SPATIAL VISIBILITY ANALYSIS OF STATIONARY ACTIVITIES AROUND DIGITAL URBAN SCREENS IN JOHOR BAHRU

MARIAH MASYKURAH BINTI AB HADI

UNIVERSITI TEKNOLOGI MALAYSIA

SPATIAL VISIBILITY ANALYSIS OF STATIONARY ACTIVITIES AROUND DIGITAL URBAN SCREENS IN JOHOR BAHRU

MARIAH MASYKURAH BINTI AB HADI

A thesis submitted in fulfilment of the
requirements for the award of the degree of
Master of Philosophy (Architecture)

School of Architecture
Faculty of Built Environment and Surveying
Universiti Teknologi Malaysia

SEP 2022

DEDICATION

This thesis is dedicated to my mother, Masita binti Ab Manap, and my father, Ab Hadi bin Mohamad who taught me that life is always full of mysteries and puzzles, and to never give up on my dreams… Thank you to my close friends and siblings, especially younger sister – I am nothing without you, for being the ears and shoulders. Further to mr Jones, thank you for your existence, along through my up and down in life.

ACKNOWLEDGEMENT

In preparing this thesis, it was something that I couldn't imagine that I will jump into this research field, after three years spending in professional field as an architect. Along this difficult journey, I have been connected with many people, including researchers, academicians, practitioners, and other workers in the government and private sectors, who are all enhancing our urban sceneries and environments. All of the people have contributed towards my understanding and thoughts in every single thing I have learned along the way. Notably, I wish to express my gratitude and sincere appreciation to my main supervisor, Dr. Sharifah Salwa Syed Mahdzar, for her acceptance of my thesis proposal in the first place – as well her encouragement, guidance, constructive criticism and close relationship. Without her consistent support, this thesis would have never been realized in the research world.

Furthermore, I am also owed to the School of Graduate Studies (SPS), Universiti Teknologi Malaysia for a fully funded scholarship for my M.Phil. study, and Research Management Centre (RMC), and Universiti Teknologi Malaysia for awarding the FRGS full grant for this thesis.

My fellow postgraduate student should also be recognised for their support. My sincere appreciation also extends to all my colleagues and others who have aided at various occasions. Their views and tips are useful indeed. Unfortunately, it is not possible to list all of them in this limited space. I am grateful to all my family member, and everyone in my life.

ABSTRACT

With the growing dependency on technological advancement, both architecture and media technologies have intertwining functions and application. As most modern buildings are media infrastructures with sculptures of huge and massive facades, they serve as the backdrop of the city fabric. The use of cutting-edge technology as the media facades for buildings portrays a different use of technology on building appearances, unlike in the past where normalcy is prevalent with erection of massive concrete blocks, cladded with glass facades. The amalgamation of digital urban screens has been a successful approach for place-making across numerous metropolitans. As such, this study proposes the use of the digital urban screens as new electronic landscape mediation instead of being used merely as a commercial projection on billboards within the cityscape. Theoretically, the success of public spaces can be determined based on the density of stationary activities (sitting, talking, and waiting) performed by pedestrians or city dwellers. Turning to this study, the physical elements and digital urban screens installed at Jalan Wong Ah Fook were examined. Besides assessing the relationship between human static activities and visibility spatial integration values, this study had identified factors that influenced the successful function of public spaces in the inner city of Johor Bahru. It is imminent to look into the efficacy of digital urban screen as an urban feature for effective actions to be taken by the local authority, stakeholders, and planners.

ABSTRAK

Selari dengan kebergantungan terhadap kemajuan teknologi yang semakin meningkat, teknologi media dan seni bina mempunyai fungsi dan penggunaan yang saling berkaitan. Memandangkan kebanyakan bangunan moden merupakan infrastruktur media dengan arca fasad yang besar dan teguh, bangunan-bangunan tersebut berperanan sebagai latar belakang fabrik bandar. Penggunaan teknologi canggih sebagai fasad media untuk bangunan menggambarkan pelbagai penerapan teknologi terhadap rupa bangunan. Tidak seperti masa lalu, pembinaan blok konkrit yang besar dan ditutupi dengan fasad kaca sering dilaksanakan. Penggabungan skrin bandar digital telah menjadi suatu pendekatan 'place-making' merentasi metropolitan yang berjaya. Justeru, kajian ini mencadangkan penggunaan skrin bandar digital sebagai pengantara landskap elektronik yang baharu, bukan hanya digunakan sebagai platform penyiaran komersial pada papan-papan iklan dalam landskap bandar. Secara teorinya, kejayaan ruang awam boleh ditentukan berdasarkan kepadatan aktiviti-aktiviti pegun (duduk, bercakap, dan menunggu) yang dilakukan oleh pejalan kaki atau penduduk kota. Berbalik kepada kajian ini, elemen-elemen fizikal dan skrin bandar digital yang dipasang di Jalan Wong Ah Fook telah dikaji. Selain menilai hubungan antara aktiviti pegun manusia dan nilai integrasi kebolehlihatan ruang, kajian ini telah mengenal pasti faktor-faktor yang mempengaruhi kejayaan fungsi ruang bandar di pusat bandar Johor Bahru. Keberkesanan skrin bandar digital sebagai salah satu ciri bandar adalah penting untuk diperhatikan bagi memastikan pihak berkuasa tempatan, pihak berkepentingan, dan para perancang dapat melaksanakan tindakan-tindakan yang berkesan.

TABLE OF CONTENTS

	TITLE	PAGE
	DECLARATION	**ii**
	DEDICATION	**iii**
	ACKNOWLEDGEMENT	**iv**
	ABSTRACT	**v**
	ABSTRAK	**vi**
	TABLE OF CONTENTS	**vii**
	LIST OF TABLES	**xi**
	LIST OF FIGURES	**xiii**
	LIST OF APPENDICES	**xv**
CHAPTER 1	**INTRODUCTION**	**1**
1.1	Background Study	1
1.2	Problem Background	3
1.3	Problem Statement	4
1.4	Research Questions	5
1.5	Research Aims and Objectives	6
1.6	Research Scope and Limitation	6
1.7	Research Significance	7
1.8	Research Methodology	7
1.9	Thesis Structure	10
CHAPTER 2	**LITERATURE REVIEW**	**13**
2.1	Introduction	13
2.2	Digital Urban Screens	13
	2.2.1 ‘Digital’ Urban Screens in Ancient Times	14
	2.2.2 Digital Urban Screens in Modern Times	15
	2.2.3 Digital Urban Screens in Urban Setting	17

2.2.4 Digital Urban Screens and Media Environments and Interactions 18

2.2.5 Digital Urban Screens in Urban Space Spatial Configurations 23

2.3 Public Spaces as Urban Places 25

2.3.1 Public Urban Space for Human Behaviour 28

2.4 Summary 30

CHAPTER 3 RESEARCH METHODOLOGY 32

3.1 Introduction 32

3.2 Space Syntax Methodology 33

3.3 Specific Variables 35

3.3.1 Dependent Variables 35

3.3.1.1 Social Activities: Social Variable (V_1) 35

3.3.2 Independent Variables 36

3.3.2.1 Physical Designs or Socio-physical Variable (V_2) 36

3.3.3 Visual Integration Value or Syntactical Variable (V_3) 36

3.4 Data Collection 37

3.4.1 Selecting Potential Streets 37

3.4.2 Observing Street Spaces Used for Static Activities 37

3.4.3 Observation Days 39

3.4.4 Observation Periods 39

3.4.5 Observation Technique 39

3.5 Data Analysis 40

3.5.1 Statistical Significance and Frequency Distribution of Social and Socio-physical Variables 40

3.5.2 Analysis Variable Relationships 40

3.5.3 Calculating the Sociability of the Independent and Dependent Variables 42

CHAPTER 4 DATA COLLECTION AND ANALYSIS 43

4.1 Introduction 43

4.2 Preliminary Observation 44

4.2.1 Distribution of static activities patterns in Johor Bahru city circle 44

4.2.2 Distribution of static activities patterns (Social Variables) 46

4.3 Distribution of NOR according to Detailed Physical Location Categories 52

4.4 Distribution of spatial use and spatial visibility analysis 54

4.4.1 The Distribution of N, O, R to the NOR for Gates at Jalan Wong Ah Fook 55

4.4.2 The Distribution of N, O, R to the distribution of NOR on SE, BE, and LE 57

4.5 Relationship between the static activities and physical elements 60

4.5.1 The relationship between the occupation of static activities on SE, BE, and LE in individual gate of total NOR 60

4.5.2 The relationship between the static occupation on Street Element, Building Element, and Landuse Element and the total of NOR on each detail physical designs 62

4.6 Strength of NOR activities and spatial visibility analysis 66

4.6.1 Relation between the total of NOR activities on Street Element, Building Element and Landuse Element on Difference Kilometre Radius 68

4.7 Analyzing data 70

4.8 Summary 73

CHAPTER 5 FINDINGS AND DISCUSSIONS 75

5.1 Introduction 75

5.2 Stationary activities pattern of city dwellers 75

5.3 Stationary activity along Jalan Wong Ah Fook 78

5.4 Strengths and Weaknesses of Social, Socio-physical, and Spatial Visibility Variables in Static Activities 78

5.5	Findings of the research	79
5.6	Discussions of the research	81
5.7	Summary	92
CHAPTER 6	**CONCLUSION AND RECOMMENDATIONS**	**93**
6.1	Introduction	93
6.2	Research Outcomes	93
6.3	Relation of City Dwellers Performing Static Activities to Digital Urban Screens' Location	94
6.4	Relation of City Dwellers Performing Static Activities to Spatial Visibility	95
6.5	Recommendation of implementation of Digital Urban Screens within urban area for potential stakeholders	96
6.6	Concluding Discussion	98
REFERENCES		**100**
LIST OF PUBLICATIONS		**112**

LIST OF TABLES

TABLE NO.	TITLE	PAGE
Table 3.1	Guide on the r value (Rowntree, 1981, p. 170)	**41**
Table 4.1	Distributions of Static Activities within Johor Bahru selected streets	**45**
Table 4.2	Frequencies of Static activities within Johor Bahru selected streets	**45**
Table 4.3	Description of gates along Jalan Wong Ah Fook	**47**
Table 4.4	Data findings for overall NOR static activity for Jalan Wong Ah Fook	**48**
Table 4.5	Matrix of p-value between SE, BE, LE to NOR activities	**48**
Table 4.6	Distribution of Necessary Activities on each gates	**49**
Table 4.7	Distribution of Optional Activities on each gates	**50**
Table 4.8	Distribution of Resultant Activities on each gates	**51**
Table 4.9	Distribution of NOR according to Detailed Physical Location Categories	**52**
Table 4.10	Matrix of correlation coefficient (r) and coefficient of determination (r^2) for each static activity per overall NOR distribution	**55**
Table 4.11	Matrix of correlation coefficient (r) and coefficient of determination (r^2) of NOR distributions on each SE, BE and LE	**58**
Table 4.12	A correlation matrix between the distribution of each type of static activity and the distribution of NOR per each category of SE, BE, and LE physical designs	**62**
Table 4.13	Score of integration visibility value analysis	**66**
Table 4.14	Score of NOR stationary activities analysis	**66**
Table 4.15	Matrix of p-value between score of NOR static activities and score of integration value analysis	**67**
Table 4.16	Matrix of correlation (r) and coefficient of determination (r2) on score of N O R static activities on score of integration visibility value in varies kilometre radius	**67**

Table 4.17 Matrix of p-value between score of NOR static activities on each physical elements and score of integration value analysis **68**

Table 4.18 Score of NOR static activities analysis on each physical element **69**

Table 4.19 Matrix of correlation coefficient (r) and coefficient of determination (r2) on score of static activities on each physical elements and score of integration visibility values in vary kilometre radius **69**

Table 4.20 Result of correlation tests between score of NOR static activities and score of integration visibility values in vary kilometre radius **72**

Table 4.21 Result of correlation tests between score of NOR static activities on each physical elements and score of integration visibility values in vary kilometre radius **73**

Table 4.22 Proposed scale benchmarks on spatial configuration ideal for liveability of city based on the locality of digital urban screens **73**

Table 5.1 Static activities distribution on each main categories physical elements based on gates **76**

LIST OF FIGURES

FIGURE NO.	TITLE	PAGE
Figure 1.1	Research methodology framework	**9**
Figure 2.1	One of Digital Urban Screens located at Jalan Wong Ah Fook, Johor Bahru	**16**
Figure 2.2	General advertising flowchart from stakeholders to targeted users (Dr Christopher Koller, p. 414, Kronhagel, 2010)	**20**
Figure 2.3	London urban environment quality [source: Tibbalds (1993, p. 22)]	**24**
Figure 2.4	Relations between urban design actions and its potential	**26**
Figure 3.1	Gates distribution along Jalan Wong Ah Fook, Johor Bahru city district	**38**
Figure 4.1	Histogram of Static activities within Johor Bahru selected streets	**46**
Figure 4.2	A scattergram between N activity and overall of NOR activities	**56**
Figure 4.3	A scattergram between O activity and overall of NOR activities	**56**
Figure 4.4	A scattergram between R activity and overall of NOR activities	**56**
Figure 4.5	A scattergram between N activity and NOR distributions on SE, BE and LE	**58**
Figure 4.6	A scattergram between O activity and NOR distributions on SE, BE and LE	**59**
Figure 4.7	A scattergram between R activity and NOR distributions on SE, BE and LE	**59**
Figure 4.8	A scattergram between occupation of static activities on SE in individual gate of total NOR	**60**
Figure 4.9	A scattergram between occupation of static activities on BE in individual gate of total NOR	**61**
Figure 4.10	A scattergram between occupation of static activities on LE in individual gate of total NOR	**61**

Figure 4.11 A scattergram between distribution of NOR activities on distribution of NOR per each category of SE physical design **63**

Figure 4.12 A scattergram between distribution of NOR activities on distribution of NOR per each category of BE physical design **63**

Figure 4.13 A scattergram between distribution of NOR activities on distribution of NOR per each category of SE physical design **63**

Figure 4.14 Other factors been explained in Venn diagram that might influence the changing in correlation results **71**

Figure 5.1 Pie chart of NOR total distributions along Jalan Wong Ah Fook **76**

Figure 5.2 Key attributes of successful place by Carmona *et al.*, 2003, p. 100 **82**

Figure 5.3 NOR static activities distribution on weekend **83**

Figure 5.4 NOR static activities distribution on weekday **84**

Figure 5.5 NOR static activities distribution on weekend and weekday **85**

Figure 5.6 NOR static activities distribution at 10.30-12.30 **86**

Figure 5.7 NOR static activities distribution at 16.30-18.30 **87**

Figure 5.8 NOR static activities distribution on 20.30-22.30 **88**

Figure 5.9 Syntactical VGA on n km radius of Johor Bahru city centre **89**

Figure 5.10 Syntactical VGA on 3 km radius of Johor Bahru city centre **90**

Figure 5.11 Syntactical VGA on 5 km radius of Johor Bahru city centre **91**

Figure 6.1 Proposed installation of digital urban screens framework **97**

LIST OF APPENDICES

APPENDIX	TITLE	PAGE
Appendix A	Photograph: Observation Field Survey	**105**
Appendix B	Table O (Observation Table)	**108**
Appendix C	Example Of Field Works Of Distribution Of Static Activities	**109**
Appendix D	Stationary activities raw data collections based on activities categories	**110**
Appendix E	Stationary activities raw data collections based on elements	**111**

CHAPTER 1

INTRODUCTION

1.1 Background Study

To the present days, the quality and liveability of urban areas in many big cities in Peninsula Malaysia, especially in the Johor Bahru city centre has been decreasing. The problem of dysfunctional streets turns to become a triumph for people that still now have not overcome although there are a lot of improvement, regaining the concept of people in streets being introduced. During 1990s, the expanding the use of digital urban screen being displays along the streets, as one of advertising mediums to the city dwellers, has been influencing in major cities in the South East Asia region, such as Kuala Lumpur, Singapore, and Bangkok. Such trend of communicating to the large public has been the preferred method adopted by the local authorities, urban designers and city planners alike. This mean of communication via the urban screen relay messages and information as an effective strategy for the city development, socially, economically as well as environmentally.

In conjunction with the objectives of JB Smart Cities idea which is set by Iskandar Regional Development Authority (IRDA), urban screens are widely been used as one of new smart digital media, which can be functioning as necessary amenities placed around the city district. Therefore, this new approach is adopted in order to rejuvenate public space, open plazas and city streets, and specifically aiming to help the marginal small business operators to catch up with rapid technology developments. Therefore, these also as well as one of ways to promoting touristic activities in the city centres. As opportunity of technology arises, retail operators, and the stakeholders also have choosing the digital screens either in small or big scales, depending on the commercial needs. However, the function of urban screen as an attractor for visitors, tourists, local workers, and local public at large scale been

seemingly insignificant to each other. For some most of the places, which in the location of urban screens are seems to be left abandoned.

Some professional experts have mentioned that streets, on some occasion, are designed to cater on certain road design specifications rather than to be used by the people or community (Southworth and Ben-Joseph, 1997). For ease of access to pedestrians walking and crossing the street, footpaths are broadened and traffic lights are placed mainly in the city centre, as a solution to increase the walkability of the city around main street designs for urban area.

Static activities are dealt by an amount of urban and street design management affairs (Tibbalds 1992, Moughtin 1992). They normally think that their way of design by integrating such attributes of people's doings will make streets lively. Yet, Whyte (1980) asserts that rather than factual observation of how people act naturally in the streets, lots of these structures have been based on perception. To have a better understand the process and perception, extra studies are still required on static activities understanding, mainly for pedestrian in the public spaces (Hillier and Hanson, 1984).

Of course, pedestrian networks are one of integral part of street designs in urban elements. Since the neo-traditional era, the development of pedestrian access has been promoted through sidewalks; other ideas are with greater unique pedestrian and bicycle tracks, and an attempt to innovate a path network that interconnecting to community and destination, like parks, schools, civic facilities, shops and services (Southworth and Ben-Joseph, 1997, p. 115). Provision of fine-grained and well-related pedestrian routes that provide visible interest allows walking and bicycling enjoyable (Southworth and Ben-Joseph, 1997, p. 116). Pedestrians, bicyclists, parked and moving cars are all sharing the same street space (Southworth and Ben-Joseph, 1997, p. 117).

1.2 Problem Background

In the era of globalisation cities growing and developing of technology, such as digital urban screens, several cities really implementing the usage of it. In the last few decades, the use of digital urban screens been broadens widely in urban public spaces, such as: town squares, promenade, pedestrians' walkways and especially on façades' buildings. The idea of implementation digital urban screen into public spaces in existing or new developing areas, may give varies impact of stationary activities might occurs around the installation of it, especially at selected urban public spaces. This problem will be further discussion in next topic, mainly on stationary activities.

Therefore, in urban element contexts, the appearing of urban digital screens along infrastructure in public spaces, it would create new 'breathe' of urban landscape, which can be called as modern contemporary urbanism, especially in the developing countries in South East Asia region. The modern contemporary urbanism is a planning and development approach depending on the principle on how the city been built in the past centuries; which are they prioritise walkable blocks and streets, neighbourhood and commercial within near distance and accessible public space for all users.

In this contexts of the modern contemporary urbanism, despite the truth that some of the digital urban screens are not being utilized efficiently for the target users, who are can be the pedestrians, the trend of using them nonetheless continues and widely. As the most the digital urban screens been located in urban area, the pedestrians and city-dwellers playing a big important roles for the functionality and successful of the use of digital urban screens .

City life means never being able to completely retreat from the multiple effects of other people's action and behaviour. This is another way of saying that a city is by definition a public space (Turmel, 2009). However, McQuire (2006) disputes that digital urban screens have been converted from small-scale interior devices to large architectural surfaces that no longer broadcast to the inside of private spaces but to the outside of public spaces, which brings same target to users, which are city dwellers or

pedestrians. Rather than the public produces interactions in the city, architectural facades have been transformed into public media interfaces, conveying mostly content presented by corporate organisations and focusing on economic sectors.

As Kingwell suggests, “Urban life is public life, the courtyard is the city, and proximity inevitably creates the complicated shared gazed of the unprivate private – which is to say, the always already public’. According to Carmona (et al., 2003), the urban design states four themes that happens to be significant and it is a process of producing better places for people than would then be created. First of all, it emphasizes the urban design is meant for and concerning people. Secondly, it stresses the importance and value of ‘place’. Third, it distinguishes urban design functions in the ‘real’ world with its area of opportunity restrained and limited by political (regulatory) and economic (market) strengths. Forth, the value of design is recognised as a process. All of these four factors can determined successful the urban public spaces that been meant to create for people, theoretically. But in 1988, Peter Buchanan disputed that urban design was basically about the fact that places are not only specific spaces, but include all the events and happenings that make it feasible (Carmona et al., 2003, p. 7).

1.3 Problem Statement

Many major cities in Southeast Asia like Kuala Lumpur, Singapore and Jakarta, are progressively implementing the use of digital urban screens and has started to increase the use of up-to-date technology, exactly similar to developed Asian cities, such as Tokyo, Shibuya, and Shanghai. Johor Bahru in this case, as one of developing state in Peninsula Malaysia, currently been embedded the use of digital urban screens as wholly, to today’s date, as a new digital media been inserted in an existing urban public spaces. The digital urban screens can be seen along Jalan Wong Ah Fook, mainly, as the road is one of important road that connecting to many internal roads within inner circle city.

Therefore, the advertisers competed and physically fought with each other, paying little attention to the official edicts meant to control the situation and its functionality (Huhtamo, 2009). Not enough awareness and small intention given to implementation of the digital urban screens will create dysfunctional impacts and cause of money wastage. Catherine Gudis has aptly summarised its significance: 'like the buildings rising in growing metropolises, billboards contributed to the accretion of commercial centres and formalised the incursion of pictures and texts to the public sphere' (Huhtamo, 2009).

According to Kronhagel (2010), as a hybridization of architecture, city design, media and new technology, 'mediatecture' is hastily gaining ground in the city environment. Matrixes of extreme-shiny LEDs also can wrap buildings absolutely as a "skin" or so-called a façade that reacts to stimuli from the outer part and often display themselves as "media machines" for staying in, however they're not only progressively regarded on urban screens as a form of digital windows interfaces. All this appears a natural consequence of the goals of the media-obsessed society of past due towards modernity (Kronhagel, 2010).

In this research, one of urban features has been pointed out to foster relationship between the use of urban screens, location of urban screens and people - through human interaction/reaction and human behaviour. The keys of research are understanding the human behaviour on implementation for the urban screens and impacts on quality of public experience on different and selected public spaces. As a matter of facts, the impact of human behaviour on urban screens will be aimed to maximise the quality of urban experience thoroughly.

1.4 Research Questions

The research questions of this study on digital urban screens are listed as below;

(a) What is relationship may occurs between visual pattern movement in street network to locality of digital urban screens placed around Johor Bahru city district?

(b) What is density of occupational of space with stationary behavioural pattern of activities may occur and influence the locality of digital urban screens?

(c) What is possible suggestions or significant location of digital urban screens as one of new urban feature in Johor Bahru city centre?

1.5 Research Aims and Objectives

This research aims to help to promote implementation of the digital urban screen in Johor Bahru City's inner city circle, as one of the significant urban qualities designed.

The objectives of the research can be described as follows:

(d) To measure the visual connectivity influence the movement of pedestrians to the locality of digital urban screens and thus help strategies of implementation

(e) To identifies the density of occupation of space with stationary behavioural pattern of activities (Necessary, Optional, and Resultant) support and influence on the locality of digital urban screens

(f) To analyse the relationship between static activity patterns in the street network to the locality of digital urban screens placed around Johor Bahru city centre

1.6 Research Scope and Limitation

The studies scope may be pushed on studying the human behaviour towards the presence of urban displays on the particular urban areas as an instance urban park, boulevards, pedestrians' pavements or general hall. The human communication technique among them could be centred on human behaviour types which include stands, sits, observing, and contacts among public, people and digital urban screens included its approach within public spaces, includes parks, walkway, and plazas or so

on. The ‘Space Syntax’ approach is used to collect and examine the records related to public communication and interactions towards the digital urban screens.

Second, investigation might be narrow right down to human revel in between human beings and people and their environment when technology is introduced at selected public areas mentioned.

1.7 Research Significance

The study will contribute a lot to the benefits of society, especially architecture subjects or fields, in considering that the digital urban screens play an important role in developing countries, aligns with moving science and technology world today. In order to explore the link between the localities of digital urban screens with the pedestrians’ stationary activities, these studies assess the spatial visibility of Johor Bahru urban areas. Hence, this thesis more likely will helps architects, urban planners, advertisers, and broadcasters for better understanding on the implementation of the use of digital urban screens and to shape the future development of the 'screen world' in a sustainable manner, considering the danger of visual and technological pollution of urban space. Additionally, this thesis also benefits for city citizens or city dwellers in developing a better understanding of the implementation of urban scape with the digital space, besides to generate a rich urban experience as one of new urban features. So as to the degree of the visual integration values in Johor Bahru internal town circle, this thesis is likewise scientifically using the Visual Graph Analysis (VGA) and the latest software program of ‘Space Syntax – UCL Depthmap X’.

1.8 Research Methodology

To answer the issues appeared in the problem statement above, the methodology of the research clarifies the techniques or the ways selected. It is included in four work levels that are being used along this thesis as in figure 1.1, Level 1 – Literature Review. At this level, this thesis stated the public spaces functions, and the

rising usages of digital urban screens worldwide. The locality of digital urban screens could enhance by thinking about the distributions of stationary sports around urban areas, mainly in public areas and its surrounding. This observes is centered on the connection of the spatial visibility and the stationary activities within urban contexts. The literature review was carried out, especially before the observation have been made in better understanding on current debate on the use of digital new media, both in big urban screens and small urban screens that have been designed or installed around public spaces. In spite of the fact, the literature review will be forwarded to how the existence of urban screens effectively integrated into the existing public spaces. Therefore, the details of outlined issues will be in literature review..

Level 2 – Data collection: In-situ (in-field) observation. This research is being investigate within Johor Bahru city centre circle and selected street that accommodate the location of digital urban screens. As this case study, Jalan Wong Ah Fook been chosen to investigate the density of stationary activities detail. The photo mapping observation of static sports, people following (pedestrians' movement lines to song the flow around the district) and area syntax (syntactical) visibility graph configurational technique of analyses are all combined on this operational framework of the research. By recognising the locations of hobby of the pedestrians within the studied area, those combined strategies analyse the importance of the urban functions locality (digital urban displays related)and experiment the sample of humans motion behaviour.

For the commentary, a good way to be conducted during the day, every pedestrian's movement might be regulated for a particular of time and one of a kind coloured pen could be used to distinguish the samples. Next, the sports of the human beings which include status and sitting within the location of the urban digital screen may be recorded with the static snapshots 'Static Activity Mapping' experiment.

Different shapes of legends will be used to distribute the actions among city dwellers, such as browse, wait, map, cigarette, mobile, eat/drink, read, taking picture, talk, watch, sell, crime and so on.

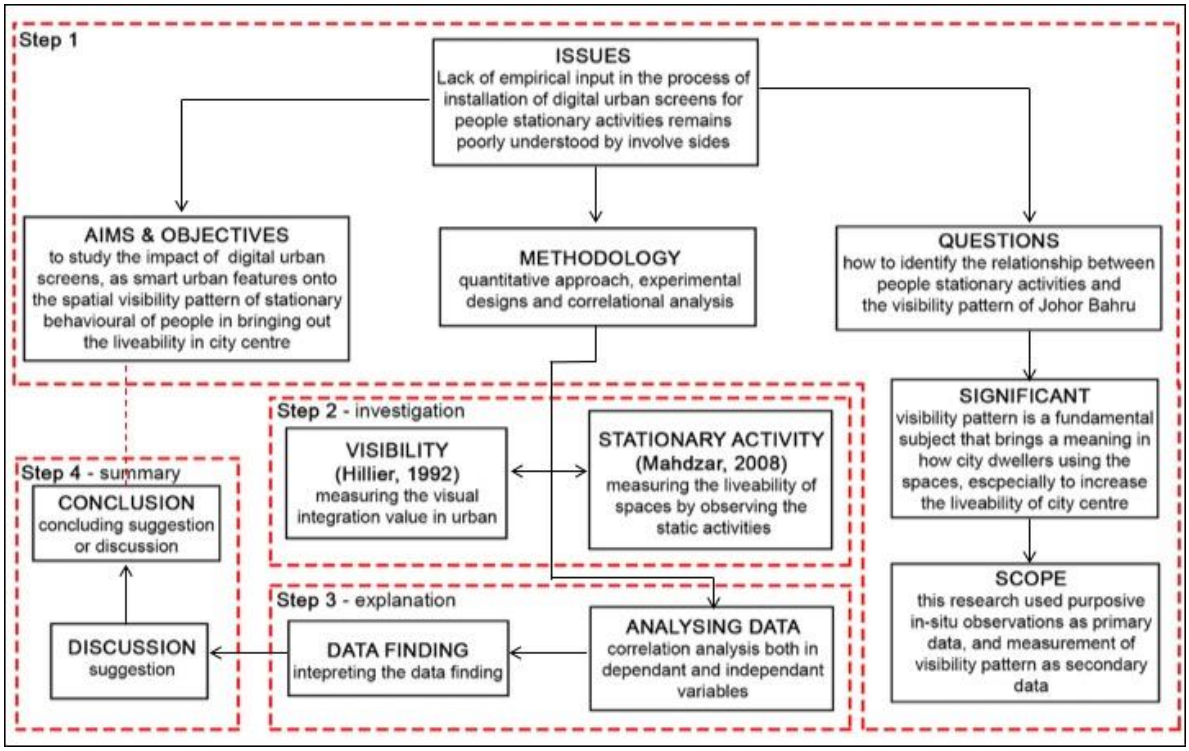

Figure 1.1 Research methodology framework

To compare the similarities and differences between built environments at both building indoors and concrete neighbourhood scale, Space Syntax Analysis methods had been first developed. All longest traces (Axial) of sight are drawn as the plan of an environment which is represented as a map. This map is then converted right into a graph wherein a line is represented as a node and intersections between lines are shown as hyperlinks between nodes, that's known as Visibility Graph Analysis (VGA).

New strategies of representation had been developed greater these days which replaced the 'line map' with a grid of factors inside open area and built a visibility graph in which points are connected if they are seen to each other. The plan of an environment is represented as a map in which all longest lines (Axial) of sight are drawn. This map is then translated into a graph in which a line is represented as a node and intersections between lines are shown as links between nodes, Visibility Graph Analysis (VGA). In the concept of attraction, one of the idea of natural motion of the pedestrian movement pattern in urban area, as pedestrians have a tendency to observe the shortest and maximum direct direction when moving from place to region is known

as Space Syntax (Hillier, Penn, Hanson, Grajewski, 1992, Hillier 1996, 1989, Mahdzar 2008) – the theory of attractions.

1.9 Thesis Structure

The thesis structure been presenting in six (6) main chapters. Chapter one described the current issues of urban and focusing on used of digital urban screens as in worldwide contexts. This chapter also identifies main arguments of the current issues with purpose of establishing the objectives and the theoretical aspect relationship between the visibility pattern of pedestrians and the social activities.

Chapter two critiques literatures on how the digital urban displays evolved and translates the wider aspects of designing the social use of city areas in the usage of the digital city monitors as one of the city features. This chapter focuses on the wrong methods of the expertise of the city layout practices on the use of virtual urban displays and its interpretation with social use of selected streets. Throughout the literature reviews of selected works and papers, it forms a proper basis research frameworks in studying and designing the lively sociable streets for people using digital urban screens.

Chapter three specializes in the chosen methodology and case studies of this thesis. For the methodology part, it discussed the theoretical and realistic selected synthesis methods which will growing the empirical analytical framework to degree the relationships of streets with the life of virtual city screens. The empirical input of stationary activities been collected in selected urban area in Johor Bahru, and been synthesising ‘statistical’ and ‘syntactic’ calculations in analysing the sociability of the streets. On case studies part, it described the studied areas, in Johor Bahru city centre especially along Jalan Wong Ah Fook, where the location of digital urban screens been installed.

Chapter four analyses the data collected and findings to cater the first and second research questions of this thesis. The variable of dependants and independents

been compared to each other's to find the correlations of both variables. The finding results from the analysis constantly suggest that comparative values should be take noted.

Chapter five focuses on interpreting and highlighting the research finding of the cases studied above. The main focus is to find the relationship between visibility pattern of VGA using Depthmap and stationary activities pattern and its locality along the studied area. Further from this outcome, it answers the third research question of the thesis. A new guideline will be suggested and utilized to generate contribution towards liveability of urban area in Malaysia, especially.

Lastly, Chapter 6 identifies the valuable standards levels which are applicable for locating virtual urban screens among urban areas. The conclusion discusses the probability of the analysis which is identified as limitations and establishes recommendations for further research.

REFERENCES

Al_Sayed, K., Turner, A., Hillier, B., Iida, S. and Penn, A. (2014) 'Space Syntax Methodology', *Book*, pp. 1–117.

Bacon, E. (1974) *Design of Cities*. New York: Penguin Books.

Behrens, M., Schiek, A. F. G. and Brumby, D. P. (2015) 'Designing Media Achitectural Interfaces for Interactions in Urban Spaces', in *Citizen's Right to the Digital City: Urban Interfaces, Activism, and Placemaking*. Springer, Singapore, pp. 55–77.

Benedikt, M. (1979) *To Take Hold of Space: Isovists and Isovist Fields*.

Brynskov, M., Dalsgaard, P. and Halskov, K. (2013) 'Understanding Media Architecture (Better): One Space, Three Cases', pp. 1–4.

Carmona, M., Heath, T., Oc, T. and Tiesdell, S. (2003) *Public places-urban spaces: the dimensions of urban design*, *Library*.

Collins, R. (1981) *Sociology Since Midcentury*. New York: Academic Press.

Fisher, C. D. (1993) 'Boredom at work-A neglected concept.pdf', 46(Human Relations).

Foth, M., Brynskov, M. and Ojala, T. (2015) *Citizen's right to the digital city urban interfaces, activism, and placemaking, Citizen's Right to the Digital City: Urban Interfaces, Activism, and Placemaking*.

Gehl, J. (1987) 'Life Between Buildings: Using Public Space', p. 202.

Gianni Ranaulo (2001) *Light Architecture - New Edge City*. Italy: Birkhauser.

Gordon, E. and de Souza e Silva, A. (2011) 'Net Locality', *Regional Studies*, 45(10), pp. 1403–1404.

Hillier, B. (1998) *Space is the machine: A configurational theory of architecture*, *Space Syntax*. London, United Kingdom: Cambridge University Press.

Hillier, B. and Hanson, J. (1984) *The Social Logic of Space*. London: Cambridge University Press.

Hillier, B., Hanson, J., Peponis, J., Hudson, J. and Burdett, R. (1983) 'Space Syntax: A Different Urban Perspectives', *Architects' Journal*, 178(48), pp. 47–63.

Hillier, B. and Vaughan, L. (2007) 'The spatial syntax of urban segregation The city as one thing', *Progress in Planning*, 67(4), pp. 205–294.

Holland, C., Clark, A., Katz, J. and Peace, S. (2007) ‘Social interactions in urban public places’, *Water*, 12, pp. 1–84.
Huhtamo, E. (2009) ‘Messages on the Wall: An Archaeology of Public Media Displays’, *Urban Screens Reader*, 09(Fall), pp. 15–28.
Jacobs, J. (1993) ‘The Death and Life of Great American Cities’, *New York*, 71, p. 458.
Kronhagel, C. (2010) *Mediatecture*. SpringerWienNewYork.
Lynch, K. (1981) *A Theory of Good City Form*. Cambridge, Massachusetts: The MIT Press.
Lyon, D. (2001) *Surveillance Society: Monitoring Everyday Life*. Buckingham, UK: Open University Press.
Mcquire, E. S., Martin, M. and Niederer, S. (2009) *Urban Screens Reader*, *International Studies*.
McQuire, S. (2006) *The politics of public space in the media city*.
McQuire, S. (2008) *The Media City: Media, Architecture and Urban Space*, *SAGE Publications Ltd*. London, United Kingdom.
Mitchell, T. (2002) *Rule of Experts: Egypt, Techno-Politics, Modernity*. University of California Press.
Mitchell, W. J. (1996) *City of Bits: Space, Place, and the Infobahn*. Cambridge, Massachusetts: MIT Press.
Newman, D. M. (2006) *Sociology - Exploring the Architecture of Everyday Life*. 6th edn. Indiana, United State of America.
Pushkarev, B. and Zupan, J. M. (1976) *Urban Space for Pedestrians*. The MIT Press.
S. Mahdzar, S. S. (2008) *Sociability vs Accessibility - Urban Street Life*. University College London.
Schiek, A. F. G. (2006) *Towards an integrated architectural media space*.
Southworth, M. and Ben-Joseph, E. (1997) *Streets and the Shaping of Towns and Cities, American Planning Association. Journal of the American Planning Association*. Washington, DC: Island Press.
Struppek, M. (2006) ‘The social potential of Urban Screens’, *Visual Communication*, 5(2), pp. 173–188.
Tibbalds, F. (1993) *London’s Urban Environmental Quality*. London, United Kingdom: London Planning Advisory Committee.
Tscherteu, G. and Tomitsch, M. (2011) ‘Designing Urban Media Environments as

Cultural Spaces', *Chi 2011*.

Turmel, P. (2009) 'The City as Public Space', in *Rites of Way: The Politics and Poetics of Public Space*. Waterloo, Canada: Wilfrid Laurier University Press.

Turner, A. (2004) 'Depthmap 4: A Researcher's Handbook', *University College London*, (June).

Whyte, W. H. (1980) *The Social Life of Small Urban Spaces*. 3rd, reprint edn, *Ebook*. 3rd, reprint edn. New York: Project for Public Spaces.

LIST OF PUBLICATIONS

Non-indexed Conference Proceedings

(a) Mariah Masykurah Ab Hadi & Mahdzar. S.S.S (2018) The Relationship Between People's Activities and Digital Media For Urban Liveability. *7th IGCESH 2018 – International Graduate Conference on Engineering, Science and Humanity,* 13th-15th August 2018, Faculty of Built Environment and Surveying, Universiti Teknologi Malaysia, Johor Bahru, Malaysia.

(b) Mariah Masykurah Ab Hadi & Mahdzar. S.S.S (2019) Does Digital Urban Screens and People Activities are Related to Each Other?. *1st International Graduate Conference of Built Environment & Surveying,* 24th-26th June 2019, Faculty of Built Environment and Surveying, Universiti Teknologi Malaysia, Johor Bahru, Malaysia.