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On-Street Visual Analysis on Outdoor Space of Jalan Hang Jebat, Melaka

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Abstract

Outdoor space in between heritage buildings of heritage streets defines as ‘outdoor living room’. Whether it’s impressively ‘heritage’ or ‘commercially’ character; physical and socio-cultural attributes of the streets have great influence towards eliciting on-street pedestrian pattern. The aim of this study is to determine the relationship between timeframe and density, activity and movement based on the on-street cultural phenomenon. For the purpose of this paper, the presentation unveiled one section of the study which shares the analysis on-street’s aerial-visual data only. Unobtrusive methods were employed through Digital Photography and Closed Circuit Television (CCTV) at Jalan Hang Jebat, Melaka. The objectives of this study are to interpret pedestrian density, activity and movement analysis.

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Keywords: Outstanding value; outdoor living room; pedestrian pattern; street shopping

1. Introduction

The direct relationship between pedestrian movements and on-street activity to revitalize a positive aura within a heritage outdoor space may be fully not understood, but further studies on heritage street’s ambiance with therapeutic quality proves that indulging in a creative activities such as outdoor street shopping often decreases solemnity and increases livability. However, the relationship between pedestrian movement and activity can be analyzed through a number of methods including Digital Photography Analysis or Close Circuit Television (CCTV) which records street’s activities. Why Digital Photography and CCTV are important choice? The current research on evaluating urban outdoor space quality

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indicated that both manual and technological application is applied as complimentary methods. CCTV has its limitation to certain height and location therefore; Digital Photography to record on-street visual observation has great potential to fill up the gap of the study area's coverage for recording purposes.

The CCTV form of data collected is in the form of video motion and non motion detection. From time to time, all collected video camera input data is kept for record purpose in case of any crime and accident scene in the area. Since public has accepted as Jalan Hang Jebat as one of the most vibrant street within the heritage core zone and Police Department has considered it as the least crime street, therefore this juxtaposition has elevate this street with added value of street with unique identity: 'vibrant but safe street'. Due to this uniqueness of high revitalization with peaceful street yet maintain its vibrancy makes the street a real attractive street. No doubt, this street has its own outstanding value on top of the outstanding universal value as established in UNESCO World Heritage Sites in 2008..

1.1. Outstanding value

Outstanding universal value of Melaka is on her 'multi-culturalism' quality which rarely found to the world. The architectural style of its built heritage as demonstrated in the historical shop houses and on the other hand cultural heritage as demonstrated through the continuous trading lifestyle as previous port city activity from the sub-cultures from Asian such as India, China, Malay and other continent such as Europe.

There are mainly three most Outstanding Universal Values as recorded by Cultural Heritage Action Theme (CHAT) of Penang in which this value as shared by Melaka:

- First Outstanding Universal Value – Multi-trading town as forged from exchanges of cultures.
- Second Outstanding Universal value – Living Testimony of Tangible and Intangible Heritage.
- Third Outstanding Universal Value – Melting Pot of Multicultural Architecture and Township.

The outstanding value is clearly shown in the leftover built heritage including the early shop houses in Melaka. The almost similar built heritage of early shop houses can also be found in Georgetown Penang. The close image and identity between Penang shop houses and Melaka shop houses are due to their similarity in terms of social influences of historical Port City with spice up with architecture from the British Colonial, European, Asian and multi-ethnic influences. Due to high awareness and local appreciation towards the existing shop houses that make the conservation of historical shop houses acceptable and the built heritage in well taken care and remains in a good condition. The continuous livability shall be inherited to the next generation in order to convey the physical heritage to the next end users of the future.

1.2. Outdoor living room

R. Robertson (1992) in the particularization within the globalization age stated dictated that globalization has its own richness such as particularization of local tourism activity empowerment to attract global tourism. For instance, to consume World Heritage Sites physically tourists can only access the physical elements such as the architecture or the interior in the indoor and the outdoor space of the sites. The activities that tourists may do are visiting galleries, shopping, eating and heritage walking. Since the space that served for public is too limited therefore, the space in between heritage streets shall be treated nicely an outdoor living room to provide tourist basic amenity while they are outside their accommodation. This area shall be properly designed with appropriate street furniture, inclusively design for all ages and ability, robust and flexible to cater universal tourism and local public. (Evans, 2009) promoting a creative spaces in revitalizing urban area by all means of design principles to reduce unintended area and reduce crime-prone area. (Edwards, Griffin & Hayllar, 2008) criticized the weaknesses which identified among practitioners, researchers and policy maker on the lack of integration

of spaces. This is the one of the threats of a livable heritage city which caused under-utilized and negative space in urban area. The space shall be focused for urban recreation activities rather than left as unintended and no man's land (Samadi, Z and Hasbullah, M.N., 2008).

1.3. Pedestrian pattern

The research on pedestrian pattern and intensity were cross examined by many city legibility researchers. S. Stefan, (2006) described that the accuracy of application of Geo-Positioning System (GPS) until the millennium era was limited up to thirty meter from the ground due to international military safety restriction. Due to that limitation and satellite's accessibility restriction to obtain data from the authority has lead the research conduct to have on-site visual observation to record pedestrian linkages. At this level however, at human eye level's visual observation has its advantageous in psychologically sense the positive aura of the street outdoor environment, calculate the density of pedestrian and observed in the realistic of the on-street activity.

1.4. Street shopping

The daily operation for the indoor shopping activity in the heritage shop houses begins in between 09.00am to 10.00pm. Beginning from Friday to Sunday's night the business activity in the indoor shop houses are closed their business earlier at 1800 to allow Night Market to operate until midnight. During this night market, vehicular traffic is closed but adjacent streets such as Jalan Kubu and Jalan Tun Tan Cheng Lock are remained accessible for traffic.

The main activities were meant for on-street shopping and outdoor street dining. Selected items such as art and craft, fashion and fabric outlet, tit and bits, souvenirs, on-street dine for local cuisines are on offer to visitors. Besides that, local snacks such as 'popiah' and hot and spicy fruit salad which locally known as 'rojak buah-buahan' are part of the major attraction. Bargaining is not a common scene since most of the products are antique, aesthetically attractive and on-sale within market price.

Jalan Hang Jebat's night market opens every weekend beginning from Friday evening to Sunday night. The number of pedestrian increasing tremendously as the street was closed for vehicular movement to focus for on-street shopping. The Night Market has attracted local and international tourists to come and join in this street as pedestrian. They enjoy outdoor ambiance and some of them just come to experience the high crowd and vibrant environment. The character of the street is supported by the nearby heritage tourism activity where visitors come to visit other historical monuments in Bandar Hilir such as A Famosa, Stadhuys and other visiting spots such as Museum of Malacca and Melaka Night Cruise.

1.5. Heritage street's activities

Even though the employed unobtrusive data does not involved end users' direct participation but the narration on the historical background of the street especially in the making of the revitalization of Jalan Hang Jebat needs to be considered for this research. According to the one of the senior personal of the street whom was interviewed in March 2012, Datuk Wira Gan Boon Leong whom once lead the street committee clearly explained that the vendors along the street was initially rejected the idea to enhance their business activities by extending their business hour. The reason why they declined to prolong their on-street vendor was due to low market attraction in this old heritage street. Due to this initial rejection, he had to strategize on how to make the dream comes true in making the Hang Jebat Street to be revitalized from its gravely environment. Continuous motivation was given to vendors and shop houses owners a special fund was created to elevate the façade of the shop houses but physical enhancement was

not enough to revive the heritage street. Finally, Datuk Gan found that bringing in more people coming and visiting the street. But, with special incentives and personal encouragement between him and the heritage street committee then only small business entrepreneurs gave their cooperation to operate in long hours of operation. Finally, they remain their business up from 6pm to midnight. During the early years between 1990 and 2000 the night market was operating slowly and start developing but recent observation has shown that a very lively experience can be felt along the street.

Besides, shopping activities at Jalan Hang Jebat, an open-air stage performance with minus-one equipment is provided to cater elderly outdoor activity. The open air stage is located at the end of Jalan Hang Jebat heading to Jalan Kubu. The performance in this open air stage was criticized loudly by certain group of shop owners due to its annoying loudness but it has attracted more street shoppers to visit and join the joyful performance. Sometimes special and famous performers also invited to perform especially in celebrating special event such as Chinese New year, National Day and new eve celebration. The purpose of this kind of activities is simply to provide street shoppers a light entertainment, freedom expression and to create fun environment.

The idea of revitalization with value-added of positive aura enhancement within a heritage outdoor space has attracted Majlis Bandaraya Melaka Bersejarah (MBMB) to venture with the Ibu Pejabat Kontinjen Polis, Melaka Tengah (IPK, Melaka Tengah). Their aim was to provide a safety measure for the benefit of city citizen and tourists in visiting Jalan Hang Jebat, Melaka which was found as remarkable street in Banda Hilir in Melaka. And due to those reasons has created an urgent call for the conduct of the research.

2. Methodology

2.1. Participation, ethics and procedures for CCTV

This research was conducted in between March 2012 and August 2012 in which employs two types of non-obtrusive measures; Digital Photography Analysis and CCTV analysis. The depth of CCTV interpretation in the research however, does not achieve the level of forensic CCTV Video Analysis as offered by Forensic Resources Ltd (2009). In terms of research participation, CCTV does not involve end-users direct involvement except for recording their routine behavior in the real phenomenon of the street. The application of CCTV video camera is typically used to capture and record event of any suspicious circumstances and recall event to a non broadcast transmission system. The additional feature in the system is the inclusion with special requirement as specified by the operator/owner of the CCTV sets. At present, CCTV recording is quite a common unobtrusive measure through video camera input as this similar application also being used in the indoors of banks, prisons, airports and public institutions.

The selected operating system allowed certain numbers of closed circuit camera within the selected points along the study site of Jalan Hang Jebat. Video input is recorded according to time and date and then video output is channeled to hard disk (HD) which belongs to the police head quarter. As the owner of the data those CCTV camera have its pre-set selected resolution and rate.

The police department together with MBMB set the CCTV at the selected points within the heritage core zone. The main aim was to collect ariel-view data at the height of about 10 meter (30 feet) high from the ground to record city pedestrian and vehicular traffic within the all year round. The exact positioning of the equipment was identified in ensuring public safety and function as part of crime reduction measures for maintaining high quality safety and surveillance. The CCTV setting in the heritage street is part of the precaution to detect and provide useful information on end users behavioral patterns. The most common examples of behavior are heritage shop house owners' constructing illegal renovation, end-users

vandalism to public properties; urban crime of pick pocket, unauthorized direction of end users linkages, vehicular traffic control, unintended signage positioning and removal.

Therefore, in this research it does not required as direct participation but end-users were observed in terms of their movement pattern, behavior and intensity from the CCTV only. However, due to the limitation of view there is space which is located as hidden spot. In the conduct of this research, the researcher required to grant a verbal and written permission as compliance to the ethical procedure from the Head of Police Contingent prior to the CCTV assessment and on-street visual observation to avoid any future difficulties in the study site.

2.2. Aerial-Visual and Human Eye Level Visual Data

In this research, the visual of bird's eye view data was chosen as the most synoptic viewpoint to capture a larger area to see the physical surface feature in the spatial context in between heritage buildings. According to Thomas, A. and Gevanthor, A. (2007) defined that aerial as originated in early 17th century from Latin called "aerius" and from Greek called "aerios". Aerial photography was the first method of remote sensing and still remains in use in the current post millennium era. It is the most common, versatile and economical form of remote sensing.

The Human Eye Level Visual Data are also used in this research method. The following figures are sample of human eye-level's digital camera data which was used to support the CCTV data which can be viewed confidentially and not meant for any publication. Due to this limitation, this paper only shares the digital photo only. Prior to the research conduct, researcher had logged in report to police department for ensuring their presence on-street with consent and under protection of the police.



Fig. 1. (a) Night market view; (b) Day view (morning) shopping along Jalan Hang Jebat

3. Aerial-Visual Assessment Criteria (AVAC)

3.1. Research design and data log sheet

This research employed unobtrusive-data collection with on-street manual calculation for recording on-street intensity of pedestrian passing-by and shopping along the study street. This manual calculation on site from selected points at the beginning, intermediate and the end of the street was to counter checked again from digital photography and CCTV data in validating the result. However, due to non-synchronized time in collecting the pedestrian intensity it is considered as a standard error. Similar with digital camera data, real-time of video camera collected from the CCTV's is also not synchronized as the

same time as manually collection data. The above figures representing sample of digital photography used for on-site data for analysis in calculating density of street during night market. Since the CCTV data is strictly confidential and limitedly for viewing therefore, this paper only shares the Aerial-Visual Assessment (AVA)'s assessment table and findings only.

Table 1. Sample of A4-sized Data Log Sheet of the Aerial-Visual Assessment (AVA)

| Timeline | Duration (6 Option) | Type of Activity (3 options) | Intensity of people 10 sq ft area (4 options) | Movement (3 options) | Distribution of Frequency by Percentage |
|--------------|------------------------|---------------------------------|---|---|---|
| Morning | 0800-1200 | Indoor Shopping | 1-5 | Direct and one way only | |
| Afternoon | 1200-1600 | Indoor & Outdoor | 6-10 | | |
| Evening | 1600-2000 | On-street shopping | 11-15 | Meandering and to and fro shopping outlet | |
| Early Night | 2000-2400 | | 20-30 | | |
| Midnight | 2400-0400 | | | Meandering | |
| Night Market | 1800-2400 | | | Active | |

The above table shows the column of options for the aerial visual data collection activity which was completed by researcher as researcher stopped and walked from the end of the street and to other end. The route started at right and the entry of Jalan Hang Jebat and ended at junction of Jalan Kubu. For the purpose of on-site intensity collecting data a enlarge scale of the street were used to record activity, movement and behavioral pattern and the end user's intensity. The visual limit street was within the radius of 20feet (6 m) and the viewing point and angle are recorded.

4. Result and Discussion

4.1. Activity along Jalan Hang Jebat

Based on the data collection in March 2012 to October 2012, there are three main activities in Jalan Hang Jebat. The first activity is Indoor Shopping which is lineage along the heritage shop houses. The second activity is Indoor and Outdoor Shopping and the third one is On-Street Shopping. The activity is observed as varies along the daytime and night-time line as shown in the following table.

Table 2. Activity along Jalan Hang Jebat

| Timeline | Duration | Type of Activity | % of Frequency |
|---------------------------------|-----------|--------------------|----------------|
| Morning | 0800-1200 | Indoor Shopping | 11.40 |
| Afternoon | 1200-1600 | Indoor Shopping | 22.00 |
| Evening | 1600-2000 | Indoor & Outdoor | 18.00 |
| Early Night | 2000-2400 | Indoor & Outdoor | 30.10 |
| Midnight | 2400-0400 | Indoor & Outdoor | 2.00 |
| Friday to Sunday [Night Market] | 1800-2400 | On-street shopping | 16.50 |
| Total | | | 100.00 |



Fig. 2. Selected type of activity by pedestrian

The interaction between indoor and outdoor shopping in Jalan Hang Jebat is considered as highly related to each other. The pedestrian along the street whom acted as the main customer moves from outside to inside and vice-versa and make the activity between indoor and outdoor active and robust. In fact some of the indoor product sales are duplicated for promoted sales during night market.

4.2. Intensity of end users including visitors, shop owners and street vendors

The first one is as Low Distributed Pattern (LDP) with number of pedestrian with intensity between 1-5 person in 10 square meter area as detected early in the morning, afternoon and evening along the walkway of the study street. Pedestrian passing by to their work place and tourist also found for site seeing. This is due to the vehicular traffic is open for accessibility for both directions that limit pedestrian to walk on the street. The second is the Average Distribution Pattern (ADP) with the rate of pedestrian is between 6-10 end users in 10 square meter area which pedestrian pass by in between peak time. The third one is the High Distribution Pattern (HDP) rate of pedestrian intensity of 20-30 end-users in 10 square meter area during evening to mid-night.

Table 3. Intensity of pedestrian at Jalan Hang Jebat

| Timeline | Duration | Intensity of End User in 10 square meter area | % of Frequency |
|---------------------------------|-----------|---|----------------|
| Morning | 0800-1200 | 1-5 | 8.00 |
| Afternoon | 1200-1600 | 6-10 | 25.00 |
| Evening | 1600-2000 | 11-15 | 12.00 |
| Early Night | 2000-2400 | 11-15 | 13.00 |
| Midnight | 2400-0400 | 1-5 | 17.00 |
| Friday to Sunday [Night Market] | 1800-2400 | 20-30 | 25.00 |
| Total | | | 100.00% |

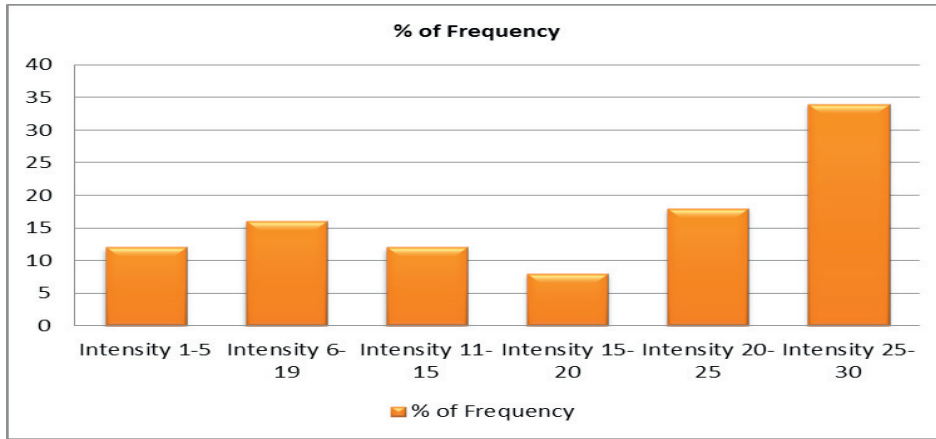


Fig. 3.Result of pedestrian intensity

4.3. Pedestrian movement pattern of linear linkages

The existing pattern of pedestrian movement pattern has created a very strong linear linkage along Jalan The existing pattern of pedestrian movement pattern has created a very strong linear linkage along Jalan Hang Jebat. The pattern varies along the 24 hours of the day during weekdays of the week. During research conduct and data collection period which took about six months duration, it is observed that there were three main patterns in this street which varies from peak hour to low peak pattern can be detected in this street. Most of the pedestrian along this street are shop owners, vendors, local and international tourists and tourist guides whom are very familiar with the tourism culture. The result based on the table indicated that the morning session began with low intensity and gradually increases as time goes by. Usually pedestrian in this session were shop owners, shop operators, workers and elderly from the closest neighborhoods. They enjoyed the walking activity due to the morning climatic factor.

Table 4. Pedestrian movement pattern of linear linkages

| Timeline | Duration | Pedestrian Movement | % of Frequency |
|---------------------------------|-----------|-----------------------|----------------|
| Morning | 0800-1200 | Direct and one way | 12 |
| Afternoon | 1200-1600 | To and fro shopping | 10 |
| Evening | 1600-2000 | To and fro shopping | 18 |
| Early Night | 2000-2400 | To and fro shopping | 22 |
| Midnight | 2400-0400 | Direct and one way | 20 |
| Friday to Sunday [Night Market] | 1800-2400 | Meandering and active | 18 |
| Total | | | 100.00% |

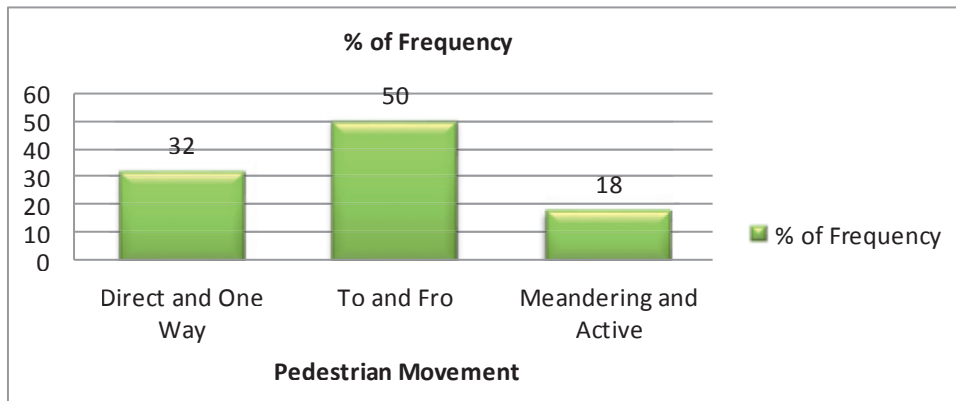


Fig.4. Result of pedestrian movement's preference

The above table illustrates the Pedestrian Movement Pattern which varies from direct and one way in which has changed to meandering from morning to evening. The change of movement's pattern is simply related to the pedestrian movement whom moves to and fro between one shopping lots to another due to high interest on display products. There are also observed to be more active by liners shopping to adjacent and sometimes crossing the street to continue their shopping activities during night market period.

5. Conclusion

The empowerment and participation of shop owners and street vendors in Jalan Hang Jebat in managing the heritage street caused a great impact towards the revitalization of the street. Even though the encouragement from the local authority through physical enhancement of shop houses provided initiatives for street improvement but the employed data analysis have proved that livability and vibrancy of activity of the outdoor living room is highly depending on the pedestrian intensity. The current trend indicated that there an inclination of interests towards urban heritage environment which promotes the local place identity which is more favored by international tourists. By having this study, hopefully it helps on improving the pedestrian movement management in heritage streets in Melaka.

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