

BRIDGE AS SPATIAL PLATFORM  
FOR GALLERY EXHIBITION AT  
UNIVERSITI TEKNOLOGI MALAYSIA

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A dissertation submitted in partial fulfilment of the  
requirements for the award of the degree of  
Master of Architecture

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

JULY 2022

## **DEDICATION**

This thesis is dedicated to my father, who taught me that the best kind of knowledge to have is that which is learned for its own sake. It is also dedicated to my mother, who taught me that even the largest task can be accomplished if it is done one step at a time.

## ACKNOWLEDGEMENT

In preparing this thesis, I was in contact with many people, researchers, academicians, and practitioners. They have contributed towards my understanding and thoughts. In particular, I wish to express my sincere appreciation to my main thesis supervisor, Dr. Sharifah Salwa Syed Mahdzar, for encouragement, guidance, critics and friendship. Without their continued support and interest, this thesis would not have been the same as presented here.

I am also indebted to Majlis Amanah Rakyat (MARA) for funding my Master study. Lecturers at UTM and staffs at Technovation Park UTM also deserve special thanks for their assistance in supplying the relevant information.

My fellow postgraduate student should also be recognised for their support. My sincere appreciation also extends to all my colleagues and others who have provided assistance 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.

## **ABSTRACT**

A pedestrian bridge is one that is designed specifically for foot traffic. It divides traffic into pedestrian and vehicular lanes and extends the length of the actual terrain. In high-density cities, it is used for more than just pedestrian traffic channels and has a significant impact on the urban landscape. In addition to showcasing the city's three-dimensional structure and its verticality, interconnection, and complexity, they serve as public areas for urban mobility and activities. A pedestrian bridge, like streets, can be a key component in creating a connection between humans and the built environment. In the context of Universiti Teknologi Malaysia (UTM), the Innovation & Commercialisation Centre (ICC) is mostly unknown by the local people, including the UTM community. Located in the isolated plot of Technovation Park, ICC requires the right exposure to stimulate the innovation and commercialization eco-system. That being said, the pathways and streets around the ICC do not facilitate achieving the mission. The objective of this paper is to find the strategy to connect the existing pathways with the built environment around the area and the people there, while identifying the principals involved to facilitate the ICC mission through galleries and exhibitions. Methods involved in achieving the said objective are through reviewing literature and case studies, urban site analysis, and space syntax analysis. The research findings outline the design principals and strategy involved in creating a well-connected linkage between the existing street and the exhibition through the combination of the studies. For example, space syntax analysis can show the best configuration of a layout based on a series of simulations of spatial planning, both macro and micro view. Pathways and exhibitions can essentially be weaved together into one element with the proper linkage and strategy.

## ABSTRAK

Jambatan pejalan kaki adalah jambatan yang direka khusus untuk lalu lintas pejalan kaki. Ia membahagikan laluan kepada lorong pejalan kaki dan laluan kenderaan serta menambah kepanjangan laluan asal. Di bandar berkepadatan tinggi, ia digunakan lebih daripada hanya sebagai laluan lalu lintas pejalan kaki dan mempunyai impak yang besar terhadap keseluruhan landskap bandar. Selain keunikannya dalam mempamerkan struktur tiga dimensi bandar, kesalinghubungan dan kerumitannya, jambatan pejalan kaki juga berfungsi sebagai kawasan awam untuk tujuan mobiliti dan aktiviti bandar. Jambatan pejalan kaki, seperti jalan, boleh menjadi komponen utama dalam mewujudkan hubungan antara manusia dan persekitaran yang dibina. Dalam konteks Universiti Teknologi Malaysia (UTM), Pusat Inovasi & Pengkomersialan (ICC) adalah satu organisasi yang tidak diketahui oleh masyarakat tempatan termasuk masyarakat UTM. ICC terletak di kawasan terpencil yang dipanggil Technovation Park dan ia memerlukan pendedahan yang bersesuaian untuk merangsang inovasi dan ekosistem pengkomersilan. Laluan dan jalan di sekitar ICC juga tidak memudahkan ke arah pencapaian misi tersebut kerana kondisi semasa Technocation Park. Objektif kertas kerja ini adalah untuk mencari strategi baru bagi menghubungkan antara laluan sedia ada dengan persekitaran binaan di sekitar termasuk komuniti-komuniti yang sudah sedia ada, di samping mengenal pasti prinsip desain yang bersesuaian untuk membantu mencapai misi ICC melalui aktiviti seperti galeri dan pameran. Kaedah yang terlibat dalam mencapai objektif tersebut adalah melalui kajian literatur dan kajian kes, analisis tapak bandar serta analisis sintaks ruang. Penemuan penyelidikan bakal menggariskan prinsip reka bentuk dan strategi yang terlibat dalam mewujudkan jalinan antara laluan sedia ada dengan pameran. Sebagai contoh, analisis sintaks ruang boleh menunjukkan konfigurasi terbaik bagi siri simulasi perancangan ruang berdasarkan susun atur untuk paparan makro dan mikro. Laluan dan pameran pada asasnya boleh dijalin bersama menjadi satu elemen jika menggunakan prinsip dan strategi yang betul.

## TABLE OF CONTENTS

	TITLE	PAGE
	<b>DECLARATION</b>	<b>i</b>
	<b>DEDICATION</b>	<b>ii</b>
	<b>ACKNOWLEDGEMENT</b>	<b>iii</b>
	<b>ABSTRACT</b>	<b>iv</b>
	<b>ABSTRAK</b>	<b>v</b>
	<b>TABLE OF CONTENTS</b>	<b>vi</b>
	<b>LIST OF TABLES</b>	<b>ix</b>
	<b>LIST OF FIGURES</b>	<b>x</b>
	<b>LIST OF ABBREVIATIONS</b>	<b>xiii</b>
<b>CHAPTER 1</b>	<b>INTRODUCTION</b>	<b>1</b>
1.1	Bridge as Spatial Platform for Exhibition	1
1.1.1	Pedestrian Bridge Placemaking and Inter-visibility	1
1.1.2	Exhibition on Bridge	3
1.2	About Technovation Park	4
1.3	Problem Statement	5
1.4	Research Aim & Objectives	6
1.5	Research Questions	6
1.6	Research Methodology	7
1.7	Significance of Research	7
1.8	Chapter Summary	8
<b>CHAPTER 2</b>	<b>LITERATURE REVIEW</b>	<b>9</b>
2.1	Introduction	9
2.2	Bridge Overview	9
2.3	Pedestrian Bridge as Spatial Platform	10
2.3.1	Bridge Placemaking	12

2.4	Exhibition on Bridge	14
2.4.1	Exhibition Covisibility	15
2.5	Visitor Experience and Exhibition Environment	16
2.5.1	Exhibition Design	17
2.6	Architecture of Locality	19
2.6.1	Malay House Genotype	20
2.7	Chapter Summary	21
<b>CHAPTER 3</b>	<b>RESEARCH METHODOLOGY</b>	<b>23</b>
3.1	Introduction	23
3.2	Proposed Method	23
3.3	Research Framework	24
3.4	Questionnaire Survey	25
3.5	Literature Review	25
3.6	Case Study Review	26
3.7	Space Syntax Analysis	26
3.8	Chapter Summary	27
<b>CHAPTER 4</b>	<b>CASE STUDY</b>	<b>29</b>
4.1	Introduction	29
4.2	Jishou Art Museum, Jishou, China	29
4.3	Floating Archipelago, Shenzhen, China	32
4.4	Crystal Bridges Museum of American Art, Bentonville, Arkansas	34
4.5	High Loop, Shanghai, China	36
4.6	Universiti Teknologi Malaysia, Johor, Malaysia	39
4.7	Chapter Summary	41
<b>CHAPTER 5</b>	<b>FINDING &amp; DISCUSSION</b>	<b>43</b>
5.1	Introduction	43
5.2	Procedures of Data Analysis	43
5.3	Questionnaire Survey Analysis	44
5.4	Case Study Analysis	50



5.5	Design Approach Solution through Literature Review Analysis	54
5.6	Site Analysis and Path Study with Space Syntax	57
5.6.1	Axial Line Analysis of Technovation Park	58
5.6.2	Segment Analysis of Technovation Park	62
5.6.2.1	Segment - Integration	63
5.6.2.2	Segment - Choice	64
5.6.3	Path study by Visual Graph Analysis	65
5.6.4	Gallery with Malay House genotype	71
5.6.4.1	Bridge gallery based on Malay House Genotype, Version 1	72
5.6.4.2	Bridge gallery based on Malay House Genotype, Version 2	74
5.6.5	Section study by Visual Graph Analysis	76
5.7	Chapter Summary	81
<b>CHAPTER 6</b>	<b>CONCLUSION</b>	<b>83</b>
6.1	Introduction	83
6.2	First Objective: To study the human activities and connectivity of streets and pathways around Technovation Park of Universiti Teknologi Malaysia.	84
6.3	Second Objective: To study the design principles/strategies in creating gallery and exhibition spatial experience.	84
6.4	Third Objective: To identify the design strategies in linking people with gallery exhibition through bridge connectivity integration.	85
6.5	Limitation & Recommendations	85
6.6	Conclusion	86
<b>REFERENCES</b>		<b>87</b>

## LIST OF TABLES

<b>TABLE NO.</b>	<b>TITLE</b>	<b>PAGE</b>
Table 5.1:	Table of comparison between the selected case studies.	50
Table 5.2:	Table of comparison between existing galleries in UTM.	52

## LIST OF FIGURES

<b>FIGURE NO.</b>	<b>TITLE</b>	<b>PAGE</b>
Figure 1.1:	Canter’s place model. Source: Based on Canter’s model (1977).	2
Figure 1.2:	Location of Technovation Park relative to Universiti Teknologi Malaysia (UTM). Source: Google map.	4
Figure 1.3:	Location of Technovation Park (Yellow) and Skudai-Pontian Highway (Red). Source: Google Map	5
Figure 2.1:	Canter’s place model. Source: Based on Canter’s model (1977).	13
Figure 2.2:	Framework of necessity and sufficiency of placemaking. (Wang <i>et al.</i> , 2016)	14
Figure 2.3:	The Graph was drawn for each house from the point of main entrances of houseplot, the ‘Serambi’ (front home), ‘Rumah Ibu’ (middle home) and the ‘Dapur’(rear home). Source: (Syed Mahzar and Yahya, 2016)	20
Figure 3.1:	Research framework.	24
Figure 4.1:	Exterior view of the Jishou Art Museum. Source: <a href="http://www.archdaily.com/916413/jishou-art-museum-atelier-fcjz">www.archdaily.com/916413/jishou-art-museum-atelier-fcjz</a>	30
Figure 4.2:	Elevation and section of the Jishou Art Museum. Source: <a href="http://www.archdaily.com/916413/jishou-art-museum-atelier-fcjz">www.archdaily.com/916413/jishou-art-museum-atelier-fcjz</a>	31
Figure 4.3:	Aerial view of the Floating Archipelago. Source: <a href="http://www.archdaily.com/947168/floating-archipelago-pedestrian-bridge-design-fcha">www.archdaily.com/947168/floating-archipelago-pedestrian-bridge-design-fcha</a>	32
Figure 4.4:	Schematic layout plan of the Floating Archipelago. Source: <a href="http://www.archdaily.com/947168/floating-archipelago-pedestrian-bridge-design-fcha">www.archdaily.com/947168/floating-archipelago-pedestrian-bridge-design-fcha</a>	33
Figure 4.5:	Sectional perspective of the Floating Archipelago. Source: <a href="http://www.archdaily.com/947168/floating-archipelago-pedestrian-bridge-design-fcha">www.archdaily.com/947168/floating-archipelago-pedestrian-bridge-design-fcha</a>	34
Figure 4.6:	Panoramic view of the Crystal Bridges Museum of American Art. Source: <a href="http://www.inexhibit.com/mymuseum/crystal-bridges-museum-american-art-bentonville-ar-safdie-wright/">www.inexhibit.com/mymuseum/crystal-bridges-museum-american-art-bentonville-ar-safdie-wright/</a>	35

Figure 4.7: Pavilion interior view of the Crystal Bridges Museum of American Art. Source: <a href="http://www.inexhibit.com/mymuseum/crystal-bridges-museum-american-art-bentonville-ar-safdie-wright/">www.inexhibit.com/mymuseum/crystal-bridges-museum-american-art-bentonville-ar-safdie-wright/</a>	36
Figure 4.8: Aerial view of the High Loop. Source: <a href="https://100architects.com/project/high-loop/">https://100architects.com/project/high-loop/</a>	37
Figure 4.9: Urban intervention diagram of the High Loop in the city. Source: <a href="https://100architects.com/project/high-loop/">https://100architects.com/project/high-loop/</a>	38
Figure 4.10: Diagram of the High Loop design elements and circulation. Source: <a href="https://100architects.com/project/high-loop/">https://100architects.com/project/high-loop/</a>	39
Figure 4.11: UTM buildings and elements. Source: Author.	40
Figure 4.12: Location of existing galleries in UTM (Yellow circles). Source: Author.	41
Figure 5.1: Questionnaire Survey Set 1. Source: Author.	45
Figure 5.2: Questionnaire Survey Set 2. Source: Author.	46
Figure 5.3: Questionnaire Survey Set 3. Source: Author.	47
Figure 5.4: Questionnaire Survey Set 4. Source: Author.	48
Figure 5.5: Questionnaire Survey Set 5. Source: Author.	49
Figure 5.6: Conceptual diagram of the bridge pavilion typology. Source: Author.	55
Figure 5.7: Event space, Kiosk, and Cafe. Source: Author.	55
Figure 5.8: Café Bookshop and Café Library. Source: Author.	56
Figure 5.9: Retail, Walk of Fame, and Open Exhibition. Source: Author.	56
Figure 5.10: Passive and Active Exhibitions. Source: Author.	57
Figure 5.11: Location of Technovation Park (Yellow), Skudai-Pontian Highway (Red), Jalan Meranti (Blue), Jalan Pulau (Green), and Jalan Universiti (Purple). Source: Google Map.	59
Figure 5.12: Axial line analysis of current pedestrian activity around Technovation Park through Space Syntax. Source: Author.	60
Figure 5.13: Axial line analysis of pedestrian activity around Technovation Park with added axial line through Space Syntax. Source: Author.	61
Figure 5.14: Segment-Integration analysis of pedestrian activity around Technovation Park with added connectivity line through Space Syntax. Source: Author.	63

Figure 5.15: Segment-Choice analysis of 1km-Choice pedestrian activity (above) and 2-km bicycle activity (below). Source: Author.	64
Figure 5.16: Visual Graph Analysis for Spatial Visibility for plan design, version 1. Source: Author.	66
Figure 5.17: Visual Graph Analysis for Spatial Visibility for plan design, version 2. Source: Author.	67
Figure 5.18: Visual Graph Analysis for Spatial Visibility for plan design, version 3. Source: Author.	68
Figure 5.19: Visual Graph Analysis for Spatial Visibility for plan design, version 4. Source: Author.	69
Figure 5.20: Visual Graph Analysis for Spatial Visibility for plan design, version 5. Source: Author.	70
Figure 5.21: Spatial planning based on Malay House genotype. Source: Author.	72
Figure 5.22: Spatial planning based on Malay House genotype with actual spaces function. Source: Author.	73
Figure 5.23: Spatial planning based on Malay House genotype with main pathway as part of gallery. Source: Author.	74
Figure 5.24: Spatial planning based on Malay House genotype with main pathway as part of gallery. Source: Author.	75
Figure 5.25: Isovist view range (from red dot) and Isovist Area for hypothetical section with normal level. Source: Author.	76
Figure 5.26: Scatter plot for section graph in Figure 5.25. Source: Author.	77
Figure 5.27: Isovist view range (from red dot) and Isovist Area for hypothetical section with upper floor void. Source: Author.	78
Figure 5.28: Scatter plot for section graph in Figure 5.27. Source: Author.	79
Figure 5.29: Isovist view range (from red dot) and Isovist Area for hypothetical section with upper floor void and split level. Source: Author.	79
Figure 5.30: Scatter plot for section graph in Figure 5.29. Source: Author.	80

## **LIST OF ABBREVIATIONS**

UTM	-	Universiti Teknologi Malaysia
ICC	-	UTM Innovation & Commercialisation Centre
VGA	-	Visual Graph Analysis
SS	-	Space Syntax

## CHAPTER 1

### INTRODUCTION

#### 1.1 Bridge as Spatial Platform for Exhibition

Due of their ability to link previously inaccessible places, bridges are essential parts of the land transportation infrastructure. Bridges have been utilised as part of the infrastructure to cross rivers, valleys, and roads from ancient times to the present, enabling people to move between various regions of the nation. Depending on how it is used, a pedestrian bridge across a road may serve different purposes and present diverse viewpoints.

##### 1.1.1 Pedestrian Bridge Placemaking and Inter-visibility

A bridge designed exclusively to carry pedestrian traffic is known as a pedestrian bridge. It separates traffic for vehicles and pedestrians along the length of the actual land. It is a standard approach of reducing traffic congestion in cities. In high-density cities, it is used for more than just pedestrian traffic channels and is crucial to the urban environment. They serve as public areas for urban movement and activity, exhibiting the city's three-dimensional form and the verticality, interconnectedness, and complexity of urban space. (Wang *et al.*, 2016).

According to Celik *et al.*, (1994), the structure on which to weave the complex interactions of the architectural fabric with human organisation is provided by streets, which are regarded a basic ingredient of urban existence. This suggests that the street plays an important role in fostering connections between individuals and their surroundings, as well as facilitating interaction, because it essentially directs people to their next location while allowing for interaction between people in any way available. In another argument by Lefebvre (2015), streets are meeting locations rather than

circulation or transition zones, with informational, symbolic, and ludic roles. Bridge is a form of an extension of street in a way that it also has all the potential that a street can offer. Due to its function of connecting two sites, bridges play a unique role, not just for surrounding context permeability but also in enhancing community.



Figure 1.1: Canter's place model. Source: Based on Canter's model (1977).

Wang *et al.*, (2016) highlight how pedestrian bridges may serve a variety of purposes and how people's regular use of them transforms them into vibrant and active everyday places using the theoretical model created by Canter (1977). Physical inspection of the pedestrian bridges in Hong Kong reveals that they take on a variety of shapes and connecting patterns that are closely tied to the "essential activities" of people's daily travel. To cross the street to catch the bus or to get to work or school, pedestrian bridges are utilized. Due to the fact that it can be the only path for people to do their daily activities, pedestrian bridge can be very crowded.

The Mong Kok Pedestrian Bridge is used in the same study to show that, in addition to being a place for people to commute, it also serves as a shared setting for social gatherings, public expression, and cultural exchange for all people. As an illustration, consider how a street performer who uses the bridge's high inter-visibility can profit from the busy foot traffic. One example is how a street performer taking the advantage of the highest degree of inter-visibility within the bridge can benefit from the heavy pedestrian flow. (Wang *et al.*, 2016)



### **1.1.2 Exhibition on Bridge**

Exhibition has a difficult and lengthy history, moving along with societal demands while also resisting those very expectations. Art shows have a dangerous yet dependable role; as ill-defined but independent entities, they assume several identities. Exhibitions are placed strategically at the confluence of artists, their work, the arts institution, and a variety of publics (Cline, 2012). Exhibitions, which are in the end related to larger institutions, may have the duty of advancing such institutions' objectives, whether that be increasing audience or generating income. However, because of their relative independence, they can also act as testing grounds for new ideas and challengers of conventional wisdom in quest of new ideologies that best meet the demands of modern society.

Every exhibition's effect, message, and reception are significantly influenced by the presenting style. The exhibition installation consists of the area where the art is displayed, the objects that are displayed next to one another, and the ways in which they are displayed. Just like how the pedestrian bridges in Hong Kong is a commonplace location for public expression, social gathering and exchange, pedestrian bridge also has the potential to hold exhibition by taking advantage of the high degree of inter-visibility due to the nexus of interest and activities created by the single linking point of a pedestrian bridge. Thus, provides with an ideal opportunity to study the relationship between the environment (built environment) and the mind (human behaviour).

## 1.2 About Technovation Park



Figure 1.2: Location of Technovation Park relative to Universiti Teknologi Malaysia (UTM). Source: Google map.

UTM Technovation Park is located right at the southwest of Universiti Teknologi Malaysia (UTM), along Jalan Pontian Lama with a total area of 105 acres (42.5 hectare). UTM Technovation Park currently houses over 40 tech companies located in Skudai, Johor Bahru, Johor. Managed by the UTM Innovation & Commercialisation Centre (ICC), UTM Technovation Park offers conducive environment for incubation and start up. ICC mission is to stimulate UTM innovation and commercialization eco-system towards wealth creation. The issue is that the location of ICC which is in the middle of Technovation Park makes it isolated and the communities do not really know about the existence of it (refer questionnaire survey on Chapter 5). This issue sparks the idea of discovering the best method of exhibiting the research and developments of UTM through identifying and analysing the possible connections.

At the other side of the Technovation Park is the local community area which includes housings, shops and other community facilities. Basically it means that the Technovation Park is sandwiched between the UTM community and the general public.

### 1.3 Problem Statement



Figure 1.3: Location of Technovation Park (Yellow) and Skudai-Pontian Highway (Red). Source: Google Map

The location of Technovation Park in between UTM and public communities can be seen as wall or barrier that separates two large communities to connect and interact. The lack of street connectivity highlights the isolation that happens towards Technovation Park as there is a lack of engagement with UTM Innovation and Commercialisation Centre (ICC). Commercialization is the process of technology transfer which plays a big part in bringing these ideas from the lab to the market. Government and private organisations provide funding that supports the critical research from which new discoveries are brought about. ICC performs to protect these discoveries and create partnership to help the intellectual properties and assets to be developed into new products.

However, due to the isolated location and bad connectivity, the potential is limited within the knowledge of related personals. Thus come the question of finding the method for exhibiting the research and development activities through connectivity.

#### **1.4 Research Aim & Objectives**

The purpose of this research is to discover a method of connecting the community around Technovation Park of Universiti Teknologi Malaysia (UTM) with gallery and exhibition culture. The aim of this research is to investigate the usage of a bridge as a design intervention in connecting people with gallery exhibition of research and development at Universiti Teknologi Malaysia.

The objectives of the research are:

- (a) To study the human activities and connectivity of streets and pathways around Technovation Park of Universiti Teknologi Malaysia.
- (b) To study the design principles/strategies in creating gallery and exhibition spatial experience.
- (c) To identify the design strategies in linking people with gallery exhibition through bridge connectivity integration.

#### **1.5 Research Questions**

This research is founded on the following questions:

- (d) How is the human activities and connectivity of streets and pathways around Technovation Park of Universiti Teknologi Malaysia?
- (a) What are the design principles/strategies in creating gallery and exhibition spatial experience?
- (b) How can bridge connectivity link people with gallery exhibition?

## **1.6 Research Methodology**

In order to understand the issues on connectivity and exhibition, this study used a mixed qualitative research technique. The basic research structure will be separated into four stages: defining the research problem, collecting data, analysing data, and lastly coming to a conclusion. The primary data will be taken from urban site analysis, questionnaire survey, and Space Syntax analysis. The secondary data will be taken from literature reviews, journals, books, articles, and case study reviews.

The early phase of the research began with urban site analysis of Technovation Park and the surrounding context. Questionnaire survey is then distributed to the suitable respondents. Then space syntax is used to understand the human behaviour and activities through the connectivity and integration of the spaces. This is the list of space syntax variations that will be used for this research: Axial line analysis, Segment Integration analysis, Segment choice analysis, and Visual Graph analysis. At the same time, more data are collected from literature review around the central topic. After that case studies are analysed to comprehend the concepts and principals related to urban design, street design, bridge design, gallery design and design elements for connectivity integration.

## **1.7 Significance of Research**

Since UTM was established in the 1972, the main campus has moved from Kuala Lumpur to Skudai, Johor. After 40 years of the Johor Bahru campus establishment, a plan which is called 'Pelan Induk UTM 2035' was designed to identify the potential and feasibility of the open campus concept in the UTM JB campus from the perspective of spatial planning and design in an effort to create a more environmentally friendly, active, vibrant, non-exclusive and easily accessible by the local community. In conjunction to that, some of the long term action is to upgrade and develop continuity of the pedestrian walkways in UTM campus and upgrade public facilities/attraction in campus.

This idea of creating an ideal planning to attract outside community certainly raised the question of why would people will want to go there other than the upgraded facilities? What is there to be promoted? Referring to questionnaire that has been done, majority of the UTM community do not know about the research and developments of the faculties other than their own faculties, which shows the low level of legibility on the exposure for research and developments in UTM. In this context, certainly the outside communities have lesser information on the topic mentioned.

As a result, this research will present the theoretical method on exhibiting the research and developments at Universiti Teknologi Malaysia through series of analysis. Significantly, this research will help in finding the best solution in giving the exposure towards the community regarding Universiti Teknologi Malaysia's research and development sector as well as other relevant works.

## **1.8 Chapter Summary**

The first chapter covers the background research and issues surrounding the usage of a bridge as a design intervention in connecting people with gallery exhibition of research and development at Universiti Teknologi Malaysia. The significance of the study is discussed in order to guide the exploration original study direction. The research goal and objectives are determined by the issues and hypotheses presented. Forming an architectural design plan necessitates extensive readings, literature evaluations, and analysis.

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