table 1. The demographic changes of Kermanshah city and its province during seven periods of the national population and housing census (1956-2011).

	1956	1966	1976	1986	1996	2006	2011
City	125439	187930	297315	560514	692986	794863	851405
Provincexi	1376989	776409	1042268	1474257	1778569	1879385	1945227

Source: General population and housing census results, 1956-2011

Table 2. Annual population rate (in percent) of Kermanshah city and its province during six periods of national population and housing census (1956-2011).

	1956-1966	1966-1976	1976-1986	1986-1996	1996-2006	2006-2011
City	4/69	4/69	6/55	2/14	1/38	1/38
Province	5/57-	2/87	3/65	1/97	0/55	0/69

Source: General population and housing census results, 1956-2011

URBAN ECONOMY

As the city was located on the strategic commercial and pilgrimage travel route linking Mesopotamia to the Iranian plateau, most of the traditional bazaar facilities and infrastructures are the results of such location. Moreover, the city was also a regional center for the collection and distribution of commercial commodities. Both these functions contributed to the prosperity and flourishing of the market economy, and consequently to the urban development of Kermanshah. From 1920 onwards, the beginning of the Iran's modernization and "the construction of new streets led to an organizational review of the distribution of commercial activities and consequently gave rise to the extension of commercial, economic and social activities in the city"xii.

Kermanshah's development process declined after the coup of 28 Mordad (18 August, 1953) due to the political conditions and the economic recession of the first decade of 1952. However, from the 1961 onwards, the social and economic modernization process of the country and consequently that of the Kermanshah was intensified due to the sudden increase in oil prices and oil revenues, and the city enjoyed considerable growth in terms of industrial and economic activities and services.

URBAN DEVELOPMENT

The earliest map of the city dates back to 1850 drawn by Russian surveyors. Based on this map, the old city of Kermanshah contained seven gates (figure 2) which show its commercial privileged location along the Silk Road towards Iranian plateau and the plains of Mesopotamia. The second visual document of the city was provided by English expeditionary forces involved in Mesopotamia in 1919 (figure 3). This map is a good basis for the delimitation of the old town and the city's growth in the period of modernization.

Figure 2: Seven Gates of Kermanshah in 1850 and its map in 1919
Sources, left: Mehriar, Shamil et al., 1998xiii, middle: Gharavi et al., 2009, left: and Clarke and Clarke, 1969: 29

In the first Pahlavi dynasty (1921-1941), the epic of modernization, which brought forward the western style of urban planning and design, transformed the traditional face of the city by imposing new network of wide streets based on axially in 1935. This replaced the twisted and organic alleys and thoroughfares which changed the morphology of the city's entire urban area. In this period, the main square of Kermanshah (Sabzeh Maidan) disappeared and the bazaar divided into several parts and the new three parallel streets became the backbone of urban traffic. Today, these three streets (Javanshir, Modarres, and Jalili) formed the backbone of city structure for urban transportation.

From 1921 to 1966, the city experienced relatively a slow growth. More importantly, the main feature of this period was extensive intervention in the old fabric of the city to upgrade the city's traffic network to ease the flow of vehicles. At the end of this period, the conditions gradually changed due to the city growth resulted from migration of the people from rural areas to the city particularly "to the assembly industries"xiv. During 1966-1976, the city growth was mainly influenced by the oil economy and the changes happened in the national economy. City's physical growth occurred in the north side of the city particularly in the farmlands. They were quickly turned into residential districts. In this period, based on the guidelines of the comprehensive plan, urban sprawl with low-density patterns of physical development became the dominant mode of urban development. In the period 1976-1986, the city rapid growth continued, and several new towns with new planning style founded based on the grid pattern, and the spaces between developed sites and old neighborhoods gradually filled. Due to the transition period of revolution and the start of Iran-Iraq war, the uncontrolled and unauthorized growth led to the construction of informal settlements and the most important parts of them created in this period.

In the recent decades, in total, the rapid growth of the city was associated with formal housing and urban planning policies, and the informal trend of housing construction. This rapid growth has faced the city with serious problems. On the southern and northern parts, the topographic constrains, and on the eastern and western parts, the military and industrial sites limited the city's horizontal expansion. Although the land development projects are still underway on the western and eastern parts, the excessive horizontal growth of the city created great problems regarding the approach of sustainable city. For this reason, increasing building density is a new policy for city's authorities to cope with the housing needs. In recent years, following the Mehr housing policy lunched by the government to provide housing for poor and low-income social groups, city growth continued on the suburb, particularly on the steep slopes as a fragmented patchwork of suburban districts.

URBAN CHALLENGES

Like other Iranian cities, Kermanshah experienced an accelerating growth of urbanization in recent decades. This growth was to such an extent that the city's authorities were unable to provide the required infrastructure and facilities. Therefore, many problems emerged and a major part of the city's capital and resources invested to reduce or eliminate these problems in the past few decades.

Although the city council established in 1999 to pave the way for local government, a unified local government remained unsolved due to the weak and restricted function of city council and mayor's office in the provision of water, sewerage, electricity, education, and so on, all of which are directly managed by other lines of governmental ministries. From people's point of view, the mayor's office is still a part of the government and its budget should be provided by the government. Due to such problems and the dependency of urban management system, particularly the mayor's office, on oil revenues, the mayor is more accountable to the government than the council and thus the participation of local communities has become very low. In addition, due to the unstable of governmental funding and weak economic base of the city and its financial sustainability, the Kermanshah municipality faced another problem in relation to the inefficient employees.

According to the resent research, there are twenty three impoverished neighborhoods in Kermanshah which contained more than 280000 peoples in 2011xv. This means that about 34 per cent of Kermanshah Population are living in such settlements namely as informal settlements. Apart from the problems associated with quantitative and qualitative aspects of housing, the main challenges of informal settlements can be related to unemployment, low income and social problems such as drug, crime and domestic violence. These issues, in turn, would result in reproduction of poverty and thus acceleration of informal settlement expansion within the city or in suburb.

The city center of Kermanshah is still suffering from traffic problems associated with the capacity of urban streets network. Although city authorities tried to do some changes and reconstruction on some of the streets to ease the car movement to the city center, the challenge has not as yet been resolved due to the lack of enough budget for property acquisition, innovative participatory plans and that the Kermansha is still a car-dominated city. Air pollution is another problem in the city of Kermanshah. The most common sources of air pollution include the burning of fossil fuels in factories, automobiles and other forms

of transportation. In the resent years, however, dust storms became a major source of air pollution in the city.

According to data provided by Kermanshah Organization of Revitalization and Renovation, the old and dilapidated areas of the city contained 1228 ha which covers almost 11 percent of Kermanshah city area. This part of the city can be recognized based on the three factors of instability, problems of accessibility and impermeability. In addition to the physical problems, this part also contained some major socio-economic problems including high rate of unemployment and economic recession, the concentration of low-income and mostly immigrant households, immigration of original inhabitants, pollution, traffic problems, and lack of safety and security.

CONCLUDING REMARK

In this article, we have tried to set out the main challenges that the city of Kermanshah faced in terms of urban development. What it highlights is that Kermanshah faced major challenges of spatial inequality, lack of a strong formal economic base drove the great majority of people to live in informal slums and survive in the informal economy, traffic and urban transportation issues, air pollution and environmental deterioration in urban development as the results of rapid urbanization, rising urban poverty and lack of well-governed and managed urban areas. This is mainly exacerbated by the lack of a unified local government due to the weak and restricted function of the city council and mayor's office in the provision of water, sewerage, electricity, education, and so on, all of which are directly managed by other lines of governmental ministries. This requires visionary leadership with the ability to adapt to change, skilled management, new sources of funding and financing for infrastructure and services, strong governance, and long term investment in basic services to generate sustainable urban environments. This means that the city leader should goes beyond the duration of their term with a capable urban management team, clear performance metrics and accountabilities as well as alliances with civil society and business stakeholders. For fiscal resources, the local government should rely on the local communities' participation and its capacity by increasing their transparency, responsibility and accountability. Apart from these, as Hall stated, the technological approach will be another way to cope with the problem of informal economy which allow poor citizens to get access to phones, internet and to the outside world for culture and business purposes[xvi]. The increased connectivity also improve the capacity of civil society to monitor the governance of their elected officials while reaching out and discovering best practices[xvii]. In addition, the informal economy should be progressively formalized by strengthening the relationships with the mainstream economy.

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SD 5 - AN ASSESSMENT OF QUALITY OF SPACE THROUGH THE USER'S PERCEPTION TO IMPROVE PHYSICAL ENVIRONMENT

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ABSTRACT

The user-centered approach has been changing the way of the city and urban planning today. Unlike a traditional one, this approach begins with an investigation of the place usage and expectation of the end-users. As the users perceive an environment different from the architectural creators, their perception depends on purposes and how it could be utilized so that the real needs could be found there and could lead to efficient solutions. The principal aims of this study including identification a potentiality of an existing campus environment for further development and suggestion to improve its quality. This study investigated the perception of campus environment on users with diverse cultures and backgrounds. A drawing participation method was used to collect data of users' expectation of the actual physical condition. The result shown campus spaces were used in various ways. Furthermore, the needs more open and green spaces for studying, recreation, and leisure activities were reflected. When comparing with an existing physical condition, its quality was revealed which viewing and accessibility to the spaces should be considered for the improvement. Further study could explore in more depth and a wide range of users.

Keywords: The user-centered, Environmental perception, A drawing participation method, Quality of space

INTRODUCTION

People are using and perceiving spaces differently regard to their cultures and experiences (Loukaitou-Sideris 1995; Fraser et al. 2013) and since people do not directly recognize, rather they indirectly perceive its quality through the outcome which means to them (Gifford 2002) results in perceiving physical environment in different ways according to different desires of people. However, the environmental perception of people is useful and can become more dynamic when considering human activity which could impact on the environment. Since it can indicate causes, means, and results of the action which relates to an actual situation of the environment as well as desires and needs for a future situation (Hynek 1985, 174).

In recent day, better approaches to gain ideas and knowledge have been sought from various fields in order to enhance efficiency in design and planning physical environment. On the one hand, it has been done by evaluating quality of existing physical conditions through

various tools and assessments in many studies such as visual assessment, field survey, etc. (see Wells and Evans 2003; Ulrich 1984) while many studies have moved beyond knowledge of scholars to gain ideas from the user through participatory approach in order to reassure that the real and mutual needs are reached. As people are living there and using its resources, they know how to use and organize resources through the perception of utilization from the past (Whyte 1977, 14). Thus, it could be achieved with a dialogue of the inhabitants since cities are best to understand by its people and people know what and how their city can serve them. As Jacobs (1961) asserted in her famous book 'The death and life of great American cities' – "City have the capability of providing something for everybody, only because, and only when they are created by everybody." (p. 238). As the result, the efficiency of design and planning should be based on people and it is necessary to understand users' perceptions, preferences, and images of themselves and other users in their present and desired environment because this reflection of the end user can indicate the efficiency of planning (Aitken et al. 1989 cited in Fenster 2014). Moreover, associating with physical condition assessment may lead a significant determinant to become more explicitly.

As a community, 'Campus' is like a small city. It is sharing a similarity of city's socio-physical system, consisting physical elements; buildings, roads, and spaces, and providing functions of living and working as cities. Nowadays, an academic institution has gone beyond a place of teaching and learning facilities to considering on campus life by providing physical spaces for their diverse inhabitants to use in order to make them feel they experience a good quality of life. However, the place usage may not just occur alone since it has a strong relationship with quality of physical environment which is consist of; Accessibility, Availability, Safe and Comfort, and Viewing (Gehl 1996; Whyte 2004; Lang 2005). In a logical sense, the place usage is directly influenced by the quality of a physical environment, for instance, people will attempt to use a particular place more frequently if they perceive it's a better quality. As the result, the perception of the user should be understood due to it is essential and it can produce useful information which could reflect the real needs of the user and could be incorporated into design and decision-making in order to improve the physical condition of the environment. In this paper, the physical conditions assessment will be performed simultaneously with an art participatory drawing of students (the predominant user of a place) to determined and compared the quality of space as the environmental perception in the campus environment.

METHODS

Site of Study

In this paper, we used Saga University, Honjo campus, located in Saga Prefecture, Japan as a site of study. In the campus area, consists of various buildings for education and administration, outdoor spaces, and natural greenspace. For greenspace area, there are different size of green spaces scattering all over the campus area. However, there is only one large greenspace located in the middle of the campus area. This greenspace is adjacent to the main cafeteria and the main road and has a small canal pass along at one side which the canal serves as a boundary line separate the area with a tennis court. This greenspace performs as the main green area providing space for leisure, recreation, and social activities for campus inhabitants while providing greenery vision for the passerby.
In terms of the policy of the university, like other universities, its policy of internationalization has brought students from all over the world living together in one place. As the policy has brought multicultural atmosphere into campus, it is beneficial to all

students which they could learn and gain experiences from the multicultural environment. As the result, the university endeavor to maintain their relationship with university partners in order to sustain the number of foreign students while providing spaces for them to meet and interact with local students.

Analysis Method

In this study, we investigated needs and expectation of students, as a predominant user, who is living in and using campus space by using a drawing of desire space as a tool to reflect their environmental perception of campus which we believed that drawing not only can reflect perception of actual physical condition, but also can reflect a certain needs and expectation of its users on a certain place. Moreover, by adopting this method and associating with data collected from an actual physical condition, we can create efficient solutions which derived from the assessment and user's ideas and can be used to improve physical environment which will be mutual benefits for the user.

Data collection in this study was conducted in two phases. Firstly, to investigate user' environmental perception, qualitative data were obtained from three pictures drawn by eight participants from different countries (2 Japanese, 3 Thai, 1 Vietnamese, 1 Finnish, and 1 Sri Lankan) who voluntarily took part at a participatory event which took place in the site of study, Japan. Secondly, to evaluate the quality of outdoor greenspace in campus, the main greenspace which located in the middle of campus area was selected as a sample area due to it is the largest greenspace which can provide various activities for many users. The data of its physical condition was collected through field surveys and visual assessment using quality of outdoor space assessment consist of; 1) **Accessibility** determined by the space which is easy to enter without requiring major commitment or having a financial or physical barrier. Moreover, it links with other places/spaces to provide flow of people in and out of the space, 2) **Availability** determined by the space which has long opening hour and encourage diverse activities to occur, 3) **Safe and Comfort** which the space could provide a sense of safety and comfort with lighting and soft elements such as hedges, green yard, and shade tree. Furthermore, it should not be overprotected by guardians or hard elements such as safety camera, opaque wall, fence, etc. since it could make people feel uncomfortable and obstruct vision to and from outside, and 4) **Viewing** which people in the space are provided a view of seeing other people and distractions such as public art, fountains, flowers, garden, etc. Then this comparison result will be discussed, consequently according to the assessment's issues.
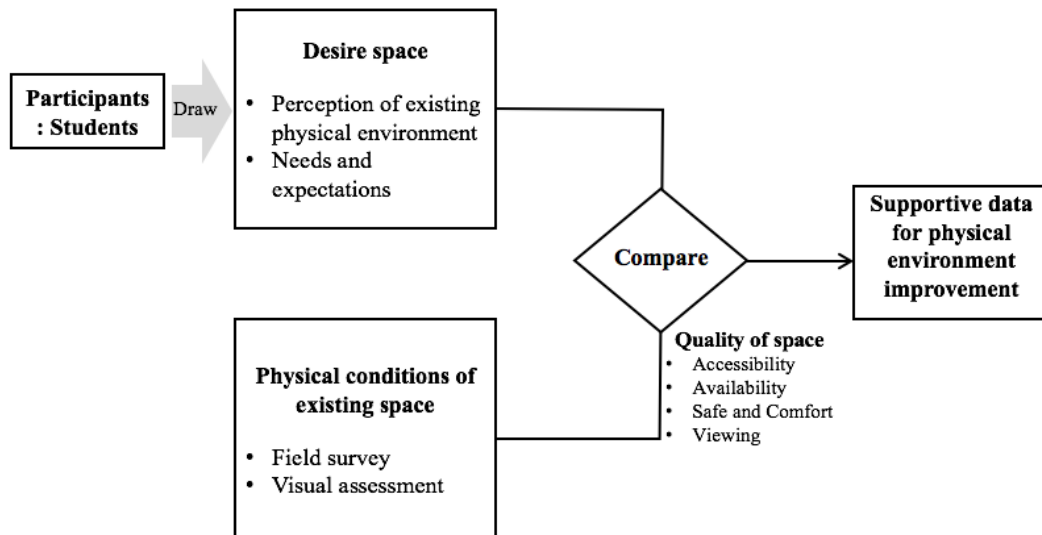
Figure 1. Analysis method (Source: Authors)

RESULT AND DISCUSSION

Findings based on drawing pictures

The result indicated the needs of outdoor greenspace for various activities in all three drawings (see Figure 2(a), (b), and (c)) which activities were different regard to students' cultures. In the need of greenspace detail, a notable result has shown natural greenspace with a river, mountain, green yard, and trees were mainly needed for them. Additionally, the need of view from buildings has been reflected in Figure 2(b) and the need of additional public places also reflected in Figure 2(b) and 2(c).

Findings based on field surveys

The existing greenspace in the site of the study was used for sitting, eating, chatting, or doing homework, mostly by students. Many shade tree and benches are scattering arranged all over the area providing lingering spaces for its users. There is a small canal pass along at one side which serves as a boundary line separate the area with a tennis court and it is surrounded by fences, hedges and small trees including cherry blossom trees.

For its availability, because this space is an open space so that it can be used for all day long and opens for all people. This space is safe for people since people who use can be seen from outside due to its location in the middle of campus area and is adjacent to the cafeteria and the main road. It also provides comfort for people due to a plenty of shade tree and green yard. However, when concerning with its accessibility and viewing, there are some signal elements which imply prohibition such as fences and hedges (see Figure 3(a), (b), and (c)) which could restrict people access to some space such as the canal, moreover restrict the viewing from and to the outside.

Figure 2. Participants' drawings of desire space (Source: Authors)

Figure 3. (a) the canal and its surrounding, (b) the greenspace and the canal view which obstructed by hedges, (c) the canal located between the greenspace and a tennis court (Source: Authors)

DISCUSSION

The result showed that the data obtained from the drawings of desire space correspond to the quality of space assessment. It indicates both the potentiality of existing greenspace and its quality which should be improved. This study suggested that to enhance the quality of the greenspace to respond the need of the user. The quality of space has been reflected according to this study's comparison method, the needs to Accessibility and get close to natural greenspace including water were reflected in all drawings (see Figure 2) while there were several elements in the site of study which obstruct Accessibility to the canal such as fences and hedges (see Figure 3). Availability of greenspace is also needed for various activities such as recreation and leisure activities (see Figure 2), an art exhibition (see Figure 2(c)) and additional public places for gathering and scenic point (see Figure 2). However, there are a small number of general activities occurred in the site of study, for instance, the place is used for sitting, eating, chatting, or doing homework. The need of Comfort has been reflected through the need of seating near water scenic point (see Figure 2). However, there is a small number of seating scattering around on the site of study while no seating near the canal. Additionally, the need of viewing from buildings was significantly reflected in Figure 2(b), moreover, the need of water viewing was also shown in Figure 2(b) and (c).

Finally, the result has indicated Accessibility is the most priority and need to be considered. Therefore, the design should be reconsidered Accessibility and Viewing to nature in order to provide beneficial effects such as a feeling of comfort and stress restoration, moreover, to improve Availability and encouraging more activities. It could be done by providing greenspace all over campus area including spaces between buildings and interior. Furthermore, it is important to redesign Accessibility to the canal since it can provide a

feeling of comfort and people can get benefit from it by just looking or touching of the nature (Whyte 2004).

CONCLUSION

This paper presents the correspondence between data obtained from field surveys of quality of outdoor greenspace in the campus environment and the data drawings of participants' desire space which can reflect the users' perception of the physical environment and their needs and expectation. This can be used in improving existing physical conditions according to the assessment.

The result from the drawings has also shown the human needs of the natural environment and accessible to the greenspace. As they can perceive benefits from nature which can strengthen their physical and mental health. In addition, its beneficial effect to reduce stress from working and studying and recovery from fatigue (Ulrich 1984; Kaplan 1989) so that an explanation of the need of natural environment can be explained here.

The result from this study reflected the requirement of people who live in the same environment which may help planner and designer to pursuit the real need of the community. This requirement may very simple and could derive from the dialogue of the end users. When associating with the assessment of actual physical condition, it can help to identify a significant determinant with more precisely and leads to better solutions to improve its quality. Therefore, to enhance design achievement, it is important to facilitate user participation in order to ensure that it could meet the real needs and virtually utilize the users. Our analysis reveals how the perception of users can reflect their real needs which are useful and can be used to support in designing and planning process. However, there are various participation methods which could combine with the visual assessment to achieve this goal. Further studies should be done in more depth and a wide range of users which will benefit and be meaningful for all.

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SD 15 - SOCIAL CAPITAL AMONG AGEING RESIDENTS OF HOUSING COMPLEXES IN SUBURBAN TOKYO – THE CASE OF HARAICHI-DANCHI AND OYAMADAI-DANCHI IN AGEO CITY

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ABSTRACT

Globally, developed nations such as Japan are currently facing an ageing population. The health and social care system in the living environment for the elderly population in Japan is important to develop strong social ties and social networks that can connect the elderly people and promote active ageing. This paper aims to identify the extent of social capital among the ageing population in Haraichi-danchi and Oyamadai-danchi, which are housing complexes located in Ageo City, a suburb of Tokyo. The people in the 60s and 70s age groups are focused on in this paper. A questionnaire survey, divided into three parts; the basic attributes of the residents, the elements of bonding social capital and bridging social capital was conducted. Then, cross-tabulations were done between age groups and both the social capital categories. Next, chi-square and further post-hoc analyses were conducted to determine the strongest association between the variables. The results show significant association between the 60s and 70s age groups for both bonding and bridging social capital. The variation of results may be influenced by the physical environment of the housing complexes that they are living in now. Future research on the physical environment of housing complexes that influences the community's social capital will be conducted.

Key words: Super-aged society, active ageing, social capital, housing complexes, suburban

INTRODUCTION

Japan, as one of the world's developed nations, has seen the percentage of its elderly population (aged 65 and older) increase from 19.8% in 2005 to 26.3% in 2015 (World Bank, 2016), thus making it the country with the highest ratio of ageing population, against the country's total population in the world. To cater to this trend, a shift towards focusing on planning for the ageing population in all sectors of development is needed such as social, health and even the physical built environment. This study will focus on the extent of social capital among the ageing population in Haraichi-danchi and Oyamadai-danchi, which are housing complexes located in Ageo City, a suburb of Tokyo. Social capital in the ageing society is important to promote active ageing (Aminjafari et al., 2016). Thus, it is important to create a strong social capital, which can be further understood by the three main domains by Putnam (2000), which are bonding, bridging and linking social capital. Bonding is associated with the relationship between the community members with the same

demographic characteristics and socio-financial positions (Babaei et al., 2012), which often includes family and friend relationships (Twigger-Ross et al., 2003). Bridging social capital, is based on the connections between community members that do not have similar characteristics such as age, socio-economic status, ethnicity; and education (Szreter & Woolcock, 2004). Babaei et al. (2012) defined linking social capital as the linking relationship among groups or individuals with power, authority, and access to key resources, especially in situations such as formal decision-making processes. This paper focuses only on two elements of social capital which are bonding and bridging. Table 1 below shows the detailed classification.

Table 1. Classification of bonding and bridging social capital context

Bonding Social Capital	Bridging Social Capital
Presence of reliable person	Participation in neighbourhood association
Relationship with neighbours	Recognition on neighbourhood association activities
Communication exchanges between neighbours	Necessity to join neighbourhood association
	Experience of stairs committee*
Necessity for communication exchanges in housing complexes	Participation in volunteering activities
	Participation in disaster prevention training
	Awareness on voluntary disaster prevention training

*Stairs committee: A small informal floor committee in each blocks of the housing complexes

Two housing complexes, Haraichi-danchi and Oyamadai-danchi, were chosen as the research sites; these are public housing complexes constructed and managed by the Urban Renaissance (UR) agency in Japan. Located in Ageo City of Saitama Prefecture, currently there are approximately 2,781 residents and 1,532 households in Haraichi-danchi and approximately 3,005 residents and 1,741 households in Oyamadai-danchi. The two housing complexes were chosen as research site because the percentage of elderly residents out of the total residents was quite high in both, about 35.3% and 41.2%, respectively. Danchi means housing complex in Japan, and the main feature of the 5-storey housing complexes was that no elevators were provided in them. Hence, there was no need for outer or inner corridors connecting all apartment units on a floor, so outer staircases were built to connect two apartment units on one floor.

For this paper, the age groups involved are the 60s and 70s age groups which are considered as young-old and old-old age groups, respectively. The age group of 80s is not included because of the limited number of respondents in this age group in both the housing complexes. A questionnaire survey was conducted and divided into three parts; the basic attributes of residents, the elements of bonding social capital and bridging social capital. In the analysis stage of the study, cross-tabulation was done between the two variables of the elderly age group and the social capital attributes, bonding and bridging. Then, chi-square analyses were conducted to know whether the two attributes were associated. The next step involves further post-hoc analyses, which obtain the adjusted residuals to know which combination in the cross-tabulation has the strongest association.

MAIN RESULTS

From the analyses, significant associations were found for both bonding and bridging among the 60s and 70s age groups in both the housing complexes. For bonding social capital, the people in the 60s age group tended to have at least one person to rely on. They greeted their neighbours on a daily basis. The people in the 70s age group tended to have several people to rely on and tended to chat with their neighbours on a daily basis.

For bridging social capital, those in the 60s age group joined the neighbourhood association, participated in volunteer activities, had experienced being members of the stairs committee and had the desire to participate in disaster prevention training if it was convenient for them to spare time. For those in the 70s age group, even though there was no significant association found for joining the neighbourhood association, they tended to know very well about the activities conducted by the association and they thought that it was necessary to join the association. Similar to the people in the 60s age group, the people in the 70s age group also had experienced being members of the stairs committee. From the main results obtained, it is understood that most people in their 60s and 70s tended to show some significant bonding and bridging social capital; however this was not always the case for both Haraichi-danchi and Oyamadai-danchi.

The major similarities among adults in the two housing complexes were that the people in their 60s tended to participate more in bridging activities and those in their 70s tended to have several people to rely on for bonding social capital. On the contrary, the major differences between the two housing complexes is that the people in their 70s in Haraichi-danchi tended to be aware of the community activities conducted, even though they did not join the association, whereas the people in their 70s in Oyamadai-danchi did not show any significant association for bridging social capital.

CONCLUSION

In conclusion, this research has achieved its purpose of distinguishing the distinct features of elderly groups in Haraichi-danchi and Oyamadai-danchi. From the significant similar findings observed in Haraichi-danchi and Oyamadai-danchi, further investigation on how to strengthen the bonding and bridging social capital, especially among the groups of people in their 60s and 70s, in both housing complexes by looking in terms of physical neighbourhood environment can be conducted. Thus, future research on the physical neighbourhood environment that influences the community's social capital especially among the ageing population needs to be conducted.

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SD17 - MALAYSIA EFFORTS IN TRANSFORMING MELAKA INTO RESILIENT CITY

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ABSTRACT

Asia experienced 70% of all the disaster in the world and there is no indication that this will decrease in the future. The disaster experienced by a city mostly caused by combination and collision of climate change, urbanization, social-economic instability, terrorism, natural disaster, cyber-attack, poverty, endemic outbreak and etc. Subsequently the disasters faces by a city can be further divided into acute shocks where sudden disaster happen unexpectedly and threaten the city, and chronic stresses where tension situations occur on daily basis and weaken the city operation. The crisis stumbled upon a city has captured attention of many audiences, thus in order to conquer the issues, city needs to be resilient in order to face and overcome the situation. Government and state government are responsible to manage city in order to prepare the city capacity so it will be able to endure, adapt, recover and grow despite of any shock and stress it encountered. This paper will discuss the efforts taken by Malaysia in transforming and preparing Melaka into resilient city.

Key words: Climate change, Urbanization, Resilience city, Malaysia, Melaka

INTRODUCTION

Resilience has appeared as a new buzz word and one of the most important research topics in the context of achieving sustainability (Kates et al., 2001; and Foley et al., 2005) in the development of organisations to withstand upcoming uncertainty of the world. As described in the oxford dictionary, resilience is "ability to withstand or recover quickly from difficult condition" (Oxford, 2016). The concept of resilience for urban environment or city development as defined by The Rockefeller Foundation is "the capacity of individuals, communities, institutions, businesses, and systems within a city to survive, adapt, and grow no matter what kinds of chronic stresses and acute shocks they experience" (100ResilientCities, 2016).

In the context of cities, resilience has helped to bridge the gap between disaster risk reduction and climate change adaptation. It moves away from traditional disaster risk management, which is founded on risk assessments that relate to specific hazards. Instead, it accepts the possibility that a wide range of disruptive events – both stresses and shocks – may occur but are not necessarily predictable. Resilience focuses on enhancing the performance of a system

in the face of multiple hazards, rather than preventing or mitigating the loss of assets due to specific events (100ResilientCities, 2016).

As recorded in the Global Risks report (2016), the world we are living on facing issues of climate change, social instability, unmanageable inflation, large scale involuntary migration, biodiversity loss, terrorism, and so forth. It is forecasted that countries like Asia are likely to experience major natural catastrophes with extreme weather events (World Economic Forum, 2016). The most shocking issues Melaka facing are depleting environmental resource as it is being jeopardized to accommodate with the urban expansion. Melaka urban development has brought consequences associated with coastal erosion, flash flood, landslide and air pollution (Gary et al., 2014); and another issue is air pollution resulting from transportation sector, industrial emission and open burning (ASEAN, 2012).

The series of natural disaster take place in Malaysia have prepares Malaysia Government to embark into resilience concept. Cities such as Putrajaya, Melaka and Wilayah Persekutuan Kuala Lumpur were nominated as part of role model cities in Making Cities Resilient Campaign (MCRC) (UNISDR, 2011). The MCRC was launched by The United Nations Office for Disaster Risk Reduction (UNISDR) together with local partners (local governments and authorities) with aims to raise awareness of resilience and disaster risk reduction among the local governments and communities (UNISDR, 2005).
In this paper the researcher will discuss on the efforts taken by Malaysian government to transform Melaka into a resilient city in particular to analyse the initiatives taken by local authority of Melaka in making Melaka a resilient city. The output of the research would be beneficial to the state of Melaka redundant in the context of local authority in preparing for integrated strategy plans and to manage Melaka urban development in becoming resilient from any future disaster risks.

MATERIALS AND METHODS

This study used qualitative analysis. Data collected are based on document analysis. The document being used includes government policies, Malaysia national plans, newspaper and relevant previous research.

FINDING

The government of Malaysia has taken the initiatives toward resilient approach by participating and involving in a series of international sustainable action plan and disaster mitigation plan such as Millennium Development Goals (MDGs), Sendai Framework for Disaster Risk Reduction 2015-2030, 2030 Agenda for Sustainable Development, Hyogo Framework for Actions (HFA), and etc. (EPU, 2016).

In the national level, as shown in **Table 1**, Malaysia has initiated parallel operation with Malaysia Plan by executing policies and action plans. It is to improve nation's readiness in managing, preparing and mitigating issues of overpopulation, environmental degradation, structural failures and natural disaster in order to increase nation's resiliency against the unforeseen impacts.

Table 1: Malaysia's Initiatives towards Resilient City

No.	Initiatives Involved	Year
1.	Third – Eleven Malaysia Plan	1976 - 2020
2.	National Climate Change Policy	2009
3.	KL Action Plan	2009
4.	National Green Technology Policy (NGTP)	2009
5.	Low Carbon Cities Initiatives (LCCI)	2010
6.	Land Use Planning Appraisal for Risk Areas	2005
7.	National Physical Plan	2005 - current
8.	National Security Council Directive no. 20	2005

Among the policies *National Green Technology Policy* and *Low Carbon Cities Initiatives* are initiated with main objectives to reduce carbon emissions by promoting low carbon transport, infrastructure and green technology in order to conserve environment, enhance national economy and improve quality of life (MNRE, 2009). While *National Climate Change Policy* integrate national plans and policies to strengthen the resilience of development from the climate change impact and to reduce adverse effect of climate change (MNRE, 2009). In all the previous (2006 – 2015) Malaysia Plan, government emphasized on managing environmental distress due to climate change, and in the latest Eleventh Malaysia Plan (2016-2020) government strengthening environment for climate resilient development and resilience development against climate change and natural disasters (EPU, 2016).

The launching of MCRC in 2011 has also brought the adoption of *Melaka Declaration on Disaster Risk Reduction (DRR)* by state government of Melaka with main objectives to incorporate climate change adaptation and reduction of disaster risk, communities' involvement, and build resilience at the local level. That embarked the journey of Melaka development toward resilient development. Later on in 2014, Melaka engaged and consult with *International Council for Local Environmental Initiatives (ICLEI) – Local Council for Sustainability* (shown in **Table 2**) in order to promote local action for sustainability and sustain cities in becoming resilient. While in 2016, Malacca was chosen to participate in the 100 Resilient Cities Programme organized by Rockefeller Foundation, of which the program will prepare and help cities to build resilience to the economic, social and physical challenges encountered by cities (100RC, 2016).

As shown in **Table 2**, Melaka also initiated series of green initiatives such as *Green Technology City Blueprint*, *Melaka Green City Action Plan* and *Green House Emission Inventory Report* with the purpose mainly to assess city performance, educate public about climate change, global warming, green technology and green practices (Gary et al., 2014).

Table 2: Melaka's Initiatives toward Resilient City

No.	Initiatives Involved	Year
1.	Melaka Declaration on Disaster Risk Reduction (DRR)	2011
2.	Green Technology City Blueprint	2011
3.	United Nations Urban Environmental Accords	2012
4.	Melaka Green City Action Plan	2012
5.	ICLEI – Local Council for Sustainability	2014
6.	Green House Emission Inventory Report	2015
7.	100 Resilient Cities	2016

CONCLUSION

Melaka was listed as UNESCO heritage site. However with the current urban expansion and development has jeopardize the state with resource depletion, flooding, water borne diseases, coastal erosion and ecological disruptions. Therefore Melaka government has initiated resilient development programme by adopting series of strategies such as disaster risk reduction programme, ICLEI – Local Council for Sustainability, 100 Resilient Cities, and local plans and policies. The main interest is to bring the context of resilient city into Melaka by reducing the gap between disaster risk reduction and climate change adaptation. Even though there are series of initiatives taken by Melaka Government, there is still a need for resilient city framework that integrate urban system in a holistic manner which includes governance, health and wellbeing, economic and social, and infrastructure and environment. The resilient city framework will then assist Melaka to assess the extent of their resilience, ascertain areas of weaknesses and to classify plans to enhance Melaka urban resiliency.

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SD 21 - THE INFLUENCE OF NEEDS IN THE SHELTER DESIGN OF THE EXTREME POOR: CASE STUDY OF PADANG JAWA, SELANGOR & BUTTERWORTH, PENANG

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ABSTRACT

One of the dilemma that has been clouding over the issue of low cost housing in Malaysia nowadays is concerning the space design. The space layout had been solely designed to only emphasize on minimizing the area. Regardless of space quality, this design caters only to a standard space requirement & area without considering the real needs of this "constraint" poor family. This research attempts to identify the basic needs of the extreme poor in influencing the existence and layout of spaces in their self-built home. The strategy adopted for this research is the case study. Three sample cases were selected at three different houses and the study was conducted through observations and interviews in generating the data. This research concluded with the finding that the evolution and distribution of spaces in the house centered towards occupying the most basic needs, where each space has been fully maximized and manipulated in function purely to cater the two utmost basic needs of the households, which are– shelter and food. Hybrid space of the living area evolves due to space constraint and financial limitation. Each space and layout of the house have a strong connection between one space to another, making it meaningful and functional. Driven by the rule of need, home is modestly self-built using recycled materials adapted from various sources.

Keywords: space layout, extreme poor, role of needs, self-built, evolution, hybrid space

INTRODUCTION

Cambridge dictionary defines poverty as "the condition of being extremely poor" (Poverty, n.d). As to the current global poverty rate, Globalissuenetwork, reported that there are 1.2 billion people living in abject poverty that live on less than $1(MYR 4.41) a day (Globalissuenetwork, 2017). Poverty or abject poverty is a problem faced by almost all developing countries around the globe. Malaysia is not exceptional in facing this problem.

According to the Implementation Coordination Unit, (2011) based on *National Poverty Information System (e-kasih)*, poverty status in Malaysia is based on *Poverty Line Index (PLI)* and *PGK per kapita isi rumah* that were set by *Economic Planning Unit (EPU)*. Razali, (2015) explained further in his article that *Povery Line Index (PLI)* is defined as sufficient income that enables the household to occupy basic needs such as food. Poverty is categorized into three(3) categories as per table below :

Table 1.0(1) : Poverty category based on Poverty Line Index (PLI).

No.	Category	Guideline
1.	Abject Poor (Miskin Tegar)	Group that earns less : MYR 430 for east peninsula MYR 540 for Sabah MYR 520 for Sarawak
2.	Poor (Miskin)	Group that earns less : MYR 720 for east peninsula (MYR 163 per capita) MYR 960 for Sabah (MYR 184 per capita) MYR 830 for Sarawak (MYR 180 per capita)
3.	Easy Poor (Mudah Miskin)	Group that earns more than PLI below than threshold : MYR 1500 for urban area MYR 1000 for rural area

Sources : Implemenation Coordination Unit, (2011)

One of the effort extended by the government to help the poor is through providing low cost housing. One of the dilemma that have been over the issue of low cost housing nowadays is concerning the space design. The space layout had been solely designed to only emphasize on minimizing the area. A recent study shows that a low cost flat sized at only 600sqft, (Hajizan, 2015). Regardless of space quality, this design caters only to a standard space requirement & area without considering the real needs of this "constraint" poor family. Hajizan stated that due to this insensitivity, this has eventually become a catalyst towards uncountable social problems that cause by the incommodious, tight space (Hajizan 2015). This paper focuses on the study of space of the dwellings/ shelter of the abject poor. The main aim is to study the relationship between the basic needs of this group in determining space where home is self-built utilizing the recycled and natural materials in sustaining a living. According to this basis, spaces within the shelter are crafted according to the basic needs, the hierarchy of the needs, the priority of each of these needs in their everyday life, the needs of having a shelter and other basic needs such as food, living and sleeping. The research focuses on strengthening a methodological approach in order to establish a framework that becomes a comprehensive tool in understanding the influence of needs towards the layout of spaces and the hierarchy of space importance.

Significance and the Role of Needs in Influencing the existence of spaces
Needs play an important role in formation of spaces as people order their daily activities and interaction within the built forms that they have created. Kovtun emphasizes that needs are the cause of human activities which contribute to the formation of function and features of a usable architectural space (Kovtun, 2014). Architecture is as well a form of happiness, a reminder of cultural values and spatial values is purely about the awareness of needs (de Botton A., The Architecture of Happiness,2007 cited in Kovtun, 2014). Humans satisfy their needs in the hope of becoming better than before. In association with architecture, needs can be categorized into 2(two) categories which are primary needs and higher needs (Kovtun, 2014). Primary needs cover the aspect of physiological and biological needs – the needs of preservation of life and procreation. Preservation of life means protection from external

dangers imposed by natural disasters and enemies. Analysis by Kovtun (Kovtun, 2014) highlights that domestic space/ house involves less attentive activities whilst a more sensitive activities such as sleep, sexual intercourse, birth and care for children. Architecture provides material conditions to meet these physiological needs. This influences the distribution and organization of space and protection. "Recognition of space is not a privilege of some talented people, but a biological function" stated L.Mohoi-Nad, cited in (Kovtun, 2014). Higher needs are the human needs of love, identification and participation in a group. This refers to the dependency of a person towards the other which refers to food and protection. This dependency extends to the interaction between one's actions depending on other people's behavior. In architecture, it refers to the need of having a place of communication (Kovtun, 2014). An Analysis of Mangolian tent, by Caroline Humphrey (1974) cited in (Waterson, 1990) analyzed that a Mongolian tent is a tightly ordered microcosm of the social world. Spatial division of the tent is used to place people according to social positions, seniority and gender. The study of Atoni, archipelago's house (Cunningham's 1964, cited in (Waterson, 1990), the internal spaces is ordered around fixed point which is the door, water jar, hearth and the platform. The platform is hybrid (multi uses) in terms of its function as it acts as sitting places, eating and sleeping area, and also as storage of utensils, foods and other goods. The smaller platform located on the left acts as a sleeping platform for the elders of the household. On the left, there is the third platform, for food preparation and where women may give birth. From this, Cunningham illustrates the interweaving of both lateral (right/left) and concentric principles where contrast between male and female are the important part of the arrangement. It is obvious from many of the examples across the literature that needs is the most important aspect in influencing the layout, the hierarchy and the relation between one space to another.

Self-build House
Self-build house is a condition where a house is self-built by the owner. As been discussed by Kamau (Kamau, 2005), these are due to high standard of living and the poor economic factors of the occupant. This group tries to fit their living by building their own house in meeting their need in having a living space as a basic need of shelter. Figure 2.1(1) explains the relation between adaptability, affordability and suitability in the existence of the self-build house. This group prefers to build their own house due to the design flexibilities of the house, to be extended or contracted depend on needs. A study of public housing in Nairobi, Shihembetsa and Olima, (2000) cited in (Kamau, 2005) noted that households prefer self-build home ownership due to the opportunity to make improvements based on their needs. As for the Masai people in Kenya, they set up their dwelling hut in circle. Masai women build and maintain their hut themselves (Laffon, 2004). They gather cob and branches to build their hut. This typical Masai structure supports a covering of several layers of dried grass held together by a mixture of mud and dung. The door is made of animal skin and the campfire is located in the middle of the hut and it separates the men and the women.

METHODS

This research employed case study as the main method. This method is divided into three case studies to establish the data collection and the analysis of the study. Case study of this research were mainly located at the squatter areas. The first case study was conducted at Butterworth, Penang. The second case study was conducted at Padang Jawa, Klang and the third case study was also conducted there but at a different location. Each of the case studies took $2^{1/2}$ hours to complete along with the observation and interviews. Owners were
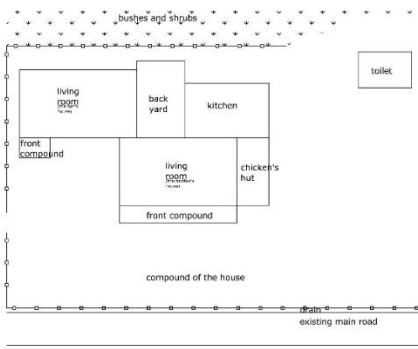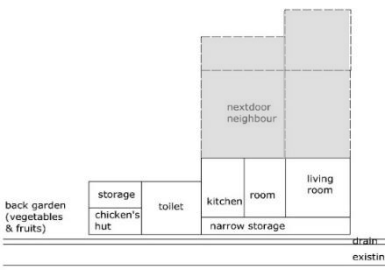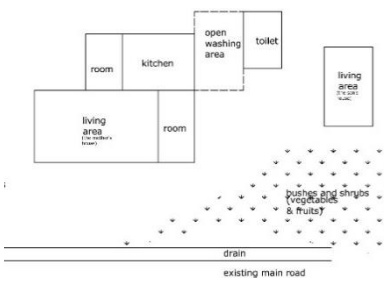
interviewed with a look through tour from the exterior to the interior part of the house. Several pictures were taken to further explain and clarify the issues.

FINDINGS & ARGUMENTS

The priority hierarchy of each spaces – relation between spaces & function.
The priority of each space is demarcated according to the importance and the necessity of the space to the owner. Each space available inside the house is the most necessary space to the owner.

Table 3.0(1): Analysis of the space layout of all the case studies. Sources: (Author,2016).

Space layout	Analysis of the space layout
Figure 4.0(1): House 1, Butterworth, Pulau Pinang. (Author,2016).	- Living room 1 is the most important space and functions as a multifunctional space for almost all indoor activities of the family which include sleeping, resting, eating and studying. - Living room 2 functions as a multifunctional area for the owner's wife and son. - Kitchen is the next important space to prepare food which is a basic need of humans. - Backyard functions to connect the son's house with the mother's house. - Chicken hut situated next to the kitchen provides meat supply.
Figure 4.0(2): House 2, Padang Jawa, Klang, (Author,2016).	- Living room is the most important area and functions as a multifunctional space for almost all indoor activities of the family which include sleeping, resting, eating and studying. - Room functions as a private storage area which stores owner's private belongings. - The size of the kitchen is adequate enough for the owner to cook his daily meal. - Both storage areas store the owner's working tools. - Chicken hut located at the back provides meat supply to the owner.
Figure 4.0(3): House 3, Padang Jawa, Klang, (Author,2016).	- Living 1 area is the most important area as it is a multipurpose/ hybrid area which in the daytime functions not only as a family area, but also as resting and eating area, whilst at night it functions as a sleeping quarter. - Living area 2 is the extension of the house for the eldest son. - Kitchen is the next important space to prepare food which is a basic need of humans. - Both of rooms function as a wardrobe area(storage). Only one of the rooms is still used for sleeping(adult). - Washing area and toilet are located outside of the house.

Based on the 3(three) case studies, there are 2(two) main needs which become the main reason of the existence of these 2(two) main spaces. This result determines the basic needs of the owners which are:

Table 3.0(2): The existence of type of space according to the 2(two) main basic needs.

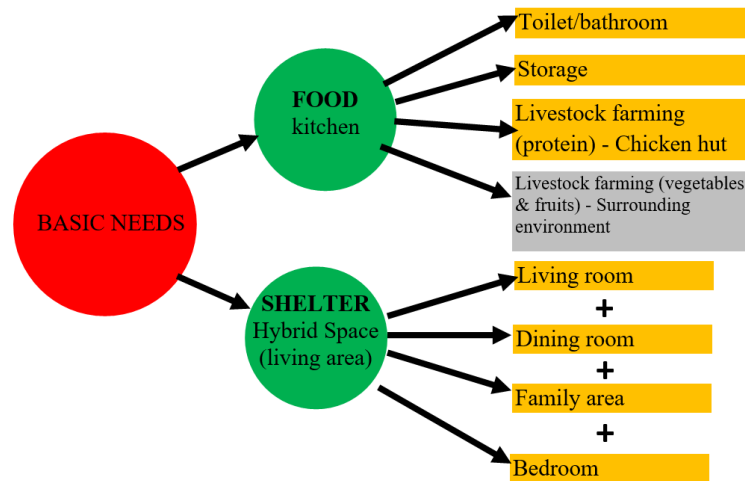| No.	Main Needs	Program /Activities	Main Spaces
1.	FOOD	Cooking/Food Preparation, Storing, Live-stock farming.	Kitchen
2.	SHELTER (sleep, rest, eat, gather, etc.)	Sleeping, Eating, Resting, Studying, Playing	Living Area (Open & Hybrid Space)

Sources: (Author, 2016).

Figure 3.0(1): Program of the hybrid space. Sources: (Author, 2016).

Food and shelter are the most basic need, thus this is the relevance of the existence of kitchen and the open hybrid space. All of the case studies demonstrate that open hybrid space, which is represented by the living room is the important space in the house design. With financial constraint, standard spaces for each of the activities under shelter needs, such as sleeping, dining, resting, and studying are considered as luxury and unaffordable by the abject poor group. This constraint simultaneously contributes towards the formation of hybrid space – a space that engages almost all possible activities interpreted by the users. In this case, hybrid space caters all activities under the basic needs of shelter. It becomes the most functional and fully utilized space out of all the other spaces due to its size and flexibility. Numbers of activities of the households happen here – resting, sleeping, eating, studying, playing (for the children), replacing the conventional spaces which are living, dining, family area, and bedrooms. These program and activities which are developed within these hybrid spaces are utilized to the maximum, fitting the affordability level of the owner. Space consideration towards the guest is less as it caters only towards the priority needs of the occupants as a mean of shelter. The priority is more towards the personal need rather than public need. The next important space is the kitchen which functions to supply the basic needs of food to the household. Kitchen functions as a place to cook, wash and is equipped with storage area/space. All of the case studies comprise of a self-sustaining kitchen. Each of the house allocates space for livestock farming area as well as surrounding exterior environment for planting vegetable and fruits as a mean to provide a free and sustainable supply of food to the household. Each of the spaces inside the house is significantly related to one another, based on the basic needs of the household. The layout of the spaces follow the needs priority rather than privacy. It breaks the normal privacy hierarchy (from public to private) since the hybrid space (living area) is located at the front and private area is only demarcated by walls(rooms).

CONCLUSION

In conclusion, this paper reveals, that the layout of the house, spaces, function and size of each space, hierarchy of spaces and relation between one space to another are strongly based and according to the hierarchy of basic needs of the occupants/owners. Space is defined by the function and the importance of the owner's/occupant's everyday activities. Hybrid area is the most needed area. Living area becomes a hybrid space and the most utilized space by the household, catering activities such as sleeping, resting, eating, studying and playing throughout the day. Spaces for continuous supply of meats, farming fruits and vegetable are among the needed spaces to sustain the household. With further research and implementation, these findings can as well help to improve and optimized the design of the current low-cost housing design and scheme. Corresponding to this, it is suggested that future research should cover on making the space needs and its significant to the poor group relevant with the new housing design and scheme for the poor group.

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SD11 – CLIMATE AND DISASTER RESILIENT CITIES: CHALLENGES FOR MALAYSIA

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ABSTRACT

The notion of disaster resilient cities have gained much attention and interest over recent years. The increase in the occurrences of natural and man-induced disasters have led to higher awareness on the need to move towards disaster and climate resilient cities. Cities and its entire system are vulnerable to the impacts of climate change and calamities that may occur naturally or man-made. The recent occurrence of disasters have highlighted that cities are not prepared to face disasters and climate related events. However, in any condition, cities need to continuously maintain its function to provide protection to the people and the facilities. Previous studies have stated that the process of making a disaster resilient cities is complex due to its nature of multidisciplinary and multi-level approach. The collaboration and input of various stakeholders are crucial to ensure that the goals of disaster resilient cities are achieved. This paper aims to review the concept of disaster resilient cities and its challenges focussing on the context of Malaysian cities. Subsequently, the paper proposes several strategies to address the challenges towards achieving disaster and climate resilient cities.

Keywords: Disaster Resilience, cities, urbanization, and climate change

INTRODUCTION

The concept of disaster resilient cities has gained interest and attention over recent years. This is directly related with the increase on the occurrences of natural and man-induced disasters. According to Davoudi *et al.* (2012), the term *resilience* can be categorized into two types- engineering resilience and ecological resilience. It is described that engineering resilience refers to the ability of a system to return to a state after a catastrophe. The catastrophe in this context maybe caused by natural disaster or a social disruption such as economic crises or wars. The quicker the system return to its normal states indicates greater resilient. On the other hand, ecological resilience is referred as the *"the magnitude of the disturbance that can be absorbed before the system changes its structure"* (Folke et al. 2002). However, the definition of resilience may vary according to field of interest and context-specific. Based on the OECD (2013) definition, *resilience is the ability of*

individuals, communities and states and their institutions to absorb and recover from shocks, whilst positively adapting and transforming their structures and means for living in the face of long-term changes and uncertainty". The use of resilience concept has been associated with the agenda on addressing the impact of climate change. Among them include the publication of document by the World Bank (2012). In recent year, the notion of resilience or resilient have been included in various level such as in policy development, urban planning and development policies and city administrations (Davoudi *et al.,* 2017). Hassler *et al.,* (2017) explained that an array of risks identified through the themes of resilience, sustainable development, disaster planning and climate change adaptation has led to the notion of resilience to enter the general public discourse and has gained attention to increasingly use the term. Globally, to achieve urban resilience, efforts were made through the implementation of the 2030 Sustainable Development Agenda, the Sendai Framework for Disaster Risk Reduction, the Paris Agreement on Climate Change, and the New Urban Agenda (ICLEI 2016). Measuring and mapping the level of resilience of cities is the key step that enables stakeholders to understand the current situation. This process allows the decision-makers and other stakeholder to assess the current and future potential climate-related risks that their city faces. The outcome of the process will lead to developing a baseline measurement of the current level of resilience (UNISDR 2015). This is important to identify priorities for the development of policies, strategies and actions. According to OECD (2016), resilient cities are characterized as cities that have the *ability to absorb, recover and prepare for future shocks.* Four sectors that consist of the economy, society, environment and institutions are the main drivers of resilient cities (OECD 2016). These drivers have become the key variables in measuring and assessing the climate disaster resilience level of cities prior to the establishment of strategies that addresses the current situation and context (Shaw et al. 2010). Hence, this paper focussed on to review the concept of climate and disaster resilience. Alongside, challenges of Malaysian cities towards becoming a climate and disaster resilient nation are also discussed.

ACHIEVING CLIMATE AND DISASTER RESILIENCE IN MALAYSIA

In general, disaster can be classified into two categories; man-made disaster and natural disaster *(Mohamed Shaluf and Ahmadun 2006).* Based on the definition outlined by the United Nations Office for Disaster Risk Reduction (UNISDR), the term disaster refers to *"a serious disruption of the functioning of a community or a society involving widespread human, material, economic or environmental losses and impacts, which exceeds the ability of the affected community or society to cope using its own resources. Disasters are often described as a result of the combination of: the exposure to a hazard; the conditions of vulnerability that are present; and insufficient capacity or measures to reduce or cope with the potential negative consequences. Disaster impacts may include loss of life, injury, disease and other negative effects on human physical, mental and social well-being, together with damage to property, destruction of assets, loss of services, social and economic disruption and environmental degradation "*(UNISDR, 2007) (Peel and Fisher 2016). As a result of global warming and the effect of climate change, Malaysia has been exposed to the increase of hazard potenial in most areas. The Malaysian government has taken strong initiatives to address the problem. In the Eleventh Malaysia Plan, efforts toward achieving disaster resilient nation have been higlighted through green growth that incorporates climate change adaptation measures and disaster risk management. Thirty-five high-risk area maps have been developed to guide the development planning within high-risk areas. Specifically, the main objective specified is to strengthen the disaster risk management through prevention, mitigation, preparedness, action and recovery. Other related policy documents

that spell out policies and strategies towards achieving disaster resilience in Malayia are as follows:

      (i)   National Physical Plan (II & III,

      (ii)   National Urbanisation Policy (I & II)

      (iii)   State Structure Plan, and

      (iv)   Various Planning Guidelines and Policies, Federal Department of Town and Country Planning, Peninsular Malaysia.

THE CHALLENGES

Previous studies have reported that among the main challenges to achieve disaster resilient cities are lack of regulatory framework, unplanned cities and urbanisation, old building stocks and high-risk infrastructure, inadequate capacities of local authorities, lack of funding, inadequacy of qualified human resources, uncoordinated information, corruption and unlawful activities (Malalgoda, Amaratunga, and Haigh 2014) (Jabareen 2013). On the other hand, in Malaysia, a previous research reported that at the planning level, non-compliance of development plans and planning guidelines at state and local level, lack of data for detail assessment, ineffective implementation of development policies, lack of support, commitment and funding from stakeholders including the local and state planning authorities are the issues that restrain Malaysia to progress rapidly towards achieving climate and disaster resilience (Mohamad Amin and Hashim 2014) (Mohamed Jamil 2008). Resilience mapping is one of the important processes towards understanding the current status before preceding to developing the suitable policies and strategies. To date, the best practice in measuring the level of resilience is through the application of Climate and Disaster Resilience Index (CDRI) initiated by Kyoto University in collaboration with CITYNET, Tokyo Distance Learning Centre of the World Bank Sustainable Environment and Ecological Development Society and UNISDR (Shar et al. 2010). However, the process of mapping the current status of resilience is a challenge for Malaysia as it requires commitment and collaboration of various stakeholders. Lack of coordinated data and information are also an issue because of the bureaucratic and multi-level of different agencies.

CONCLUSION

Despite the impact of disasters and climate change, Malaysian cities need to continuously maintain its function to protect the people and the facilities. Previous studies have stated that the process of achieving disaster resilience cities is complex due to its nature of the multidisciplinary and multi-level approach. The collaboration and input of various stakeholders are crucial to ensure the goals of disaster resilient cities are achieved. Drawing from cases of developed countries with advanced DRR practices, among the best strategies to apply by the Malaysian agencies towards achieving disaster and climate resilience are to ensure the incorporation of disaster risk and climate risk assessments into the planning and management, revision of existing development policies to include measures of DRR, continuously monitor and assess developments in high-risk areas and finally to ensure successful collaboration of various stakeholders involved. Also, an educated population with high awareness on disaster and climate resilience is essential to enable a more holistic approach to build a culture of safety and resilience at all levels within the city.

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SD 4 - MEASURING THE SWAY OF IMPERCEPTIBLE FACTORS IN SHAPING THE DISTINCT CHARACTER OF ANCIENT INDIAN ARCHITECTURE AND CITY PLANNING

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ABSTRACT

In India, great obey to nature is evident in architecture and the essence of life is fairly apparent in city planning, human kind reflects his perception of life in architecture by locating the spaces within the dwelling in particular order to ensure great harmony with positive and negative forces of the cosmos. Modern Architecture shaped by political and economic factors resulted in sameness among most of contemporary capitals or developments and ignoring farming and human needs caused decays in urban fabric and gas emissions level reaches high figures in Mega cities. By contrast ancient architecture in India connects the occupants with surrounding environment and ensure harmony between humans and nature through many aspects and scale is great element considered in space and city planning leading into the Mandala graph. In Indian philosophy, disproportion and detachment of mankind from nature and surrounding environment lead to disaster hence the Mandala diagram addresses all the existences taking into account farming, human scale and needs. The purpose of this paper is to examine the impact of intangible factors such as traditional belief and religion in shaping the astonishing character of Indian architecture furthermore I shall study many metaphysic theories to test their influence on evolving the Mandala diagram and the logic behind the distribution of functions within its parts.

Key words: Mandala diagram, Vastu Purusha, five element, the Vedika, responsive architecture,

INTRODUCTION

Nowadays cities are similar building and skyscrapers in Dubai, Singapore and Kuala Lampur are alike and plants, trees or finishing materials may only look different in contemporary capitals. Mega cities diminished human peace and generated many problems for societies, traffic jam pollutions and high level of crime furthermore harmony between individuals vanished whereas ancient cities recognized human scale and sustainable as all building materials are local and settlements safer with great harmony between settlers. Indian cities meet most of resident's needs addresses social cultural customs, the character of the blocks are different in Indian towns but premises are in great harmony and the atmosphere is positive as villagers interact with each other's moreover everything can be reached within short distances. In India many philosophies inspired scientists thinking and led to form distinct norms, among those principles is the appreciation of nature Indian architects believe that nature is crucial factor and affects mankind in various ways it can influence us internally – *spiritually and psychology* or externally –*Physically.* Likewise Mankind shares the earth with many other existences including animals, plants and different forces effect his cognizance hence architecture should reflect every aspect of our universe,

evil and divine forces are also acknowledged and consequently spaces in Indian premises distributed in harmony with those forces to maintain positive level of energy. *"As human body is a combination of divine and evil forces, a site is also a combination of divine and demonic forces". The spirt of Indian architecture, p25*. This conception led to numerous Mandala graphs, they are a celestial diagrams addressing all existences and divided into sections representing various aspects including evil, godly forces, plants and animals. Mandala commonly used as guidance to locate spaces or buildings within the site according to specific logic for instance kitchen is located in fire section in Mandala, and a farming or furnaces can be placed near god of Sun Isa. Religion is another crucial contributor in shaping the architecture of India, every aspect of life is controlled by various deities guiding rain, wealth, death justice, sun, moon and youth Figure 1.
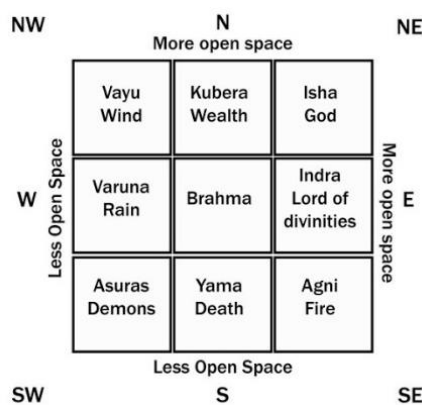

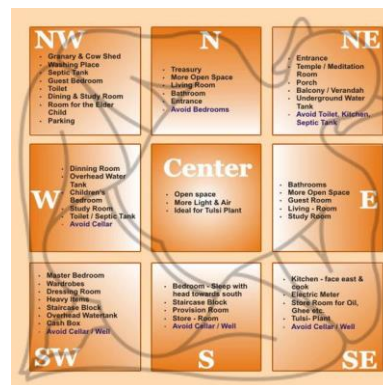Figure .1   Figure .2

Most of goddesses are represented in Mandala graph and impact the setting of spaces or premises in city planning, in fact Locations of divinities in Mandala determined by sun motion since it rises from east Aditya god of sun, brightness, power and warmth divine forces are located in east quarter, therefore functions relevant to administration and power are usually located eastwards. The west is sun setting direction cold and represent oceanic rainy side where Varuna god of water situated in Mandalah. Northwards is the arctic coolness distant from sun path and associated with moon, north is the place of Soma lord of wealth, moon, or light but cold light contradicting the warm rays of sun light hence financial activities are positioned in this section. Whereas south is warm as sun voyages in this path therefore god of fire- Agni is in southern quarter. Through early mentioned arrangement, Mandala's Layout reflects the influence of religion, each aspect of life controlled by specific God and it is apparent locations of the goodness in Mandala related to sun path and the four cardinals.

MANDALA GRAPH AND THE DISTRIBUTION OF FUNCTIONS

Mandala shapes are numerous but square Mandala or rectangle are very regular in usage however triangle shape is rarely used and circular ones are common in worshiping or buildings with divine purpose. Hexagon, octagonal or sixteen sided shapes Mandala also exist but uncommon. There is 32 types of Mandala exist in India and many features are shared between them at the east side of the graph is Adita or Isa god of sun, it is a divine force and commonly host worshiping activates, farming, orchids and diary. southern side is Yama the god of death and in command of justice and ruled the death orders it regarded as divine demonic force hence courts, jails, butchery, brothels and burial ground situated in this

area. Western side is Varuna god of water or ocean a celestial force and lodge traveling trading activates, treasury, industrial and defenses academics.

Finally Soma the moon is in northern side whereas central part is dedicated to goddess of earth and open to sky. There are Mandala for site planning and other ones for dwellings for instance Pitha is simplest and first sample consist of 3x3 sections with core open to sky and other parts are dedicated to divine forces such as fire, water, wind, ancestress, justice or death god and this basic diagram is suitable for domestic and public buildings furthermore its layout was inspiration for other sophisticated Mandalas. In fact any site is amalgam of positive and negative aspects hence Indian architects developed the Mandala to deal with such opposite forces and consequently the layout of the building reflects ecological forces and other balances.

The five element theory of life air, fire, water and earth are recognized in Mandala layout and occupy the corners for instance the northwest corner indicated Vayavya-air force symbolizing movement hens preferable transit activity in this area a gust room, unmarried person room or a finished material storages can also be located in this section where the items are subject to movement or deliver shortly. Vayu is lord of wind and located adjacent to air's god it represent divine forces thus northwest quarter commonly occupied by activities reflect law enforcement, distilleries and professional. Northeast corner dedicated to Isan - Sun and worshiping activates or buildings are favorited whereas southeast corner represent Agneya- fire and commonly a kitchen, boiler room or bread furnace shop is ideal in east angle and southeast corner.

Finally is the west south spot where Nairutya earth force exist and commonly physical functions a massage room, dining or dressing, maternity room, hospital, jail or slaughter rooms are common in this side Figure 2. Worshipping, ancestors deity take place in two different sections southwest corners or northeast this variety allow the designer flexibility to locate the spaces according to site condition. Even the location of main entrance determined reference to specific theory the door can be in one of the four directions, north, east, south or west. If the door is placing in north it underscores the intellectual aspect and east for administrative while west for business and south for workers.

POSTURE OF VASTU PURUSH MODEL

As mentioned earlier the Mandala takes into account the five element; fire, water, earth, wind, plants, animals, ancestors, demonic and divine forces and these elements should be balanced within the dwellings to enhance the flow of energy and consequently the occupant's health. Nature is in the core of Indian architecture in various ways it influences dwellings layout and represented by a figure known as Vastu Purusha set within the mandala graph and according to this notion the torso of the figure is in the middle of the diagram and should be free from pain thus center of dwelling free of columns and open to sky Figure.2 *"Nature, the governing power of the cosmic processes in the universe, is omnipresent. Nature govern every piece of land and every dwelling. The scriptures refer to this as the presiding spirt. This spirit, in architectural parlance, is called the Vastu Purusha." The spirt of Indian architecture, Page 37*.

Location of court yard commonly in the middle but it can also occupies the corners or the sides, the court yard accommodates Vedika (sacrificial alter) for worshiping and family gathering or celebrating events *"while designing, due care must be taken to*

ensure that the nerve centers or the vulnerable points of the Purusha are not put to pain therefore structural members like columns, walls, Fire places or anything that can cause pain to the Vasta Purusha must be avoided."The spirt of Indian architecture, p39.

Another crucial idea is the offering or oblation to fire which normally occurs in the court yard, fire maintain good eyesight and is life giving energy similar to sun should not be extinguished or wane. Later the Vedika replaces by basil leaf or different types of medical plans which can be used to heel against diseases. The beauty of nature apparent in mountains, flowing water features and frosts may not be available in every site hence the court yard compensate deficiencies of natural features and commonly accommodates plants and water element. In fact having an open space for gathering is replicated in city planning in ancient Indian cities, commonly settlements accommodates numerous open zones woven within the every district allowing people from same background to socialize Figure 3.

Likewise, Settlements in India shaped by particular rationality, Indian philosophers think that every society is usually divided into four sectors, first part represents thinkers or planers who carried the intellectual work and called Brahmin Cuna, they assist in maintaining the literary culture of society and when the intellectual falls it leads into corruption and the nation will ruin. Second segment in charge of administration and governing mission therefore they are politicians or rulers known as Kashatriya Guna while third part Vaishya Guna consists of traders and farmers and finally comes the labors who assist the other three parts they are Shuda Guna and blue –collar workers Figure 4. Ancient Indians were against admixture they believe it mess up the values in society and caused adverse progeny and create deep psychological tensions people of same rank should live together and admixture can cause fear among settlers for instance mother of children doesn't feel safe letting her children socialize and play with other youngsters coming from different caste hence segregating is evident in Indian city planning and reflects social culture.

Ancient nations were aware of energy level radiating from earth and planned their buildings to benefit from positive energy, in China proposed location of any settlement investigated carefully by the ruler's officers and commonly cities were built at foot of mountains and nearby water body or frost to benefit from the energy radiating from natural landscape. Greeks took into consideration the earth energy field and designed their city Agors to benefit from such energy and similarly the ancient Greek urban planner Hippodamus of Miletus known by his methodology of using the grid iron patterns in city planning. The spaces within the grid lines are in the positive energy therefor blocks are laid whereas the intersections of grids lines are within the negative or low energy of earth and human activates are not placed in the nods. Every object radiate energy and the Lecher Antenna can be used to measure the radiation of energy and also the gems have powerful effect on energy level of humans.

Similarly the Mandalas lower the effect of negative energy of existing site and create or accentuate positive energy level of the setting therefore the Mandala was a key factor in city planning or designing the buildings internally and externally. In fact D K Bubbar in his book the spirt of Indian architecture stated that an experiments took place in a flat located in Mumbai reveled how certain elements can reverse the negative energy to positive energy. According to D K Bubbar a geo biological test carried out in the flat in certain zone showed high level of negative energy, then a Conch cell was placed in the area and the test repeated surprisingly the reading shows positive energy level .the same

was repeated but with a lit lamp and gave same outcomes and in particular when the lamp is located in Northern corner Isan the negative energy changed to positive therefore the conch shell and lamp are fundamental elements in worshiping in India, the flame can diminish negative energy and turn it into positive hence the temple is commonly recommended in negative energy field to reveres it.
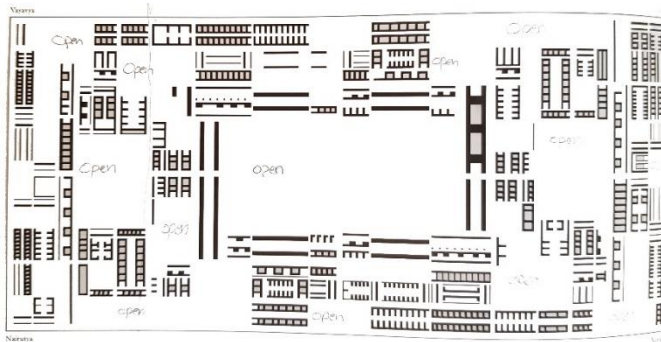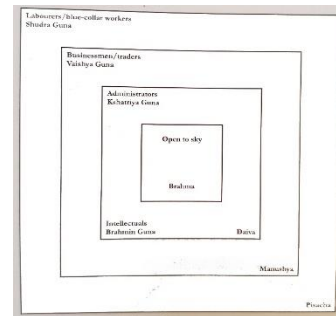

Figure 3

Figure 4

In general there are many graphs employed to design Indian settlements however the city preferable to be established near water body, mountain or frost to utilize the energy coming from natural terrain. There are common features shared between those various Mandala, the city should follow grid layouts, roads are perpendicular and the core of the city is open to sky for public, temples commonly in northeast in Isan corner, then the city accommodate many open areas for as a public meeting points and matching ranked citizens gathered in certain zones according to early mentioned arrangement.

CONCLUSION

The ancient Indian architecture is an amalgam of religion and a traditional interpretation on how the decrees of nature affect mankind, Indian architect develop the Mandala graph which recognizes the principle of five elements and within its components the five elements are distributed according to sun path, four cardinals and location of India in the planet earth. Among many planets in our Galaxy earth is the only sphere consist of these primary elements necessary to establish life thus they are dominant in Mandala layout, the environment and occupants wellbeing in any building or settlement can be enhanced by distributing the function in certain direction according to Mandala suggestion, It takes advantage of the benefits conferred by the five elements of nature to create a genial living and working environment thus facilitating spiritual well-being and paving the way to enhanced health, happiness , prosperity and wealth.

The acknowledgment of Indian norms and beliefs led into such distinct architecture which lasted since thousands of years and can be great inspiration for the coming generation. Furthermore reviving our ancestor approach is a great tool to diminish similitude layout of nowadays capitals and creating long lasting architecture that never fade away over centuries.

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SD 10 - ARCHITECTURAL PRACTICES OF PROJECT COMMUNICATION MANAGEMENT IN IRAQ

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ABSTRACT

Architects are significant initiators for the built environment projects, while architecture is all about communicating effectively with clients. Yet, some problems occur in regards to the mutual transfer of project information between those two parties. Thus, it is essential to enrol a proper system for managing project communication through the communication management discipline. Communication management is a notable part of the project management body of knowledge that coordinates and manages the process of exchanging information of the designing project. However, studies confirmed that practices of communication management are often underestimated and overlooked. This paper discusses communication management from architect's perspectives and aims to determine the current practice in Iraq, where few studies were engaged in this field. This paper follows the quantitative methods of research, whereas an online questionnaire survey is utilised and structured via surveymonkey.com and sent to 100 architects working in private firms in Basra city, southern of Iraq. The collected data are further analysed with SPSS version 23. The analysis shows that Iraqi architects have little information and knowledge in project communication management, where standards and methodologies are not followed. Thus, this paper concludes to the necessary need to introduce communication management as an evolving knowledge area to the architects in Iraq, and raise its implementation that attempts to fulfil clients' requirement and aspirations in regards to the architectural design.

Keywords: communication management, architects, practice, clients, Iraq.

INTRODUCTION

Architects are the first initiators of the direct communication process with the clients during the designing phase. Moreover, communication has an influential impact on the architecture practice among individuals and project teams (Shen 2011). As to Charvat (2003), communication is the backbone of project success, and if it was missed, it causes unpleasant consequences of delays that lead to project failure. Thus, researchers indicated the significant need of commencing an adequate communication management system that helps

to solve occurred problems (Foley and Macmillan 2005). Communication management is a fundamental part of the project management field, as it controls the systematic information exchange among the involved parties of the project (Muszynska 2015). However, it was claimed through the literature that little attention was paid to the significance of communication management, and project management studies were a lack of this part (Dainty, Moore, and Murray 2007). Therefore, Samáková, Sujanová, and Koltnerová (2013) highlighted the necessity of major changes and improvement in communication plans, as well as in managing the required communication. Subsequently, it is a demanding call to assist architects to set exquisite guidelines of communication management methods that ensure effective communication and correspondence with the features and environment of the project (Muszynska 2015).

Iraqi studies in regards to project communication management were little and limited. This was proven after going through the Iraqi Academic Scientific Journals, where only two studies were found. This paper aims to launch an in-depth investigation to determine the current level of communication management knowledge and practices, especially among the architecture practices in Iraq.

This paper follows the quantitative approach of research methods, in the form of a self-administrated closed-ended online questionnaire survey, that was initially structured by surveymonkey.com and sent to the respondents. Prior to this, a pilot study was conducted for testing the reliability of the research instrument through Cronbach's alpha coefficient of internal consistency. This paper targets the architects working in the private sector in the city of Basra, Southern of Iraq, with a minimum of two years of experience. This paper has concluded to the little attention given to the project communication management in Iraq, where the practices among architects are considered weak. It is further recommended to raise the knowledge of this significant part of the project management context in architectural practices as a vital part of the construction projects.

METHODS

Since this paper aims to determine how communication management is currently practised in Iraq, it is an obvious need for a relevant method of sampling. Literature mentioned the two types of sampling: probability and non-probability sampling. Thus, this paper follows the non-probability sampling which respondents are basically chosen with no probabilities of selection, as it used when researchers plan to study among a particular group of respondents (Lemeshow, Hosmer, Klar and Lwanga 1990). Results can be further generalised to the bigger population. Therefore, among the 150 architects in Basra, and according to Krejcie and Morgan (1970), the sample size for this population is 108 architects. Subsequently, some researchers consider setting some criteria for the sample is a necessity to increase adequacy of the study (Muhwezi, Acai, and Otim 2014). Thus, the respondents of this paper need to own at least two years of experience of designing and dealing with clients within their practice.

Data collection for this paper was performed through an online self-administrated closed-ended questionnaire survey, which was structured via surveymonkey.com, and distributed through e-mails. However, after setting the sample respondents of this paper, a pilot study was conducted to test the reliability of the instrument. As to Connelly (2008), 10 percent of the sample size is sufficient for conducting a pilot study, this equals almost 11 respondents. Moreover, Cronbach's alpha of internal consistency was calculated according to George and

Mallery (2003), where it was suggested that range between 0.7-0.79 is acceptable. Cronbach's alpha for this paper was 0.845, which is considered good. Thus, the data collection process through the online survey is proceeding. The online questionnaire surveys are getting more attention by the researchers, due to the ease of reaching respondents, less costly as well as high response levels and flexibility (McDonald and Adam 2003). These features are further confirmed by Baruch and Holtom (2008) who stated that the response rate achieved by the online surveys could be equal or higher than those by emailing surveys.

The online data collection for this paper was conducted in the period between 22nd January and 14th March 2017. Total questionnaires sent to respondents were 115, only 100 questionnaires were sent back, and 89 of them are completed and accepted. This gives a total response rate of 82 percent, which is higher than the 70 percent response rate set by Nulty (2008) to be accepted. The questionnaire survey consisted of questions with 4 Likert scale measurement options for agreement. A Likert scale is a group of items with an equivalent number of likely and unlikely statements, answered by respondents according to their levels of agreement (McIver and Carmines 1981). Likert scale options are given values range from 1 to 4 as it refers to 1=strongly disagree, 2=disagree, 3=agree, 4=strongly agree. Although studies are commonly using five responding options of Likert scale with the neutral option, this paper follows Nemoto and Beglar (2014) who demonstrated that having a Likert scale of four or six measurement option can be more reliable. Similarly, Garland (1991) stated that removing the neutral option helps to increase the reliability of responses.

Furthermore, collected data are analysed using Statistical Package for the Social Sciences (SPSS) software version 23. Descriptive data analysis was used in this paper, where it gives a comprehensive summary of respondents' data (Greasley 2007). For this paper, descriptive data includes calculating one of the central tendency measurements, the mean, as well as the standard deviation (SD). The mean is the most common used measure of the central tendency, as it refers to the scores' average which summarises the interval scores (Patel 2009). For this paper, scales of mean that range between 1.00 to 2.99 are considered low, whilst values $\geq$ 3.00 are high and accepted. On the other hand, the standard deviation is the value of average distance for each element from the mean value (Patel 2009).

FINDINGS AND ARGUMENT

The general demographic information of the respondents is depicted in Figure 1, which includes the age, gender, affiliation according to the Iraqi Engineers Union and years of experience. Results show that majority of the respondents are 25 to 34 years old, which demonstrates that the architects in Basra mostly belongs to the Y generation. Y generation is the cohort of the population that was born between 1981 and 2001 (Brosdahl and Carpenter 2011) and considered to be one of the biggest cohorts among the workforce (Nightingale 2011). Subsequently, this causes the years of experience of the respondents to be between 2 and 10 years. Thus, the most common affiliation is the assistant and practitioner engineers, as architects in Iraq follow the engineers' affiliation under the Iraqi Engineers Union. Finally, results show an almost equality of genders in architectural practice in Basra.

On the other hand, responses to the presented 13 questions show that architects have an agreed opinion of the weak current practice of communication management. Moreover, they confirmed the little attention is given to the practices of communication management, and the international standard and methodologies are not followed. Additionally, architects find

it an important act to adopt the proper communication methods with their clients. And it is the architect's responsibility to propose, maintain, manage, perform and instruct the communication, in relevance to the project environment and requirements. The values of the mean and the standard deviation are represented in Figure 2.
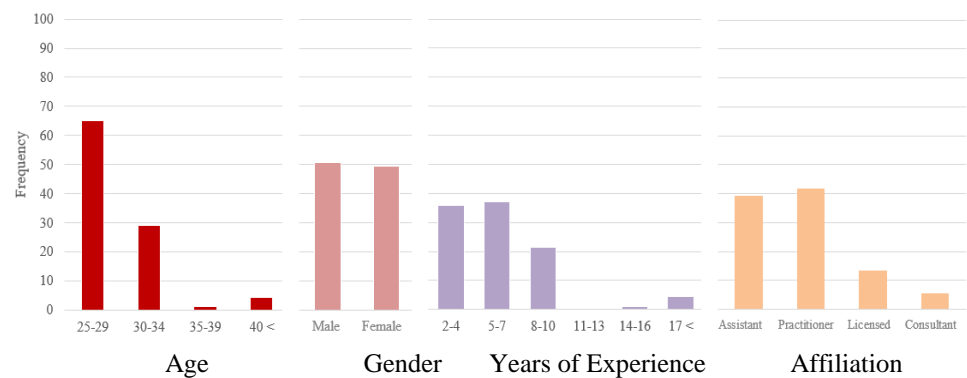
Figure 1 General demographic information
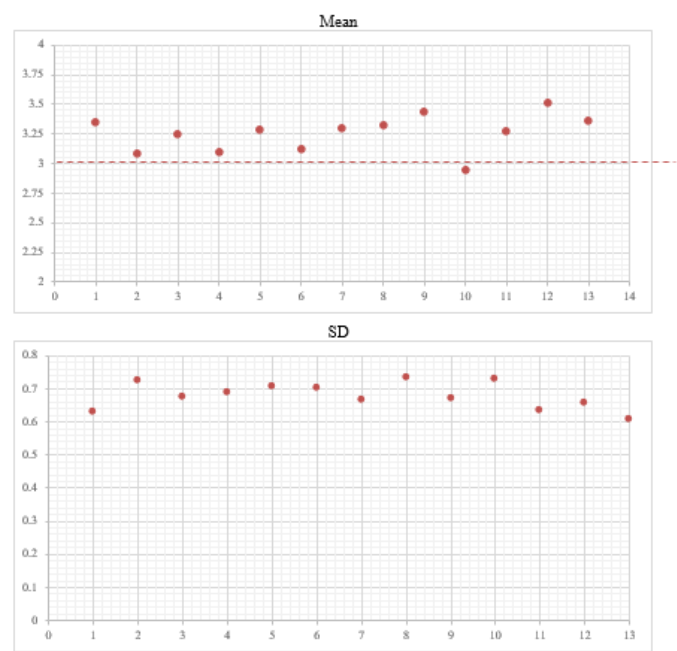
Figure 2 Distribution of values of Mean and Standard Deviation

CONCLUSIONS

By the end of this paper, the current practice of project communication management, as a significant part of project management, has been determined throughout the responses collected from the architects in the city of Basra, Iraq. Project communication management is the process that deals with the coordination and controlling the project information exchange between the architect and the client. It helps to solve and control the communication-related issues, which can cause project failure or client's dissatisfaction. The results of this paper can be generalised among the architectural firms and practices all over Iraq, due to the similarity of the working environment and typical clients and projects. However, this paper helps the architects to raise their knowledge and understanding

regarding the project communication management, as it will increase the client-architect mutual understanding level. Finally, as an architect has agreed on the need for communication management, this paper recommends for future researches to be conducted on the architects' competency and strategies to the convenient improvements.

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SD 16 - UNDERSTANDING THE ROLE OF FACILITY MANAGEMENT AND FACILITY MANAGER IN SOLVING POOR INDOOR AIR QUALITY

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ABSTRACT

According to the World Health Organization Committee on 1984, more than 30% of new and remodeled building throughout the world become subject to excessive complaints related to the Indoor Air Quality (IAQ). In many cases conducted, it show that the level of indoor pollution is higher than the contaminants contained in the external environment. The poor IAQ will have adverse effect on human health and lifestyle. This effect known as Sick Building Syndrome (SBS) and its effect on human health as a problem threatening public health and more. Even though SBS does not threat life, but it still uncomfortable and can causes loss of labor force and efficiency and may lead to serious health problem. This paper will explain how facility management and facility manager role and help solve the impact of Sick Building Syndrome.

Keywords: Indoor Air Quality, Facility Management, Facility Manager.

INTRODUCTION TO INDOOR POLLUTION

Research conduct by American Environment Protection Agency (EPA) (1991) shows that the poor level of indoor air quality in a modern building isolated from the external environment is more dangerous than the external outdoor air quality itself. The Indoor Environment Quality (IEQ) plays an important role in determining the comfort and productivity level and efficiency of building occupant (Salleh, Kamaruzzaman, Riley, Zawawi, & Sulaiman, 2015). Salleh et al., (2015) also said that physical comfort affecting the occupants refers to meeting the basic needs of residents such as adequate lighting for all occupants, space suitable to the number of occupants, psychological comfort that will affect the level of satisfaction of the occupants of colleagues as well as management, and fun feeling for work. According to Greenpoint Building Technologies (2015), IEQ refers to the interior of a building. It is not only specific to air quality, but covers all aspects that affect the quality of the environment as shown in Figure 1 below.

Figure 1. Factors contribute to Indoor Environment Quality

FACILITY MANAGEMENT

According to Kooij (2012), Facility Management was first introduced in 1984 in Europe. Several years later, Facility Management has begun to gain attention from outside the country and is growing rapidly. The actual definition of Facilities Management is still difficult to set because concepts and definitions are still growing and are always influenced by world trends. P.Rondeau, Brown, & D.Lapides (2006) give definition for Facility Management as a practice and profession that provide management services that meet strategic long-range and short-term corporate requirements and will continuing to evolve. P.Rondeau et al. (2006) also describe Facility Management as a proven and innovative methods and techniques with the most current technical knowledge to achieve humane, productive and cost-effective work environments.
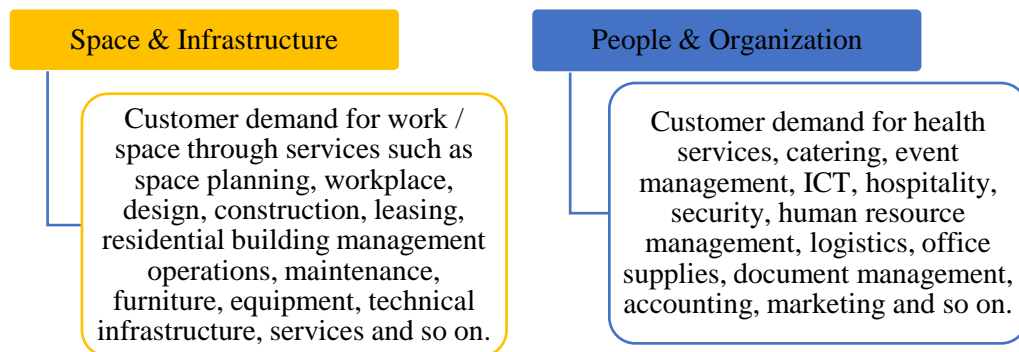
Figure 2. Definition derived from International Facility Management Association (IFMA)(2017) and approved by European Facility Management Network (EuroFM)(2017) about four major elements in Facility Management which is Place (space), Technology (infrastructure), People and Process (organization).

Atkin & Brooks (2015) stated that the management of the facility serves to create a conducive environment. A conducive environment is needed to implement the core operations of an organization. An organization can implement core operations through an integrated approach to infrastructure services and delivery for customer satisfaction and value-added money through support for further business development.

FACILITY MANAGER ROLE

As a result of the partnership acquired by Lorenz (2016) with ten energy managers, there are several methods that can be applied by other energy managers that can help reduce the

energy consumption of a facility. This method can be categorized into ten major categories which can be simplified in Table 1 below.

Table 1. Energy manager role for reducing energy management in facility methods

Energy manager	Method of reducing energy consumption
Mark Sanderson, Operations Manager, EMCOR Facilities Services;	Reduce the use of nightlight systems
Don Amuzie, Program Manager Supervisor, PG & E;	Review of facilities
Gary Stark, Assistant Director Facilities, North Idaho College;	Participation of local communities in order to reduce the cost of energy consumption
James Vetter, Vice President & Account Manager, Grubb & Ellis Management Services;	Off vending machines vending lamp
Robert A. Flores, Lockheed Martin STS;	Establish more zones within a level to maximize escalation
Michael Schulz, Profit Improvement Manager, Hyatt Hotels;	Use the latest process to reduce energy consumption in kitchen
Dean Gerstein, Profit Improvement Manager, Hyatt Hotels;	Reduce the heat absorption of solar energy at certain hotels
David Black, Director of Facilities, John Muir Health;	Reduce the energy used for cooling
John Christoffersen, Project Manager, Chukchansi Gold Resort and Casino and Dean Gerstein, Profit Improvement Manager, Hyatt Hotels;	Setting the cooling temperature to the appropriate temperature
Doug Snell Sr, Vice President of Facilities & Purchasing, D & E Communication Inc.	Bring your own transformer

CONCLUSION

From all aspects covers in this paper, it can be concluded that if the facility have great and systematic facility management system and facility manager, the total energy consumption for this facility can be reduced. The combination of facility manager and responsible occupant will also give positive impact on working space. Further research about the effect of poor Indoor Environment Quality (IEQ) which is Sick Building Syndrome (SBS) and Building Related Illness (BRI) can be a recommendation for this study.

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SD 29 - AN OVERVIEW OF IMPLEMENTATION OUTSOURCING SERVICES OF FACILITIES MANAGEMENT IN MALAYSIAN PRIVATE HOSPITALS

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ABSTRACT

Malaysian private health care faces a problem in the implementation of outsourcing facilities management. Due lack of benchmark standards and data, as well as lack of transparency in processing of contracts there are misconceptions about the practice of FM. The effectiveness of FM outsourcing design practice should meet the standard of Ministry of Health. Private hospital support services play a vital role in order to understand a customer's needs by defining the performance of outsourcing in FM. This paper comprehensively analyses the articles and journals in reviewing the definitions and concepts and discussing the implementation of outsourcing of FM in private hospitals. quality services of outsourcing in FM healthcare highly depends on trained, motivated and competent staff, which have been highlighted and recommended by researchers. This article will emphasize successful factors in the implementation of outsourcing FM in Private Hospitals.

Key words: health care; outsourcing; facilities management; private hospitals

INTRODUCTION

Facilities management (FM) has started growing from property and construction into a new industry sector since the late 1980s and early 1990s (Meng, 2015). "Facilities" include buildings, grounds, utilities, and equipment, and typically represent majority of an entity's capital assets. Facilities management concerns range from expansion or reductions in the size of a physical plant to the manner in which the quality of the workplace affects employee and/or user productivity. Outsourcing facility services can be a monumental challenge for organizations that perform those functions using in-house staff. However, as even the most routine tasks become more complex, facility executives search for innovative ways to improve services and save cost. Despite a steep learning curve, hiring service contractors is a logical business decision that, if implemented properly, can benefit

an organization for years. The strategy can be in-house and out-source strategy. Both strategies have their own benefits and their disadvantages. It depends on an organization and the nature of its business to determine its strategy. The facilities management strategy reflects the organization's business objectives, needs and policies, as well as practicalities. Outsourcing strategy means transfers made by an organization on one of its support functions or the facilities management service to a third party service provider, thus this brings the concept of hiring outside professional service to meet the in-house need. The subsequent section will highlight some of the Facilities Management in Malaysian private hospitals.

FACILITIES MANAGEMENT IN MALAYSIAN PRIVATE HOSPITALS

Malaysia is a multi-ethnic society of more than 24 million people including Malays, Chinese, Indians and numerous indigenous communities living together harmoniously. Despite the country's astonishing economic growth in the last two decades, the Malaysian healthcare sector is still developing. Currently there are 117 public and 224 private hospitals in this country. The Malaysian government has spent around three per cent (3%) of its Gross Domestic Product (GDP) on healthcare, considerably lower than other developing countries in the region (Butt and Run, 2009). Although the Malaysian government continuously allocates funds to improve its public healthcare infrastructure, others have alleged that government officials indirectly encouraged the private sector by allocating insufficient funds for the public sector healthcare (Ramesh and Wu, 2008). In comparison to neighboring countries such as Thailand, with highly state funded public health sector, the Malaysian government has managed to maintain a balance between private and public healthcare. Malaysia has achieved this balance mainly through gradually reducing public hospital funds, while avoiding any political backlash (Ramesh and Wu, 2008). This has resulted into significant private healthcare provider growth particularly in urban areas. Nowadays, private healthcare plays a significant role in the overall Malaysian healthcare sector growth. This is also evident by recent growth projections that Malaysian private health care will be responsible for half its needs by 2020. These trends indicate that a highly competitive healthcare industry is emerging in Malaysia, where private healthcare will face competition from the existing public healthcare facilities and the growing private enterprise. The private hospitals need to maintain the facilities provided to achieve their goals and to make their patrons satisfied. As discussed earlier, certain facilities in Malaysian private hospital has been outsourced. Thus, hiring maintenance team to maintain the facilities provided in private hospitals is unavoidable. Malaysia has a mixed public-private healthcare system, where the private sector is particularly strong in the urban areas. In the public sector, the Ministry of Health (MOH) is the main healthcare provider through its extensive network of primary care clinics, and hospitals ranging from small district hospitals without specialists to large hospitals at state capitals providing specialist and subspecialty services. Besides MOH, University Hospitals under the Ministry of Higher Education are also important providers while the Ministry of Defense has two hospitals for military personnel and their families. Table 2.1 shows the distribution of hospital beds in the country by sector and major providers.

Table 2.1: Distribution of Hospital number of beds in Malaysia, 2006

Sector	Amount	Number of beds	Percentage of total
Ministry of Health	128	34,761	71.7%
University Hospital	3	2,474	5.1%
Military Hospital	2	276	0.6%
Hospital of Aborigins	1	166	0.3%
Private Hospital	222	10,794	22.3%
Total	**356**	**48,471**	**100%**

While the public sector community or health clinics are the major primary care providers in the rural populations, private general practitioners operating as solo or group practices, are major providers in the urban areas where several clinics can be found in a housing area or commercial area. Malaysia's total health expenditure constituted 3.8% of its GDP in 2002 where 56% were in the public sector. The Ministry of Health (MOH) is the largest source of health expenditure within the public sector (86%) that has been funded through general taxation. Household out-of-pocket spending accounted for the largest source in the private sector (74%). Supporting services for healthcare are like hospital infrastructure, HR managing, research development, procurement and facilities management meanwhile the primary activities are operation, services and managing and sales. (Kadir, 2014)

Over the years, there have been many definitions of Facilities Management based on its specific objectives and scope. Facilities Management includes the services and performance toward organizational improvement, and these involve people, process, environment, health and safety which are the responsibilities in Facilities Management and the focus of Facilities Management in the workplace appears to be a commonality (Madding, 2011). The authors have added workplace in this article. It refers to a place where work of any nature is carried out. Thus, it is not limited to commercial office buildings of the private sector only but also includes other types of workplace such as hospital, educational and industrial workplaces in the public sector; (Ruzalli,2013) defined Facilities Management as the process which the provision of a total work environment including building, office equipment and services of the highest acceptable standards are of value for money. This definition enables an organization to optimize its core skills and focuses more on the profit of the core product. The fundamentals of this disciple are constantly being rethought with new ideas and theoretical approaches in order to build its image and to ensure that it is planned, organized and implemented to match the organizational needs.

The Facility Management Association of Australia (FMAA) defines facilities management as 'a business practice that optimises people, process, assets and the work environment to support the delivery of the organization's business objective'. Although facilities management centres on the triad of people, process, and place, the element of people is incomplete without recognition and consideration from different generations that make up today's workforce and the differences between these groups. Furthermore, the concept of core and non-core competencies (Waheed and Fernie, 2009) is logically the starting point for understanding what facilities management is not perceived to be at the moment. The authors describes core organisational capabilities as those capabilities that are directly added for the benefits of customers, are not easy for competitors to imitate, and can be leveraged for competitiveness across products and markets. Non-core capabilities, simply put, are those that are not critical to the company's revenue stream. Unfortunately,

facilities management currently falls into the latter category. The next section will discuss some of the outsourcing services in facilities management perceived by private hospitals in Malaysia.

OUSOURCING SERVICES IN FACILITIES MANAGEMENT

Facilities Management outsourcing may lead to a leaner, more efficient organisation that can concentrate on core business and reduce operating costs. Organisation explores outsourcing options for a variety of reasons where are to reduce the cost, the potential to convert fixed costs to variable costs, insufficient management time available for the in-house operation or its improvement and difficulty in retaining sufficiently qualified staff, (Young,2007), those services which are not seen as basic (core services) are more disposed to be outsourced. However, the most complex and professional areas are more difficult to outsource due to the power owned by workers and to the difficulty in measuring and controlling the specifications related to services. Outsourcing the Facilities Management to an external specialist enables the customer to retain control of services strategy and policy whilst simultaneously delegating the management of the premises and related functions. This allows customer to focus their management resources toward their own core business, whatever it may be with careful planning and management, organisations can achieve substantial gains by efficiently contracting out their facilities management service (Ruzalli,2013). Outsourcing is transferring business process from one company to another. A parent company uses outside firms to provide a business function that could have been done in house. The aim of outsourcing is to make the business or organization more competitive by staying focused on its core competencies. However, the motivations for outsourcing remain largely the same and have traditionally centred on cost reduction although the advantages of outsourcing in terms of access to scare expertise, faster time to market, and higher quality products and services, are now also being recognised as key drivers. The authors have added a decision to outsource based on achieving better ''scale'' or being able to ''specialise'' in certain business areas which is considered functional. However, a decision to ''sell'' or ''surrender'' the IT function to an external vendor either for short-term gain or to extricate the organisation from IT responsibility is considered dysfunctional. Meanwhile, with a rapidly expanding outsourcing industry in the 1990s, the scope and nature of outsourcing began to attract more research attention. The authors also have focused on the performance of outsourcing arrangements. In particular, the relationship between client and vendor is seen as a critical determinant of outsourcing success. (Gonzalez et.al.,2013) Concepts, principles, practices and theories demonstrate their true value when they can be tied to positive or negative results, and as such, the practice-performance link is of considerable interest to researchers and practitioners alike. As a general rule, "performance" in the supply chain-related literature has focused upon financial and operational measures of performance (Ketokivi and Schroeder,2004) which is supported by (Brewer ,2011).

CONCLUSION

This article reviews the literature on outsourcing in the healthcare sector with aggregated view. Available information regarding the importance of implementation outsourcing services in Malaysia private hospitals, and also advantages and opportunities that turned out sourcing in this sector has been summed up. It is crucial to highlight that prior to having facilities

management it is essential to understand the outsourcing services in the private sector. Therefore, this article categorizes the literature and does a critical review on the information according to outsourcing facilities management functions in private hospitals. To do this, 10 articles on the issues pertaining to outsourcing facilities management have been reviewed critically. To highlight the importance of the implementation of outsourcing FM and its criteria, a primary data collection method using survey or interview can be conducted in future.

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