

Reflecting and Learning from the Mode of Multifunctional Food Markets in Macau

by

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My interests in markets started from having trips to foreign countries. Every time I wanted to have a better understanding of an unfamiliar culture, visiting museums and tourist destinations was not enough, walking into a local market could be a better way to know the exact daily lives of local people. The smells of fruits and flowers, the tastes of foods and deserts, hearing the talking and noises, and markets always became a small window for me to have a peek into a different world. These travelling experiences raised my curiosity about the market which is a common and basic urban function in every city and every culture, making me wonder what the roles of the market in urban lives were, except for being a method of economic activity. This is my first reason to put my research focus on the market as a public function.

During years of study on urban design and architecture, I found the market was a common answer to all kinds of urban problems, such as urban regeneration, but people hardly could tell what a proper market was and how to design a proper market. Different to other architectural prototypes of urban functions, such as hospitals and libraries, a market is too simple to have a design standard to explain how it operates and what is necessary for it to succeed. On the other hand, in practice examples, markets were always not a single function space and had many different functional combinations and forms, in different cultures, markets may seem to be the same but named differently and operated differently. To conclude a standard design of the market and figuring out how to design a proper market, that was the second reason I wanted to take markets as my research object.

The third reason for wanting a deeper knowledge of markets was related to the current situation of markets in the urban generation process. Facing urban generation projects and economic development, many markets around me had been torn down for new urban planning, and I heard many complaints about missing market function in the urbanization process. Whether markets would be eliminated by economic development when more and more people choose to shop online, and physical chain shops become less and less. Being one of the basic and common public functions in human history, would it disappear in modern economic activities or still exist in another appearance? It's common to see many pieces of research on other urban functions or spaces, people discussed the roles of streets and plazas, but only a few researchers take markets into consideration. Finding a method for markets in future social development becomes the most important motion for me to conduct research on markets.

In the early part of my research, I planned to take markets in England as the main research objects, trying to explain the current situations of markets in England and figure out the ways to improve the design of markets to help them survive from challenges of modern economic activities. But in the process of research, the Covid-19 pandemic happened, and it stopped my research on UK markets not only in field research aspect but also in achieving current information on existing markets, due to the temporary stop of market activities. Following my relocation to Macau, I found a different type of market, it was a kind of multifunctional market, and different functions were combined into a building, so I temporarily named it the multifunctional market building. I hoped researching this kind of market could lead to a new method to solve the problems and challenges which the traditional markets were facing, giving a solution for urban regeneration and urban revolution projects. As a result, I changed my research object and aims at the halfway stage of my research.

In the end, I would like to thank some people who contributed a lot to my research. First of all, I would like to thank my family, they supported my research a lot and gave me some important ideas from different points of view. Especially my wife who took care of me when I was living in Macau, contacted friends who had done some pieces of research on Macau markets for my research and provided a lot of information

about Macau markets. In the field research part, my wife also helped me with questionnaires and interviews, I could not imagine what my research would be without her selfless contribution.

Then I would like to thank my supervisor, Professor Tim Heath. During my research, my professor helped a lot in every step of the research process. I was a new 'bird' in professional academic research and did not know many details about doing research at first, Professor Tim Heath gave his ideas and told me how to do research step by step, making me finally able to start any academic research. Moreover, Professor helped me a lot with mental states, I sometimes felt hesitant and uncertain during my research because of the process and results of my research, but he told me how to treat these conditions and what were the real aims of doing PhD research, not about the results but the process of showing the abilities to do academic research.

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Chapter 1 INTRODUCTION

This chapter generally introduces the elements of the thesis, including the research topics, aims and objectives. Despite these detailed aspects, this chapter also presents the structure of the thesis and explains the roles of each chapter and related research questions. In the end, some definitions and terms used in this research are discussed to make clear the differences between different cultural backgrounds of the markets in Macau.

1.1 Context of study

This century is still the generation with markets, they mean a lot to people. Shopping, wandering, and talking with people whether know or not, we spend time with the market in all kinds of daily lives. It's common to have several markets in a city. Some are big, some are small; some are covered with rooves, some stand in the air; some are single-minded, some are all-inclusive; enumeration can't be enough. In current days, no one will doubt that the 'market' is a part of the city, a part of urban space, and a part of human history. It's so ordinary that knowledge about markets is not considered. What is a market? What influences a market? How does the market work in daily life? Seldom is known.

Being one of the oldest public functions in human history, markets always play important roles in urban space. Being the centre of trading, markets indicated the scale of cities. As cities emerged, markets were the economic centres of the city, as important as churches. But things are changing now, markets are in danger. The number of markets is declining, and many are struggling to survive facing the changes in the economic system.

Two reasons can answer why the current condition came. One is a change of trading lifestyle, more and more online trades make physical space unnecessary. Virtual currency and powerful logistics systems let people don't need to trade face-to-face and many people seem to tend to not go out while having more choices. With fewer customers, many markets are facing the fate to close and so does vendors. Vendors also seek opportunities for industry, and good and quick delivery service enables them to trade over long distances. The Figure of trading is different from the past, leading to difficult situations for markets.

The other one is the urban generation. Capital is the motivation of the urban generation. For normal urban space, the value they created supports the current urban positions they stood. Markets were used to create big enough economic value in the past, but under the current conditions, things became different. Markets are on the list of first choices when it comes to urban generation. In some cities' regeneration plans, most of the markets have only two ways to go: relocation or demolition.

Like many other urban spaces and functions, when they became in danger, people try to understand and save them. Many researchers turn to find new ways for markets to survive. The benefits of markets are discussed at academic and industry levels. Some efforts are made to change the current condition of markets. Although the big picture is not good for markets, some kinds of markets are increasing, such as farmer markets. It's the turning point for markets in the urban context.

The same situation also happened in Macau, which is a place with history, before 1999, under the Portuguese government, learning from modern urban theories, markets in Macau already had stepped into the same modern stage as other European cities. On the other hand, the markets in Macau were also influenced by Hong Kong which was ruled by the UK or by Singapore culture, due to geographical factors, these places formed a special Chinese cultural area at that time outside mainland China. As a result, markets in Macau combined two cultures, one from the east showed in trading mode and cultural contexts, and one from the west reflected on architecture and regulations. It's obvious that the development of markets in Macau could represent a special market phenomenon connecting both western culture and eastern cultural backgrounds, researching these markets may make some contributions to strategies of market development of both eastern and western countries. Stepping into the modern age, when electricity and automation changed human lives, a kind of new mode was applied in Macau which may also be learnt from Hong Kong, when the first of this kind was built in Macau, the

government was proud to say it was the most modernized market in Southeast Asia. This mode of the market could be concluded as a mode of multifunctional food market building whose official name is 'municipal complex', apart from the function of the food market, there are some other municipal services put together, and this mode may be a result of limited land usage in central of city and a method to rearrange the municipal service map.

After the first multifunctional food market which was built to replace the modern market in the 1990s, this mode of the market had become the mainstream method in market regeneration adopted by the government of Macau, through about 20 years of usage and changes in lifestyle, it's time to find out whether the mode works well or not, answering the questions, such as 'Should this mode to be continued', learning from this mode may give some experience to certain conditions of urban regeneration like market regeneration in central cities. Considering these features, this research takes the mode of a multifunctional food market as the research object, trying to figure out answers to further development problems under different cultural backgrounds.

Although the mode of the multifunctional food market is the only research object in this research, the history and POE research (post-occupancy evaluation) of this mode could show a certain process of the development of the market around the world, improving current understanding of the market system and give some suggestions for markets in current struggling conditions facing threatens from the online and offline economy organization, especially after the pandemic which may change a lot of human lifestyles.

1.2 The research aims, objectives and questions

1.2.1 Research aims

The aims of this research could be concluded into three aspects. These aims could be accomplished during the research and arranged through the process of research, they may have limited overlaps in certain areas, but the main directions are different. The following three paragraphs introduce the three main aims of this research:

1. The first aim is to research on the phenomenology of the 'market' and establish a general idea of the market system in the field of urban design. the function of markets seems to be a common thing around us, but it's more complicated than thought. Categorizing it as an urban space is not enough, 'market' is a mixture of human activities and physical structures. In past research, markets are divided into a single category, sometimes urban space, sometimes urban function, and sometimes trade system, pieces of research through a single category can't see the big picture and is limited by factors and knowledge. In this research, one of the aims of the research is to fully comprehend markets from different aspects and structure a more reasonable and understandable concept of markets, along with the factors which have a direct influence on markets. Apart from previous theories from other research areas, such as economy, the concept of markets in this research is more frequently deconstructed through architecture and urban aspects.
2. A Second aim is to learn and comprehend the history of the 'market' in Macau and get the reasons why the mode of multifunctional food markets was imported to Macau. Research on the history of markets is a big gap in research of markets, although there are some pieces of research on ancient markets, the connection between ancient markets and modern markets is missing (or researchers

thought there were no differences between them) in research of all countries. The changes in markets during history can give ideas of how markets work in different stages of cities and human lives, explaining what and how different factors work in the system of the market. Due to the special history of Macau, the cultural background of this city could give a much more varied Figure of how the market developed in southeast Asia and give some reasons to answer why these modes of markets were adopted by residents and governments. For these reasons, one of the aims of this research is to complete people's knowledge about the history of markets in Macau and explain how and why the mode of multifunctional food market emerged in Macau, connecting the history of markets in Macau with other markets around the world, importing some positive examples of markets projects operating well in urban spaces in the history and getting some new ideas about how to use markets in urban development and to survive in future urban regeneration.

3. The final aim of this research is to show the current condition of multifunctional food markets in Macau, know the advantages and disadvantages of the mode of the multifunctional food markets and finally find a new method for market development in Macau. Through field research of current multifunctional food markets in Macau, the idea of users can be understood. Although this mode has been used for over two decades, none has asked whether the mode worked well or whether it suited the urban generation, especially after the pandemic, the markets are facing another wave of updating and replacement. After learning from theories of the market system and the history of market development in Macau, using the theories and cultural factors in Macau may give a better understanding of the multifunctional food market, evaluating the roles of this mode in the urban generation of further planning of Macau.

1.2.2 Research objectives

Compared with the research aims, the objectives of this research are much easier to complete during each process of the research, but they are not separated from each other or with the research topic, they are related in some fields. There are also some small objectives of this research.

The first objective is to have a deep understanding of market research in the previous decades, finding what has been done and what is missing in previous studies on market through different academic aspects, the results would show the current situations of studies on markets.

There are many academic definitions of the 'market', not to mention definitions from urban aspects or city development aspects. One of the objectives of this research is to make a clear definition of markets from the urban aspect, starting a way for other researchers to research the relationships between cities and markets in an urban system, not like previous pieces of research which discussed markets in the economy and social aspects. This objective is the starting point of the research and also one of the outcomes at end of the research, moreover, knowing more about markets under different cultural backgrounds and situations can change the definition of the 'market' in common knowledge.

Markets are complicated systems, which combine different aspects of urban and human, some primary and obvious factors will be elements considered, leading to further research on factors of markets, all factors and their relationships with the system of markets would be applied in the field research part to be tested and confirmed. After knowing the factors behind markets, the next step is to build a system of the 'market', expressing how markets actually work in the view of urban design. In another word, this is a way to set up a standard evaluation system for markets and related cases. The relationships will change if factors change or have a deeper understanding of markets. limited by time and context of research, the

relationship between factors in the market system would be only discussed in the mode of the multifunctional food market, but the conclusions may also be applied in other markets.

Before having deep field research on multifunctional market buildings in Macau, the history of market development in Macau should be carefully reviewed, showing how and why the situations of markets in Macau were developed into current stage. On the other hand, the history of market development in Macau could also substantiated the elements and relationships in the system of the market.

The last two objectives are the most important and applicable in this research, to evaluate the mode of multifunctional food markets and learn from the mode of multifunctional food markets. It is hard to say whether current multifunctional market buildings are not suitable for future lifestyles, but it's time to analyse this mode and give some suggestions for regeneration and improve the current situation of markets in Macau. Moreover, having a better understanding of the mode of multifunctional food markets can give some ideas for market regeneration projects in Macau and other cities in similar conditions. So, the last objectives are more practical in reality application, different from the previous discussion on theory, these two objectives connect the research with the practice usage of markets.

These objectives tend to be the route of this research, going through step by step, leading the research from the theory of market system to the field research of multifunctional food markets in Macau. These objectives make up a cycle system of research on the markets, without the end and the start points. If pieces of knowledge about markets change or new things are discovered, a new round of research will start again from the definition, factors relationships, and definition, until the facts of markets are fully understood, and the studies on practice usages of the market would be imported in any point to drag the theoretical research of markets into real social lives.

1.2.3 Research Questions

According to the research aims and objectives mentioned in the previous section, there are following questions would be discussed in this research, each chapter has its own questions and shared questions to be solved. The research questions are listed in the table 1 below, and the details will be discussed individually.

Chapter 2	What are the research gaps in previous research on markets? Why was the multifunctional market building chosen as the research topic?
Chapter 3	What was 'market' in the theory of urban space? Defining the system of 'market'.
Chapter 4	What was the development process of markets in the history of Macau? How the elements in the system of 'market' affected the development of markets in Macau?
Chapter 5	What research methods should be applied in the study
Chapter 6,7,8	Gathering information of multifunctional market buildings in Macau through the field research and making conclusions from results of analysis.
Chapter 9	What the conclusions of this research? What could be recommended or advanced for future research and practice?

Table 1. Research questions in this thesis

The five research questions related to the whole thesis are the main research questions running through the whole process of this research, requiring methods and analysis from different aspects to find and

explain the answers to these questions, so they are not limited to any one of the chapters. The other research questions are individual questions in different processes during the research on multifunctional market buildings. These research questions could be divided into five aspects: current situation of research on the market; history of the market including the history of market and history of market development in Macau; Theory aspect would consider social interaction theory, urban design and human cognition related theories. The current situation of markets in Macau discusses the questions around the market existing in Macau and the operation conditions of them; the improvement aspect deals with the research problems related to improvement on design principles and theories of the market, not only from urban design dimension but also from social interaction and economics dimension.

These research questions are supposed to be all solved in the different periods of the research and lead the process to finish the aims and objectives of this research, so the structure of the thesis is arranged with the research questions. But these research questions would not be necessarily all solved in this research, depending on the results and progresses of research from different aspects. Generally, the five big research questions would be the main targets in this research and mentioned in the following chapters when the related contexts and discussions are raised, the individual ones will be discussed in their own section and also would be applied in other parts when it is necessary.

1.3 Structure of the thesis

The structure of this thesis is divided into three main sections and seven chapters.

Introduction	Chapter 1	Introduction of the research
		Introducing the general structure of the thesis, explaining the intentions and aims of this research
	Chapter 2	Introduction of research on markets
		Describing the current situation of research on markets around the world, comparing the research topics and methods, and showing the research gaps in the research field of markets.
Theory research	Chapter 3	Models of the market system
		Deconstructing the concept of ‘market’ by elements and reconstructing the concept through the view of architecture and urban design.
	Chapter 4	History of food markets in Macau
		Introducing the history of market development in Macau, combining with situations, and explaining the ideas of designs and regulations behind the mode of the multifunctional market building.
	Chapter 5	Research Methods
		Making discussions on different research methods, comparing advantages and disadvantages, and deciding the

		proper method for this research.	
Case study	Chapter 6,7,8	Case study Using field research methods to gather data from customers of multifunctional market buildings in Macau and getting some brief results of current situations.	Table 2. The structure of this thesis
	Chapter 9	Conclusions Making some conclusions about markets according to results of history and field research and explaining the limitations and criticisms of this research.	

The first section

ion, which contains two chapters will introduce the research topic and conduct a review of previous research on markets. The first chapter is the introduction of this thesis, explaining the selection of markets for this research, especially multifunctional food markets in Macau as the research object, presenting the culture and personal background of this research, stating the research aims and objectives and showing how the goals of the research could be achieved through this research. The first chapter is a traditional chapter for introduction in every thesis, it only shows a general path of this research, and the results and conclusions of the research are not included in this chapter. What this research aimed and tried to achieve is not necessary or surely realized in this research, just showing what this research planned and desired.

The second chapter is an introduction to the current situation of research on markets around the world and in China, this chapter aims to review previous research on related markets, analysing such research from several aspects and finding the research gaps among this previous research on markets in order to show the reasons why this research chose the mode of multifunctional food markets as the research object and the research gaps would be covered in the research. The literature review is separated into two parts, one is a review of research on global markets which consists of history research and timeline research, and the other part concludes research on markets in China as well as research related to markets in Macau. In the global research part, the timeline and topics of previous research are analysed to show the changes and factors of research on markets and what other researchers are interested in. In the part of research on markets in China, more attention is put on showing the big picture of the research, telling the current situation of research on markets and the research gaps between research on markets in China and research around the world, and finally, the preview of research would go into research on markets in Macau, although the number of the research is small, it shows the real Figure of the market development in Macau, showing why doing a piece of research on the markets in Macau is important and necessary. The second chapter is the thinking and explaining process of how this research started from global markets and narrowed into the field of markets in Macau, drawing a brief big picture of research on the market in recent decades and what researchers were interested in and ignored, explaining this research on the mode of multifunctional food markets in Macau would make contributions to research on markets in China and around the world, not only improving research on the market and related development in Macau.

After the introduction section, the following three chapters make up the theory section, which establishes the model of operation of the market system and explains its connections with urban space through historical research and case study research on recent market regeneration projects.

The third chapter introduces how to form a model of the market system and discusses the elements of markets and the relationships between each element, establishing a model that can be commonly used and expounding public spaces phenomena though the whole study. The mode of markets is discussed

through architectural psychology theories and related research, starting from the original source of markets and explained in urban aspects. Different from the third chapter, the fourth chapter is related to the history of food markets in Macau, narrowing the research objects down to the Macau area, discussion is based on related culture and policies. Though history research, connected with the mode of the market system discussed in the previous chapter, the relationships between markets and urban are shown in a very different way, unique from what has been done in preview research on Chinese markets and other related studies, showing which could be the key elements in markets system which influenced the development of markets. In this process, the model of markets built up in the third chapter is applied, verified and replenished, also helped to explain how and why the mode of multifunctional food markets was adopted and used.

The following three chapters are all about the case study, forming a field research section used to respond to the theory in this study. This section shows the process of field research in this research, from choosing the research methods to analysing the result of the field research, it's a normal process of research the same as other field research in architecture or urban areas.

The fifth chapter explains three questions: (i) What research method to choose? (ii) Why choose certain research methods? (iii) How to apply certain research methods in this research? There are also some small questions related to the three big ones, such as what cases to choose for the case study. The process of this chapter starts with a review of research methods in other research on markets or urban functions, knowing the advantages and disadvantages of different research methods. After deciding to use the case study method in the field research, the selection of cases will also be discussed, as well as the detailed methods of case study, such as questionnaires and interviews. Similar to other research on public functions, the field research in this research doesn't have many innovation points, that chapter is aimed to show the planning of field research and explain the rationality and feasibility of the field research part of the research.

The sixth, seventh and eighth chapter are the main process in this research, after the theory discussion, in this chapter is the time to put theories and assumptions into practice, learning from the previous chapter, using questionnaires and interviews to gather the data of the selected cases. The chapter could be divided into two parts of field research for each case, one part is to show the current condition of each case of the multifunctional food market, through photos and policies, showing the operation of markets and what problems can be found without data collecting. The second part is post-occupancy evaluation for each market, gathering data about the feelings and experiences of users regarding different functions in multifunctional food markets, and trying to show the inner problems of the mode. In this part, questionnaires will be applied as the main research method, but some interviews with vendors and authorities of the markets would be used to explain the relationships between each element of the market system.

Analysing the data collected in field research on multifunctional food markets by questionnaires and interviews, this research could get a quantified result of the feelings of users of multifunctional food markets and know what they desired in this public function. According to the theory of market system in previous chapters, this research could give a conclusion on whether the mode of multifunctional food markets is still suitable for urban generations. Learning from the advantages and disadvantages of this market mode, some advice and suggestions will be raised for the government or architects of Macau when facing future challenges. On the other hand, improved mode recommended could be used as a solution to problems of market regeneration projects in a certain similar situation.

The final chapter of this research is for the conclusions and further research planning, not only giving the conclusions of the research on the mode of multifunctional food market but also indicating the limitation and shortage of this research, pointing out the planned research aims which are not achieved as expected.

A discussion about market regeneration projects is made, showing a general tendency of theories of market regeneration by having research on the case study of successful market regeneration projects in the recent decade. Apart from data and history reviews, experience and practice patterns of urban regeneration projects or hypothetical thoughts would be the major research objects, learning from these successful existing cases may give some ideas for further market regeneration activities in Macau, combing the ideas supported by the theoretical aspects and data analysis. The conclusions and results of this research are obvious through the process of previous chapters, they are not the main aims of this chapter, but having a brief review of this research is the most important part. Knowing the limitation and insufficiency of this research also give essential information for future research on markets or urban functions, although this research could not be perfect in all parts, the review, in the end, could make it relatively complete. A future research plan could be applied after the review of the research, letting other researchers know what could be chosen as research gaps based on this research and how to extend the research on certain research areas.

1.4 Definitions in this research

This section will explain and outline the key definitions in this research in order to help establish the focus and terminology expressed throughout the thesis.

1.4.1 Names of markets in this research

The names of markets used in this research have different names in different languages, the official language in Macau was Portuguese whilst the residents speak Cantonese. The Portuguese names of markets usually are named after Portuguese names of streets and areas or after government officials or festivals. The Chinese names of those markets are named after streets or area names in Chinese, sometimes people have replaced the official names with nicknames. In the current condition, the names of markets could be confusing to readers, therefore, to make the names of markets in this research correct and coherent, the names of the markets used in this research are their Chinese names represented in Mandarin pinyin. In the following table (Table 3), the names of markets used in this research are written in three languages: Mandarin pinyin, Cantonese pinyin, and Portuguese, enabling the connections of this research with markets in actual life and other research previously conducted in Chinese or Portuguese, making it easy for other researchers in different related languages. The Cantonese pinyin forms of names of markets will be used in historical research and field research because the people and evidence involved in this research are mostly under the Cantonese cultural background, people speak Cantonese and records were written in Cantonese, it's much better to show first-hand evidence and data in their own language and culture background. Portuguese names could be found in government records and regulations, largely related to the history of the colony, even now, the government still use Portuguese as an official language.

In Mandarin pinyin (used in this research)	In Cantonese pinyin	In Portuguese	In simple Chinese
Yingdi market	Jingdei Gaaisi	Complexo Municipal do Mercado de S. Domingos	营地街市
The red market	Hung Gaaisi	Mercado Municipal Almirante Lacerda	红街市

		(Mercado Vermelho)	
Quezaiyuan market	Zoekzaiyun Gaaisi	Mercado Municipal da Horta da Mitra	雀仔园街市
Xiahuan market	Haawaan Gaaisi	Mercado Municipal de S. Lourenço	下环街市
Taishan market	Toisaan Gaaisi	Mercado Municipal Tamagnini Barbosa	台山街市
Youhan market	Jauhon Gaaisi	Mercado Municipal do Bairro lao Hon	祐汉街市
Danzai market	Tamzai Gaaisi	Mercado Municipal da Taipa	氹仔街市
Luhuan market	Louwaan Gaaisi	Mercado Municipal de Coloane	路环街市
Shalitou market	Saaleitau Gaaisi	Mercado do Patane	沙梨头街市

Table 3. Names of multifunctional market buildings in different languages

1.4.2 The mode of markets

The market in this research refers to the public urban functions, not the economic system or stock markets often talked about in other pieces of research. To make it clear for other researchers, some definitions and special nouns of markets used in this research are needed to be discerned before the main context begins, in this part, the mode of multifunctional food market would be generally described, and other terms of markets are also included.

The 'multifunctional' mentioned in this research referred to the combination of public functions other than 'market function'. There could be many different definitions of 'multifunctional' according to dimensions and divisions, such as 'multifunctional' defined by different goods sold in the market. In the research, the 'multifunctional' in the multifunctional market buildings in Macau is mainly defined by public functions designed in the markets, such as the sports field, these functions are in the same category as market function in the social behaviour patterns in urban design.

'The mode of multifunctional food market' is a term used to describe the current architectural style of markets in Macau. In official records and regulations, multifunctional food markets are called 'Municipal Complex', because the functions of buildings are made up of different municipal services, as a definition, they are just a kind of normal multifunctional government buildings, but on the other hand, these municipal complexes are named after located markets which were replaced by these municipal complexes. From the government aspect, the main function of these municipal complexes is the market function, as a result, these complexes have the title of markets, in fact, a large portion of the space in complexes is used for market functions. Combing these facts and terms, these municipal complexes could be categorised as a mode of the multifunctional food market, this term indicates two features, the main designed function of this prototype is for a food market, the food market only includes selling uncooked food, according to regulations and planning of the government. The other feature is multifunctional which results in different public functions in these buildings. So, in this research, the term 'the mode of multifunctional food market' replaces the term 'municipal complex' and covers a similar phenomenon that happened in Hong Kong.

The term 'modern market' in this research refers to a stage of the food markets in Macau, not meaning the modern architecture style, because the modern facilities were applied in these markets, such as elevators and ice storage rooms. Compared with the old traditional market, these markets were more suitable for lifestyle at that time, so using a term used by governments and newspapers, this type of market is called 'modern market' in the history of markets in Macau.

Chapter 2 RESEARCH REVIEW

This chapter focuses on research on different pieces of research on the market from all regions of the world, explaining the research gaps in the fields of research on the market according to cultures and technologies, and substantiating the reasons for choosing this research topic and objectives.

2.1 Worldwide research on markets outside China

This section mainly focuses on the pieces of research on markets outside of China, showing the big picture of research related to markets around the world.

2.1.1 Big picture of worldwide research

2.1.1.1 Geographical Factors of Research on Markets

In some undeveloped countries, the markets were still serving as the basic function of trading in the urban context. Researchers with this kind of background tended more focus on the economic system of markets, ignoring or not considering the market as a public space and other city functions. On the contrary, researchers and research with much higher-level economic backgrounds started to take the market not just as an economic tool. They began to explore more about the market, its function as a public meeting place and its positive effects on communities and the local food system. This phenomenon can be indicated by the number of academic research from different continents (Table 4). The numbers of research on Europe and American markets are much higher than other continents, pieces of research which treated 'market' as a pure economy concept are not included. More researchers from these two continents are interested in the relationships between markets and urban life, to a certain extent, the economic function is not one of the main drives for people to turn their eyes back on markets, the oldest public realm in human history.

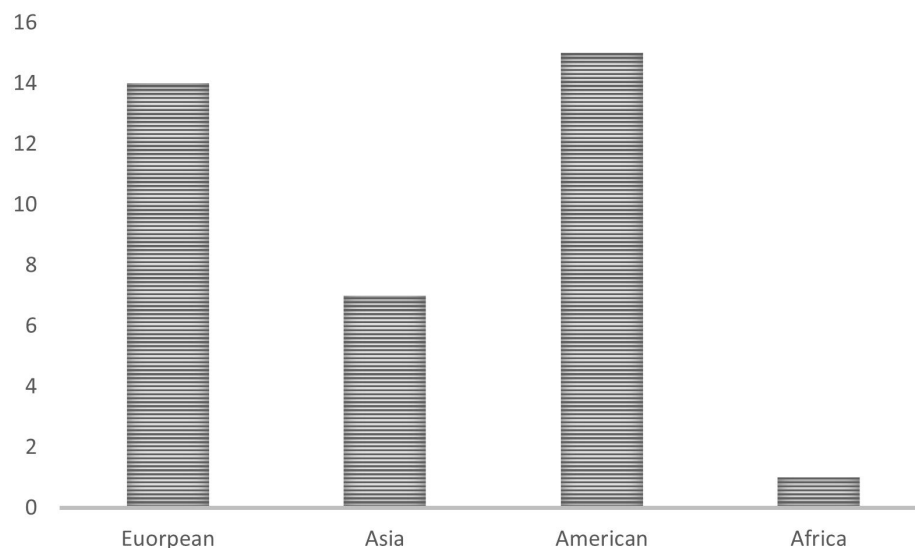


Table 4. Pieces of research on markets divided by continents

Furthermore, by taking a deeper look into research, the relationship between economic background and research interests can be confirmed. Picking out three countries contributing most of the research on the market, the United Kingdom, the United States of America and Iran are the most prolific (Table 5). Iran is a special source of research on the market. The markets in Iran and other Islamic countries are the bazaars, a special form of market consisting of economic, political, and religious space. In other words, most pieces

of the research on the market from Islamic countries are research on bazaars, the same thing happened in Iran. Why Iran contributed most among other Asia countries, especially in Islamic countries, the reason assumed they have the Grand Bazaar in Isfahan. The Grand Bazaar is the symbol of history and culture to Iranians, not just trading and exchanging, it's common for researchers to consider relationships between bazaars and cities, regardless of economic background. The other two countries mentioned above are two developed countries, so it's not surprising to see the UK and U.S.A contribute the most to research on the market. Researchers usually think markets in UK and U.S.A are not just a place for selling, they want to explore more roles of markets in urban life.

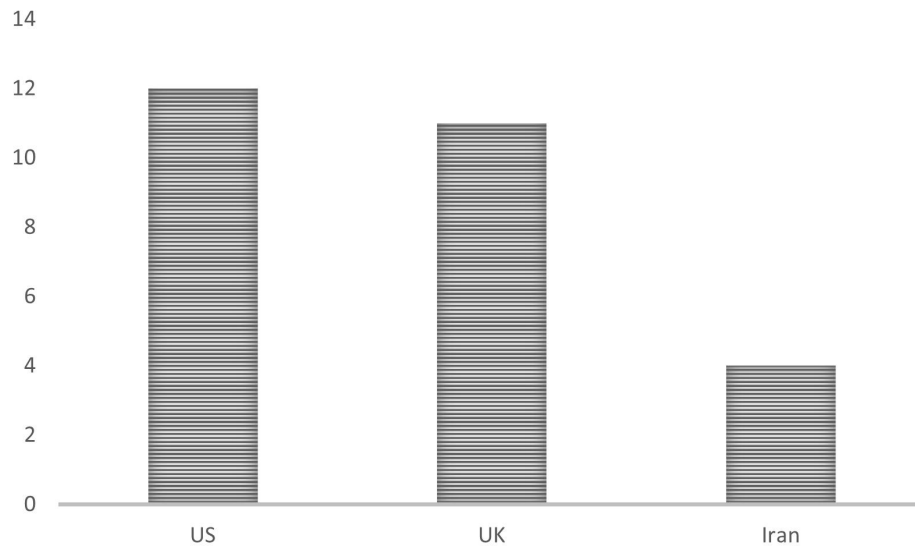


Table 5. Numbers of pieces of research from major contributors divided by countries

This kind of thought about markets is influencing more people from other countries and continents. Many researchers started to rethink the condition of markets in their own places, according to what had been done by UK and U.S.A researchers. This phenomenon can be seen in the following section about the timeline of research on the market.

2.1.1.2 Timeline of Research on Markets

The geographic element is not the only difference appearing in research on markets, the timeline shows another aspect of the current research situation. People with different backgrounds do the research at different periods, due to different reasons. Excluded historical research on the market in the early period, the 'modern' research on the market normally began after the new century, people started to think more about the market and human life.

In the data of research on the market used in this research, a new thought came at the coming of the new century (Table 6). A few pieces of research on the market were conducted around the first half of the first decade in the 21st century, and then one research peak came around the year 2009. After the number of research on markets grew steadily, then came the second research peaked around the year 2015. On the surface, it's a turnover of attitude toward the market system, changes are not that simple if research is related to the geographic background.

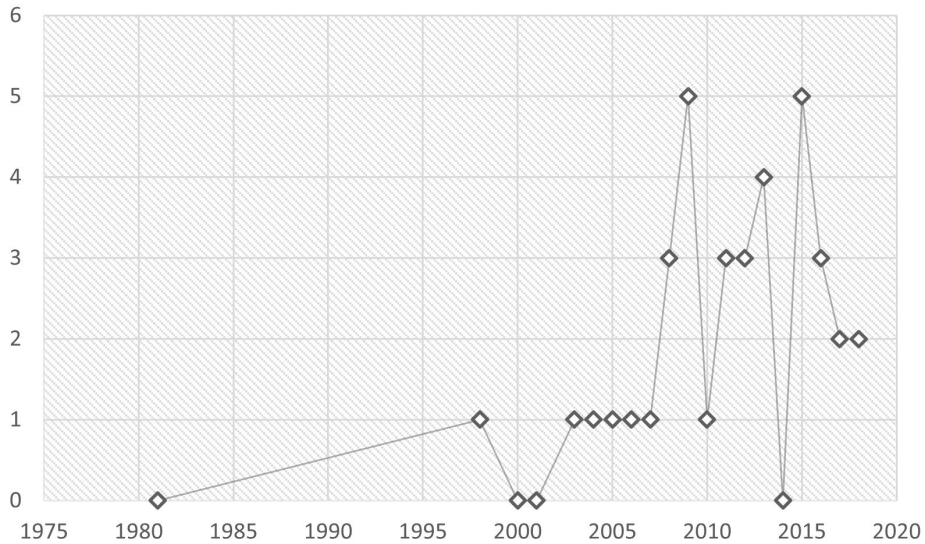


Table 6. Numbers of pieces of research on markets according to years

Taking research on markets in the U.S.A as an example (Table 7). The beginning of research on the market is the same as the global tendency, but there is only one research peak until 2018. The number of research on markets raised around the end of the first decade of the 21st century, the peak came at the year in 2011. After that, the passion of researchers began coming down, and a few pieces of research were made in this decade. The timeline of research on markets in the U.S.A changed might be related to their attitude toward markets. Around the first decade of the 21st century, there is a call on rediscovering and saving farmer markets, people came to realize there was still a place for farmer markets in cities of the United States of America, considering food and job provision.

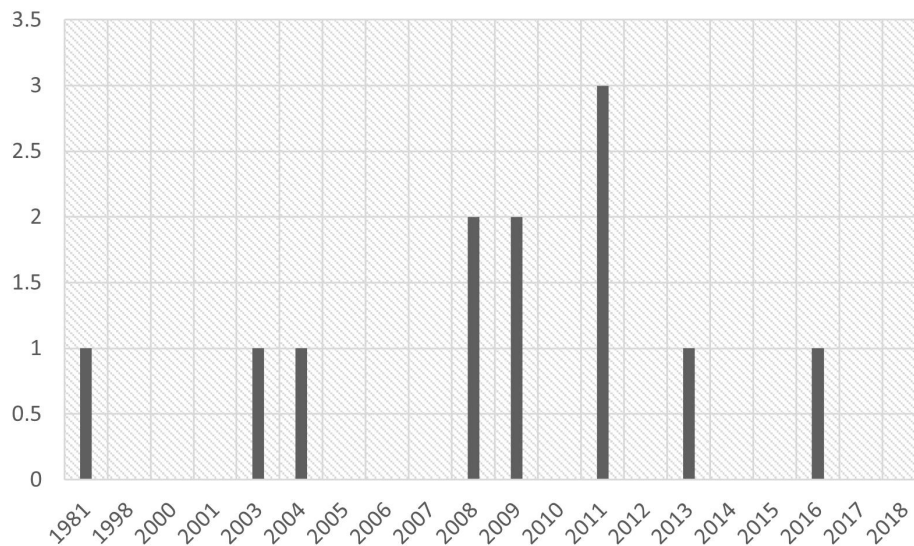


Table 7. Numbers of pieces of research on US markets according to years

On the other hand, talking about research on the market in the United Kingdom, the timeline of research is quite different (Table 8). The 'new' research started around the end of the first decade of the 21st century, there were two research peaks, one around the year of 2009 and another one around the year of 2015. These two peaks show two different periods of research on markets. The first period of research peak was the time people worried about can traditional markets survive in a modern retail economic system, researchers started to find ways and reasons for people to maintain the existing

markets. The other period of research peak was around recent years, in this period, researchers more focused on the social functions of the market, not just worrying about market failures, they tended to explore other roles of market performing in urban daily life, this will be responded in the following section about current condition about research on markets.

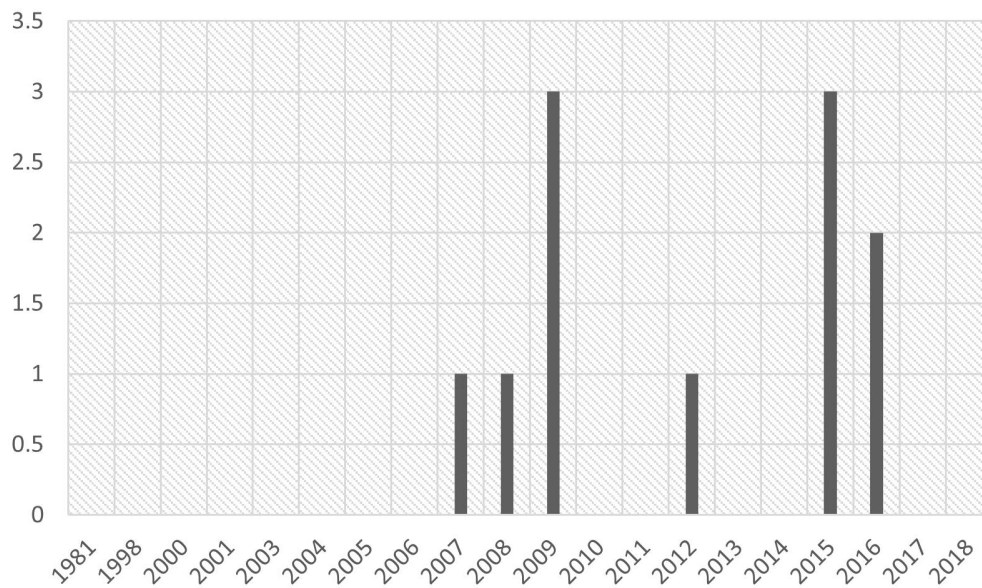


Table 8. Numbers of pieces of research on UK markets according to years

Combining research from the U.S.A and the UK shows the timeline of current global research on markets. Apart from these two countries, more research from other continents and countries came up in this decade, especially in recent few years, not only European countries, some researchers from developing countries noticed the importance of markets in urban life. This might be influenced by research in the UK and the U.S.A and the awareness of markets in danger. In some research, there were also some comparisons between markets in other places with markets in UK and U.S.A. It can be predicted that there will be more research on urban markets from more different countries in future.

2.1.2 How 'markets' work

Faith Ossy Ikioda's paper (2013) focused on the difference in research on the marketplace. The author found researchers had increasing interest in different aspects of marketplaces in Western culture countries, many papers and research discussed how marketplaces worked in urban daily life and current condition. Rather than still talking about marketplaces in the United Kingdom and the United States of America, Faith Ossy Ikioda did research about Africa and especially marketplaces in Lagos. First, the research reviewed different research on the marketplace, both from Western countries and Nigerians. Then it tried to make comparative research strategies, including Nigerian Marketplaces and Western ones. The author thought apart from different cultures and environments, marketplaces in different places were the same in playing important roles in local food systems and informal employment. On the other hand, they also faced the same kind of problems and current conditions, threatened by more and more expanding modern retail modes such as supermarkets and shopping malls. The goal of the study was to bring back the recognition of marketplaces in Nigeria such as Lagos, showing that marketplaces in Nigeria had the potential in providing colourful urban life, not just the image of chaos, unruliness and poverty, serving a low-income population. In final, the author suggested further research should be made to fully understand

marketplaces in Lagos and other Nigerian towns and cities.

Other researchers were more interested in the true situation of the market, they tried to figure out how to make markets better in order to survive an economic crisis. This kind of research appeared mainly because of the decline of markets themselves and threats from outside, especially from urban development.

Mark Casson and John S. Lee (2011) tried to find out how the market spread and influenced business in the European country. Although it was a piece of research from the view of business history, it somehow showed how markets turned into the current situation and why. Some researchers tried to find out the reasons why markets were facing retail gentrification and how things changed. Pedro Porfírio Coutinho Guimarães (2018) concerned about whether retail gentrification is happening in markets in Lisbon and why. This is a piece of similar research about retail gentrification that happened with markets in another cultural background. Researchers used a case study and qualitative approach with eleven interviews conducted in the three markets, indicating markets in Lisbon were also having some dramatic changes that were not obvious. This might provide some gaps between the original design and the current situation, creating problems for the least mobility class. On the other hand, they thought markets in Lisbon were taking the same rehabilitation process as elsewhere, like Barcelona, playing a key role in contributing to social inequality. Knowing the reasons, to deal with problems that rose from urban development, Sara Gonzalez and Gloria Dawson (2015) tried to give some advice to vendors and customers on how to protect or preserve the market from threats from other retail methods. This research took both vendors and customers into concern, not like other research, just telling vendors or governments how to do better. Several similar research tried to rescue different kinds of markets from the edge of disappearing.

While other researchers were discussing problems of markets by describing and quality measuring, some researchers tried to use quantitative methods to explain the situations and put efforts into solving related problems.

Bernadette Logozar and Todd M. Schmit (2009) were talking with numbers, they tried to use quantitative analysis to figure out how to assess the success of a farmer market in Northern New York. They made their research by surveying farmer market managers, market vendors, and customers attending the markets in 27 farmers' markets, asking related questions to different groups of people and linking with each other. Mainly, they wanted to find out how the farmers' market impacted and how did three groups of people in the market think it works. Finally, they found out how some factors of the farmers' market exactly impact the success of a farmers' market, such as the number of vendors and the number of amenities. This thing happened in research on street markets.

For the same objectives and using similar research methods, researchers Mio Suzuki and Jorge Almazan (2015) emphasized a specific type of market: the street market. Rather than the research discussing how the street market worked, its goal was to find out how to make better use of streets in Japan, street market is just a tool to active street potential. After a review of previous research, the research chose London being the source of the case study example. Despite field research and other regular methodology, in this research, what was used and mentioned were other investigation data and conclusions, mainly from government documents and publications. Researchers divided London Street markets into several categories, depending on policy features. To understand how street markets in London, most discussions were around the management of street markets. How to apply opening a market and getting administration on site were crucial to street market policy, comparing the change of London Plan about the market between 2004 and 2008, some evaluations about attitudes toward markets could be aware of. Another field this research considered is the effects of markets. Similar to other research, economic benefits, environment friendliness and improvements in quality of life were conclusions of what market could affect urban life. In the end, research came to compare Japanese street

markets' current condition and potential, pointing out there should be a better way to make use of streets, than just controlling by strict regulations and lacking a management system.

Rosemary D. F. Bromley (1998) discusses the relationship between the model retail system and the market in Latin America through the case study of Quito. Like other parts of the world, the global spread of the supermarket and the planned shopping centre was transforming retail space in the Latin American city. Which differed from other parts of the world, marketplace trading has continued to flourish in most cities and itself a key element of retail change in Latin American cities, and the incipient 'retail revolution' had impacted principally on the more affluent areas of the city. Researchers first found how the market worked in Latin American cities. The size and distribution of daily markets are key factors in the interpretation of structure and change in the market system. Through the case study, major periodic markets in northern Quito show that those periodic markets not associated with daily market activity, are most peripheral, providing evidence of their role as 'pioneer' markets. Using numbers and analysis, Rosemary showed the impact of the growth of modern shops appears to have been gradual, leading to a slow decline in the sales of certain products as fewer market traders found their operations profitable. Considering politics as an important power to markets, it was clear that various markets, particularly periodic markets, been established by municipal or national government decisions, often were as part of a broader strategy. This study improved knowledge of the transformation of retail space in the Latin American city. It provided an assessment of growth in the little-studied sector of urban marketplace trading and offers insights into the role of government intervention in the continued evolution of this highly adaptive retail form.

2.1.3 Benefits of 'markets'

2.1.3.1 Social benefits

Some pieces of research emphasise the social benefits of markets, researchers think it could be a good way to use markets in an urban context, especially as a public place. Several researchers claim markets have more social potential than people think, just people don't know how to use them as a good public space like streets and squares. Thomas K. Tiemann (2008) discussed the farmer market as a third place creating an informal association for users, not only for customers but also farmers and vendors. Furthermore, being a good third place, markets provide diversity and social benefits for communities and cities. Facing the changing and decline of the market, he also raises some advice for the market, such as policy and skill teaching. The same thing was discussed in Mark Francis and Lucas Griffith's research (2011), they used a case study to explain why the market is a good third place for social activities and how should farmer markets be designed to become a better public space. There are several useful and reasonable strategies raised in the research.

There are also many researchers interested in other aspects of the social potential of markets, they tried to open a new way to use markets in a different social situation, apart from the original trading function of markets. For example, Patrícia Schappo and Rianne van Melik (2017) used the Hague market as an example to represent the role of the market as a meeting place in social lives. Through field research, they find some social benefits realized in the Hague Market, but the role of the market as a meeting point is limited in social aspects, other than trading activities, under the European context.

The United States of America is one of the most successful countries studying in social potential of markets. One American report indicated many people use the market not only for shopping but also as a social vehicle. People find new friends and build new relationships during social interaction in markets,

especially for vendors, in their case studies. Being a space for the low-income class, people can seek opportunities for upward mobility during social activities, making a market a good place for both communities and individuals (Project for Public Spaces, 2003).

Some researchers tried to compare markets with other trading or shopping public spaces. Robert Sommer (1981) noticed the differences between supermarkets and farmers' markets. Researchers thought farmers' markets were welcomed by people because of the friendly setting and more interactions than supermarkets, thanks to the architectural setting and ideal environment of farmers' markets. Due to less academic discussion on the amount or quality of interaction in supermarkets and farmers' markets, researchers tried to find out the reasons and factors for this phenomenon. They used a questionnaire containing several key questions and gave it to 171 customers, discussing the setting of the environment, such as cleanliness, privation etc. The main study was to perform observations of nine farmers' markets and 26 supermarkets which were national chains in ten California cities. Finally, the conclusion was the same as assumed, the supermarket is a much less friendly environment than the farmers' market. One reason was the design of the farmers' markets provided more social interactions. Another reason was the self-service idea and management of supermarkets reduced the level of interaction in the American supermarket. But limited by region, researchers were not sure whether this phenomenon is the same throughout the world.

Not limited to normal social functions, some researchers used markets as mediums to test some social phenomena or functions. Hinrichs C. Clare, Gulespie Gilbert W, and Feenstra Gail W (2004) wanted to find out how social learning passes on through the farmer market in the U.S. and impacts small business development. Through literature research, few sociologists studied the process of economic development happened in farmers' markets, especially the factors and impact of it. In the research, three places were chosen: California, Iowa, and New York, in order to cover different types of agricultural, economic, and cultural contexts. Telephone surveys with market managers and mail surveys with farmers' market vendors were applied to collect data. In the end, the research could conclude that farmers' markets sometimes acted as social institutions of social learning and innovation of economic development, through social interaction between vendors and customers, in addition to their original urban function. Another American research also put emphasis on the roles of the farmer market in low-income communities, through field research data, people were satisfied with farmer markets and wanted more choices to be shown on markets. In this aspect, farmer markets played key roles in local people's lives. But this research was limited in region and culture (Ruelas, V., Iverson, E., Kiekel, P., & Peters, A, 2012).

It's obvious that research on American markets usually used the term 'farmer market', this is largely influenced by cultural background, 'farmer market' mentioned in American research is applied to the low-income class which quite differs from markets in the European region. On the other hand, researchers from European regions tended to use the 'market' as a symbol of the middle class and a medium of communities.

This kind of high expectation on the role of the market in the social aspect is not just happening in European and North American countries, almost researchers around the world have aware of the advance of the market in social development. Christopher Mele, Megan Ng and May Bo Chim (2015) found the relationships between wet markets in Singapore and urbanism, especially strengthening communal ties. In the research, data showed types of social interactions in wet markets were wide-ranging and informal, regardless of ethnicity, generation, and class. Researchers thought markets as meaningful social spaces for urban neighbours and they should not be replaced by other urban redevelopment projects. Furthermore, researchers not only considered the 'market' as a good tool for community development, due to its impact on the community and different classes but also, they can be positive for the urban generation.

Freek Janssens and Ceren Sezer (2013) used their article as a call to draw more attention to urban-related projects about marketplaces in urban space. They thought the marketplace was more than a public space as governments and designers first thought. Not only providing goods and information trading between

different people but also some benefits encouraged urban to grow and develop stably. Furthermore, they also noticed the difficulties marketplaces were facing, becoming the source of health and safety problems. Some cases mentioned in the article showed urban markets were in danger. To understand more about the marketplace and relationships with urban development, they came up with the idea of three dimensions of marketplaces and urban: marketplaces and communities, marketplaces and governance, marketplaces and design. Through these three approaches, authors thought people might find out the potential of the marketplace and how it works with urban development. In this article, some existing pieces of research about marketplaces were mentioned, some fields were carefully covered, and some were not, most can be classified in those three aspects. Through this process, Freek Janssens and Ceren Sezer wanted more academic discussion about the roles of marketplaces in cities among planners and designers, and taking the marketplace as an urban development strategy in the works.

Yolande Pottie-Sherman and Daniel Hiebert (2013) explored suburban culture and migration through the new phenomenon of the Richmond Night Market, showing the social benefits of the market for migration. This paper considers the suburban night through the recent cultural phenomenon of the Summer Night Market in Richmond, British Columbia, Canada. Night markets have existed in China since the 8th century, and have followed Chinese migration, first to Southeast Asia, and more recently, to Canada. Richmond, because of significant Asian settlement in the 1990s, is known as the 'new Chinatown' ethnoburb of Metro Vancouver. Its night market is a weekend evening event where predominantly Asian vendors sell clothing, food and a range of other products to the Chinese community and others attracted by the spectacle or seeking a bargain. The market has been re-branded as a multicultural, rather than being Chinese space. The researchers explored the roles of the market in the night-time leisure culture of Metro Vancouver, through themes of the changing. Nature of the suburbs, suburban night places, and the (messy) question of authenticity in an age (and place) of ongoing migration and super-diversity. Researchers focused on the first and third of these elements, examining the role of the night market in Richmond's night-time landscape through interviews with market participants and administrators. This research also included quotations from Chinese Canadian consumers of the night market in an effort to understand their interpretation of the market, including its authenticity. Research made a literature review on suburban nightlife, nightlife economics, immigration, the concept of authenticity, and reviewed the history of immigration and the night market in Vancouver. Through ten in-depth interviews with 'expert consumers', and 26 interviews with consumers in the Richmond market, the market has been re-branded as a multicultural, rather than Chinese space, showing explore the role of this market in the night-time leisure culture of Metro Vancouver, through themes of the changing.

Daniel Hieber and his colleagues (2013) advocated the study of local street markets to explore fundamental issues about the relationship between the economy and society. This relationship evolves over time, and we believe that it has been recast in an age of increasing cultural diversity and neo-liberal state regulatory structures. This research tried to define and provide a sense of coherence to a field of scholarship, by situating it conceptually and offering a set of research directions. The researchers contend that people in their everyday encounters in street markets develop methods of intercultural engagement and learn a repertoire of intercultural skills and that diversity helps propel markets. The discussion argued that these processes have consequences for both the economy (the ways that markets operate) and society (the ongoing development of social civility and even, more broadly, social cohesion). Researchers discussed concepts of market and related to market, such as social interactions and what is social diversity in the street market: while buyers tend to be 'local', many sellers may come from outside the locality, bringing different activities and cultures and goods. Comparing the new relationship between markets and diversity with the old one in the market itself, the nature of diversity, spatiality of markets and regulation of markets, researchers proposed proper methodology for specific research issues about diversity. In short conclusion, diversity shapes markets, and vice versa. Markets promote a kind of economic integration, but it's limited.

Sophie Watson (2009) used plenty of field research to claim that markets represented a significant public and social space in the UK. With different social connections and interactions such as 'rubbing along' and performances, 'market' was a vibrant social site for different local groups and mediating differences for communities. Alfonso Morales (2009) also agreed on the advantage of markets in community development. The benefits of markets in place-making, employment and social activities could be used for community improvement. The research used Merchants and Maxwell Street market as a case study, comparing different data varying from a different time, showing the changes in the community and the market.

Using two case studies in Manchester, Elnaz Ghafoorikoohsar (2016) tried to figure out the relationships between culture and society in markets and dig into the changes between market and city social and culture. The findings of this research highlighted those marketplaces were sites of plural, heterogeneous and distributed practices, identities and cultures that accommodate casual relationships. Finally, researchers assumed the market as a micro-public to develop a new methodology applying for understanding urban spaces. The same idea also showed in several other research.

Alison Hulme (2017) put eyes on night markets and cultural diversity. Increasing frequent occurrence of "Asian style" night markets in London, especially in the form of "pop-ups" in run-down areas and derelict urban spaces. The popularity of the night market as a food aesthetic and dining culture provided an example of the way in which Asian foodways are used to restructure urban life by bringing new prospects to run-down areas. A new clientele of diners played out their own cosmopolitan ideals via the night market, in a process that not only eats the Other, but insists that eating the Other is relatively every day, and in doing so makes more complex the category of "Other." The night market is effectively a theatre for the performance of cosmopolitan subjectivities, rich in global cultural capital. Local authorities, keen to regenerate deprived areas, are now capitalizing upon these subjects' desires in ways that play with the fluidity of globalized identities in one of the most famous world cities. What follows will examine what is behind being part of that spectacle, examining the sense of cosmopolitan global embodied by the diner, and the way in which this becomes enmeshed in specific strategies of regeneration across the city. This research was based on participant observation with diners at Hawker House over a series of weekends in early 2016. In almost all cases, diners were eating with a group of friends, rather than as individuals and information was noted after diners by the researcher.

2.1.3.2 Environmental benefits

Some pieces of research emphasized on environmental benefits. Researchers had different ideas of how to use markets due to their environmental benefits. One of them was thinking of markets related to the local food system. Hannah Wittman and other researchers (2012) linked farmers' markets with the local food system and social economy. They put their effort to understand how people related to farmers' markets define the local food system and the role of farmers' markets in the social economy, in order to raise people's attention to the potential of farmers' markets to bring local food systems into the social economy framework. In the big picture, it was a matter of the links between food and health, the local economy, and the environment. Researchers used two rounds of questionnaires to get information from 29 British Columbia and Alberta farmers' market vendors, market managers, academics etc. They came to figure out how people learnt about the local food system and what factors or strategies such as government support were important to the development of farmers' markets, doing a great job in the social economy process.

There are some similar ideas among researchers. Karen A Franck (2005) focused on the important characteristics of food in urban life. It emphasized that urban planners and designers should maintain and

improve food-related functions of a city, such as the market, dining room and farm. These aspects of city life could bring vitality and cultural experience to residents and tourists through local food experience, social experience and job opportunities. On the other hand, these urban functions also benefited the government through worldwide income and tourism. Researchers thought it was time for architectural and urban design planning professionals to handle these functions seriously. There also some research tried to cover almost every aspect of market benefits. Alfonso Morales (2011) generally talked about the roles of markets in social, economic, and political development, showing how planners and policymakers can advance public purposes through markets.

Apart from physical urban generation, some researchers also found the roles of the market in economic and other generation processes. Sara Gonzalez and Paul Walesy (2013) marked the traditional retail market in Britain as the frontier in the retail selling generation. Due to threats from higher retail selling methods and cost rising, retail markets had to be relocated or replaced. If retail markets wanted to survive, they had to accept new retail tendencies, facing the need of the middle class or providing higher service.

Montserrat Crespi-Vallbona and Darko Dimitrovski (2016) tried to use quantitative ways to explain how food markets work and provided insights to be considered for future Destination Management Organization's policies, related to promotional activities and destination branding development. They could create effective tailor-made promotional campaigns and adequate business strategies to further attract more food lovers' markets, without removing apathetic-market visitors. In the research, through surveys, all usable data were put into Statistical Package for Social Sciences for statistical analysis. Various analyses had been applied, and descriptive statistics were performed to obtain the profiles of the total samples at first. Then, the factor analysis was conducted in order to identify the attitude dimensions.

2.1.4 History of UK markets

There are two reasons the research focuses on the history of UK markets. During the research process, this research focused on markets in England until the pandemic began, and the situation lead to a change in the research topics, the history of the UK markets was relatively more understood than other market histories around the world. The second reason is that the history of markets in the UK was the most typical one, the UK has old charter markets like other countries in European and Asia, and also has the first prototype of a modern market hall because of the Crystal Palace and should be one of the first countries having modern market systems and regulations, such as the United States of American. As a result, the research on the history of markets in the UK could be the most complete and typical history of markets for now.

Peter Jones, David Hillier and Daphne Comfort (2007) made their research on market halls and covered markets in the UK and tried to find a way to preserve market halls and covered markets. Discussion on the origin and evolution of market hall indicated that market hall used to play a crucial role in UK market history and people's life. On the contrary, market halls declined after the 20th century, and they thought the change in customers and locations of market halls were the main reason. Researchers used two examples in the research, one was the Grainger Market in Newcastle and the other one was the Chester Market Hall in Chester, to how the common problems of market halls and how people tried to rescue market halls. They thought the refurbishment of the traditional market halls was a method to break away from decline, also redevelopment and relocation of market halls showed another way to go.

More official research put much emphasis on how the situations became and what local government could do. The report from the House of Commons Communities and Local Government Committee (2008) gathered different research about British markets and tried to give out a deeper understanding of why the

situation of the market came to this stage. From the local government's perspective, it also gave a temporary answer to what benefit can the market provide and what it does to make the market better to survive under the declining tendency of the market. In the report, local governments were responsible for the reactivation and management of the traditional markets.

Paul Dobraszcyk (2012) focused on the relationship between ornamental iron and the civic in British market halls, a subject which has been overlooked in the existing literature on their architectural development. Like many other forms of nineteenth-century retail architecture - shops, bazaars, arcades and department stores - market halls embraced the new architectural possibilities suggested by iron. The planning of these buildings in the Victorian period was strongly influenced by the widely held idea that the improvement of public space in towns and cities was dependent on 'middle-class models of respectability, social order, and civic virtue. Defining the 'civic' in relation to market halls as the representation and enactment - through a combination of spatial reorganization, architectural aesthetics, public ceremonies, and legislation - of a certain set of middle-class values that came to dominate the planning of municipal buildings from the 1840s onward. The market halls considered in this research had a shared geographical focus, namely the industrial towns of the north Midlands and northern England. Throughout the nineteenth century, traditional open markets were regarded as sites of disorder, their often-ramshackle appearance being perceived as directly linked with lower-class lawlessness, food riots and insalubrious entertainment. The research considered many markets hall: Leeds's Kirkgate market, the market hall in Preston in 1851, Bolton market hall and Derby market hall. In the last three decades of the nineteenth century, new market halls in towns were designed and built across Britain, most of which followed the architectural model of those in Bolton and Derby, while Leeds's Kirkgate market hall represents a high point in the long period of development of these buildings in the Victorian period. In this research, throughout the nineteenth century, architects, critics and the public alike expected their architectures to be decorated embodying historical associations serving as a powerful means by which to assert a corporate identity.

2.2 Research on food markets in China

Having considered the international context of markets, this section will now focus on the specifics of markets in the Chinese context.

2.2.1 Current situation

Before going through the current research on markets in China, the terms of markets and their definitions needed to be clear, like many other countries, there are many different terms expressing similar ideas about the market depending on culture and age.

There are many different names for 'food markets' in China and when it comes to research on food markets, some are called 'vegetable markets', some 'public markets', and others 'farmers markets'. In this research, the term 'food market' is defined as the regulation of 'Standardized vegetable market setting and management specifications' which was promulgated by the Ministry of Commerce of the People's Republic of China in 2011. In this regulation, the 'food market' was defined as 'A business place that sells various agricultural and side-line products with fixed booths (including booths, shops, business rooms, etc.) and related facilities, mainly selling fruits and vegetables, meat, poultry, eggs and related products, aquatic products, dairy products, soy products, condiments, cooked food or braised products, preserved

products, grains or oils and related products, etc.’¹. According to this definition, no matter what the market sells, no matter whom the market serves, ‘food market’ should be the proper term to express the idea of all kinds of food markets in China, different from some European food markets, food markets in China mainly sell raw materials for cooking not cooked product ready to eat, sometimes this kind of food market would be called ‘farmer market’ in the UK. But in this research, the main research object is the food markets in Macau, not in mainland China, like such kind of markets in Hong Kong, they are usually called a ‘street market’ literally, but the functions and merchandises are the same as the food markets in mainland China, so to avoid ambiguity, the research object and cases in this research are collectively called ‘food market’. As a result, the terms appear in the following research reviews such as ‘vegetable market’ or ‘public market’ all refer to the term ‘food market’.

2.2.1.1 Research timeline

The food market was not a major research topic in China, in the last fifteen years, there were only 16 pieces of research in urban planning or architecture aspects. Although there were many pieces of social and economic research on the market before 2010, the design of the market did not draw much attention until the year 2011 came. Analysing the tendency shown in Table 9, the peak of research on the food market came after 2011, in 2016, there were 4 pieces of research published focused on food markets in China. This situation of research on the food market was mostly caused by the policies made by the government.

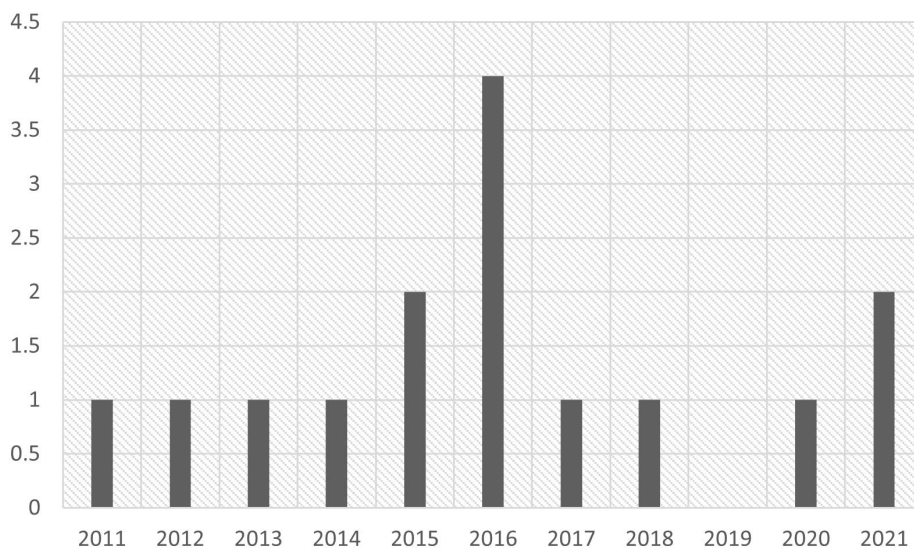


Table 9. Numbers of pieces of research on markets in China according to years

As mentioned above, the regulation of the standard food market was promulgated in 2011, the same kind of regulation of food markets in Beijing was released in 2012, the same regulation was published in Shanghai in 2011, and a similar issue was considered in Guangzhou in 2017. Due to the influence of political factors in China, after 2011, people put more effort into research on food markets through urban planning or architecture aspects than usual. In 2021, there were 2 pieces of research on the market published, more than most other years in the last fifteen years, the reason for this rising may be related to the Covid-19 pandemic that happened in 2019. Being a suspected source of infection, researchers started to improve the food markets and tried to help them survive through this huge change in society and human lifestyles.

¹Excerpted from the official website: <http://scjss.mofcom.gov.cn/article/zc/201106/20110607607795.shtml>

After all, the topic of research on food markets in China through urban planning or architectural aspects is still not a popular choice in China, the situation is the same as those around the world. Although many practice projects had been carried out in the past ten years, the research on the food market is still not enough in both depth and breadth and lacks systematic theory. But due to the pandemic and the regeneration of the old parts of cities, more and more researchers would notice the importance of research on food markets.

2.2.1.2 Research review

Among these pieces of research, most of them were about planning or designing aspects of food markets in China. Some focused on the public space of the food market. Ding (2015) thought markets being a kind of welfare infrastructures were important to the daily life of citizens of Wuhan and urban development, but due to rapid urbanisation and replacing food markets with supermarkets, food retail markets were in great danger and had negative impact on surrounding urban space. In the first part, the researcher looked through other policies about food markets in cities such as Beijing and Shanghai and related cases, then three points about urban planning and policies were made for Wuhan city to learn from. In the following parts, the researcher analysed the current situation of food markets in Wuhan city, three weaknesses were pointed out, one was about whole urban planning which was a lack of reasonable location planning of retail food markets, another one was about local market planning system which was unbalance and incomplete, the final one was about old infrastructure of markets and bad environment. Against these three weaknesses, the researcher considered the experience of other cities and raise a proposal for a new market planning system to encourage a more proper planning of the market and demand a better practice of policies of markets in the urban planning aspect.

Another researcher Zhang (2018) also agreed that the community vegetable market is essential to the basic lives of residents, with the rapid development of big supermarkets, chain shops and convenience stores, the community vegetable markets were facing challenges and struggling to survive. On the contrary, Zhang thought the traditional model of community vegetables was not just a commercial infrastructure, the vitality of markets could improve the quality of experience of users and help markets themselves to adapt to modern urban development. The first part of the research established the research objects and research methods of this research and gathered some cases about the good design of markets in China and abroad. In the following field research part, Zhang used 30 community markets located within the second ring of Chengdu as a database, though field research and other methods, spatial and experience features of the markets of Chengdu were summarized and the vitality of the community market was defined by these features. Based on the results of field research, the researcher used concepts in the environment and behavioural psychology theories to the conclusion that people, activities and space environment should be the three main factors of the vitality of urban space, also the same for community markets. At last, three typical cases of different categories were selected from the database for improving the design of community markets, though hypothetical design, this study proposed some advice and guidance for improving the spatial vitality of community vegetable markets facing urbanisation in Chengdu.

Very few researchers were interested in the infrastructure design of the market, Zhong and Zeng's research (2004), put the design of the health aeration system of markets as the priority. First, researchers thought the necessity of the health aeration system of markets is a result of more and more indoor markets replacing old outdoor markets. During the development and operation of indoor markets, bad condition of indoor air conditions can be related to six aspects, personal breath, poultry slaughtering, spice, garbage, seafood and wastewater, the researchers emphasised the negative impact of bad air conditions on human health and blame the reasons of bad air condition on the traditional incomplete

design of traditional markets. Instead of mechanical ventilation, Zhong and Zeng tried to use a design of the structure to arrange different kinds of natural ventilation depending on different kinds of situations and a related case, then they made some advice for architecture designing of indoor food markets to apply these methods of natural ventilation to improve indoor air condition in the indoor food market.

Many researchers thought food markets could be a good medium for the regeneration of old parts of cities, some took it as a catalyst for urban revitalization. Xing's research (2012) emphasised the important role of the traditional market in the process of urban revitalization, in this research, traditional markets were advised as the urban catalyst facing the development of urbanization. First, the researcher presented the current research situation through a review of research related to markets in China and abroad, giving the reason why to raise the traditional market as the catalyst in urban revitalization and defining the concept of the market in this research. The main part of the research is field research based on an investigation through six markets in Hefei City, using questionnaires as the method to gather information about traffic, the experience of users, the environment and infrastructures. Analysing different parts of information, the researcher concluded the advantages and disadvantages of traditional markets in Hefei and prepared a database for the following research. Contrary to traditional design and planning methods of traditional markets, using the theories of urban catalyst in urban revitalization, Xing thought the traditional market can be a kind of catalyst for urban revitalization projects and gave some advice about the design and planning of traditional markets in Hefei.

In the same kind of situation, Facing the challenges from modern technologies and changing people's lifestyles, Wang (2021) thought, being a part of the culture of China, the food market was the foundation of the economy and a source of urban vitality should be improved to promote the revitalization of urban space in Guangzhou. The first part of the research is basic research about policies and regulations of food markets in Guangzhou in recent years, the development history of the food market in Guangzhou, and other research on the food markets in China and abroad, giving the current research situation of food market about public space. The second part of the research was a piece of field research which had a database of 35 cases of food markets in the historical area of Guangzhou, divided by researchers into three types of markets depending on the relationship of space. One type was an affiliated market, one was the central market and the last one was the street market. Through spatial analysing, three aspects of food markets were summarized, location, outdoor space and indoor space. At last of the study, considering the historical district of Guangzhou and these advantages and disadvantages, researchers raised suggestions to improve food markets design and business methods, basically, the environment of the food markets should be improved, and increased the function and diversity of business and function of the food market, if possible, creating urban food market landmark would help food markets to develop in the historical districts in Guangzhou and survive though the expansion and invasion modern technology.

Another research noticed another historic city, Beijing, Hu's research (2014) like most other pieces of research on markets concentrated on the design of public markets and solving the problems they were facing. In this research, after research on policy and history, the researchers regarded markets as an important part of urban space, they would help in the preservation of historical areas and creating a favourable human environment during the regeneration of the old area. The case study of this research is based on a database of 47 markets within the area of the old city of Beijing, and the researcher divided them into four categories: continuous lines of stores, centralized markets, affiliated markets and decentralized markets. Compared with the good regeneration projects about markets around the world, the researcher tried to solve the problems of those markets in the old city and raise suggestions for future planning of market development which focused on space aspects and was linked with five pieces of advice. The first one was to unify the style of architectural design with surrounding communities which could make contributions to the preservation of the historic areas of Beijing. The second one was to make full use of underground space. The third one was to improve the quality of community public space and encourage social interaction. The fourth one was to improve the arrangement of vendors inside the

markets, as well as space and function arrangement. The last one was to encourage to use of natural ventilation in architectural design. The researcher tried to apply these improvements in a hypothetical design of the 'drum tower' market, showing an example of the research objects.

Being one of the most important cities in China, food markets in Shanghai were also good examples of urban regeneration, Yu's research (2016) tried to get some strategies for the development of markets in the city centre of Shanghai, not only to survive but also improve to be a hot point in the city. The research had divided into three parts, the first part is background research, including policy aspects and concept definitions, mostly related to the regulation of the urban planning system in Shanghai. In the second part of the research, the research concluded some problems of the current situation of markets in the centre of China, according to the division of markets into two kinds. Community markets didn't meet the need of the working class, private markets were usually too small and at relatively high prices depending on the cost. The third part of the research was the most important part, Yu gave some suggestions and strategies according to the case study. These cases included seven markets around the world, and the researchers divided them into three methods: improving social space, improving infrastructures and forming a modern eating lifestyle. From former experience, the research gave five suggestions for markets in the centre of markets facing modern urban development: becoming effective, establishing landmarks, improving social interaction, encouraging corporations of government and private companies and setting up a standard of local food.

Some researchers focused on how to refurbish markets to make them more chances to survive through urban generation. Zhang and Liang's research (2016) focused on a particular case located in the historical area of Harbin, due to its special location and long history, the Old Daowei vegetable market needed to be regeneration which is the aim of this research. At first, the researcher had a brief understanding of the history of the market, then the research went into the study of the current situation of the markets, mainly from four aspects, function arrangement, transportation organizing, the environment of market and infrastructure, raising the problems about the market. To solve those markets, the researcher tried to improve the market through five aspects, function arrangement, façade, infrastructure, environment and traffic. The strategy of this research is a whole plan from inside to outside, linking the markets with other public functions to improve the quality of experience of the user, becoming the source of vitality of the city.

Different from other research, Liu's research (2016) tried to improve the current design strategy of community vegetable-selling markets through the design of the Tangjiawan vegetable-selling market in reality and used markets as attractive points and catalysts in urban communities. The research was divided into three parts: the history and current design theory of vegetable-selling markets, the redesign of the Tangjiawan vegetable-selling market by the author, thoughts after the design of the Tangjiawan vegetable-selling market and inspiration. In this research, Liu gave a clear process of design of the Tangjiawan vegetable-selling market, considering the site environment and background, focusing on three parts of markets: traffic and function, vertical arrangement of the building, and design of market itself. The multifunctional building included underground parking, market space, a resting space, a café, an eating space and a landscape garden. The researcher thought more usage of underground space and a better social environment would help the community vegetable-selling market be more attractive through architectural design.

Apart from these research aspects, some researchers tend to study markets on a much bigger scale, such as urban planning or policy aspects. Hong's research (2013) aims that the policy changes in vegetable markets which put public welfare at the top of planning principles. The researcher thought the problems vegetable markets in Shanghai were facing were from limited space, cost of operation, regeneration of old city regions, unstable supply and illegal markets. So, to solve these problems, Hong used three basic features of the vegetable markets which were convenience, low price and food safety, to improve the

situation of vegetable markets in Shanghai. Through these basic features of markets, researchers raised four reasons as well as suggestions for vegetable markets to return to the point of public welfare. To improve the convenience aspect of vegetable markets, the location of markets should be improved, and illegal markets could be temporary markets. To become more acceptable by citizens, modern wholesale models could be applied to the operation of vegetable markets. The government could raise new regulations and systems for food safety and charity of vegetable markets to make the market become a good welfare for the public.

There was a piece of research that tried to give a much bigger Figure of food markets, Chen, Cheng and Zhao's research (2020) focus on vegetable markets through a policy aspect and tried to give some suggestions about market updating and planning. The research gave a brief introduction to the market economy system in China in five aspects: the scale of the markets, locations, operation conditions, consumption features and supply aspect. From these parts, the researchers conclude four weaknesses of current vegetable markets: improper location, financial support, models of operation and network technology. To deal with those problems, this research raised six suggestions: developing the market according to the local system; proper location of markets; improving infrastructures; completing the supervisor system; improving the financial support system and using more modern technology especially internet technology to attract the new generation.

Wu and Chen's research (2016) picked policy and governance aspects of markets as the research subject, they aimed to improve the planning and design of wet markets in China by studying cases from East Asian cities. They used cases from three regions: Hong Kong district, Taiwan district and Singapore, gathering information from these aspects: urban planning, policies and regulations, architecture features, service standards, owner, scale, government and investment. Learning from the development history of wet markets in these places, and comparing their advantages and disadvantages depending on their own situation, researchers got the following ideas about urban planning and design of wet markets in China. First, proper locations of wet markets are based on the need of surrounding residents; Second, increasing functions in wet markets leads to multifunctional and vertical development, saving space and increasing the quality of space. Third, the operation of wet markets should combine government domination with market freedom, not just only operated by the government, but also involving other participants from society.

Another interesting research is through the urban mapping method, Sheng's research (2015) tried to use mapping theory to find out the spatial logic of the local market system inside the 3rd ring of Beijing. The configurational structure of these markets which is based on 183 markets information databases in layered movement networks was demonstrated to be the main factor for the distribution of these markets rather than the distance between them. Apart from space syntax theory, this research also used field research methods to gather the information. After data analysing, the research showed, during 2005-2009, high-end markets tended to remove from the centre of Beijing, medium-level markets seemed to be stable in space location, and small markets were largely affected by other factors. The result also indicated the level of road systems linked to markets influences the stability, the higher level of the road system linked, the more stable the market would be.

2.2.1.3 Research gaps

After the review of research on food markets in mainland China, some features of current research can be concluded. The research covered these aspects of food markets: policy improvement, design theory, urban regeneration and market refurbishment, almost all research just covered one topic instead a few more. Talking of research method in each research, except a few pieces of research were introductions of

the big picture of food markets in China, most research used case studies and field research as a research method, and they tended to use cases in other developed countries, only one research used space syntax theory as a research method. Apart from these aspects, current research only covered food markets in big cities, such as Shanghai and Beijing, small cities and rural areas also have a big number of different kinds of markets that are not covered by current research.

Learning from current research, these points could be research gaps that need further research to study:

1. More aspects of markets need to be explored, such as the arrangement of vendors, and relationships between markets and communities.
2. Needing some research covering more than one aspect of food markets. The food market is a complete system of modern economic activities, research though one aspect could not get the big picture of food markets and lack of continuity and coordination. Some more research covering more parts of the food market would help to set up a system of the theory of the food market. It's obvious, without the system of theory, the terms of 'food market' in different research still have various names.
3. More regions should be researched. Current research only covered big cities in China, in view of the big picture, no more than 10% of food markets are covered in the research, and they could not represent the phenomenon in small cities and rural areas. Those markets are in a different situation and facing some other challenges. Food markets could and surely are playing important roles in many other regions.
4. More research methods could be used in research of food markets, not limited by case studies and field research.
5. Lack of depth and feasibility in research. Many suggestions and strategies in research are too brief or too theoretical, in much research, public space improvement or space rearrangement were suggestions, but just a few sentences could not make these suggestions become useful in practice when facing different situations. Problems are easy to find, but the solutions are what matter.

In one sentence, the current research situation lacks depth and breadth and needs a system of theory to improve the big picture. In this research, some aspects would intend to be improved, such as systematic and specific theory, and try to be practised for a certain situation,

2.2.2 Research related to the markets of Macau

The former research review of food markets in mainland China is the big picture and database for the research status of Macau because there was only one piece of research that used food markets in Macau as the research object.

Liang's research (2017) focused on the multiple functions of markets in Macau based on research on users' feedback about markets. like other research, in this one, the market function was regarded as an important part of urban space, not only just a type of economy function, facing the change of lifestyle and society and preserving the importance but markets in Macau had also been designed into a multifunctional building combing some other public functions. In the first part of the research, Liang had a clear idea about the background of markets in Macau, through research review, history research, case

studies around the world and the history of markets in Macau. In the second part of this research, field research methods such as questionnaires and interviews were used as the research methods, gathering the following information about four typical markets in Macau: function arrangement, space, use condition and operation condition. Through the information and database, the researchers concluded three problems about the current situation of markets in Macau, one was the open time of markets couldn't meet the need of all kinds of users, another one was the markets was not accessible enough for all kinds of users, the final one was the arrangement of vendors was not flexible enough. Considering the conditions of markets in Macau and these problems, Liang tried to use the theory of design of public space and good cases of markets in other countries to solve the problems and raised some advice for the design of markets in the practice aspect. There were five detailed suggestions. The first one was for space, using the surrounding community to make public space more useful; the second one was to combine culture with markets, making markets more attractive; the third one was to improve the transportation condition of markets, such as parking; the fourth one was to improve the quality of space to meet the need and satisfy residents in the community; the final one was to improve services and arrangement of vendors in markets. After all, the researcher agreed the goodness of the model of multiple function markets and improvement should make markets more suitable for the development of Macau.

This research was a similar piece of research which uses field research to draw the big picture of food markets in one particular area and gives solutions for current problems. It showed some features of food markets in Macau and gathered important data for further research, while it lacked systematic and constructive suggestions. The reasons and elements behind multifunctional food markets are still not clear. Overall, there were too many research gaps on food markets in Macau when there was only one related research, it's quite urgent to have more related research to complete the topic and do some help in practice facing urban regeneration,

2.3 Conclusion

Comparing research in Europe and America, the research situation of food markets in China is still at the beginning stage, not to mention research on food markets in Macau. The reasons behind the research on markets are almost the same when people face urban regeneration and the decline of the modern market, they tried to use research to describe this social economy activity and preserve this medium of culture, in the past 20 years. It's obvious, many pieces of research thought markets should be important in the social system and could help to improve the quality of life.

In research from Europe and America, the topics had come to much deeper exploration, the operation of markets and the kinds of benefits markets can provide were major research objects in current research, while research in China still could not identify markets can do what benefits to society and usually used one-word 'vitality' to express different advantages of markets. Surely in future research, we can see these aspects of research would be more detailed and professional. On the contrary, research in China put more effort into research on food markets refurbished or reused and the roles of food markets in urban regeneration, which seemed to be simple and basic research topics in other research around the world.

Both categories of research lack a system of theory, researchers could point out different points of markets but could not link them together and make them work in different situations, such as social benefit, researchers could not tell where the social benefits come from and what the relationship between social benefits and goods. There still needs some more research to connect different aspects of markets together, to research markets more professional and meaningful in different research fields, and at least can have a unity definition of different markets in different regions.

Apart from these problems, the current research situation should involve more research methods to have different views of markets. Most of the research used field research methods and case study methods, some other research methods could be applied in future research, such as space syntax technology and dynamic simulation. This would help researchers approach markets in a different way.

Talking of the research situation of food markets in Macau, there are too many aspects needed to be covered. It's surprising to see a city facing the same situation as European counties but has less research. The refurbishment and regeneration of multifunctional food markets can be back to 1998, which may be a result of the colonial government, but until now there is no more special research on the theory of food markets to help or guide the regeneration. Now, some old food markets need to be regenerated, and those multifunctional food markets had operated for at least a decade, the urgency of research on food markets in Macau is quite obvious, and in this research, some questions about multifunctional food markets and regeneration of food markets would be answered through a more systematic theory.

Chapter 3 OPERATION OF THE MARKET SYSTEM

In this chapter, the discussion will be made between markets and urban space. How to define markets and distinguish markets from other urban functions is the main problem to solve in the first part, from origin and development aspects, giving this research an anthropologic thought of the market system. The discussion goes through three dimensions, the behaviours dimension which explains the basic relationship between human behaviours and space, the trading dimension which describes the unique feature of markets, and the public dimension which puts trading in public environments to explain the market system. The discussion involves macro and micro aspects of public space and urban function, not only aiming to explain market development in human history but the whole discussion can also be applied to other urban functions, such as shopping malls and supermarkets which are both contrast objects in this discussion. Although trading is the core of the market system, the market isn't only about trading, there are many other social interactions and relationships in a market, which are discussed in the final parts to complete branches of the market system.

3.1 Behaviours and space

When dealing with space in built environments, 'functions' would be mostly mentioned regardless of context, functions could be one of the main principles in architecture and urban design. There were many theories about functions, like functionalism², which think functions should be the priority over aesthetics when determining forms, assisted with tools such as function maps guiding people through design and research. It seems to be granted that 'functions' is definitely a part of the built environment and accepted by almost all, but having second thought, do we have functions in our human activities? There is none, our lives are not made up of functions, we can see, can talk, can eat, these are behaviours we would do in diary lives, they are not functions and they should not be called functions³. It's clear that function is a word we created to describe human civilizations, a secondary product of language. Rock is hard and can be used to crack nuts, but we can't say rock's original function is to crack nuts. What people can get is the results or in another world, 'phenomenon', but we can't use the results to decide the origins. This should also be applied to functions in built environments, when talking about human behaviours, we used to choose 'function' as the bridge to connect behaviours and space or directly representing activities dealing with space problems, setting a limitation. As mentioned ahead, 'function' is a word to describe phenomena, not nature, if we just use functions to conclude our human behaviours in built environments, there would be much to be left behind and ignored. In the later part, functions will also be discussed in the later part, about how functions come into the way.

If we abandon 'function' in this discussion, how can we connect human behaviours with space in the built environment, not behaviours in space, but a separate relationship? How do human behaviours interact with space, in somehow 'deciding' space?

There is a point need to be clear the 'space' mentioned here is not the space we normally used in diary lives, it refers to 'built space'. The normal concept of space is an objective item which people can do anything except change it⁴. For example, Ferrum also usually known as iron can be made into iron and steel, and people can also turn it into buses or weapons, but no one can turn Ferrum into another objective concept, Ferrum would always exist no matter whether humans exist or not, this is what objective thing means. Space is an objective concept, people can't change space but can use it and reform it, if the concept used in this discussion is an objective item, then there is no way we can connect human behaviours with space. Human behaviours are subjective activities, depending on human consciousness, one subjective item has no relationship with an objective item, so the concept of space used here is 'built space' which is a subjective concept the same as human behaviours.

The features of human behaviours are randomness, unstable and similarity, even if the same person makes the same behaviour, it still would be different in some way, and no man ever steps in the same river twice. On the contrary, built space is fixed, lasting and unique, it inherits lasting and stable features from the objective concept of space, without subjective changes and the bits of help of nature, built space can only be changed by certain human beings. Here lies a huge human dilemma between the

²The architect Louis Sullivan revived Viollet-le-Duc's theories: a rationally designed structure may not necessarily be beautiful, but no building can be beautiful that does not have a rationally designed structure.

³ According to Heidegger "poetry is the original creation of housing allowance" (Heidegger, 2001). For him, building and dwelling are essentially related, "man dwells if he builds." Authentic dwelling is only possible if people already built, not in the usual sense, but a poetic one. People should not be limited by built space but explore their poetic life by their way of dwelling.

⁴ "An empty area that is available to be used" defined by Cambridge Dictionary. Geometrical conception of place" as "space qua extension" in the Discourse on Place date back to antiquity.

unpredictability of human nature and the consistency of objects, but the conflict between behaviours and space is not irreconcilable, human behaviours and built space influence each other.

Apart from using the function to connect human behaviours and built space, there is another way to handle the problem. Different from functions focusing on certain human behaviours, built space can be designed to connect as less certain human behaviours as possible, in other words, to be omnipotent or suitable for all kinds of human behaviours, in this case, built space is related to place not by functions.⁵ No matter which way to explain, there is no actual right answer to connect human behaviours with built space, after all, the thing that produces these two is a human common will which influences cultures and ages. Using the function to connect human behaviours and built space has its disadvantage, but it can still be used in this research to discuss what is the market system, corresponding, what is missed by function should be additionally discussed to minor the disadvantage.

3.2 Exchange

In the last part, the discussion of the relationship between human behaviours and built space is open, but for the sake of research on markets, the problem should be put passageway for a while, it will be picked up in the following parts. In this part, a deeper discussion of human behaviours will be made and put into a public context, thinking of human public behaviours. Exchange is the basic and the only model of human public behaviour patterns (Emerson, Richard Marc. 1987). the one and only model is because of the public concept. When things involve the public, it means things happened between at least two people and have interactions, exchange is a basic model of all interactions (Gabunia, Tio. 2023).

During the exchange, things involved aren't limited to realistic items such as goods and coins, they also can be virtual things, such as messages, information or feelings. The first feature of exchange is no limitation, not only in the exchange items aspect but also with people involved in the exchange, one can exchange with one person and also can exchange with groups, regardless of gender, background and age. In other words, the exchange is equal, no matter what items, no matter what people, during the exchange, this human behaviour, everything is equal. In ancient times, people use goods to make labour exchange in diary life, people use sacrifice to exchange service in religious activities; now, it's common to see currency exchange and service exchange.

Equal doesn't means you get what you want, or you get what others give, one man's meat is another man's poison, many exchanges are not just happened between two people, although it seems to be only two exist. For example, if someone catches a thief, is that an exchange behaviour? The answer is yes, but the exchanges do not happen directly between these two people, there is a medium between them, it's society. The men who catch the thief exchange thief with society, in return for safety, obligation or honour; on the other hand, the thief exchanges freedom with getting punishment, which he didn't want, but he agrees to the exchange of rights and obligations as long as he is a member of the society, according to social contract theory, man is born free, but he is everywhere in chains (Rousseau J J. , 1999.). In conclusion, a complex public activity can be made up of several exchanges, a simple public activity can also have several exchanges behind, and exchanges can associate with complex human social life (Emerson, R M. 1976), on the other hand, each exchange behaviour is not alone. Like the concept mentioned before, a phenomenon doesn't have an essence.

Exchange can be a process, and although it is completed in an instant, it requires time and space to prepare and complete the process. That is how space is involved in human public behaviours, while it

⁵ Tsukamoto, Yoshiharu. "Yoshiharu Tsukamoto." Architectural Behaviorology." (2009).

doesn't just mean space for participants in the exchange and items, the exchange needs any necessary space to complete the process, such as the space for smells, colours and sounds. This feature of exchange is important in markets, there is always some space involved in market activities that is ignored in the design of markets.

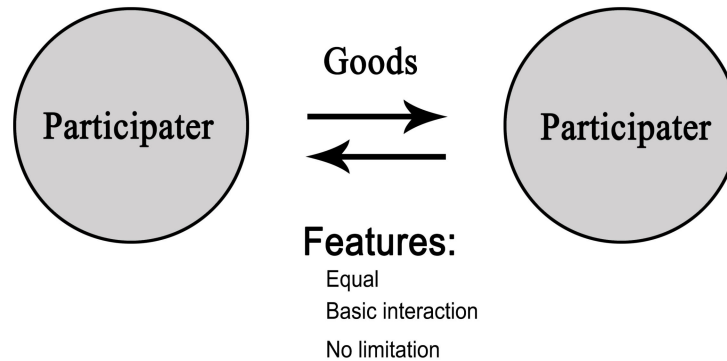


Figure 1. The elements of 'Exchange'

Overall, the exchange is a dual social interaction with procedural justice. The two participants involved in the exchange can expand to be any kind of human group covering the possibility of all human public behaviours. Exchange requires time and space to complete the process, leading public human behaviours to built space, but due to its procedural justice, there is no such built space for exchange because there is no way to cover the diversity and randomness of human behaviours and take the interests of both parts into account.

3.3 Trading

Trading is the reification of the exchange process in human economic activities, most elements are the same as those in the exchange process, there is only a major change, and one item used to exchange should be currency or near money.⁶

It seems to be a small change, just limiting one element in exchange, but it becomes different human public behaviours and contributes to bringing an explanation to functions in social activities. The name of two participants in trading has their names, buyers and sellers. Buyers use the money to exchange items or services with sellers. It's an upgrade of barter which is the origin of human economic activities, separate from normal exchange behaviours.

Although buyers are limited to using money in the exchange, they are unlimited in other aspects, time, space and behaviours. On the other side, sellers were stuck, they have to participate in exchange for money to make a living, and this makes it become a job, sellers have to spend time and space to complete the exchange, while buyers don't need to, their behaviours depend on choices. The balance starts to tilt, and the equal feature of exchange is still there, but people tend to discriminate between two participants.

⁶ Smith, Adam. The wealth of nations [1776]. Vol. 11937. na, 1937.

The original and typical model of trading space is a shop or stall, which is a semi-private space, there is no rule to decide what's the portion of public and private space, depending on the owner of the space. In this case, the space of trading is not a public space, although trading is a public human behaviour, it becomes a mixture of private and public space which does not mean there is no border between private and public. According to exchange behaviour, sellers and buyers should be equal during the exchange process, but at shop and stall level, space is not equal to both parts, built space is more decided by the sellers' part. One reason is sellers permanently or temporarily own the space, so built space is also a result of ownership; another reason is space is more important to sellers because they spent more time in this built space and make a living, on the contrary, buyers are not so frequent and space is not necessary to them, so built space is more influenced by sellers, caravans in a different culture can be a powerful example for both reasons.

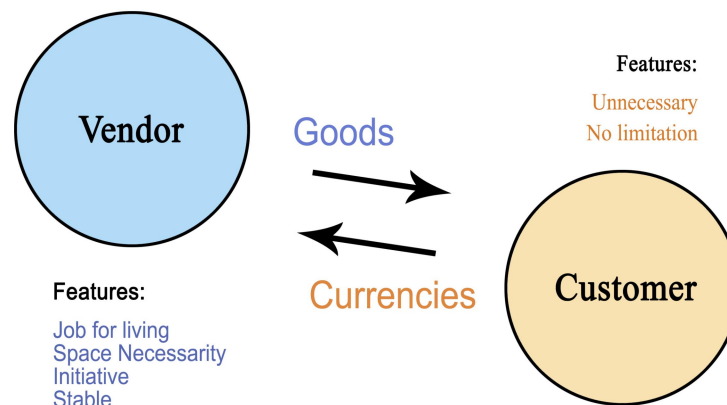


Figure 2. The elements of 'Trading'

In this part, we can find out how 'functions' comes into public lives. Human behaviours are random, like buyers in shops and stalls, we can't be sure what they will do during the exchange; by contrast, built space is a relatively stable artefact, due to the feature of space. To link two different things together, people can't cover both parts, compare to random things, a stable definition is more favoured in human languages. When some behaviours are stable or necessary in a certain space, in other words, more cost-effective, people will try to use these behaviours to represent a certain space, that is 'function', in this case, that is shops and stalls. The function is a combination of certain human behaviours and related built space, and both parts are indispensable. It's obvious that the other participant in the exchange process is a disadvantaged part, but it is inevitable, human behaviours are quite unpredictable for now, but big data gives us hope the day will come.

When exchange came into trading when temporary barter became shops and stalls, early economic activities began to sprout, but the market hadn't come yet. Shops and stalls have several features as mentioned before, a shop or stall is a privately built space combined with public space which can be temporarily private; shops and stalls are larger sellers' built space; items involved in trading should be money on buyers' side, with no limitation on sellers' side, but they have to own the items or service.

3.4 Supervisor

3.4.1 Role of the supervisor

Although we are approaching markets, there is still something missing in this discussion, when talking about function, when talking about trading, when talking about the relationship between human public behaviours and built space, something distinguishes markets from others, something defines public behaviours, something leads trading into bigger human economy activities.

Trading is a kind of public human behaviour, but it isn't necessary to take place in public space, while markets are public spaces. The core human behaviour that happened in markets is trading, but not a single trading, if this kind of trading is left messy without organizing, they are just individual or private trading, they are shops and stalls, but not markets, like mentioned in former parts, in this case, these behaviours of trading are still random and can't be generalized as a whole function. The element that organizes the trading is the one which is missing, it upgraded trading into a new public space in human history and distinguished markets with shops, it can be named as supervisor (Hughes, Jeanne Marie. 2010).

The appearance of a supervisor can be explained in three ways. The function is one of the answers, it acts as an artificial combination of certain human behaviours and related built space. It requires a third party to define the function and cover all interests in the case of markets, so the supervisor shows up to define the market function of the public space and ensure the built space matches certain intended human behaviours. It can also be interpreted as ownership, every space in the urban environment has its owner, and markets work the same, differ from shops and stalls, the ownership of a market is not the same as a shop, it needs a third party to be the supervisor to hold the ownership. Although sometimes a group of sellers can be the owner of the market space, these situations can be regarded as a special case of the supervisor, and usually, the group could not cover all sellers in the market. The third explanation is human behaviours. The prerequisite that an exchange can be taken place is that both parties of the exchange can agree to conduct the exchange process, in other words, public behaviours should be approved by society before it happens, otherwise, they will be punished or ignored. In the system of markets, the supervisor is essential to ensure and protect the agreement between the buyers and sellers, making sure the human public behaviours could be recognized by society⁷. Considering these three explanations, it could assume the roles which the supervisor element should play in a market system, defining the market function and setting up related built space, lending the space to sellers and buyers, and ensuring the legality and credibility of both parts of trading. In practice, these are related to designing, management and regulations, the elements which can be separated by organizations.

⁷ The ideology of the public sphere theory is that the government's laws and policies should be steered by the public sphere and that the only legitimate governments are those that listen to the public sphere (Benhabib, Seyla, 1992).

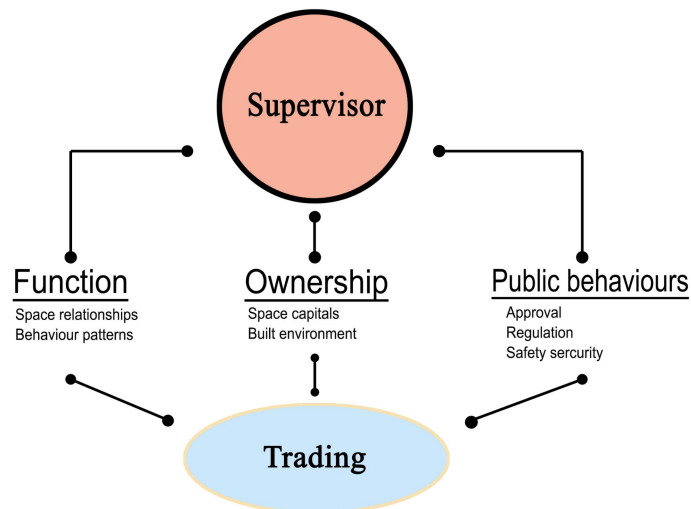


Figure 3. The elements of 'Supervisor'

Through the research of the third element in the market system, we can conclude that it is the supervisor part that decided how the market is designed and built space is reformed, different from shops in which sellers decide on space. Compared to sellers, supervisors can less focus on the sake of sellers and put some effort into satisfying buyers, on the other hand, the built space of markets shows the understanding of relationships and human behaviours of sellers and buyers by the supervisors, while the space for sellers is still mostly decided by sellers, the same as shops and stalls. So, the markets we see throughout history are always reflected in how people think their trading should be by only a group of people, not by all participants in the process. To ask the question at the beginning of this chapter, trading is connected with public built space by the supervisor group with their understanding of human behaviours of the trading process.

Supervisors can be any member of society, but in history, they usually were governments, because they owned the land of the space in urban or they can make the regulations for markets, in return, they gained tax from markets, and as a result, in history, it was quite important to design markets in cities. For example, in Chinese old city planning, there were two special places designed and provided for markets, people were only allowed to trade legally to trade in markets before the Song dynasty. In the modern age, supervisors can be private companies or individuals, it's an improvement by the modern division of the labour system, but they may harm markets in some way.

3.4.2 Supervisor element in different situations

The element 'supervisor' does not necessarily equal the roles of governments in the system of markets, although governments play the role of supervisor in reality. In most cases, governments are regarded as the supervisor element in the system of markets, due to the ownership and management, but normally, the supervisor element is a mixture of participants in the market activities, many different social groups would take part in the operation by playing different roles.

According to the process of market development in the aspect of urban design, the process could be divided into two phases and the supervisor element plays different roles in these two phases. The first

phase is constructing a market, in this process, the main tasks and aims are to design and construct a market space or a market architecture. The supervisor element is responsible for getting permissions, getting land ownership, designing market architectures and building the market. In a word, the supervisor element is responsible for creating a market. Architects and urban designers would take part in the creating market process in the designing and building phase, they are hired to help supervisors to build proper markets according to the ideas of supervisors. Although architects or urban designers participate in activities of the supervisor element, it does not mean they are a part of the supervisor element, architects and designers just substitute the supervisor group in certain related affairs. The same situation also happens in other phases, supervisors could hire companies or organizations for buying land ownership or getting permission for operating markets, these groups could only be considered as a kind of outsourcing of rights and responsibilities by the supervisors. As a result, these outsourcers might forget their responsibilities which are inherited from supervisors, and sometimes they would lack communication with other outsources, which would make supervisors not suitable for their responsibilities. In this phase, the vendor and customer elements are not necessarily active during the 'creating' process, but they could be involved in the design part if possible.

In the second phase, after creating a market, the role of the supervisor element is to maintain the operation of markets, there are few relationships with urban design theories in this part, sometimes regeneration or refurbishment projects are related to designing concepts. The supervisor element is responsible for cleaning, recruiting vendors, maintaining mechanic systems and arranging space. In most cases, it is rare to see supervisor elements in maintaining processes because of the subcontracting system, whether cleaning jobs or maintaining affairs, supervisors tend to hire other companies or groups to finish the jobs. They are in control of markets, but not in the markets. But most pieces of research on markets were conducted in this phase, they tried to describe and explain markets by customers and vendors, missing the supervisor elements behind the superficialities.

There is a special area making effects in both phases, the laws and regulations about markets, they are usually made by governments. No matter creating markets or maintaining markets, the law problems are unavoidable responsibilities related to supervisors who decide how and what to make markets legal. As a result, governments are always part of the supervisor elements in the system of the market, although the ownerships of markets may be different from governments, and that might be the most possible reason why governments are always the supervisor element in the system of markets.

After all, what are the supervisors in the system? In most cases when governments organize and build markets, the supervisors of those markets are definitely governments. In other cases, supervisors are mixtures combining companies and groups who take charge of different operations of markets, such as private market companies and social organizations related to vendors. As the previous discussion, the supervisors could be different in different phases, so the details of the market system are different in each situation and phase, this also affects pieces of research on the market which focus on the different processes of creating and maintaining markets.

3.5 Reconstruction of the 'Market' system

After the discussion of the final missing part of markets, it's time to refresh the definition and system of markets. people used to think markets are public spaces where buyers and sellers can meet to facilitate the exchange or transaction of goods and services. People prefer to concentrate on the core of markets, the function of trading in public space. From the previous discussion, we can find there were two matters that tended to be missing, one is the supervisor element and the other one is the unequal treatment of

sellers and buyers. If taking these two notions into account, the definition of markets in the urban environment may become, 'markets are public spaces where sellers are allowed to sell by supervisors.'. It's a definition of public space and urban function, not from the language aspect, this also indicates the influence of using 'function' to connect human behaviours and built space. Buyers are not necessary to the markets under the definition from urban space, just like water, the exit of water is not affected by human beings, the exist of markets in urban space is not affected by buyers, decided by supervisors and sellers, but that doesn't mean buyers could be ignored, with more data and research, certain behaviours of buyers can link to certain built space and become a part of markets.

According to the definition, we can reconstruct the system of the market. The system has three levels, the outermost level is urban, the second level is the supervisor level where the supervisor element appears, and the innermost level is the core behaviours of the market, exchange behaviours take place. The three levels indicate the process of how exchange becomes related to built space, an interpretation of human social development. The supervisor element is allocated in the second level, its job is to connect urban with markets and exchange and bring trading behaviours into a public context. The innermost level is the same as shops and stalls, trading behaviours happen here, as a result, the two elements of participants are set in this level. Here also hiding two other lower-level elements, two elements used in the exchange process, in a market system, one element is limited to be money or near money. In the big picture, the system consists of three major elements, but the system is not a ternary system, the supervisor is not in the same position as buyers and sellers, it corresponds with the trading behaviours, higher than two other elements; according to definition though function, seller element is a little big important than buyer element, but though development, we can see the changes of balance between these two elements.

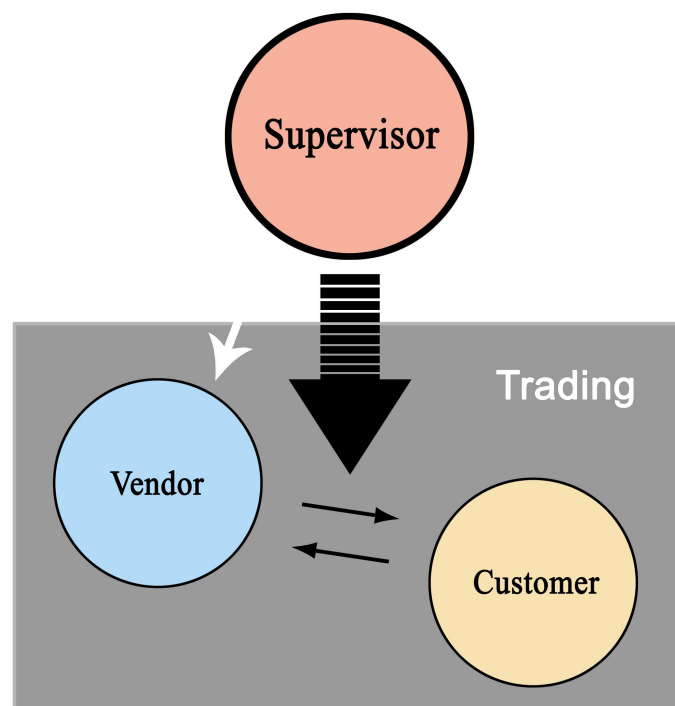


Figure 4. The relationships between elements of 'Market

After understanding the market system, the division of types of markets can be made much more proper than normal categories. To classify the type of markets, based on the market system, we can divide markets through three elements. Through the supervisor element, there are three aspects related to the supervisor's responsibility, design, management and regulation. Though the design aspect, it includes the

differences between space, design and structure etc... types of markets like market halls and open markets can be divided through this logic. Though seller element, there are two major general categories, one is the seller itself and the other one is goods which are used in trading. Markets like fish markets, food markets and tourist markets are divided through the goods aspect. Although tourist markets target tourists as customers, their goods are unified for tourist servicing, though function, they could be divided through the goods aspect, not from the buyer aspect, tourist markets can be treated as a special case. though seller aspect, markets can be divided into local markets etc... Using the buyer element, markets can be divided into wholesale markets or retail markets, according to buyers' distinguishing features. These classification methods according to elements of the market system are not mutual exclusions as long as they belong to different elements, they all can be characteristics of one market, such as a local fish retail market. Through this classification method, different types of markets have a more systematic research choice, rather than independent analysis results.

In this part, the questions about how to distinguish markets from other public functions can be answered. What's the difference between supermarkets and markets? if we put supermarkets in the same analysis process for public space function, the supermarket is an upgraded version of the shop, the major elements evolved in supermarkets are only two which are the participants of the exchange process, it's obvious that the supermarket is a dual system different from markets system. The upgrade points happen in the seller element, rather than facing one dealer, customers in supermarkets will meet many employees of supermarkets, and they share the jobs which are used to be one's, that is the result of the modern division of labour which can be noticed in some developments of urban function. How to distinguish markets from shopping malls? Through the system aspect, we can conclude shopping mall is another vision of the market, the system consists of three elements: customer, seller and supervisor, the same as a market system. Considering the objective characteristics of the customer, the changes could not be taken part in the customer element, just like the supermarket, the seller element has changes inside itself. Customers face different clerks, get services from different staff, and enjoy the experience with different people, the sellers they are exchanging with are not the one who owns the exchange items, one seller becomes a company or a chain shop, and the staff who sell you the cake may have no information about the cake at all. The same thing happened in supermarkets happened in shopping malls, the more detailed the division of the work, the less connection with the exchange. The built space also reflects what has been changed, the built space in shops and stalls are decided by sellers and designed and made for certain sellers' behaviours, but in supermarkets and shopping mall, built space is designed for employees, not for sellers themselves, so the built space aims at certain behaviours, such as goods placement and cashiers, on the other hand, more space is spared for customers, the function of shops becomes less and balance between sellers and buyers changes.

Supervisor				
Ownership	Public	Private	Outsourcing	
Function	Single function	Multifunctional	Attached	
Time	Regular	Temporary		
	Morning	Night	Weekend	Festival...
Vendor				
Goods	wholesale	Retail	Single category	
Profile	Farmer	Fishman	Craftsman	Merchant...
Goods	Virtual	Physical item		
	Fish	Fruit	Meat	Book...
Delivery method	Online			
Customer				
Profile	Tourist	Local community	Citizen	...
...				

For example:				
	Supervisor	Vendor	Customer	
A multifunctional market	Local government	Fishman	No limitation	
	Multifunctional	Fish		
	Day time			
Classification	A public multifunctional fish market			
An online market	Private company	Retail	No limitation	
	Temporary	craftsman		
		Physical items		
Classification	A temporary membership online craft market			

Table 10. The classification of markets

Furthermore, online shopping which is the biggest competitor against markets in the modern world should also be involved in this discussion, although the experience of online shopping is totally different from normal markets, the system of online shopping inherits from the market system: supervisor, buyers and sellers, while seller element is turned into a new model which is more than a company like shopping malls. As mentioned in previous parts, the exchange is not an isolated human behaviour and can associate with other exchanges, it takes time and space to complete the process. In online shopping, the behaviours of seller element are divided into more small and detailed exchange behaviours which are completed by different groups, so as a result, the behaviours which were necessary for sellers can be substituted by others, and what sellers need to do is to make sure the big picture of the exchange process is functioning well, customers would have less direct knowledge about the exchange items because people they meet have less information about the goods. It's time to review the definition of function in this research, 'function is a combination of certain human behaviours and related built space' when the certain human behaviours of sellers are reduced in online shopping, the need for built space is also reduced, they don't need space for storing, they don't need space for display, they don't need space for negotiation, what happened in shopping malls happened in online markets and extremely, they need public space in urban space, that's how trading become shops or markets and finally become online shopping, though urban space aspects. Could that mean sellers spend more space on customers? No, not necessarily. The function is a way to connect and reform-built space with human behaviours, it would not occupy public space without certain human behaviours, and the spared space would be used for other functions. In the final, 'arcade' and 'high street' will be briefly discussed.

Arcade is a special phenomenon in the United Kingdom, if the arcade is owned by someone, then it's a special vision of the market supported by three elements: supervisor, buyer and seller, arcades can be classified through design aspects with market halls and indoor markets. Sometimes, several people own their own shops and organize an organization to manage the arcade, in this case, that is a social phenomenon with a special social organization; though urban aspect, it can't form a unique function, ideally, it will become a company, in other countries like Japan, there are similar phenomenon called shopping street. It is the same as high streets, the high street is a social phenomenon that happened in the economy of urban areas, and it has its own time and cultural context.

	Market	Supermarket	Shop	Arcade	Shopping mall	Online shopping
Supervisor	Government (Generally)	Private	Private	Private	Private	Private
Ownership	One owner	One owner	Depend	Depend	One owner	One owner

Relationships with customers	Low	Medium	Medium	Low	Low	Medium
Relationships with architecture space	High	High	High	Low	High	High
Relationships with trading space	Medium	Low	Medium	Low	Low	Medium
Vendor	Vendor	Employee	Owner or employee	Vendor or employee	Employee	Vendor and Employee
Relationships with supervisors	High	Low	High	High	Low	Low
Relationships with customers	High	Low	High	High	High	Low
Relationships with architecture space	Low	High	High	Low	Low	Low
Relationships with trading space	High	Low	Medium	High	High	High

Table 11. Differences between different retail methods

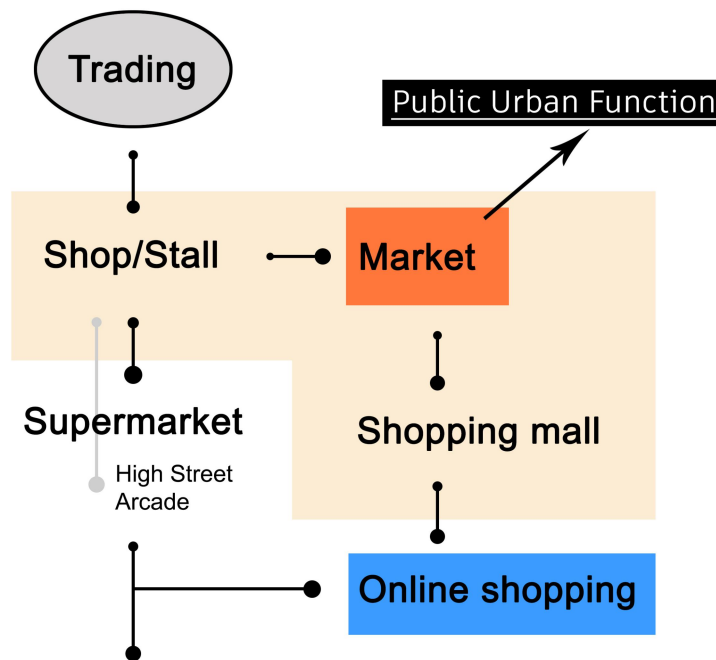


Figure 5. Development relationships between different retail methods

In the last of this part, what people would miss in the market system through using the ‘function’ in urban space. As mentioned before, the buyer element is relatively disadvantaged in the balance of trading which should be equal according to the feature of exchange behaviour, largely due to the hardness to define certain behaviours of buyers. Some built spaces have already been included in markets because of certain behaviours, such as restrooms and parking areas, only little is defined. To improve the situation, there are

two methods that may solve the problems. One is to create kinds of built space to guide customers and develop some certain behaviours of buyers. This method is popular and well-used in modern retail activities, and shopping mall is the master in this field. It's a quick and effective way to put efforts on the buyers' part, in contrast, it may not be long-lasting and welcomed by the majority, but this method needs changing and perfect surveys. The other method is to get the truth from chaos, knowing the certain pattern of human behaviours of buyers and design-related built space. There are also two ways to conduct this method, one is passive, and the other is active. Through the passive way, using technologies to show up the behaviour patterns, like water running through the ground then creating valleys, using a term from Adam Smith, the 'invisible hand', which here refers to human activities, waiting for the truth to show up. On the contrary, an active way is to plan research and use data to analyse the phenomenon, finally getting the answer. Compared to the previous research environments, it become more and more possible to predict human behaviours using proper knowledge, such as big data, and it will eventually be realized with enough computing power. In the current period, the method could be used to make up for the deficiency because of using the function in urban space.

Although the discussion of the market system has not finished yet, based on the current stage, some advice about markets in practice could be made. First, supervisors should assume majority responsibility for situations of markets. Supervisors can seldom be noticed in markets, but they are responsible for design, management and regulations, and largely decided how markets work, blaming sellers for difficulties is not appropriate, furthermore, trying to encourage sellers to improve markets is just a temporary method. In fact, changing design, management and regulations will be more effective. To adapt to the uncertain features of customers or sellers, the design of markets should be more flexible. Creating an experience to guide human behaviours is also a method, the quickest way is to combine markets with other certain human behaviours to improve utilization rate, such as bus stops. Second, be wise. Though previous contrasts, the difference between markets and other economic functions is obvious, the more detailed division of labour, the less built space is needed, and the fewer connections between customers, goods and sellers. Using these features can be advantageous for certain customers, improving direct experiences from reality such as smells and noise will help markets to survive. After everything we can simulate, reality is the only thing we would pay for. Third, improving knowledge about relationships in trading. Built space always falls behind the changes of real life, continuing to use advanced pieces of knowledge to fit the changes between customers and sellers in real life. These pieces of advice are raised according to the discussion of the market system, more detailed and proper pieces of advice will be made after full research on markets of England regions.

Chapter 4 HISTORY OF FOOD MARKETS IN MACAU

This chapter aims to introduce the history of food markets in Macau and explain why these changes happened to those markets. The history of food markets in Macau can be divided into three periods, the time of the traditional market, the time of the modern market and the time of multifunctional food market building. The political and urban development reasons behind the market generations are the main elements considered in the discussion.

4.1 Traditional food markets

Official traditional markets can be dated back to the 18th century in Macau, although private stalls always existed as long as there were residents in Macau, built markets showed the full governance of the Macau colony system, because unlike other rural markets or planned city markets, official traditional markets at that time were not open-air markets, and as mentioned in the previous discussion, markets should be a space for economy function under an element called ‘supervisor’. This kind of markets was not completely indoor market, stalls were located under a colonnade building without walls, only having roofs and pillars. In Chinese, the building structure was called a ‘market pavilion’, due to the building structures being similar to Chinese pavilions, but already they were similar to public buildings in ancient Greek or Rome culture if considering the designers of the markets were under European culture. Although the site and original structure of markets were destroyed by fires and reconstruction, information about these original types of traditional markets in Macau could be got from historical records and a historic site called ‘Ruins of Taipa’ (Figure 6). This kind of simple and crude market building was the original type of many current existing markets, such as Yingdi markets (‘Complexo Municipal do Mercado de S. Domingos’ in Portuguese) or called cental market, and Quezaiyuan Market (‘Mercado Municipal da Horta da Mitra’ in Portuguese).



Figure 6. The ruins of Taipa⁸

The Yingdi market was created in 1789, due to a conflict between Chinese residents and Portuguese residents. At that time, Macau was still half ruled by the Portuguese government and half in the hand of the Qing Dynasty. The market was divided into four lines and people used for selling fresh vegetables, meat and fish at first, but after years, many other functions were moved in, largely related to the prosperity of the market area, haircutting, blacksmith and tobacco business could be found in the market, sometimes even gambling was allowed by errands which belonged to Xiangshan county. In 1857, the ownership of the Yingdi market had already been transferred to the Portuguese colony government and had already suffered several fires and reconstructions due to safety problems, but the situation had not changed much. On the afternoon of the 11th of November in 1893, another fire destroyed the markets

⁸ <https://www.taipavillagemacau.com/tc/directory/%E8%88%8A%E6%8E%92%E8%A7%92%E7%A2%BC%E9%A0%AD/> (Data collected in Feb of 2022)

and some surrounding buildings, as a result, and after enduring too much mess and dirty, desiring a clean and tidy public market, the government handed the job over to an architect and built a market combining two 'market pavilions' (Figure 7) (Lao.J. Lv, Z.,2019) The markets kept the traditional style of colonnade building with a corridor in the middle for natural lighting and ventilation, to keep safe from fire, two wells were designed in the markets. The new market was just an updated version of traditional markets with the same logic of space arrangement and function organizing, but it solved the problems of dirty and fire and had a better ventilation system. Apart from space design, the appearance and decorations of the markets were fully planned by the architect. It's surprising to see that the style of the market was more likely to belong to the Manueline style in Portuguese culture, maybe the architect had changed the style a little bit to make it more suitable for society at that time. The new market was finished and opened to the public in 1906, still a market which was not completely indoor market. The market worked well until the end of the 1940s, residents, vendors and the government all want to build a new market to replace the old one for the sake of sanitation and convenience. The new one was built in 1950, named 'the central market', it was designed with restrooms and cold storage, the food markets in Macau enter the modern generation under the modern design concept (Lao.J. Lv, Z., 2019).

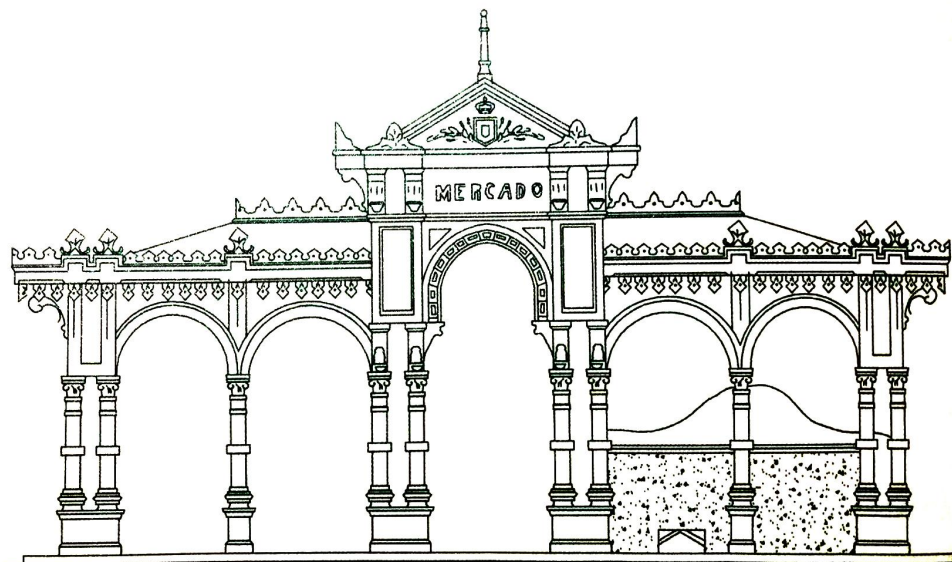


Figure 7. The new market built to combine the old market pavilions⁹

The evolution process of the Yingdi food market presented almost all food markets in Macau how they transferred from traditional markets to modern markets and what the forces behind the process of evolution were. Qiezaiyuan market became a modern market in 1939; the Xiahuan market became a modern market in 1954; the Shalitou market became a modern market in 1976; the current red market was built in 1934. It's surprising to see that the transformation processes of traditional markets to modern markets almost all happened around the 1940s when the World War Two was still in a fierce battle. This may be related to the first batch of urban planning for reclamation projects and refugees heading south, in general, it was the result of the modern urbanization of Macau.

The actual situation of traditional food markets in Macau was not as simple as the process mentioned in the previous discussion, there were some temporary markets opened and closed, there were some food markets merged into bigger markets, there were some markets moved to another place and became the

⁹ Lao.J. Lv, Z. (2019). Macau market buildings (1750-1950). The Heritage Society. P26.

names of roads. Sometimes government leased some private lands or building for food markets until the government thought it was necessary to lay out public lands to build food markets. To make a conclusion about the traditional food market in Macau, at that period, according to the previous theory of markets, the supervisor element was a complex of government and other involvers. The government was in charge of the laws, regulations, urban planning and ownership of the land, but not controlling the management of the markets. Different from the current situation, the management of markets and incomes was bided by private merchant organizations, and they also were responsible for maintenance and operation, which always led to the chaos of traditional markets. The designs of the markets were also bided by architects or directly delegated to architects of government, the design of the space usually considered tidy and clean for the top priority of the strategies, and space for vendors or customers were not carefully been planned which can be told through the architecture style of the colonnade. The trading aspect of the markets was not clearly understood, there were not many detailed description records. From these parts, the market system of traditional food markets in Macau was separated, and the connections between vendors, customers and governments were at a low level, making space for the markets not for experience but for functions only which could result in dirty and smelly. Other than these features, the early traditional food markets in Macau were oriented toward convenience and related to the development of urbanization.

4.2 Modern food market buildings

As mentioned in previous section 4.1, the modern food markets in Macau almost all started around the 1940s, these modern food markets were no longer simple colonnade buildings like traditional markets, the space was detailed designed and looking forward to having a better environment for trading and good influences on urban development, due to the roles of food markets in people's daily life and modern designing, the food markets became centres of urban texture and lives, the Yingdi markets and the red markets which still is operating now were the typical examples.

The red market expressed the lifestyle of people and the market system at that time from all kinds of aspects. The market building was completed in 1935, the design of the markets had been changed a lot through building and operation, but the original purposes and ideas could be understood through original drawings (Figure 8). The market has three floors, the triangle floor plan has a tower in the centre of the plan, which was used for the clock tower, being corresponding, four small four watchtowers were designed at the four corners of the triangle. The five towers also indicate the space of transportation space, such as entrances, exits and staircases located underneath the tower spaces or nearby, the central tower is the main transportation area with large staircases connected to the first floor. Although the markets have three floors, only two floors are used for market functions, selling food and slaughtering cows which were not applied in actual use. The second floor which is the roof of the market was designed to be a roof garden for entertainment and the four small tower at the corners was intended to be service space for the roof garden, it was a pity that the idea was not adopted at that time, leaving an empty space for a long time. The market also had cold storages and restrooms for public use, cleaning storage and currency exchange was located on the ground floor, the infrastructure of the market was quite comprehensive in the red market and planned suitable for trading activities at that time period.

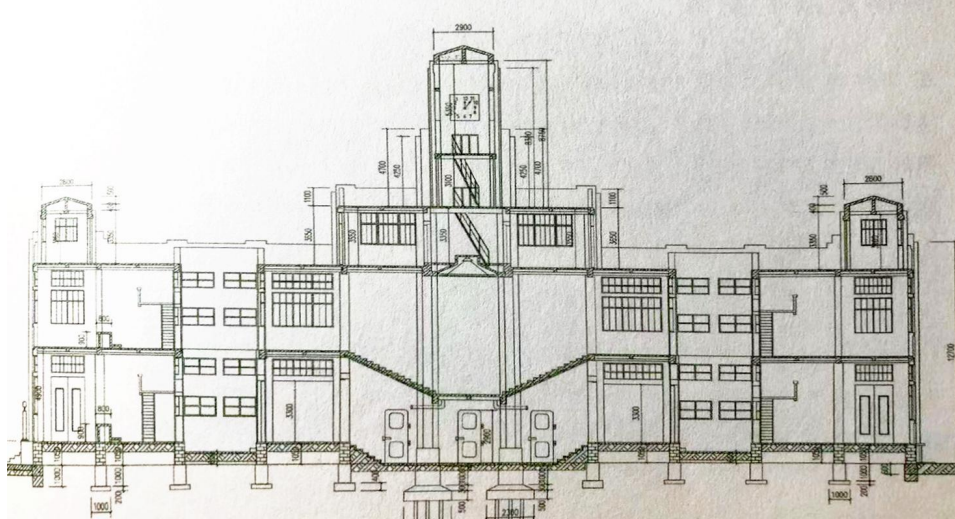


Figure 8. The selection of the Red Market¹⁰

Apart from the in advance design of infrastructure, the architect also took clean and tidy into consideration, big windows occupy the largest proportion of the design of façades, encouraging natural lighting and ventilation, there were also two patios also had the same functions as the windows do, the space of vendors arranged around the patios to get enough light and natural air. The decorations of the facades show features of the decorative arts, emphasizing the vertical columns and big wide windows, revealing the modern architectural theories of Art Deco style, due to the attractive red bricks shape decorations, the market had been called the 'red market' (Lao.J. Lv, Z., 2019). The surrounding environment was designed for public spaces such as gardens and reserved roads for cars and other transportation. Although the red market was a high-end public market at that period, it was not welcomed when it was open to the public, none wanted to do business in the market when the first bid was taken place, but with the urban development, the Red market became the centre of surrounding areas.

The modern Yingdi market which was called the central market was put into use in 1950, being the biggest food market in Macau at that time, until in 1996 it was demolished and the current multifunctional Yingdi market was built¹¹. The layout plan of the modern Yingdi market largely kept the original design of the traditional market (Figure 9), separating into two wings by a passageway in the middle. The infrastructure functions such as staircases and restrooms were arranged in the middle of the planning of the floors and the space for vendors was designed along the windows on the long sides of the triangle, the main entrances and space for traffic were also in the middle with the infrastructures connecting the two wings of the building along the long side. The market had two floors for trading, the ground floor was for a wet market and some chicken and duck vendors and the first floor was used to sell meats and vegetables, and the roof also could be available for the public but without fixed functions. The main problems the architects wanted to solve were still light and cleanness, the same as the design of the red market, vertical long stripe windows and two patios were applied in the design to provide enough natural light and air ventilation with the high ceilings, integrated with the arrangement of space of vendors, some thought the market was a church for trading. The façades of the building were designed in a modern style, and the strong sense of vertical decoration elements was a key theme, different from the intense colour design of the red market, the design of Yingdi market was concise and showed the concept of form following function. The design of the market met the need for a modern food market in trading, storing and public service, but due to the development of the modern lifestyle, the modern food market was

¹⁰ Lao.J. Lv, Z. (2019). Macau market buildings (1750-1950). The Heritage Society. P75.

¹¹ Citrated from Arquivo De Macau. <https://www.archives.gov.mo/gb/detail/34>

demolished by the government in 1996.

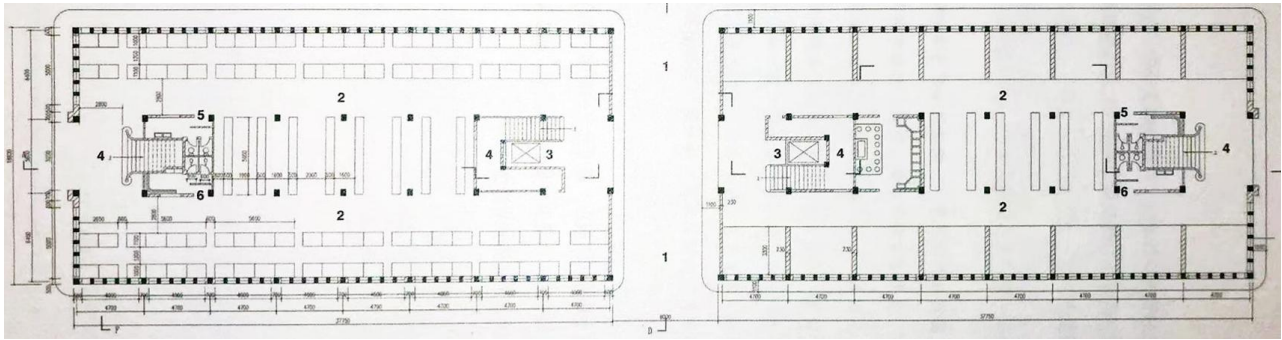


Figure 9. The original design of the floor plans of the Yingdi market in 1950¹²

The other modern markets designed and built around the 1940s were similar to these two markets. the feature of these modern food markets can be concluded into the following points:

1. Important public service building. These modern market buildings were intended to be designed into more than one-floor building, although one or two were built into one-floor market, with the high height of each floor, the market buildings were always one of the large buildings in the city which could be easy to be noticed. Different from market halls which were typically one-floor large span buildings in the UK and other countries, the modern food markets were already intended to be developed in vertical space, which could be a reason why the markets resulted in current multifunctional food market buildings. According to the theory of Kevin Lynch (1964), the food markets could be landmarks in residents' road maps, which could be the reason why some markets had big clocks on the façades, indicating the social centres of public lives. Bells and clocks tower was always important in postmodern European cities, always being designed in churches and municipal buildings.
2. Completely public welfare. After 1925, none was allowed to set up private markets, as a result, the food markets were all belonged to the government and open to the public, in the theory of the market system, the element of supervisor in modern food markets was the government without any other involvers, despite the design part was delegated to architects, other parts all under the control of the government, such as laws and maintenance. This feature can be learnt from the mode of food markets, the priority problems which the government considered were clean and tidy, the government preferred indoor markets to outdoor markets because they thought the trading should be limited in a certain space to prevent urban life from the bad smells and waste of food market. The same situation happened to market halls in the Victorian age in the UK, after the crystal palace was presented to the people, the local government wanted the new market halls built with irons and glass to show the lovely modern city lives. The modern food market in Macau removed the street element from the traditional market system by being locked in a sealed box, and the temporary stalls near the markets were also not allowed. The modern food markets provided a better trading environment for residents but also set the road for market development.
3. Improvement of experience of customers. The functions designed for vendors had not changed much, just adding cold storage, but infrastructures for customers or residents had improved a lot. Restrooms and large staircases were essential for customers, apart from these, gardens and traffic space had also been included in certain markets, although the plan for roof gardens had not been taken place, the

¹² Lao.J. Lv, Z. (2019). Macau market buildings (1750-1950). The Heritage Society. P34.

social environment and building environment had been put into consideration. From the design of the façade and environment to the basic infrastructure, the experience of customers had improved a lot, which made the modern food market to be the centre of lifestyle.

4.3 Multifunctional food market buildings

The multifunctional food market building actually should be called multifunctional municipal building, but they replaced the old modern food markets, and a large portion of space is used for food markets, so these municipal buildings were all named after food markets and became the new model of food markets in Macau. The first of this kind is the Youhan multifunctional municipal building which was finished in 1994 and expanded in 2008, but the model was not organed in Macau, this multifunctional model of urban function could be spread from Hong Kong. The same historical situation happened in Hong Kong, at first, the municipal buildings were designed for only market functions like the modern food markets in Macau, with urban development, Hong Kong combined market function with other municipal services and built multifunctional municipal buildings and used the model to the current situation. The reason why Hong Kong used this model may be related to limited space and urban regeneration, which could also be the reason why the government of Macau applied the same method.

The Youhan food market was a newly built market for servicing the first big housing estate named You Han ('Bairro lao Hon' in Portuguese) and surrounding neighbourhoods which were the new community after modern reclamation projects(Lao.J. Lv, Z., 2019). It was completed in January 1994, and the additional vendors' building was started in 2008, through several processes, the Youhan multifunctional market building became a suitable municipal service centre for the surrounding communities. In current situations, it includes a market area, sports fields, a grocery market, a cooked food centre, an activity centre, parking lots, and some municipal services. The design and using the Youhan multifunctional market building meant that the attitude of the government toward the market changed from the modern markets to the vertical multifunctional market buildings, providing urban functions for residents.

The model of a multifunctional food market building in Macau usually has the following features:

1. The space is separated by floors. The underground floors are designed for parking and freight. The ground floor usually is the space for the wet market and the low levels were for market functions. The floors above the markets are used for different municipal services, including the library, social centre and activity space. The top floors always are occupied by food courts or sports centres. The roof can be used as a sport space and roof gardens. Each function is strictly separated by horizontal space, to keep it clean and tidy, transportation spaces such as staircases and elevators are also isolated from other functions in vertical space. As a result, although the building is a combination of different services, the functions are isolated, the mode tries to increase the usage of different functions by combining them together, but actually, it decreased the social interaction between different urban functions. Suppose, if these urban functions were tiled in urban space, people could still have eye contact and flow floating to create social interaction opportunities.
2. Sacrificing experience. Located in a building with other functions made markets give up some features to not disturb the users of other functions. Colours, noises and smells are the key elements that made markets different from other merchandise methods and sources of space vitality, but in the current situation, these elements should be kept inside the markets and be covered, some of the experiences of customers are sacrificed. The same thing also happens to other municipal functions, the sports centre and activity space should be kept in a low voice while there is a library or community centre. Food and drinks are not allowed in the library but there are markets and food courts. Whether the

current combination of markets and other municipal functions is proper or not is a problem needed further discussion and research.

4.4 Political aspect on markets in Macau

The politics of markets in Macau are related to many other social aspects aspect. Those regulations on markets are always combined with other economic activities in general ideas, such as street vendors and street craftsmen. The other feature about politics is that the politics and regulations about markets are all about how to maintain markets, not about how to create markets, this may be related to the attitudes of the government which is in charge of all the permanent markets.

In the related regulations¹³, the cost of a regular vendor in a multifunctional market building could be calculated. The costs of licences change differently according to goods for selling and the size of the space for selling. For example, for an individual vendor, the licence for live poultry is 1,100 for a year, and the licence for aquatic products is the same, but a licence for fresh or frozen meat values 2,200 for a year. On the other hand, if being a general grocery vendor, the licence fees change according to the size of space which varies from 1,000 for a year to 2,600 for a year. The size of the selling space occupying less than 2.5 m² and costs 1000, the highest cost is 1,600 which represents a size over 10 m². If the vendor not only uses the public space for selling but also uses the structures supplied by the government, the fees of licence for a year would be increased. Using the same size of the stall, the space with structure supplied by the government is 1,000 higher than the normal price, 2,000 for less than 2.5 m² and 2,600 for more than 10 m². This list of license prices could be generally applied to normal vendors wherever they start the business, but the prices are different in different municipal markets according to the regulation¹⁴. The licence fees for municipal markets are calculated by size and month. Under the same standard, 1m² per month, the Youhan market is the highest, with a price is 210; the red market, Yingdi market, Xiahuan market and Shalitou market are at the second class which is 180; the third class are Quezaiyuan market and Taishan market, the price is 105; the Taipa market and Luhan market are the lowest which cost 60. This shows that the licence fees in multifunctional market buildings are normally higher than in normal municipal markets, except for the red market. If a vendor wants to rent a stall of 2.5 m² in a municipal market for a year, the lowest one is 1,800 in Taipa market and Luhan market, few lower than 2,000, which is the cost of a vendor renting the same size stall using structure supplied by the government. The high licence fee could be 6,300 in the Youhan market and 5,400 in the reading market or Yingdi market, nearly more than three times of lowest licence fees. Though this point, the multifunctional market buildings might not be the best place for starting a new business, but it should be cheaper than renting street shops.

Apart from the cost of a licence, there are also some politics and regulations about markets in maintaining process, such as management and open auctions of stalls¹⁵. According to the laws, the Municipal Affairs Bureau of Macau is responsible for the following responsibilities: supervising the operation of stalls, maintaining the order and sanitation of markets and ensuring a fair, reasonable consumption environment. It means the Municipal Affairs Bureau of Macau is the supervisor element in the process of maintaining

¹³ 澳門特別行政區公報——第一組——第二副刊, 2016年9月5日, 第36期. 附件三, 《民政總署的費用、收費及價金表》。Official Gazette of the Macao Special Administrative Region—Group I—Second Supplement (2016), Vol 36. ANEXO III, Tabela de Taxas, Tarifas e Preços do IACM.

¹⁴ 澳門特別行政區公報——第一組——第二副刊, 2021年12月31日, 第52期. 附件, 《每月每平方米租金金額》。Official Gazette of the Macao Special Administrative Region—Group I—Second Supplement (2021), Vol 52. ANEXO, Valor da renda mensal por metro quadrado.

¹⁵ 澳門特別行政區公報——第一組, 2021年6月28日, 第26期. 澳門特別行政區第6/2021号法律, 《公共街市管理制度》。Official Gazette of the Macao Special Administrative Region—Group I (2021), Vol26. Região Administrativa Especial de Macau Lei n.º 6/2021, Regime de gestão dos mercados públicos.

markets, although as mentioned in previous discussions that the responsibilities of the supervisor element are subcontracted and separated to several companies, the government is still the main source of power in the multifunctional market buildings. Discussing the allocation of the stalls, it is conducted according to the results of public auctions. If the vendors win the bids in the public auction, they can make contracts with the government to get permission of renting certain stalls for 3 years. In the regulations, the vendor should fulfil their contracts unless special conditions such as the pandemic, and they should obey the regulations about the markets. During the public auction, the vendor is scored by a committee and the members of it all come from the Municipal Affairs Bureau of Macau or are authorized by it, the system of scoring is related to an evaluation standard and weighted value of relevant scores¹⁶. As a result, the selection of vendors in markets is completely under the control of the Municipal Affairs Bureau of Macau, and winning the bid in a public auction is not totally related to capital or powers of social relationships.

In this section, the current politics of markets in Macau is reviewed, but there lack of complete literature records of politics about markets in Macau in the past. Although there was some news about how the government decided to design some markets and attitudes to markets, they were hardly near to showing the big picture of the supervisor element in the process of market development in Macau. According to the current politics of markets in Macau, they could only show the effects of government in phase two which is the maintaining market, while it hard to figure out its attitudes toward designing markets. On the other hand, although the politics of markets shows a nearly full control of the market by the supervisor element, the government mostly focuses on the normal responsibilities of maintaining markets, not on how to improve markets and related activities. It would be hard for it to realize whether the current situations of markets are good or not, as well as when and how to improve or redevelop markets in Macau. That's why the evaluation of multifunctional market buildings in Macau is necessary under current conditions.

¹⁶ 澳門特別行政區公報——第一組, 2021年12月13日, 第50期. 澳門特別行政區第48/2021号行政法规, 《公共街市摊位分配及租赁的补充规定》. Official Gazette of the Macao Special Administrative Region—Group I (2021), Vol50. Região Administrativa Especial de Macau Regulamento Administrativo n.º 48/2021, Normas complementares à atribuição e arrendamento de bancas dos mercados públicos.

4.5 Current situation

After previous research on markets in each period of history, from traditional markets to multifunctional food market buildings, the development of the market system in Macau can be summarized into the following points.

1. From the complex of government and merchants to only government. The supervisor element of the food market system in Macau is totally equal to the government, although some aspects are outsourced, the current situation of food markets and related laws or regulations shows the attitudes of the current government toward the ideas of food markets and the understanding of the relationships between vendors and customers, also what's the role of markets in urban development.
2. Too obsessed with city texture. The Yingdi market is a typical example, from the traditional market to the modern food market and multifunctional food market building, the layout plan of the market has not been changed much, all have a shortcut in the middle of the site to divide the market into two parts and entrances are on the short side of a triangle, main traffic line runs through the site from one wing to another with vendor space arranged passageways. This phenomenon may be a result of urban regeneration, the new one replaces the old one on the same site facing the same environment. This kind of persistence may be reasonable when urban development was not quick, but in the current situation, this phenomenon may result in negative effects.
3. More and more isolated from nature. The traditional markets were half indoor markets, and the modern markets were indoor markets with large windows and patios for natural light and air ventilation, but in multifunctional food market buildings, electric lights and air ventilation systems are preferred while natural modes are largely abandoned. It's the right answer for government to prevent the mess markets affecting social lives, but made the markets isolating and depressing, losing the important sources of vitality of the food markets.

Through these development patterns, the current situation of food markets in Macau is facing three different main problems.

1. Building new food markets for new communities. Reclamation is the major method Macau used to accomplish urban expansion. New buildings and communities would be built on these new lands, without history and old sites of markets, how to locate and build a market is an important question needed to be answered, even the question of whether markets are still needed in urban life should be solved before urban planning is actually put into reality.
2. Regeneration of old food markets. Urban regeneration is another big problem for the urban designer in Macau, and regeneration of markets in Macau could be divided into three different situations: preservation regeneration, updated regeneration, and space regeneration. Preservation regeneration is referred to in the same situation as the red market, the red market is on the cultural relic protection list, but due to the lack of modern infrastructures such as elevators, it is not suitable for disabled people and modern lifestyle and its functions need to be improved. In such conditions, the regeneration of the red market is a project of mediation between preservation and regeneration, needing detailed research and planning. More and more food markets in Macau may face this kind of situation when people begin to focus more on cultural preservation. The updated regeneration is the

normal regeneration mode of the market, as modern food markets are regenerated into multifunctional food market buildings. Facing the rapid change in a social lifestyle, the updated regeneration should go through reflection and reorganization processes. When residents criticize the design of the Yingdi market and Taishan market, when fewer vendors want to work in these markets, and when fewer people try to use the market, the problems are obvious. Does the combination of markets and other municipal services work well? Does the design of the architecture of markets suitable for market function? Does current trading experience satisfy vendors and customers? Updated regeneration should try to take all the elements in the market system and current urban situation into consideration, not just an unchanged project. Space regeneration is a kind of generation about space-changing, such as outdoor markets turning into indoor markets. Some parts of it are similar to the condition of building new food markets, but it involved more social relationships and contracts, it's more like a social project than an urban project. The questions about the regeneration of fairs and temporary food markets are also involved in this condition, different types of markets in Macau would play their own roles to enrich the lifestyles of residents.

3. Improving food markets. In this kind of regeneration projects, more efforts would focus on particular changes in certain aspects of the market, such as improvement for the disabled or improvement of the air ventilation system. For food markets in Macau, three projects are major goals in the current situation. The first one is an improvement for disabled people, this project involves the regeneration of entrances and transportation infrastructures, sometimes it also needs to expand space for enough space for the traffic. The second one is the traffic system around food markets, with the increasing usage of private cars and logistics vehicles, parking space and traffic space are not enough in most of the food markets in Macau. In the situations of some markets, parking systems in food markets also have to serve the parking functions of surrounding communities, due to the difficulty of regeneration of private lands, more and more needs of parking services are a part of the responsibility of municipal services, to solve the problem, improvement of traffic system around food markets would be necessary for the current condition. The final one is a regeneration project about the technology environment, facing the development of internet technologies and threats of online markets, improvements in trading experiences through modern technology would make food markets suitable for modern lifestyles and attract more young generation to use the markets, thus, improvement of technology environment of markets should also be the important choices in an urban generation. These regeneration projects don't require big changes in space and structure, but the small changes could also have big impacts on the shopping environment.

The food markets in Macau were developed largely related to the urban development of the city when the city expanded, markets emerged in new communities; when the city developed, markets needed to be developed to suit city lives. Throughout the history of the development of food markets, problems appeared and were solved, but now the food markets are facing new problems from modern technologies, changes in lifestyle and urban regeneration. How to solve related problems and draw up proper regeneration projects for different situations need further research about regeneration projects and the current situation of each market which would be the main purpose of the following parts.

Chapter 5 RESEARCH METHODOLOGY

This chapter will focus on the research methodology concept and theories applied in this research, including the methods which have already been used in research review and history research. In the following discussions, the research methods involved are intended to put attention to field research. The chapter is divided into three parts, the first part is a piece of general research on different research methods used in research related to market and urban design, discussing the advantages and disadvantages of these research methods; The second part is about selecting proper research methods among those method mentioned in the previous discussion, according to the research topics and object situations in this research, decided the methods be used; And the last section is about how to apply the selected research methods in the research process, depending on the research targets, research conditions and research questions

The research questions have been raised in the first chapter, due to the research method discussion, those research questions would also be mentioned here, explaining why the research methods in this chapter are selected for this research.

Considering these research questions of this research, the relationships between those research questions and research methods could be generally explained in the following Table 12, including the research question already mentioned in the previous chapter. The detailed application of research methods in this research would be discussed in the following sections.

Research Objectives	Data Required	Research Method(s)
Understanding the current situation of studies on the market.	1. Previous research	Literature review
The definition of markets in the field of urban design.	1. Theory research	Theory review
Defining the system of 'market'.	1. Theory research 2. Case research	Theory review Case study Case analysis
Learning and discussing the development process of markets in Macau.	1. History review 2. Case research	History review Case study Case analysis
Studying the elements in the system of 'market' affected the process of market development and design in Macau.	1. History review 2. Policy review 3. Design Information	History review Policy, law and regulation review
Analysing multifunctional market buildings in Macau through field research.	1. Customer data 2. Vendor data 3. Supervisor data	Questionnaire Interview Observation
The recommendations of multifunctional market buildings in practice uses.	1. Current situation of markets 2. Conclusions of evaluations 3. Challenges of markets	Literature review Public information review

Table 12. Research objectives and related research methods

5.1 Research methods

Research methods include different methods, such as technologies, strategies and theories, they can be divided into two different categories, one is how to collect information (or data), and the other one is how to handle information, and these methods can be applied through the whole process of the research. The process of the research could be generally divided into five parts: defining topics, literature review, planning research, data collection, and writing up, each part has its own function and focuses on different aims, no matter through what mediums, fields or online, what researchers can get from reality is always information which to improve the acknowledge of targets or situations, how to transfer information into data is also a part of how to handle information which is part two.

On the other hand, according to the types of research, research methods could vary, generally, different pieces of research can be divided into three types by the methods of data handling or analysing. Qualitative research is a kind of research using data like human experiences, human emotions or social behaviours, trying to find out social and scientific meanings or connections behind these phenomena. It is usually involved in some kinds of research in which researchers try to get a better understanding of many complex social or cultural phenomena or to improve the already existing concepts, usually used in social science-related areas which require a description of human activities. Qualitative research is useful in the explain some questions involving how or why things and phenomena occurred, or some questions defining what the phenomena are, interpreting different events under different cultural backgrounds and describing representative human actions in certain environmental conditions. The classical example of qualitative research is 'The Social Contract' written by Jean-Jacques Rousseau (1964).

Quantitative Research is a kind of research using statistical analysis, methods or theories to measure, categorise or compare numerical information collected in the research, to testify or correct theories and assumptions. It is always involved in uncertain detailed patterns or relationships between each element that needs to be clear or corrected, sometimes also used in research on generalizing phenomena, normally applied in natural science because of the data characteristics of natural science research. Qualitative research is quite useful for finding out answers to things and phenomena which can be described by number data, or some topics could be transferred into number description, like how many, how much, how often, or how large, not welcomed in traditional social research, such as historical research.

Mixed Methods Research integrates, just as the name indicates, this type of research is made up of both Qualitative and Quantitative methods, not inquire equal portion, depending on individual research background. This type of research is usually a personalized approach combining number description and human interpretation, using a number of mixed methods from two different types of research, leading to answers with great scope and depth of insight. For a large portion of researchers, mixed method research is always the first choice, because pure quantity research or quantitative research is seldom to be found in current research situations and hard to explain complicated concepts. Compared to qualitative research and quantitative research, mixed methods research is more personalized, having fewer reference substances and needing more adjustments, but becoming more flexible and professional to certain goals or aims.

In this research, mixed-method research is preferred. The aims of this research have three aspects, one is to understand and improve the theory system of the market in the urban areas, the second is to sort out the history of markets in Macau, the final one is the most important one which aims to present the current situation of the mode of multifunctional food markets in Macau and evaluate the condition of the mode in

the urban generation of Macau. To complete these three aims and other objectives, qualitative research and quantitative research are both needed. Qualitative research is used to define the theoretical market system and explain the relationships between elements in the market and urban, it was also involved in historical research on market development in Macau. Quantitative research is used to describe the situation of the markets designed in the mode of multifunctional food markets and how users experience these markets, transferring experiences and descriptions into data and evaluating the advantages and disadvantages of these markets. As a result, mix method will be applied in this research to achieve the aims and improve the theories.

Research methods are techniques and theories to collect and handle information, some are inquired to interpret information into data, and some are used to analyse data into results, as mentioned in the previous discussion. Different research methods may have the same techniques or theories, changing a bit when facing different situations, such as interviews and questionnaires. Except for techniques and theories, research methods have two hiding elements, subjects and results. Subjects are not research subjects, they are sources of information inputted in the process of research methods, like human emotions or human valuations. The result is also not the result of analyses or research, they are the expectations of outcomes of the process of the research methods, when using techniques and theories to handle information, the results could be formats or rankings. Different subjects and result expectations can change research methods even if they have the same techs or theories. In this research, the subjects of research methods are not just market, some are city plans and some are human experience, result expectations also vary, some are numbers, and some are evaluations.

Normally qualitative research methods have these techniques or tools: interviews, focus groups, observations, document analysis, oral history or life stories. Quantitative research methods use techs and tools like surveys or questionnaires, document screening, experiments or observation. The mixed method research could use both these methods in certain conditions, but not mix to use, qualitative parts still use the qualitative methods, and quantitative methods still use quantitative methods. The following parts would have a brief discussion about these common techniques and tools used in qualitative and quantitative research and explain the reasons why choosing some research methods in this research.

The interview can be structured, semi-structured or unstructured in-depth sessions or meetings with the researcher and a participant (sometimes can be more than one), it's a method to collect information. Subjects are always human dialogues, sometimes can focus on gestures and facial expressions, and other related information about participants. Result expectations normally are a deep description of a phenomenon or individual experience, they provide information about research topics, and these results of interviews can hardly be summarized into a number or visual representations.

'Focus groups' is a tech with several different but have something in common participants discuss or perform a particular topic, a set of questions or some actions. Researchers can be facilitators when focus groups are conducted or just observers. Subjects are almost the same as the interview, human dialogues, gestures, and human cations. Result expectations are different descriptions or ideals of one or a set of things. Different from the interview, focus groups can more concentrate on a certain range of topics with selected participants (sometimes not selected according to research topics), becoming more efficient, but lack of detail individual experiences and ideals in different situations.

Observation is a normal research tech with some overlap with focus groups but with a larger range of research subjects. Observations can be divided into on-site observation, in-context observation or role-play observation. Different from focus groups, the subjects of observation don't just target human beings or related artefacts, some subjects of observation could be human social activities or items, even some natural phenomena, without any limitation as long as research subjects can be visualized. The result expectation of observation can be data or description, it always depends on individual research topics and

research subjects. Although observation has fewer limitations on research subjects and expectations of results than other research methods, it lacks objective information from other participants, sometimes the observation research is largely influenced by researchers' own interpretation patterns and personal subjective ideas about the research subjects.

Document analysis is a method through interrogation of correspondence (letters, diaries, emails etc.) or reports. Obviously, document analysis subjects are not human beings, words and graphs are the main sources, narrowly speaking, the subjects could only be official documents whether in paperwork or other mediums. Result expectations can either be detailed descriptions or data in numbers, depending on what subjects can give, it also is influenced by culture and time background, sometimes maker's ideas are involved. Compared with other research methods, document analysis always deals with second-hand information, having less direct interaction with human beings, as a result, it has disadvantages in flexibility and accuracy, on the other hand, the information it gets is officially guaranteed.

Oral history or life story is a kind of different form of an interview, the difference is researchers can't control what they want to get and what they can get, the process is half controlled by participants. Remembrances or memories of experiences told to researchers, these things can be from participants themselves or from people related to or interacted with. The same as interviews, Oral histories or life stories hardly can transform into number data, detailed personal descriptions can be obtained, and the expectation of results is limited to word descriptions in different mediums.

Surveys or questionnaires are methods to ask the same or relative questions to large numbers of participants with something in common or use different scales of valuation measure opinions to get numerical data. The subjects of the survey and questionnaire are simple, personal opinions, they can be in the form of words, numbers, graphs and many other visual means. The result expectations of the surveys and questionnaires always tend to be the number type data or option groups. Being the most popular research method to get data information, a survey or questionnaire has much fewer limitations to subjects and expectations of results, but it requires a better design to take control of the process.

The previous research methods are used to collect information for the research, not for handling the data, the following research methods would be applied to analyse the information and data.

'Experiments' is a common method to test hypotheses in laboratories, finding out causes, effects and relationships, through experiments, usually, the whole process can be repeated over and over. The subjects of experiments are not limited, depending on the experiments, sometimes they are simulative research subjects. Because experiments should be repeated over and over, usually the expectation of results is in numbers, which is easy for analysis or expression. The experiment is the traditional method to handle data or information of the research, in some conditions, it also creates some data for theories or hypotheses, this method could be applied in both processes of collecting data or handling data, but normally, an experiment is used to reproduce context of the theories in research, it always combines both functions in most research.

Statistics measures are common to be seen in the process of handling data, their roles are always tools for data processing, not for qualitative purposes. Statistic measures could be theories or particular tools, such as the software SPSS, the input of these methods only can be numbered as data, and the expectation of results is also in numbers, although people usually present results in visual expressions which are easy to remember and understand. Due to these features, statistic measures are welcomed by most researchers and are applied in figures that could be transferred into numbers.

Taxonomy is another way to handle data other than statistical analysis. It is a general concept of category methods which are not necessarily related to numbers, the most used measure in urban or architectural

aspects is typology, although typology also is applied in many other research areas, such as linguistics, typology is essential in architecture and urban area which don't rely on number data, especially research on history or regional characteristics. The subject of typology has a few limitations, which could vary from words or images, but it usually prefers visual materials, depending on the aims of the research. The result expectation of typology methods could be a definition or a theory, it almost had no limitation, largely depending on the research itself.

The previous research methods are used to gather information or handle data, there are also many other research methods applied in other research that have not been mentioned in this research, such as crowd simulation or GIS system, but limited by this research, only those methods which may be applied in this research are discussed, the following Table 13 makes a brief summary of these research methods through the subject, result expectation and matters needing attention aspects.

Names	Types	Subject	Result expectation	Attention
Interview	1	Human	Participants' description	
Focus group	1	Human	Description	Document required
Observation	1	No limitation	Researcher's description	
Document analysis	1	Document	Official description	
Oral history	1	Human	Personal description	
Survey	1	Human	Participants' description	
Questionnaire	1	Human	Participants' description	
Experiment	1&2	No limitation	No limitation	Reproducible
Statistics measure	2	Number	Number	
Taxonomy	2	No limitation	Description	

Table 13. Features of different research methods

5.2 Research subjects and result expectation

To choose a proper research method, the subjects of research and result expectations of this research should be determined before carrying out further research. Some research subjects and result expectations have been discussed in precious parts. In this section, the research subjects and expectations of results in this field research will be discussed, in order to decide what research methods to use and how to design the field research plan. In this research, subjects of research are not research subjects, they vary when result expectations or situations change, especially depending on participants in the process of field research.

Markets are the core research subjects in this research, the information which is collected from markets is relatively objective, such as opening time, location or scales, etc. Lots of them are in numbers, part of them involving description and quality measurement. Considering under such circumstances, the research subjects in this field research should be public in Macau and users of markets, result expectations could be numbers, words or graphics. To get information from markets, document screening which works as a quantitative research method to gather data is quite suitable for this function. Getting information from objective items like online and newspaper, document screens will transform information into useful groups and number data, forming a general understanding of current situations of markets operating

under the mode of multifunctional food markets, the data collected through document screening or document analysis would also provide a research base for analysing research on the history of markets in Macau and theories of the market system.

Other than markets, most of the information sources in the field research are related to human beings, such as ideas or feelings, due to the users of markets being the main participants in this research. Opinions and experience about markets, what they do and buy in markets, how they go to markets, and so on. Information like opinions and experience can be obtained through interviews or focus groups, usually, interviews are more efficient in certain information, such as feelings or opinions, and results could be some personalized descriptions of markets and own feelings or ideas. Some information like how often they go to market, and how much they average spend, should be covered by designed surveys and questionnaires, numbers and graphs got from surveys and questionnaires are easy to analyze and explain the phenomena in this research. To gather information from human beings, subjects of research methods and result expectations are residents and personal expressions, in this research, interviews and questionnaires are adopted as the main research methods during the field research process in this research.

Information like historical information and the changes markets have made through urban development can only be got from the document or oral history. If some government had kept their documents well, some economic data could still be restored for research analysis, but normally what researchers can get are relatively second-hand descriptions, even if they are official documents. In this research, research on policies of markets and related drawings or photos of designing or planning relied on document analysis, and oral history measures may be applied in further research on the history part.

After the previous discussion, considering the research subjects and aims, the research methods applied in this research are document analysis, interviews, and questionnaires. The amount of information needed in this research are operators of the market, access to markets, the opening time of markets and role of markets, etc. Document analysis will be used in finding objective information like opening time. Interviews and questionnaires will be used to ask people how they access markets and the roles of markets. As a result, this research is a piece of typical mixed method research, using both qualitative research methods and quantitative research methods, gaining both subjective personal descriptions and relatively objective number data. Although the research methods have been decided, the details of those research methods vary according to contexts and conditions, the discussions between research methods and the detailed design of field research in this research are applied in the following sections.

5.3 Case study

The case study is usually involved in social and life sciences to examine selected cases. It can be seen as a special research strategy and approach that can use either qualitative or quantitative data or even combinations of both them. The studied cases are usually simple ones, and they are studied in their own special environment (Mills, Albert J. & Gabrielle. Durepos & Elden. Wiebe, 2010). There are benefits to gathering data on individual cases. Researchers may gather data by participating in the life of the studied community for weeks, or even years, and in this way receive important and fundamental knowledge that helps answer the research questions. The unique nature of the research object is part of the setting for research, and therefore the objective is not to find universal rules but to understand the case or cases deeply in their own unique environment. In this research, the case study is used to understand and explain the relationships between markets and urban, especially in the urban generation.

An embedded single-case design is notable for its adoption of multiple units of analysis in the course of an inquiry. The use of multiple units of analysis—at the levels of members, chapters, and the association—is dictated by the study's objectives and research questions as well as by the current organizational structure of the association (Mills, Albert J. & Gabrielle. Durepos & Elden. Wiebe, 2010). In this research, multiple case studies will be used to describe the whole Figure of the roles of markets in urban generations, but a detailed study will be applied to explain what exactly relationships are and how they work.

The selection of cases is the most important part of the case study research design. Because of the intensive data collection methods in case study research, the number of research units can be very limited (Mills, Albert J. & Gabrielle. Durepos & Elden. Wiebe, 2010). In this research, the number of detailed case studies won't be more than 10 or 50 cases, due to person limitations and information limitations. So, in this step of research, it's important to choose proper cases and a typical case for the detailed case study.

5.3.1 Methods of case study

5.3.1.1 Post-occupancy evaluation

Post-occupancy evaluation research is usually abbreviated as POE research, it is responsible for gathering information and figuring out problems after buildings were put into use, in order to improve the concepts and principles of architecture and urban design. The POE research could handle not limited to the following aspects in architecture and urban: user satisfaction, sound and noise, environmental conditions, aesthetic level, energy expenditure and cycles, and effectiveness of energy-saving systems. POE research is commonly used in zero net energy building research and user satisfaction research, different from other aspects, key information related to these parts could only be gathered after the buildings were used. As a result, POE research is the best method to testify theories and ideas which were raised in the design process.

The POE research was first used in the mid-1960s to solve problems related to architecture designing such as evaluating health and security built environments for hospitals and prisons. With increasing interests in researching on relationships between human behaviour and architecture or urban design, people started to focus on built environments and environment design, some cases of evaluations and research on POE research emerged, such as 'Architecture and Progressive Architecture'. The research on built environment with POE research methods expanded its research fields and targets, the research objectives were not limited to hospitals or prisons which largely relied on built environments, government buildings offices and many other functions were included in pieces of research, but the methods and type of POE research were simple and similar. After the 1980s, POE research became diverse and began to form its standards. Different organizations and associations related to POE research had regular activities and played their roles in different areas, including the International Association for the Study of People and Their Physical Surroundings (IAPS) in Europe, People and Physical Environment Research Association (PAPER) in Southeast Asia and Oceania, and Man-Environment Research Association (MERA) in Japan. In the current POE research system, there are technical elements including structure, sanitation and ventilation, electrical, and fire safety, these elements largely relied on physical aspects; there are functional elements including human factors, communication and workflow, privacy and interaction, and images and meaning, these elements are mainly related to subjective concepts which depend on physical items to present and evaluate. Considering the elements in POE research, the research methods applied in POE research could include interviews, questionnaires and surveys, observation, recording by images and

words, and behavioural mapping, which are quite similar to other kinds of research on human behaviours. Due to the database system, the result of POE research also requires quantitative methods to handle which would be mentioned in the following discussion of the process of POE research.

The process of POE research normally is divided into three steps, like other case study methods, the first step is the planning stage, knowing the cases and designing the data collecting process; the second step is conducting stage, which mainly had activities related to data collecting and data analysing; the third step is the feedbacking stage, getting conclusion and ideas from results of analysis and reviewing or substantiate design theories, each stage could also be separated into three level: indicative, investigative and diagnostic (Preiser, Wolfgang F. E., Harvey Z. Rabinowitz, and Edward T. White, 2015). The three levels showed the degree and range of a piece of POE research, indicative research normally shows the major problems and relationships; investigative research presents situations other than a brief introduction, considering not only problems but also the real operation conditions of the cases which may not be regarded as problems, in this level, usually requiring field research; the diagnostic research is a comprehensive and deeply investigation conducted research, getting the data and results behind the conditions and situation of the cases, showing the detailed logic between elements and relationships. Different levels of research have their relative advantages and disadvantages, mainly referring to time, resources, and results. In this thesis, using POE research reveal all third levels of the cases which were multifunctional market buildings, according to the research questions mentioned in previous discussions, 'What is the mode of the multifunctional market building?', 'The current situations of multifunctional market building in Macau', 'How does the mode of multifunctional market building work?'. So, the POE research adopted should be diagnostic POE research, demanding an amount of time and resources and proper field research.

Considering the cases picked for field research and research questions, the POE research applied in this thesis did not need to deal with the technical elements but was more focused on human behaviour factors, such as user satisfaction and behaviour patterns. According to the previous discussion, this process of POE research was also divided into three steps, and in this chapter, the first step should be discussed which was research designing, and the rest would be completed in the following chapters according to the research plan designed. The three most important questions in POE research are 'What data to get?', 'How to get data?' and 'What to be diagnosed?', and there are major elements, the methods and the purposes. As mentioned, the major elements in this POE research were elements related to human behaviours, such as behaviour patterns and user satisfaction. To gather these data, having field research was unavoidable, questionnaires and surveys would be the priority research methods, similar to other pieces of field research. Considering the research methods did not have particular features compared to other research, another focus point in this POE research would be those purposes, solving the three research questions about the multifunctional market buildings. After figuring out the elements of POE research applied in research, the advantages and disadvantages of using it could be concluded as the reasons and attentions for applying POE research in this research of the mode of multifunctional market building in Macau. The advantage would be the qualitative method to measure human behaviours and psychological activities, describing a big picture of the mode of multifunctional market building in Macau different from the physical aspects; the disadvantages were also obvious, requiring enough time and sources to get detailed data and results, especially for more accurate ones, usually, these elements were largely related with ages and culture. The details of the POE research would be introduced in the following research design sections, such as how to conduct the research POE research.

5.3.2 Design of the case study

In the previous discussion, the design of the case study in this research is divided into three steps, two

steps are used to collect information from the markets of the mode of multifunctional food markets, and one step is designed to analyse the data transferred from the information. Due to the multiple case studies in this research, in step two, the process of case study would be applied more than once, but the details would be changed depending on the difference between each market. The whole process of the case study is shown in Figure 10.

In Step one, a general questionnaire would be made to gather basic information about markets from the public in Macau, this step is designed to get people's brief idea about the markets of Macau, in order to figure out the direction of further field research work in each market. Considering the type of information and result is words describing the images of markets in different people's minds, the questionnaire is better than other gathering information methods, to make basic information more complete and correct, a few interviews would also be made to improve the basic information database, exploring different attitudes towards the market as an urban function. Some interviews would be designed for other elements in the market system in step one, getting the information from vendors and authorities, to explain the theory of the market system discussed in this research, as well as improving the learning of the history of market development in Macau.

In Step two, a small pilot study is designed before the detailed field research is taken place, this small pilot study process consists of a short questionnaire working as a post-occupancy evaluation for each case, different from the questionnaire in step one, the participants and result expectations are not in the same. The participants in step one are the general public in Macau whether they use markets or not, no matter who they are, but in step two, the targets of the short questionnaire are designed for users of each market, the pilot study is made to test whether the questionnaire system for POE research would work in the current situation. the result of the pilot questionnaire is to improve the basic database, establishing an individual data system for each market according to users and the market itself. Combing the result of step one and the pilot study, the POE research would be taken place in step two to gather information on people's attitudes towards those multifunctional food markets, at the same time, some questions would be designed to understand the relationships between experience and functions in user's aspect. The participants of the POE research are also the users of each market building, most of them use the function of the market, but some parts of the targets are users of other functions in market buildings, such as sports or libraries. The information collected in POE research would be handled and transferred into the result database. This process of POE research would be applied in each market four times, the same thing happened to the pilot study, and the result would be separately analysed.

Step three is an analysing process, after the field research process for collecting information, these words, numbers or images from questionnaires and interviews would be handled separately as well as together. No special research method would be applied in this step to handle the data and descriptions and contracts would be made to present the situation of the mode of multifunctional food markets in Macau and the theory about the market system, the problems and results found in step three would be discussions in following chapters to give suggestions and lessons in this research.

But depending on the irresistible sudden changes in field research during the pandemic and considering the uncertain current situations of multifunctional market buildings exclude physical aspects, the research plan which was actually carried out during the field research process was different from the original one, a new questionnaire about five senses in learning multifunctional market buildings was added to the implemented plan to replace the pilot study in step 2 (Figure 11). In the previous original plan, the field research methods more focused on gathering information about the physical conditions of the four multifunctional market buildings and user satisfaction with the mode of the multifunctional market building, on the other hand, the process of how people interact with markets could hardly be acknowledged though the original plan. So, to solve this disadvantage, sensory cognition research on the five senses of human beings in learning market activities was put in step 2 before the POE research to

gather information about how people interact with multifunctional market buildings through physical elements and the pilot study which was aimed at getting information of the current situation of multifunctional market buildings was arranged in the step 1 process combined with questionnaire 1 which was aimed at knowing residents' attitude toward markets.

As a result, the field research in this thesis was conducted through three questionnaires and several interviews, questionnaires were used to gather massive data from participants about their attitudes to several aspects including market, market activities and multifunction market buildings etc.; interviews were aimed to get individual detailed information around certain topics such as favourite elements and reasons to certain choices; the observation methods were used to abstract important statistical aspects of physical conditions of multifunctional market buildings. Depending on these data, the advantages and disadvantages of the mode of multifunctional market building could be analysed and concluded in step 3, completing the process of the field research in this thesis.

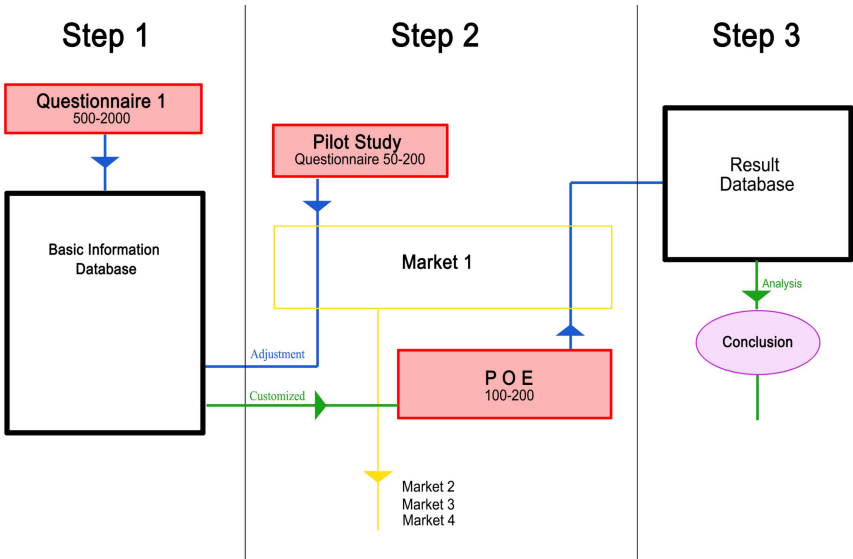


Figure 10. The original plan of field research in this thesis

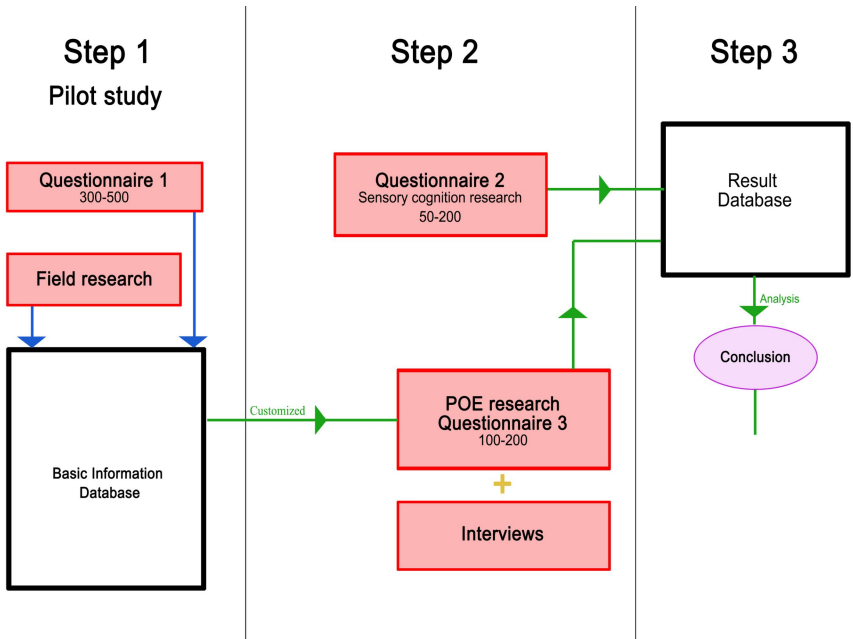


Figure 11. Implemented plan of field research in this thesis

5.4 Conclusion

In this chapter, the main tasks discussed were mainly around three topics: 1. Research on different research methods; 2. The research methods suitable for this thesis; 3. The design of field research in this thesis. There were some research methods that had already been used in previous research, such as history review and research paper review, therefore, the major portion of the research was on how to plan and conduct the field research depending on the research questions raised in the first chapter. Among those research aims and objectives, the most important three ones related to the field research were 'What is the mode of multifunctional market building', 'How does the mode of multifunctional market building work', and 'How was the mode of multifunctional market building in Macau'.

According to the research questions, the data need to be collected includes the following aspects: previous research on the market, history information about the market and multifunctional market buildings in Macau, the current situation of multifunctional market buildings in Macau and future expectations of the mode of the multifunctional market building, while the previous two were completed in previous chapters, the last two largely relied on the field research. The situations and future expectations require more data from users and real physical conditions, as a result, the field research was adopted other than the history research and research review in the following research plan to gather related information. Through the discussion between different research methods including observations and questionnaires, both the quantitative and qualitative research methods should be used in the research to gather and handle different elements of the mode of multifunction market buildings.

Considering the research aims and objectives, the case study research was the only suitable research plan for this thesis, the mode of multifunctional market building was a special kind of multifunctional market found with characters in Hongkong and Macau, and the cases related to this topic were limited, so using case study could describe the big picture of the mode of the multifunctional market building and explain the questions around the phenomenon of market. The cases selected in this thesis were the four multifunctional market buildings in Macau including Yingdi market, Shalitou market, Xiahuan market, and Youhan market. In previous research, Taishan market was one of the multifunctional market buildings in Macau, but during the pilot research, the current Taishan market was changed to a normal grocery market, and the multifunction space was closed and planned for other uses, according to the current situation of Taishan market, it was not considered as one of the cases in the field research. The four cases were the major objectives of the field research, but in the other parts, some cases about the market with multifunctional space were also chosen in short discussions.

The information on multifunctional market buildings has two aspects, physical conditions and subjective feelings from users, therefore, apart from research methods which record and analyse such as observation and photographs, some research methods were also used to get the options from residents in Macau and quantify them to explain the situation of the mode of the multifunctional market building. The research methods discussed in the first part of the chapter were only tools for field research, the ideas and concept of the research plan differed between different research theories. Due to research on the subjective feelings of users of multifunctional market buildings, POE research and sensory cognition were two selected theories to handle this kind of field research, mainly to deal with users' options and ideas, especially situations long after the buildings were built.

With these research methods and theories decided, the research plan of field research was divided into three steps. The first step was a piece of pilot research including some observation activities, a questionnaire about users' options around multifunctional market buildings, and a questionnaire focusing

on the phenomenon of the five senses in activities that happened in markets. This part was intended to get brief ideas about how people used markets and multifunction market buildings in Macau and which senses mattered; the second step was the most important part of the field research, the POE research on the four cases selected for the case study, focusing on gather the information about how people use market function and other functions in the multifunctional market buildings, trying to figure out how the mode of the multifunctional market building worked and how was the mode of the multifunctional market building, giving some brief conclusions comparing with other designs of markets; the third step was handling data and making the conclusion of the mode of the multifunctional market building, explaining the phenomenon and giving some suggestions for future designs around markets.

Chapter 6 PILOT STUDY OF CASE STUDIES

This chapter will continue to explain the process of the field research in this thesis and discuss the analysis and results of the field research. The field research includes a piece of pilot research, a piece of sensory research, and a piece of POE research to gather information and form the database. Some conclusions on the mode of multifunction market building in Macau are made based on the database and the analysis.

The pilot study of this research includes two aspects, one is a survey about the general ideas of multifunctional markets and other markets in the mind of Macao residents. In this survey, the targeted group only concentrates on normal residents, regardless of their ages, jobs and cultural backgrounds. The results of the survey could give basic information about how people think and use markets in Macao, such as advantages and transportation methods, related information would be used in further field research questionnaires or interviews.

The other pilot study is a field investigation of the current situations of selected cases in this research, including four multifunctional markets in Macao. In this part of field research, taking photos and observation are used, no questionnaires or interviews are applied in this process of field research. This pilot study collects information about the structures and designs of each multifunctional market, at the same time having a general knowledge of how current situations of different markets, such as rates of vacancy rates and popularities of different functions.

From these two pilot studies, the general situations of these four multifunctional markets are much better than markets facing closing, especially the wet market function part in the multifunctional market mode. There are regular customers buying food from these markets, but they are from a limited group of societies and highly relied on the convenience of markets. The multifunctional markets mode seems to be unable to improve the situations of markets, although some other functions of markets work very well and have many users, such as libraries or sports fields, the numbers of users in markets are not influenced by those functions. The detailed results of the pilot studies will be discussed separately in the following sections,

6.1 General situation

The survey on Macao residents about the general ideas or images of multifunctional markets in Macao used questionnaires to gather information, the targeted groups of questionnaires were normal Macao residents. Due to the questionnaires being carried out online and shared through social applications or mediums, the respondents may not include the following kinds of Macao residents: the old and children who were not able to access the questionnaires, and those who did not speak Mandarin or English (Although the main languages in Macao are Cantonese and Portuguese, the number of people who could not read either Mandarin or English is relatively low because the general education of Mandarin and English in Macao.). These limitations of questionnaires did not affect the results of the information, the survey still could give how people think of the multifunctional markets in Macao through behaviours and feelings.

Among the 300 questionnaires, there were lower than 5 per cent portions having problems with certain answers, and most of the questionnaires were valid. When asked whether you have ever gone to market buildings, 57.9% of people answered yes, the rest 42.1%, 15.8% answered no but they would go shopping in other regular markets, not the multifunctional markets, and there were 26.3% of respondents didn't go to any markets (Table 14). About the distance away from the market buildings, there were three methods when residents tried to go to the nearest market buildings, most of the respondents lived near the market buildings, and they thought a five minutes' walk would reach the markets, this answer took up one-fourth of the whole answers, there were also some people who could go to nearest markets on foot within no more than 15 minutes. But there was also someone who lived quite far away from the market buildings, some needed 15 minutes' car driving, some required 10 minutes' taking buses and further another 6 minutes walking to arrive the places.

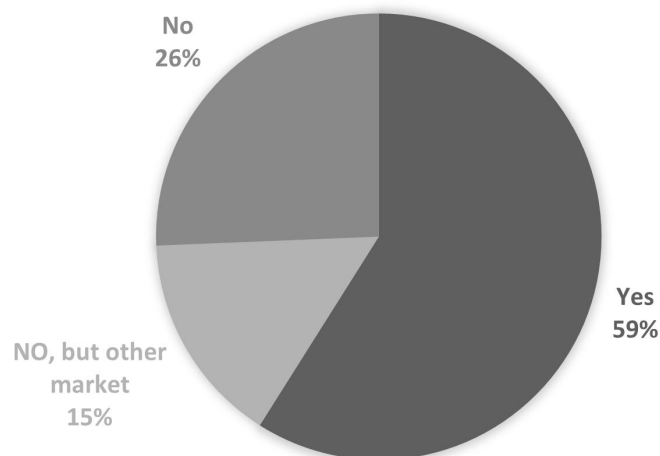


Table 14. The results of whether people would go to markets

In these valid questionnaires who answered “Yes”, female respondents consist of 40.9%, and the number of male residents is just a little bit larger, this showed a quite different image with most females undertaking housework such as cooking and buying. Regarding the cultural background of these respondents, most of them were native residents of Macao, taking up 81.8% of all, the second highest was from the Guangdong province. Regarding the ages of residents in this pilot research, most answers fell in the range from 19-60 years old, this represented the previously mentioned limitation about respondent groups in this survey, the number of respondents aged 26-35 was the highest, the two answers which from 36-40 years old and from 41-60 years old were the second and third places (Table 15). the residents aged 25-60 had sufficient economic strength and could represent a large portion of residents' images of multifunctional markets. These are the basic information of the respondents of this questionnaire, the results of genders and ages could meet the balance according to the reality in Macau.

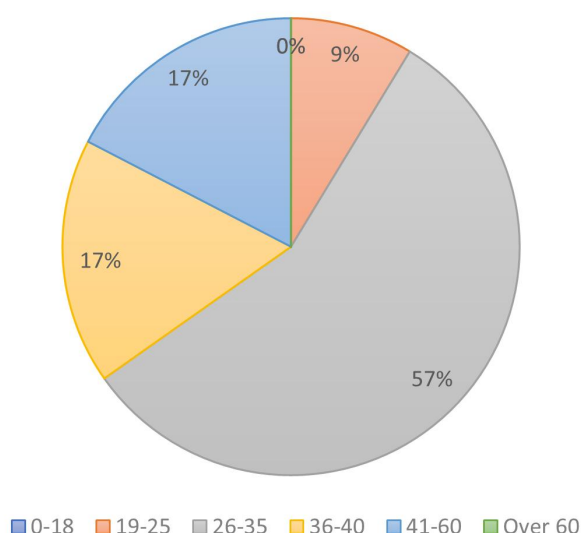


Table 15. The ages of participants in Questionnaire 1

The rest questions in this questionnaire aimed to show residents' patterns and their feelings about multifunctional building markets, in this part, many depend on personal situations and feelings.

In the question about the frequency of going to the market buildings in a week, the most raised answer is once a week, this result was hard to match with the main function of multifunctional market buildings which is providing daily products and fresh materials. On the other hand, there are two other extreme answers, some residents went to market buildings several times a week and some did it once a month, these two answers together almost occupy a third of the result. The highest frequency of going to market buildings among these answers is five times once a week, which represents a small number of people who still treat market buildings as the main food sources.

Apart from the frequency, the questionnaire also asked about the time of day when respondents go to market buildings. Although there are no outstanding answers that could take up over a quarter of the answers, over half of the residents chose to go shopping in market buildings in the afternoon, including some people who went there in the near evening. There are some special answers, these people tended to go to market buildings both in the morning and afternoon, but the number of respondents is no more than 10%.

There are five selected cases in this case study research, which are the Yingdi market, Xiahuan market, Youhan market, Shalitou market and Taishan market. Although the Taishan market returned to a normal market due to the new development, it still could be a multifunctional market building in residents' minds, so it was also an option in this questionnaire about multifunctional market buildings. Among these five markets, more respondents went to the Youhan market for shopping, which had 45.4% of the answers, and the Yingdi market 40.9% of residents' choices which was the second place (Table 16). Considering many respondents could go to more than one market as their main choice, so this question is a multiple choice, even though only 18.2% of the participants raised the Taishan market as their main choice, this could be a reason why the Taishan market needed new development.

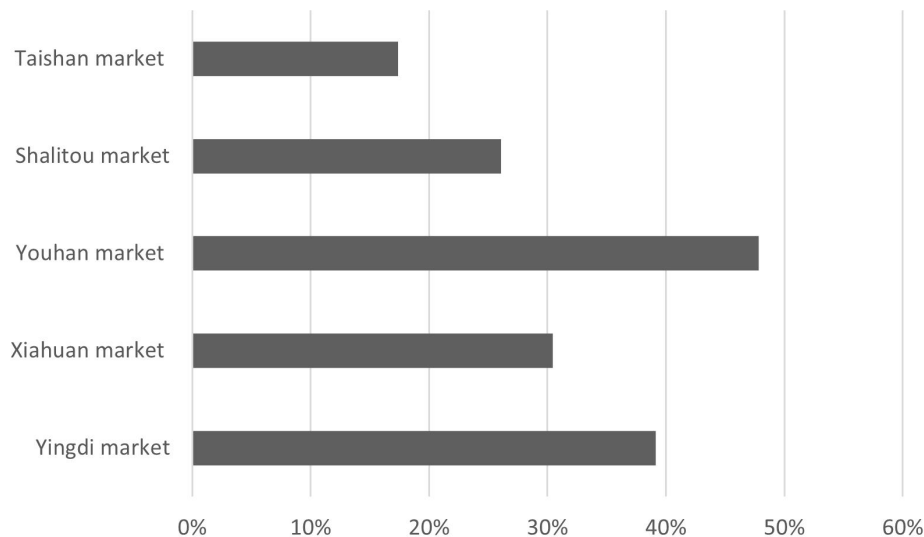


Table 16. Which multifunctional market buildings did the participant use most

The previous questions are about the general patterns of respondents, representing how and where they went shopping in market buildings. The following questions aim to tell the subjective personal feeling about how they felt when shopping in market buildings and receiving related services and rely on keywords to express the ideas.

About which part of market building is more important, 60.8% of respondents choose the good design of functions over the experience of shopping. In another two-choice question, it is surprising to see about

60.8% of participants use the other municipal services in multifunctional market buildings, the same number in the last question (Figure 17). It could be the reason why people prefer good functions and use other municipal services in the multifunctional market buildings. When asked whether markets were necessary to daily lives and how did the government do in operating markets, 84.2% of people thought markets were still important in daily and over 81.6% the answers said they were satisfied with the jobs that the Institute for Municipal Affairs of Macau did in operating multifunctional market buildings. These show residents in Macau were relatively content with the situations of markets and market buildings, they might have low requirements on roles of markets in daily lives, which would be detailed indicated in other questions.

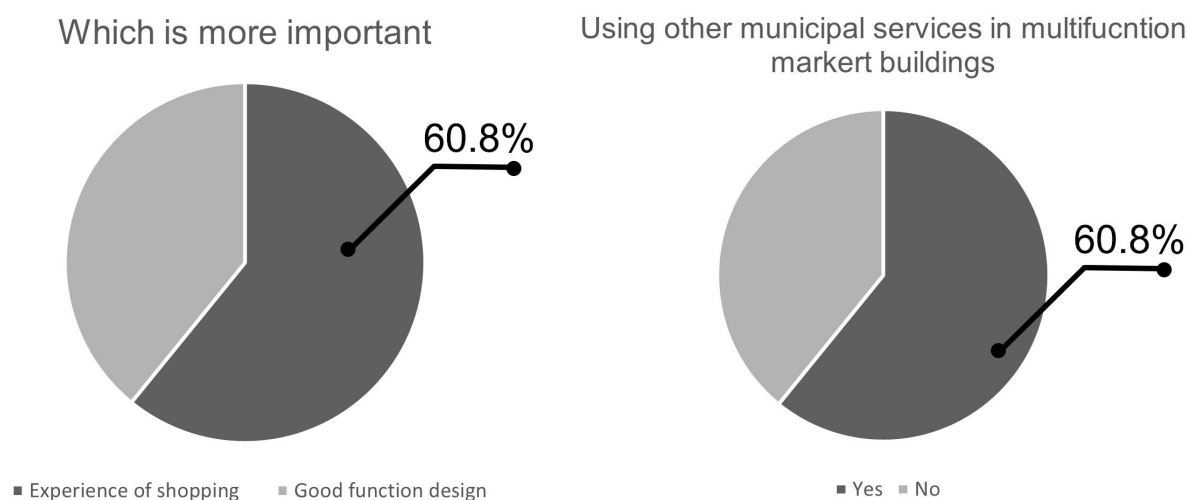


Table 17. The results of participants' attitudes to experience in shopping and functions in multifunctional market buildings

In the question about the most attractive point of market buildings, respondents gave the following answers: freshness, variety of choices, low prices, native culture, convenience, and other personal reasons (Table 18). Among these reasons, "Freshness" obviously is the favourite choice which 43.6% of the participants picked up, while the low price in market buildings is the second selected reason to go shopping in market buildings, it takes up 15.38% in the whole portion. Despite these general answers to the question, there is a special answer raised by respondents, they thought there was no attractive point of market buildings, this group made up 10.26% of the whole database, which is the third place in this question. Although only chosen by a few people, the answer said the most attractive point in the market building was the native culture which people tended to use Cantonese, special weights and measures, this indicates that there are still some residents who prefer the cultural features of markets to the normalized mode of trading, enjoying the feelings of local cultures not only through food but also by interactions.

In advanced problems based on the previous one, the question asked the respondents which aspects of market buildings in Macau most needed to be improved, there were no default answers and people provided them depending on personal experience. Although there are many different ideas or conflicts about the design and services of market buildings, the main problem people focused on is the environmental problems which successive governments considered the most as well. For some people, the environment of markets is not sanitation enough, and they would be afraid of disease or unhealthy, especially after the pandemic. Some others thought that the facilities of the market buildings were not fully qualified, such as lacking parking lots. The respondents who were not satisfied with the environmental problems took up 66.25% of the whole questionnaire, among these residents nearly half of the answers said the parking system of the market buildings needed to be regenerated, increasing the

number of parking lots and the parking instructions as well as signs. Apart from environmental improvement, few people focus on other aspects, such as disabled accessibility and units of measure, lording process as well. Although these aspects were not as attract attention as the environmental problems, they were as important as the improvement of the environment, the government has already considered these problems to be settled in future policies and planning. There are 10.6% of the answers indicated that there was nothing that needed to be improved in these market buildings, only representing a small part of residents in Macau satisfied with the current situation of market buildings.

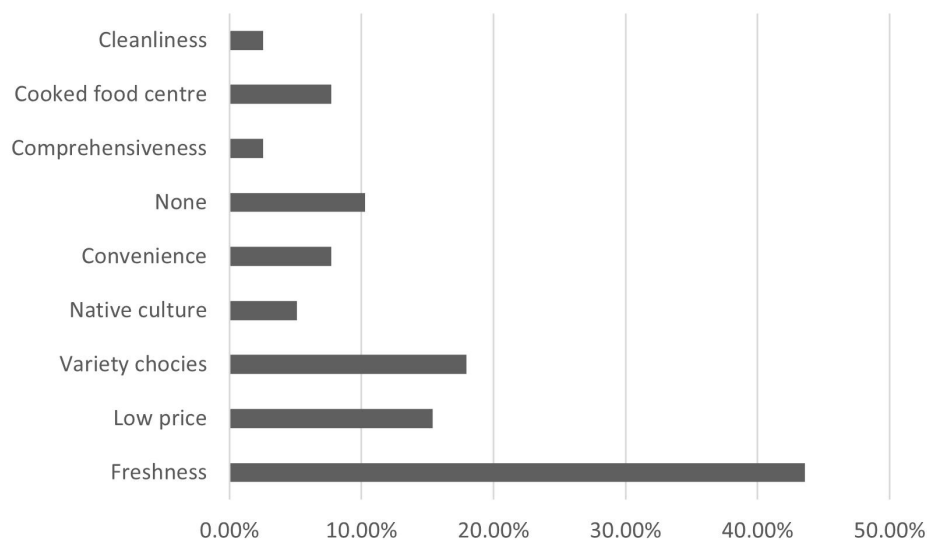


Table 18. The results of attractive points of multifunctional market buildings

The previous two questions are around the market buildings themselves, focusing on architectural aspects of market buildings, there is a question in this questionnaire asking respondents' attitudes toward the relationships between market buildings and daily lives, in other words, figuring out the benefits of market buildings in daily lives in Macau. Many people put "more choices" at the top of the reason list (Table 19), 27.27% of the answers selected this answer. The answer "convenience" was raised by 18.18% of the residents who received this questionnaire, which is the third welcomed benefit that people care about. As expected, the second widely selected benefit people considered is "freshness", which occupied 24.24% of the whole answer database. Different from the results of other questions, 12.12% of the respondents thought that providing job opportunities and starting their own business are also important benefits provided by market buildings, this answer ranks fourth on the answer list. Considering these wide-picked answers: more choices, freshness, convenience, and job opportunities, these benefits raised by the respondents substantiated the general benefits of markets discussed in previous chapters about theories and research reviews. There were few people mentioning the low price and sanitation safety of the market buildings, the numbers of answers were quite different from the results of previous questions, while many respondents chose the low price as an attractive point of market buildings and thought sanitation was a big problem. This phenomenon showed there were some other functions in the city that could provide benefits of low prices for residents, and the market buildings ruled by the government could give a sense of sanitation safety, compared with other food retail modes or methods, this could substantiate the theory about the ability of supervisor element which has already been discussed in the previous section of the supervisor element in the system of markets.

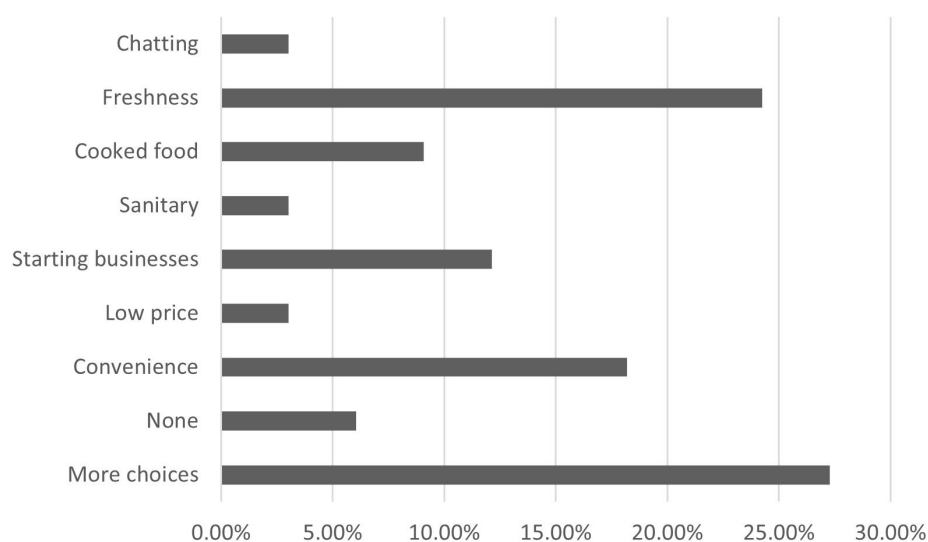


Table 19. Attitudes of participants to benefits of market buildings in Macau

At the end of this pilot questionnaire, there is one more question asking respondents about the advice of multifunctional market buildings in Macao, without given choices, there were no most selected ones in this field, but answers could be concluded in several aspects. One aspect is the design of the market buildings, due to the recent news of market regeneration projects, many people intended to improve the design of markets, according to those new projects of markets around the world. In their answers, they tried to connect markets with words such as fashion or modern, this showed what may attract people through the view of customers. Some residents thought more parking space and resting space could be useful in market buildings, this kind of improvement may bring more customers to use the market buildings. Some others focused on price problems and service aspects, this kind of answer was raised by small amounts of respondents, while a number of people did not give any advice about the topics.

Though this questionnaire is pilot research of the general idea of multifunctional market buildings in Macau, there are some simple conclusions that could be made through POE aspects. Some benefits of markets discussed in previous theory and research review parts could be found in these substances. Residents could feel the effects of markets in starting a business and providing jobs which are important benefits to the local economic system, and most people go shopping in market buildings related to low prices and fresh food. Although the market building is not the perfect municipal function for daily life, people still think markets and market buildings are necessary public functions in urban space, largely due to the more choices and freshness. Regarding the conditions of these market buildings, most people who went shopping in market buildings indicated that they prefer markets within 5 to 15 minutes walking distance, and they tended to use market buildings once a week, this may result in less and less usage of market functions.

According to the results of the questionnaires, people did not put much attention to the vendors aspect, they seldom raise requirements or complain about vendors' affairs, while blaming much on the responsibility of supervisor elements, for example, respondents considered unsanitary a great problem in the market buildings, but they still trust the products from vendors while asking governments to keep the environment clean. This may represent that customers might have a deeper subconscious of the supervisor element of the system of markets more than general ideas, on the other hand, only a few people mentioned they enjoyed interacting with vendors and loved to share cooking ideas with them. Based on this result, further research of markets could focus on the roles of vendor elements in the system of markets and use vendor elements as a medium to connect the supervisor element and customer

element. It is interesting to see another result showing that people prefer fine functions to the experience of shopping in market buildings, while some of them advised more fashion and modern styles of decoration to increase the shopping experience. In further research, the attitudes of customers need to be more detailed and investigated to show the process of change. At the same time, the other functions of multifunctional market buildings were not involved in this questionnaire, which would be an important point in following field research. Overall, multifunctional market buildings serve as a low-price and fresh food retail function in urban space, in the view of residents of Macau, this mode of the market also could be a source of jobs and small businesses. In the second step of field research, interviews and questionnaires will focus on three aspects:

1. How people use the other functions in the multifunctional market buildings.
2. How the supervisor element affects the whole system.
3. How detailed customers' ideas of operation of multifunctional market buildings.

6.2 Yingdi market

6.2.1 Location

Yingdi market is located in the Datang district (Freguesia da Sé) (Figure 12), near the front space of the town hall (Largo do Senado), connecting some important tourist destinations and municipal services, such as the Ruins of Saint Paul's and Institute for Municipal Affairs (Leal Senado Building).

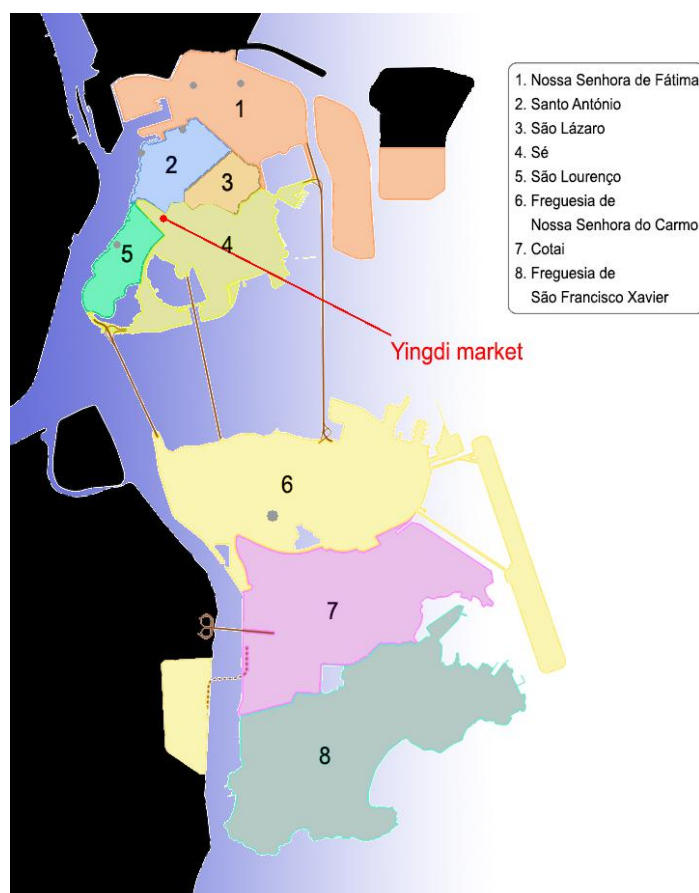


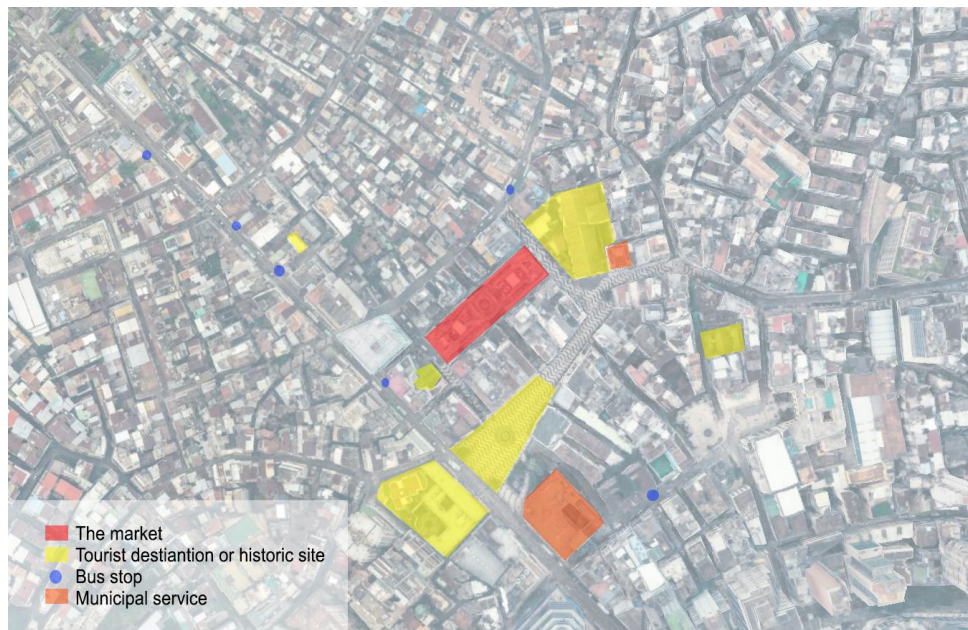
Figure 12. The location of Yingdi market

Yingdi market used to serve the residents living in surrounding areas, especially in the north and the west. After the development of tourism, a part of the surrounding space was regenerated for tourism purposes, and many shops and restaurants are serving and selling goods only attracting tourists, as a result, the customers of Yingdi market has decreased. At present, the customers of the Yingdi market normally come from the living area in the north of the market or estates outside of tourist areas.

Due to the location of the market, which used to be the centre of Macau (that's why sometimes Yingdi market was also called the centre market), the transportation condition of the market is still quite fine for the customers. There are many bus stops on the New Avenue (Avenida de Almeida Ribeiro), so customers just need a few minutes to get to the markets by bus.

About the surrounding facilities aspect, there are some municipal services like a mail station, a library and a small police station, compared with other multifunctional market buildings, which lack complementary facilities and public space. Despite serving tourists, the surrounding space also is filled with functions for foreign employees and civilians, such as international banks and low-price shops.

Being in the centre of a famous tourist destination gives the market a convenient transportation system, but on the other hand, being surrounded by tourism functions declines the features for citizens. Lacking surrounding facilities and public space is one problem, the conflict between tourist-oriented and resident oriented is the other one this market is facing, which may not be so obvious (Figure 13).

**Figure 13. The geographical conditions of the Yingdi market**

6.2.2 Layouts

The layout is a regular rectangle, heading from northeast to southwest. There are three entrances on the ground floor, one is on the northeast side of the building which mainly serves the customers, one is in the middle of the long side of the building which used to be a street connecting the north living areas with the south public areas, the third one is on the southwest of the building which serves for the vendors and

supervisors.

The layout of the ground floor is different from other floors, because of the street function crossing in the middle, but it determines the layout of the main functions (Figure 14). The main public facilities including elevators, stairs and restrooms are on the two ends of the building, working for both customers and vendors. The escalators are located in the middle of the long side of the building, the same place where the street function entrance is, this makes the trading space of the market separated into two parts, while public facilities which serve as vertical traffic function on both sides of the trading areas. The space for the traffic flow of customers works as a circle in the middle of the layout plan, with stalls of vendors on each side of the traffic flow space, this kind of layout plan doesn't change whether the functions of the floor are, even on the floor for the cooked food market.

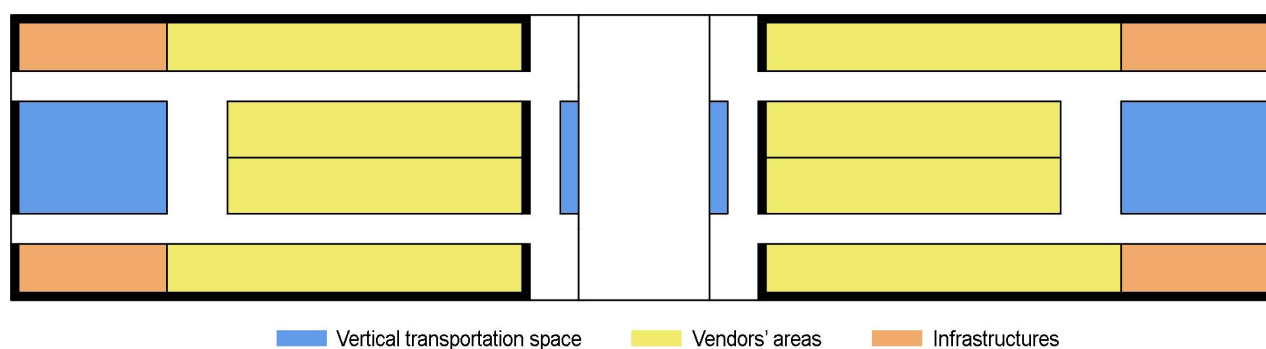


Figure 14. General ground floor layout plan of Yingdi market

Although the layout of the floor plan has enough space for a public function, the design of the building still did not include a rest area for customers. In the middle of the building where the escalators are, there is space that could be fine designed for public interaction, the supervisor of the market insisted fill the space with stalls and simple construction just for sitting. The design of putting the vertical traffic function space next to the entrance may seem to be convenient for customers and vendors, but it also decreases the chance of customers patronizing the stalls or the floor they are not intended to go to, leading to some positions in the market become unsuitable for vendors.

Wet markets and some groceries selling eggs or flowers are located on the ground floor (Figure 15), these vendors of the wet market mainly sell seafood or river fresh food, using lots of water in keeping animals alive and washing the food, so the environmental problems of the market largely are related with wet markets. The butchers and meat vendors are on the first floor, selling pork and beef on one side while selling birds on the other, due to the system of the butcher in Macau, most of the meat vendors get fresh chopped meat parts from meat factories, so these meat stalls in markets are quite cleaner than butchers and general meat vendors, but the smells of the vendors still cannot be avoided. The vegetable vendors are settled on the second floor, these stalls are not easy to access customers through both physical contact and eye contact. The cooked food market is on the third floor, and only a part of the floor is used for this function, while the kind of customers of the cooked food market is different from other customers, people who want to have meals in cooked food stalls usually don't have to spend time in other markets because their priorities have already settled. The design of the floors works well for good markets, but overall, it is not suitable for other functions, especially market functions which need easy access. This kind of design of multifunctional market building shows the opinions of the supervisor of the market, and the government, keeping environmental problems inside and making management simple are at the top of the demands, as a result, some needs of vendors and customers are ignored in the design.



Figure 15. Wet markets on the ground floor of Yingdi market

As discussed in previous sections, the space order of the market shows the ideas of the process of trading in the supervisor's mind, as well as in the designer's mind which also works as a part of the supervisor element. In the Yingdi market, the space order operates as follows: entrance, directly to vertical traffic space, and linking to different functions floor, ending in particular stalls (Figure 16). This kind of process may work for strong purpose functions, not for market functions, having conflict with the principles of shopping, there is also no place for public interaction functions.

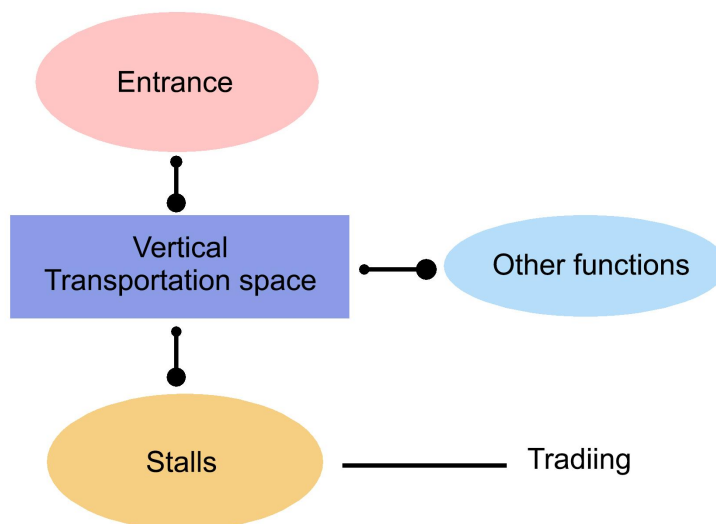


Figure 16. Spatial order of functions in the Yingdi market

6.2.3 Usage rate

Floor	Function	Facility	N1	N2	P.
Ground	Wet market, Grocery	Elevators, Restrooms	40	39	100%
First	Meat market	Elevators, Restrooms	40	26	50%
Second	Vegetable market	Elevators, Restrooms	60	14	20%
Third	Cooked Food Centre	Elevators, Restrooms	20	20	100%
Forth	Activity Rooms	Elevators, Restrooms	7	Depend	Depend

Table 20. Usage rates of stalls in the Yingdi market¹⁷

The vendors' stalls in the Yingdi market are designed by the government at the same time when deciding the design of the market, then offer to the legal vendors with supporting facilities, such as a water supply system and air circulation system. The basic space of the stalls in the market function is decorated in the same mode regardless of the different functions which vendors want to use or apply. According to the estimate, the space of a basic stall is a triangle which is 2.5m in width and 2.7m in depth when facing the passageways to the customers (Figure 17), adding the width of the structures, it may be a 3mX3m square space. Some vendors are permitted to combine several spaces of stalls to become big stalls, and most are limited to one unit. The side of the stall facing the customer has tables and cabinets to display goods, these facilities are different depending on the vendors, some vendors in the wet market tend to use large fish tanks to show the fresh aquatic products. On the top of the façade, there is a lighting system and information boards like signboards and prices, the style of signboards and information boards are prepared by the vendors themselves, it provides a chance for them to present their individuality (Figure 18), during the observation, not many vendors care about this part, maybe because the space is above the lighting system and higher than normal perspective which customers are not easy to notice when they are lowering their heads for the goods on the tables under the high brightness lighting systems. On the ground of the façade of a stall, there is a covered drainage ditch to drain away water from the passageways and stalls, this helps to prevent wet ground situations related to water and blood, on the other hand, it also encourages vendors to use water around the display area in the façade which leads to the dirty environment and the possibility of accidents. The water supply system is on the deep side of the stall, opposite the façade, vendors normally store their items and handle the food ingredients in that space. There are high windows for stalls along the walls of the market building, but vendors and supervisors prefer electronic systems to natural circulation. The stalls in Yingdi market are all designed in this kind of layout, even the stalls in the cooked food centre are in the same arrangement, except for adding some facilities for cooking.

According to the field research, the usage rate of the market function is at a relatively low level, compared to other multifunctional market buildings, especially after the pandemic. The wet market which is on the ground floor is the easiest access market function in Yingdi market, there are still some empty stalls without any vendor applied, this phenomenon is hard to find in other markets where the usage rate of the wet market is almost 100%. Not to mention the meat market and vegetable market function on the first floor and the second floor, the usage rates are even lower with the increase of the level. The level of the market function might influence the difficulty of customers getting access to the stalls, but the question of whether the level of the market itself could directly affect the behaviours of the customers or not could be studied in further research. With deeper research, most of the empty stalls are always located on the end

¹⁷ N1: number of stalls or rooms provided; N2: number of stalls or rooms occupied; P: percentage of occupied rate. The actual occupied rate depends on different occasions, this table only show the situation during the field research. The data of this table relied on the situations during gathering the information, the situations of markets varied according to different time periods, especially after the pandemic.

of the side of the market, while the vendors close to the middle escalator have a better business condition (Figure 19), this indicates customers prefer using escalators to elevators which may owe to the location of the escalator and the strip shape arrangement of the layout isn't friendly to all stalls.

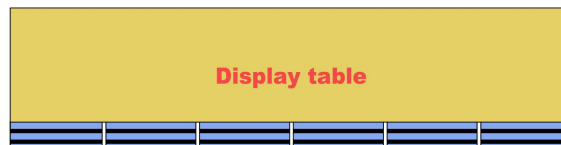


Figure 17. Plan of a basic stall

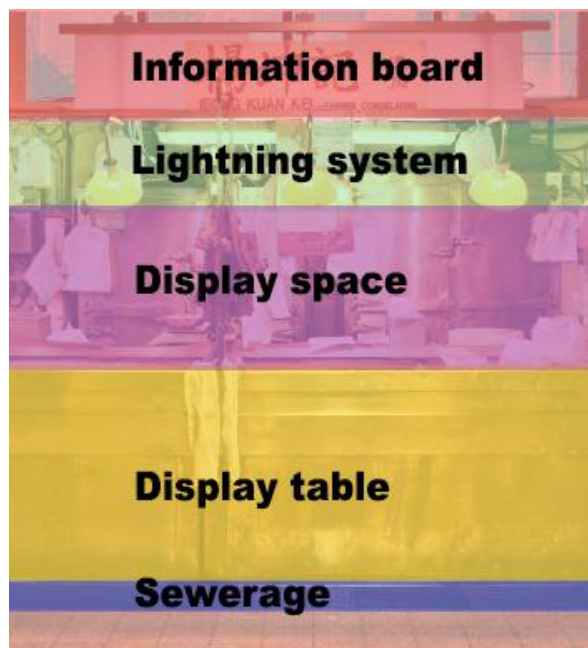


Figure 18. Façade of a basic stall

The usage rate of the cooked food centre is much better than the vegetable market function, this may relate to the irreplaceable experience they provide, some vendors' dishes are so famous that documentaries and promotional films took them as cases to present characters of Macau.



Figure 19. Conditions of empty stalls

6.3 Shalitou market

6.3.1 Location

The Shalitou market locates in the north part of the main island of Macau, on the coast of the Inner Harbour (Figure 20), due to its location near the water, people used to call it “the water market”, now it still has the largest number of vendors working in the function of the retail wet market in Macau. There is a park named after Luis de Camões who wrote the *Os Lusíadas* which is one of the most important poetries in Portugal, the park also has other historical sites, such as the site of the British East India Company. Now it works as an important leisure space for surroundings residents.

The customers of Shalitou market are from surrounding residential areas. In the south of the market, there are many old urban textures with traditional residential buildings, and in the north of the market, there are many newly built estates and some industrial areas, these places exist plenty of potential customers for the markets. In addition, due to the location of the market, which is just on the cost of the harbour, there are many aquatic product companies that provide fresh aquatic products nearby, and many residents from other parts of Macau would go to the market for fresh products.

The transportation conditions of this market are just fine for customers by cars or motorcycles, due to settling along the coast, most residents need a few minutes to get to their destination, the nearest bus stop is a block away, there is no bus stop on the road where the market is located. Maybe due to this condition, the market provides a number of parking lots for cars and motorcycles, but it is still not convenient for most customers, especially for the old.

There are some municipal facilities in the current surrounding areas, such as a museum and a library, but these facilities are at least a few blocks away from the market, and these functions don't work together,

unable to create an atmosphere or sphere of life for urban daily lives. On the other hand, the surrounding space of the market is occupied by business and industry functions, and many restaurants and companies form an area of economic society, especially along the water bank. Compared to other markets, the Shalitou market lacks a sense of daily life, playing the role of retail function.

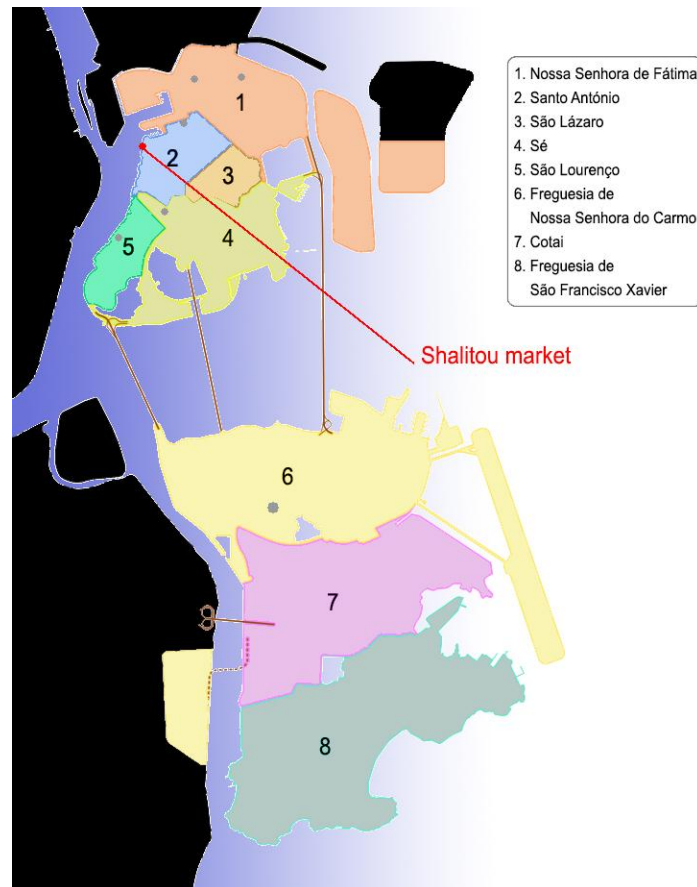


Figure 20. Location of Shalitou market

The advantage of the Shalitou market comes from its location, along the water bank of the Inner Harbour, near the source of fresh aquatic products. The freshness of the product could attract many customers from different parts of Macau, regardless of the distances and transportation. But at the same time, the location of the market also leads to the distance between main residential areas and other helpful municipal services, considering the safety, the market could not be used in certain extreme weather days.

6.3.2 Layouts

Being a multifunctional market building, the Shalitou market combines the following functions: parking lots, a cooked food centre, a meat market, a vegetable market, a wet market and public activity centre. The building was not designed only for the market, it also contains other government departments, and the Shalitou market only occupies a part of it. The shape of the layout of the market could be generalized as a rectangle, with the long side facing the road, laying from nearly north to south (Figure 21). There are two entrances on the long side, which is in the east facing the road, one locates on the south side and works as the main entrance for the pedestrians, it spares a triangle space for the hallway leading to the ground floor and the vertical transportation function which is on the south end of the building. The other entrance is almost in the middle of the long side of the building, but actually on the north end of the market, due to the north part of the building belonging to government departments. This entrance has two functions, one works as the loading and unloading area for vendors and supervisors, including garbage areas and freight elevators; the other one is the entrance for parking lots which locates on the

third to seventh floors.



Figure 21. The geographical conditions of THE Shalitou market

The multifunctional market building has ten floors, but only the ground floor and the first-floor work for market functions, the ground floor has the largest space for the market function. The ground floor is only available for the wet market, in the layout of the ground floor, the space is mainly separated by two aisles (Figure 22). The two passageways go from north to south, dividing the wet market into three parts, one part is a long line of stalls on the west long side of the market, from the north end to the south end of the market, forming a clear visual corridor of the wet market; one part has a small number of stalls standing on the east long side of the market, leaving the remaining stalls in the middle of the space, cut into several sections by a few small passageways connecting the two big passageways from east to west. Due to the location of the vertical transportation space, the space of the stalls is divided into irregular shapes, which may lead to misleading newcomers without obvious direction guides, according to Gestalt theories. The vertical transportation spaces are located on the east long passageway, one is in the middle of a section, and one is on the north end of the market. This also decreases the number of vendors on the east side of the market and cuts down the east-long passageway. As a result, the west long passageway become the main corridor for the customers, leading more people to focus on the west side of the wet market, forming a fixed mode of customers in the market, creating an unbalanced atmosphere of trading between the western part and the east part, this may seem to be unfair to the vendors on the east side, which is substantiated in an actual situation. The other facilities such as restrooms and a weight checking point located on the north end of the wet market. The first floor of the market works as the meat and vegetable market, with the meat market on the west side and the vegetable market on the east side, and grocery stalls on the north side of the market building (Figure 23). The locations of the vertical transportation functions and other facilities are the same as the ground floor. The space of the market is much smaller than the ground floor because of the parking system. The situation becomes even more terrible for the cooked food market, which is on the second floor, while most of the space is occupied by a two-lane helix structure for the parking system, only about one-ninth of the layout is used for the cooked food market, from the current situation of the market, it works no better than nothing (Figure 24).

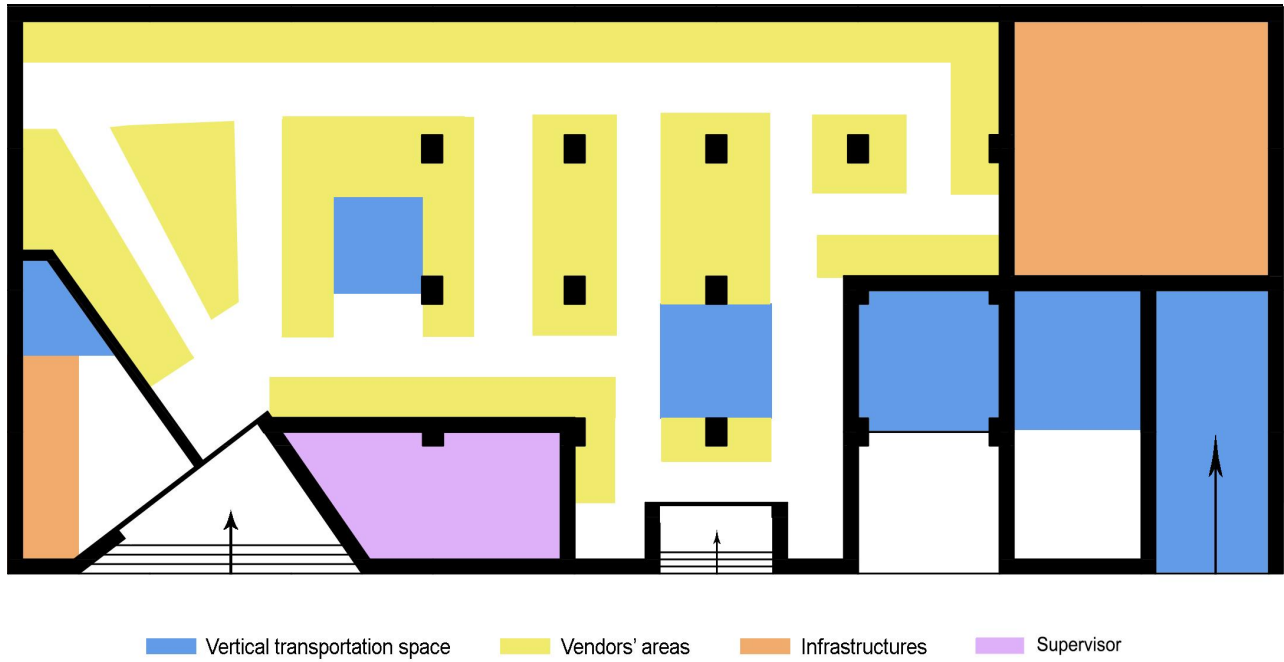


Figure 22. The ground floor layout plan of Shalitou market

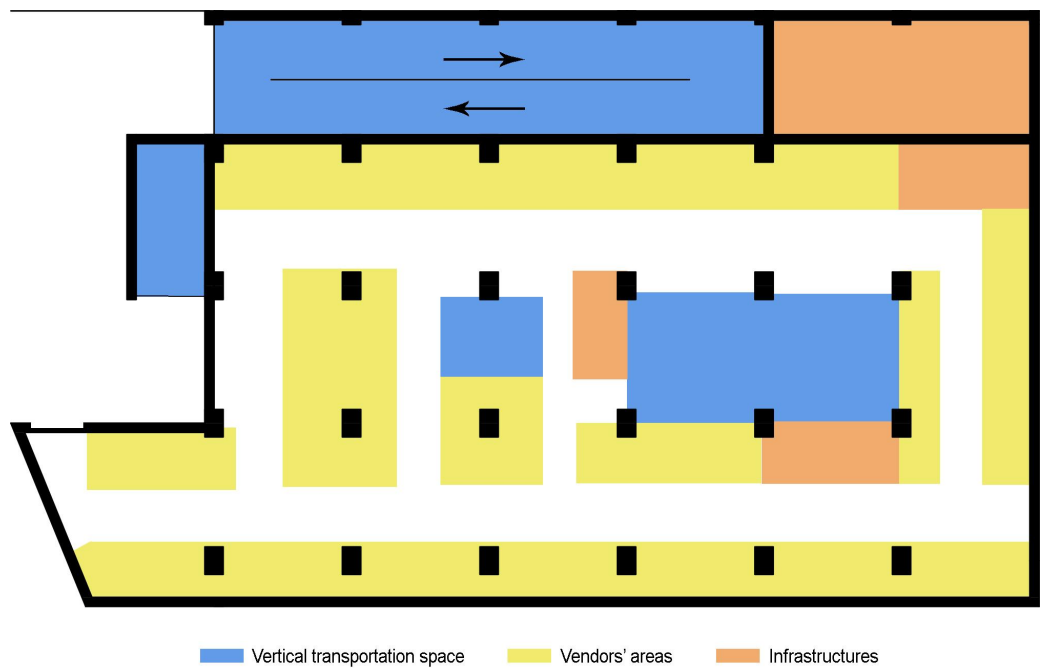


Figure 23. The layout plan of the first floor of Shalitou market

Six floors away from the market functions, the public activity centre locates on the ninth floor of the building, with a great eye view of the landscape of the inner harbour and urban space on the other side of the water bank. The space is separated into three parts, an auditorium, multifunctional rooms and open reading zone. These parts provide reading space, public computers and several amusements for children and adults. It also provides a private room for public activities. It seems to be quite a perfect public municipal space, except for the easy access, while a government museum which also provides the same functions as the library is just a few blocks away from the market, the museum is just a two-floor building and easy access to public transportations.



Figure 24. The current situation of the second floor of Shalitou market

The layout design of the Shalitou market was obviously influenced by the parking system. The parking space occupies five floors of the building, which indeed creates enough parking lots for markets and surrounding areas. On the other hand, the special design of the parking space actually does more harm than good to the market. Due to the two-lane helix structure for in and out of the parking, most of the upper space of the market is useless where the meat market has to mix with the vegetable market, not to mention the awful triangle space of the entrance and the vertical transportation function on the south end of the market building. Is this kind of upper-floor parking design necessary for a market? Definitely not, but for this market, there might be two reasons. One is the location, along the water bank, there is no underground space to use. The other reason is that the parking space is designed for government departments in the building. A parking system locates on the third to the seventh floor of the building separates the market and other functions, this also indicates the vertical transportation function.

The spatial order of this market building is as follows: from entrances to transportation space, then to stalls (Figure 25). The order is simple, showing that the supervisor element put not much attention on the vendors and customers aspects, the point-to-point method is not suitable for not strong purpose function like the market. The most thing it considered was the parking system. The only good one is the flow route of customers it accidentally created on the ground floor, letting customers see more vendors through wandering, but it also creates a disadvantage to the stalls on the east side of the market. The Shalitou market is a government building attached to markets rather than a real multifunctional market building.

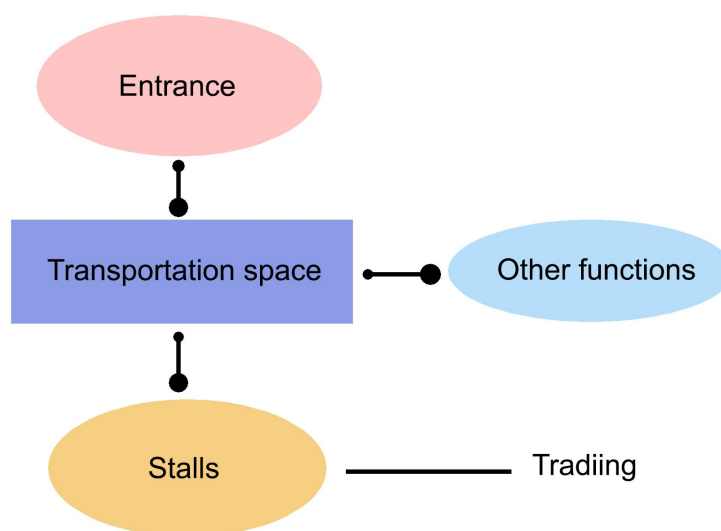


Figure 25. Spatial order of functions in the Shalitou market

6.3.3 Usage rate

Floor	Function	Facility	N1	N2	P.
Ground	Wet market	Elevators, Restrooms	59	59	100%
First	Meat market, Vegetable market	Elevators, Restrooms	57	48	80%
Second	Cooked Food Centre	Elevators, Restrooms	3	3	100%
Third- Seventh	Parking	Elevators	239	Depend	Depend
Ninth	Activity Rooms	Elevators, Restrooms	5	0	0%

Table 21. The usage rates of stalls in the Shalitou market¹⁸

The stalls vary depending on the location in the space, due to the irregular shape and design of the market, in the majority, there are six types of stalls divided by the coverage area of the stalls and the functions. One of the smallest stalls are for vegetable market and groceries, according to estimation, this type of stall is 2.5m in width facing customers and 3m in depth, and the basic facility is only a display table with three different display level (Figure 26), stall for groceries may have some more equipment. There is another type of small stall which is a 2.5mX2.5m square space, this type of stall is offered to vendors who sell frozen meat, the supervisors give no more additional facilities to the vendor, maybe because vendors use their own refrigerators to display goods. The basic types of stalls for other vendors of the meat market who sell fresh meat are much larger, one is a square space with 3m in width and 3m in depth, and the other one is a rectangle space covering a 4mX2.5m area, no matter what shape is the stall, a basic unit for a fresh meet vendor is equipped with a wash basin, a console where vendors deal with the meat and a display table, the wash basin and the console table are usually in the deep of a stall. About the types of stalls for the wet market, there are also two basic units, one is a 2.5X2.5m small square space, and the

¹⁸ N1: number of stalls or rooms provided; N2: number of stalls or rooms occupied; P: percentage of occupied rate. The actual occupied rate depends on different occasions, this table only show the situation during the field research. The data of this table relied on the situations during gathering the information, the situations of markets varied according to different time periods, especially after the pandemic.

other one is a rectangle covering 2.5mX5m area which is twice as much as the previous one, the small unit is provided with a display table and the big one has two which means that the big unit is usually divided into two vendors, there are no other facilities except water system. There are also some special units located in the corners or irregular spaces, these stalls are different sizes of space with the basic types but have advantages in the location, sometimes conversely. According to the layout of the stalls (Figure 27), it is obvious that small size stalls are mostly on the east side of the market which is facing the road, due to the facilities and entrances on the ground, the space on the east side is not easy to arrange, as a result, more small units are used. Although there are so many different types and sizes of stalls, they are not special designs or considered according to the functions, it could be seen that some vegetable vendors pile up their boxes while some meat stalls are quite empty, not to mention the vendors in the wet market which need space for tanks and deal with products.

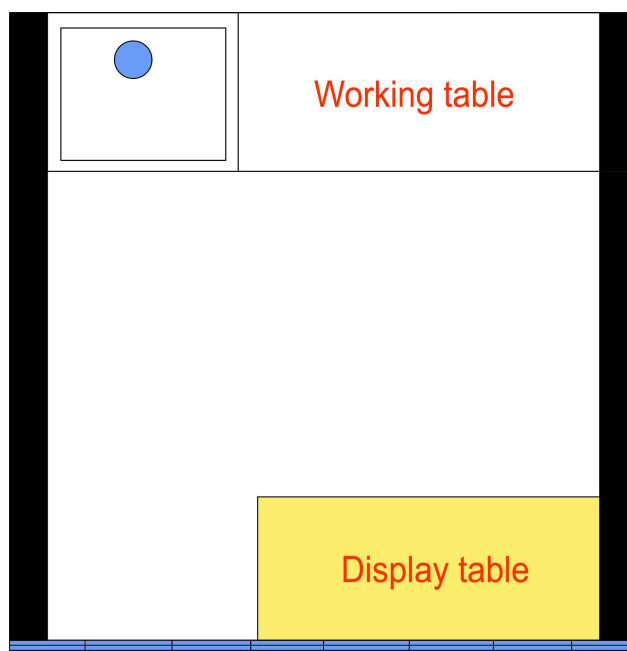


Figure 27. Layout plan of a basic small size stall in Shalitou market

Despite the size, the decorations of the stalls are the same. The façade of a stall could be divided into three parts, the most important one is the middle part between the display table and the information board on the top (Figure 28). The middle part includes the display area and lighting system, it is the space for interactions between the vendors and customers. On top of it is the information board part, mainly presenting information like the name of the stall, prices and licences, sometimes there is a ventilation system above it, while customers could not notice these things when they search for the goods on the display tables. At the bottom of a façade, there is nothing but a ditch, some vendors would store their pieces of equipment under the table.

The usage of stalls in the wet in Shalitou multifunctional market building is at a high level, almost 100% without empty ones, this may owe to the location of the market, near the aquatic products company along the water bank of the harbour, and customers thought they could get the freshest products directly from the fishermen than other parts of Macau. The usage rate of stalls in other market functions don't as high as in the wet market, there is a few empty stalls. During the pilot research, it is obvious that the number of customers in the wet market is much larger than on the first floor, where only a few customers could be found at the same time (Figure 29). The answer to this phenomenon would be asked in individual interviews in further research, whether it is because of the wet market or the unwillingness of going up.

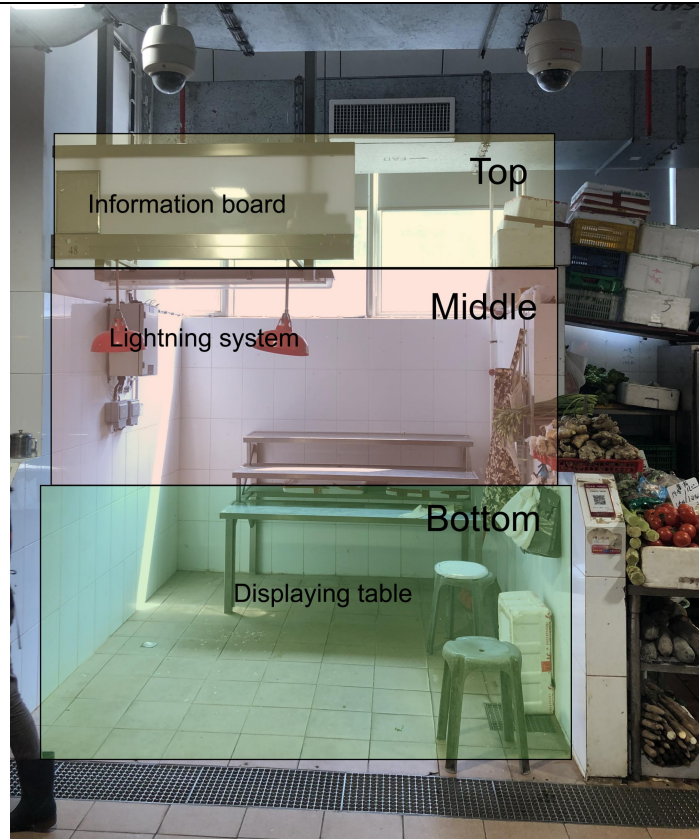


Figure 28. Façade of a basic stall in Shalitou market

The usage rate of the cooked food centre is relatively low, as mentioned in the previous discussion, due to the structure of the parking system and function division, the space spared for the cooked food centre is limited, there are five stalls that could be used for vendors, and the sitting place for eating meals is also not spacious enough (Figure 30). It could hardly be called a qualified cooked food centre without enough vendors and customers, without doubt, there is also no atmosphere for enjoying meals. About the activity centre on the ninth floor, the usage rate is also below the normal level, most of the users are the elderly, according to the observation, it is not very convenient to get to the ninth floor while there is a better place nearby.



Figure 29. Few customers on the first floor of Shalitou market



Figure 30. Sitting space for cooked food centre in Shalitou market

6.4 Xiahuan market

6.4.1 Location

Xiahuan market locates in the Shunfengtang district (district of Freguesia de S . Lourenço), which is generally in the southwest part of the main island of Macau (Figure 31). Being one of the earliest reclamation areas in Macau, Shunfengtang district is a typical area mixed with business and residential, with a variety of urban functions, people could find several famous religious sites and important old municipal buildings, such as the headquarters of the Government of Macau SAR. Due to these functions, Shunfengtang district could be called the heart of Macau, even now, there are still many high-class residential areas in the south part of the district, along the water banks.

The customers of the Xiahuan market mainly come from the surrounding residential areas and some working class as well. Due to the location and being surrounded by water, the residential areas in the south of the market all rely on this market to provide groceries and daily products, but some high-class residents are not customers of this market, because of the qualities and sanitation. In the north of the market, there are many middle-class and low-class residents, including foreign employees, these people are the main target of the market. According to the geographic situation (Figure 32), the Yingdi market is not far away from the Xiahuan market, two multifunctional market buildings are a few away from each other, but related to a higher altitude of urban space in the middle and intersecting pathways, potential customers from the east of the Xiahuan market have to go up and down to get to the destination, this decrease the desires of these pedestrians to go shopping in Xiahuan market, forming two non-interference serving areas for each of these two markets.

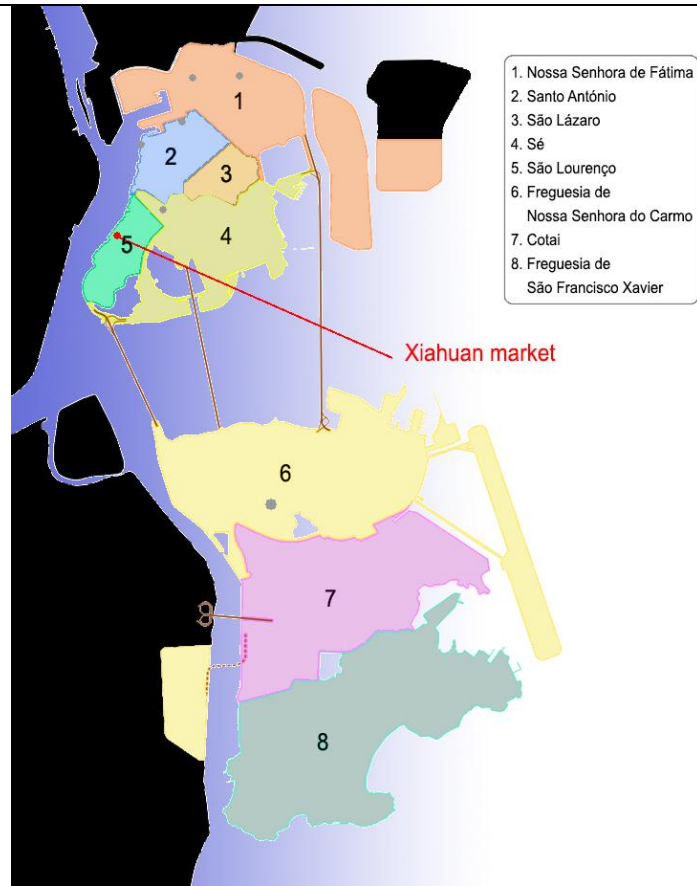


Figure 31. The location of the Xiahuan market

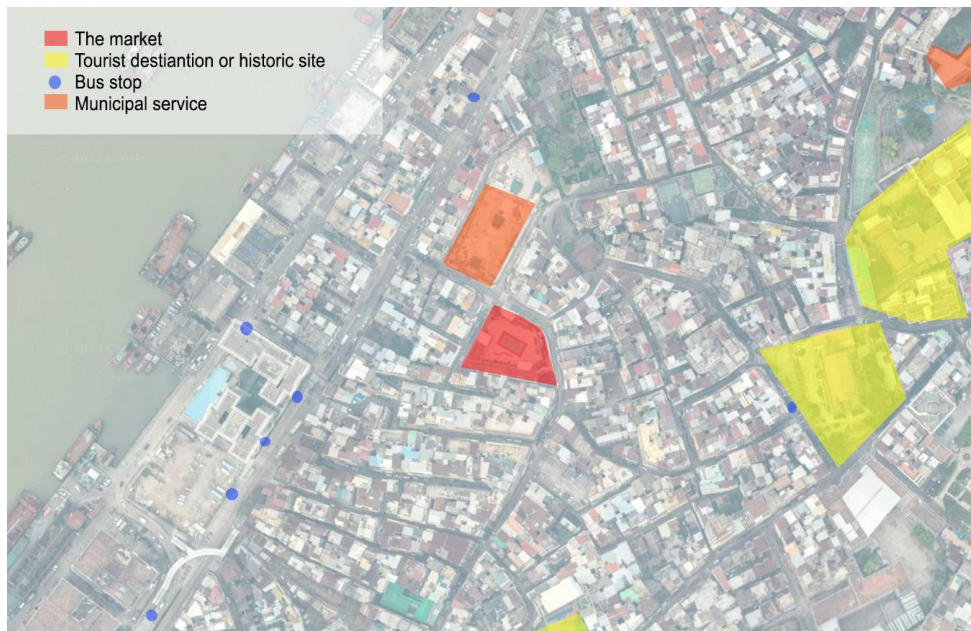


Figure 32. Geographic situation of the Xiahuan market

As previously mentioned, the Xiahuan market locates in the Shunfengtang district which used to be the heart of Macau, and with the high-low geographical altitudes of the surrounding areas, the transportation conditions of this multifunctional market building are much better than the others. There is a bus stop just outside the market, and a few bus stops a few blocks away. The Hebian New Street is a block away in the

west of the market, this street is a main traffic aisle to connect the south and the north along the water bank, giving a convenient diving experience for the customers of the markets. In addition, there is a port in the serving area, enabling some potential customers from the other side of the water to use the market.

Talking about the surrounding facilities, there is a community health centre in the opposite corner of the market, providing many potential customers for the market. In addition to the health centre and the market, many shops and restaurant with good reputations open their businesses around this corner, forming a great economic atmosphere for shopping. Although there were many municipal departments located in the surrounding area, through urban development, many of them moved to other places, leaving not many municipal services around. But there are some religious sites and educational places, these public functions may have a positive impact on the market.

The location of the Xiahuan market has its advantage in potential customers and economic atmosphere, with many surrounding residential areas for middle-class and low-class citizens, the functions in the market are essential to this distinct, although it may seem to be a bit far to the residents in the south part, a few portions of these high-class and upper-middle-class citizens would love to buy things in the market. The only big disadvantage is the high geographical altitude urban space on the east side of the market, which leads to inconveniences or getting lost for walking customers from the east, especially for the elderly. For those who want to drive to the market, they have to get to the main avenue on the west along the water bank, then turn in the block where the market locates, making it a little bit cumbersome.

6.4.2 Layouts

The multifunctional market building set at the corner of the block, with three sides facing the road, could be viewed as a near trapezoid layout planning, only the south side of the layout connects to the other buildings (Figure 33). There are three entrances in this market, the main entrance for customers is at the joint point of the north building side and the building's west side. These two edges are facing the two busy inner streets with some bus stops, but there is no other entrance on the other two sides, while the main entrance directly faces the corner of the crossroad, making it obvious and attractive to the customers. The other entrance for customers who don't drive is located on the joint point of the east side and south side, facing another crossroad point in the southeast of the market, despite a smaller scale than the main entrance, it has a small garden for parking. The entrance for the vehicles is on the corner of the west side and south sides of the building, working for both customers and vendors. Due to the design of the entrances, they become easier access to customers through visual sense and physical interactions, on the other hand, this leaves two hard edges of the building to the pavement on the north and east sides of the building, where there was an entrance on the northeast corner of the building which is abandoned.

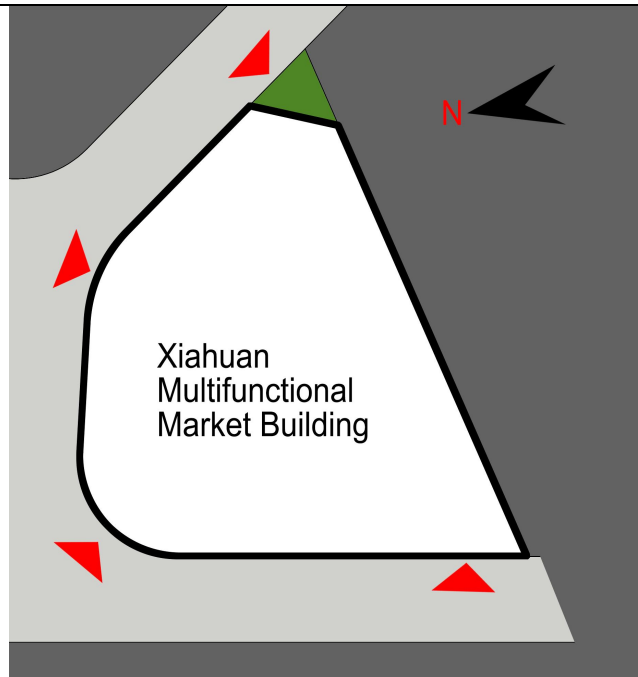


Figure 33. The general urban plan of the Xiahuan market

The typical layout planning for the market function is the ground floor, which is only for the wet market (Figure 34). The main vertical transportation function is connected to the main entrance, on the southwest corner of the layout, separated from the market function, this reduces the interferences from the market such as smells and rubbishes, but also completely cut off the interactions between market functions and other functions in the multifunctional market building. On the ground floor, the public facilities like restrooms and weight checking point, and transportation spaces like market staircases and freight elevators are all arranged on the west side or the southeast corner of the building which are nearby to the entrances, leaving the space in the middle of the market occupied by stalls. The two entrances of the market are on the two corners of the building, forming a diagonal relationship, except for a large cycle route on the periphery, the other routes for traffic are long arises connecting from the west to the east, dividing the middle part of the market into five long sections, with two shortcuts on the south section, this creates a customer flow from the west to the east, as a result, the design is not friendly to the stalls on the south side of the market. the stalls are settled along these passageways, and only a small number of stalls are on the east side of the wet market. The first floor is a market function for meat, vegetable and groceries, the layout of it is similar to the ground floor, with main facilities and vertical transportation functions on the west side, meat stalls on the north side, groceries and fruit stalls on the south side, and vegetable stalls in the middle. The blocking of the sight from the north to the south seems to be more significant on this floor, the meet stalls and groceries are separated by a long section of vegetable stalls in the middle, while the ground floor is only operated for the wet market.

The layout of the cooked food centre which locates on the second floor is much simpler than the market function (Figure 35). The main moving route of the customer is a circle passageway in the middle, with most of the vendors inside of it, and the majority sitting space settled along the north and south side of the passageway, there also some vendors are arranged on the south side and southeast corner of the market. Different from other cooked food centres, Xiahuan Market has an outdoor playground in the northeast corner of the second floor, and parents could watch children playing through the glass windows while having their meals, this attracts a certain amount of people using the cooked food centre.

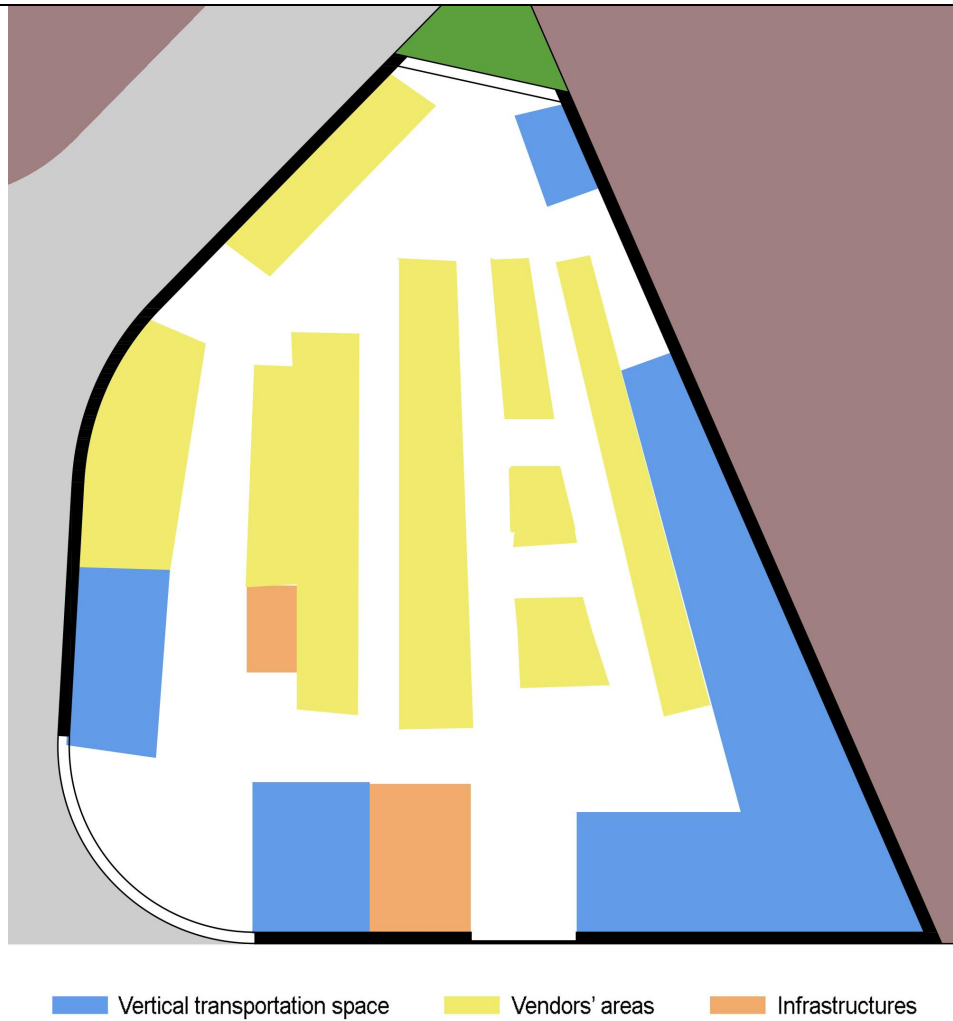


Figure 34. Layout plan of the ground floor in Xiahuan market



Figure 35. The figure of the second floor of the Xiahuan market

The Xiahuan multifunctional market building has eight floors, except the ground floor the first floor is arranged for the market functions, the three underground floors are used for the parking system, serving vendors, customers and supervisors, the third floor which is above the cooked food centre is occupied by

the public library and the fourth floor set passageway for public activities, there is also a rooftop garden on the top which has a piece of space for badminton (Figure 36). The layout planning of these functions shows the same logic as the design of the market function, the transportation function is separated outside of these functions, leaving them sealed in their own space, this may make sense for the library, but not for public activities and leisure space.



Figure 36. Rooftop garden in Xiahuan market

The Xiahuan market shows a complete system of multifunctional market buildings in Macau which has market functions and other municipal services, the layouts of the market are generally friendly to the users with enough facilities and space. The spatial order of the market works as following: from entrances to transportation functions, then to the specific function or vendors (Figure 37). The transportation function space always occupies the space next to the entrance but is physically separated from other functions. Considering the surrounding economy business, with three sides of the building facing the roads, only two entrances opening at the opposite angle corner of the market could not make the full use of the surrounding urban built environment, giving a sense of closure to the public instead, which is the expectation of the supervisor, because they want to leave the dirty and messy inside the market, while also deeply bury the vitality and diversity. The layouts of the market function are only not good for the stalls on the south side of the market, but the bigger question is whether this kind of design would improve the usage condition of the market with other municipal services. The Xiahuan multifunctional market building could substantiate the theory through further POE research.

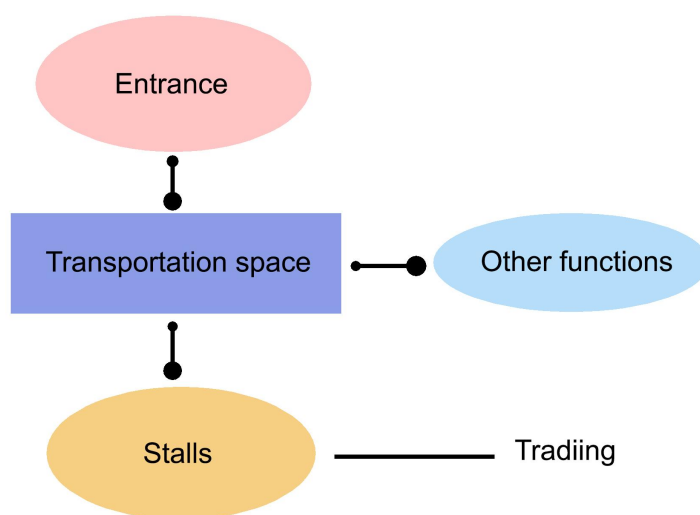


Figure 37. The spatial order of functions in the Xiahuan market

6.4.3 Usage rate

Floor	Function	Facility	N1	N2	P.
Ground	Wet market	Elevators, Restrooms, Weight checking, Guard	80		100%
First	Meat market, Vegetable market	Elevators, Restrooms, Weight checking	46	15	40%
Second	Cooked Food Centre, Playground	Elevators, Restrooms	25	25	100%
Third	Library	Elevators, Restrooms	Depend	Depend	Depend
Fourth	Activity Rooms	Elevators, Restrooms	10		Depend
Fifth	Garden, Sports and fitness space	Elevators	1	0	0%
Underground	Parking	Elevators	134	20-60	Depend

Table 22. Usage rates of stalls in the Xiahuan market¹⁹

The sizes of stalls in the Xiahuan market vary because of the irregular shape of the layout, some stalls around the outside circle of the market seem to be different from the stalls in the middle of the space. Generally, it could be summarized into two basic units according to estimation. The larger one is nearly a 3.5mX3.5m square space which is mainly provided for vendors of the wet market, the basic facilities are a display table and lighting system (Figure 38). The stalls for the meat market on the first floor are a little bit larger than the basic type of stalls on the ground floor, it has higher partition walls and a display table, equipped with a water supply system for washing blood and food. The other basic type of stall is an area within 3mX3m, these stalls are applied to vendors who sell vegetables, fruits and groceries which locate on the first floor. These stalls are designed with a basic lighting system and a basic display table, some

¹⁹ N1: number of stalls or rooms provided; N2: number of stalls or rooms occupied; P: percentage of occupied rate. The actual occupied rate depends on different occasions, this table only show the situation during the field research. The data of this table relied on the situations during gathering the information, the situations of markets varied according to different time periods, especially after the pandemic.

groceries stalls are individual spaces with complete structures of rooms or shops.

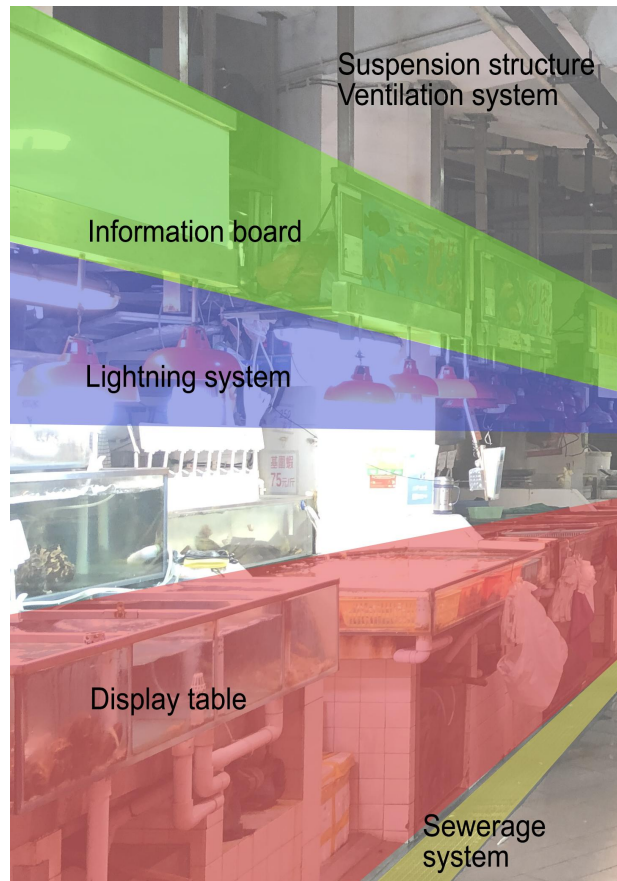


Figure 38. Façade of a basic stall in Xiahuan market

The layout of a stall is the same type in other multifunctional market buildings, with a façade of interaction space and information boards on the top, the drainage system on the ground is closer to the vendor's side under the coverage area of the display table, this may encourage customers to tend to get close to the display table and the vendor. The information board above the lightning system is a neglected point to customers and vendors, the small handwritten words on the boards are useless to both people in front of the stall or away from it.

The usage rate of stalls is the highest on the ground floor where the wet market locates, there is almost no empty stall in the wet market, the only possibility to see an empty stall is because of the vacations or goods sold out. The situation is different on the first floor where the meat market and vegetable market are, almost half of the stalls are empty, regardless of functions, the stalls are close to the staircase in the south which is the main vertical transportation method in the market are in a better condition than other parts of the second floor, while the lowest usage rate is the stalls in the middle offered to the vegetable markets (Figure 39).

The usage rates of other functions in the Xiahuan multifunctional market building are much better than some other markets, especially the cooked food market and library. Due to the small outdoor playground on the second floor with the cooked food market, during the observation, there are some parents with children using the cooked food centre. The public library on the third floor is crowded with people on the weekend, and all sitting places are occupied, the condition is changed during the working days, but it at least demonstrates the need for working or reading places like a library in surrounding residential areas. On the other hand, the usage rate of the sport and leisure areas on the rooftop is not so good, most of the time is empty or with few people using it, playing badminton on the roof without protective measures

could not be accepted by most of the residents.



Figure 39. Situations of vegetable stalls in the Xiahuan market

6.5 Youhan market

6.5.1 Location

Youhan market is the earliest built multifunctional market building in Macau, serving the surrounding residential areas in the north part of Macau which was a reclamation designed for middle-class and low-class citizens in the 20th century, until now, surrounding parts are still the most densely inhabited areas in Macau. Youhan market locates in the Hadimatang District (Freguesia de Nossa Senhora de Fátima), in the middle of a large residential area (Figure 40), with plenty of needs for daily items for the market, while lacks commercial atmosphere. In the north of the market, the custom which connects the mainland and Macau is several blocks away, in the southwest of the market, after about a quarter of an hour walking, there is a municipal park with some amusement facilities.

The customers of the market are mainly made up of the surrounding residents, some small amount of people may be workers or clerks in nearby industries or companies. There is a Taishan multifunctional market building in the west of the Youhan market, which is nearly five blocks away, considering the same function and classes of targeted customers, it may interfere with the operation of the Youhan market. but according to field research, the Taishan market has already closed other functions, only focusing on market function, in addition, it is just a one-floor small market building, Compared to three floors market system in the Youhan market, it could be said that the Youhan multifunctional market building takes hold of the market function in surrounding areas. On the other hand, due to the high hills in the southwest of the market, which is the Wangxia Municipal Park, making some potential customers living in the southwest of the market are not willing to come to the market in consideration of an up and down journey, leaving the middle residential areas of main island for the Red market and open markets in that area.

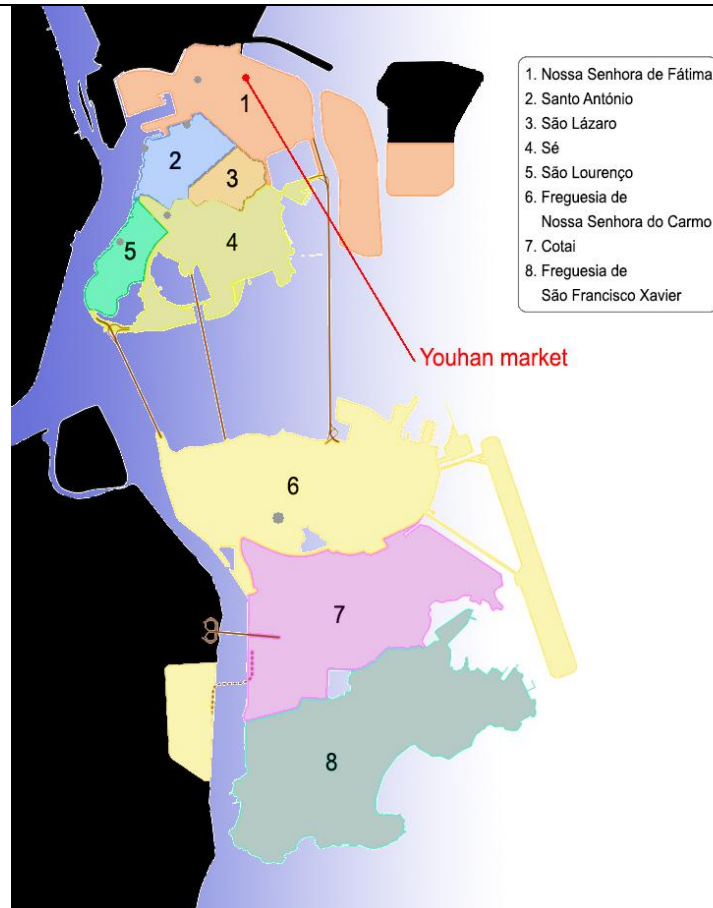


Figure 40 Location of Youhan market

Due to the massive residential areas, the transportation conditions around the Youhan market are very convenient. There are at least four bus stops around the market within five minutes walk, and there are at least another six bus stops just a block away from the market, these buses could cover almost all places in Macau. Being a reclamation area, there is no height difference between areas, so the road conditions are fine for driving customers or vendors, compared to other multifunctional market buildings.

There are some municipal facilities in nearby places, such as the health centres and integrated Government Services Building, but these facilities are at least two blocks away, some are separated by highway structures, and these facilities could not make connections with the market. at the same time, apart from the main building for market functions, Youhan market has a newly built building which open in 2012 for groceries, the cooked food centre and other municipal services, with the playground and park area on the east side of the block, Youhan market creates a city lives centre by itself.

The location of the Youhan market is a proper place for municipal services like market function, enough potential customers who want to buy daily food and products, and convenient transportation conditions for both customers who walk or drive. Although it lacks helpful municipal service or facilities nearby, the Youhan market itself could undertake the main task of serving the communities, on the other hand, though there is a Taishan market which could help in market function, the serving area of the Youhan multifunctional market building is too large than other multifunctional markets. A part of the upper-middle-class residents in the east might not be so reliant on the market, but the low-incoming citizens and foreign employees near the custom in the north and the south could be in great need of market function.

6.5.2 Layouts

Although the Youhan market has two additional buildings to be a whole system, except the main multifunctional market building, which is the five-floor building in the east called the vendors' building and the small building in the southwest called the wing building of market, they are not included in this analyses, because these two buildings have different functions other than normal market function and separate with the main market in physical space. Considering the function in the vendor's building, including the cooked food market and small items selling which are similar to the market system, it would be included in other discussions and further research.

The layout of the Youhan multifunctional market is nearly square, with four vertical transportation spaces in the four corners of the market, which have identical appearances and structures to the market space (Figure 41). The customer entrances of the market are located in the middle of three sides of the market building, except the west side which has an entrance for vendors. There is a street between the main market building and the vendors' building, but it does not connect to the vendor building, people have to get to the third floor to go to the vendors' building by connection bridge.

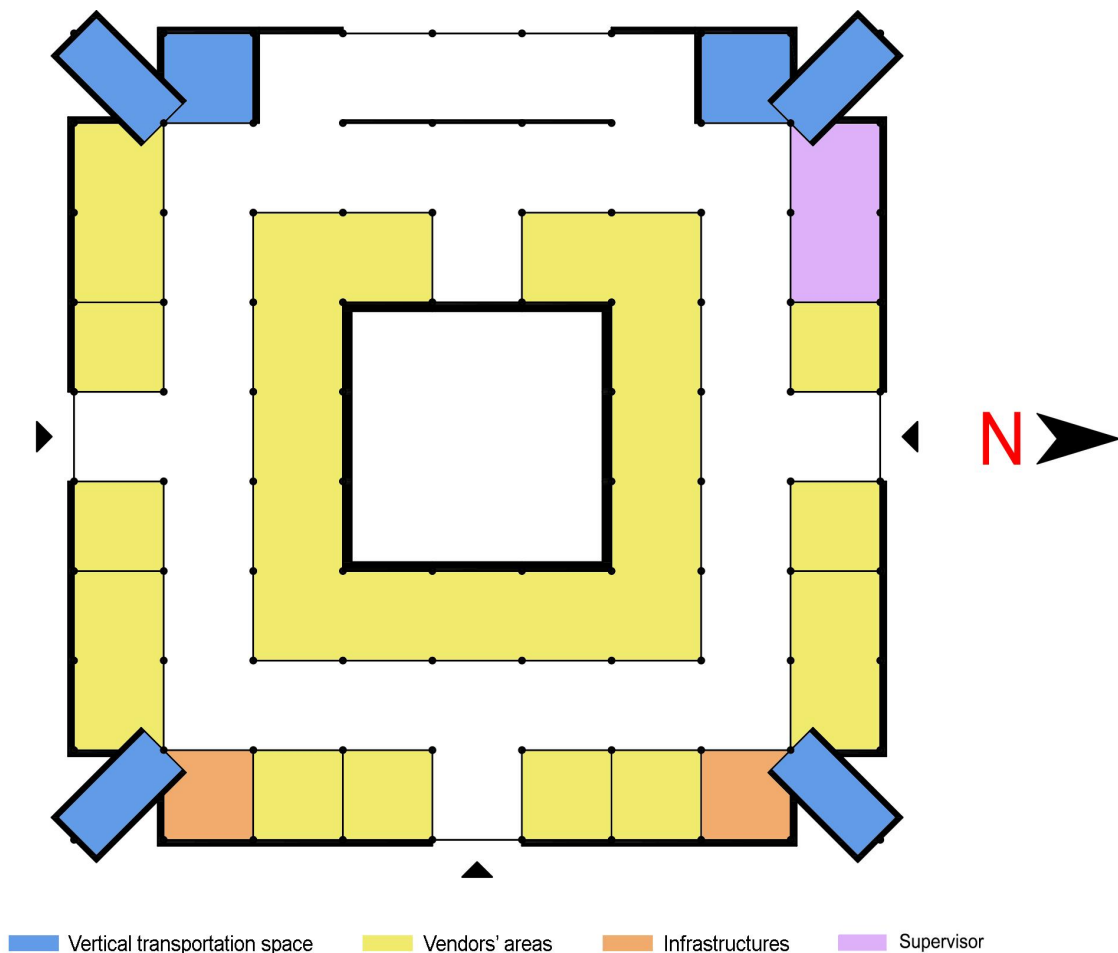


Figure 41. Layout plan of Youhan market

The ground floor is used by the wet market, plus some grocery stalls, with flower markets outside the building, settled along the small street between the main market building and the vendors' building (Figure 42). The design of the layout has the same logic as the Red market, which used patios in the

middle to provide light and air for the market. In the middle of the layout, there is a square shape patio which is four-floor high to the top floor. This patio system does not just give these advantages to the ground floor, due to the openness of the other floors, it changes the dark inner space of the market building. Different from other multifunctional market buildings which use aides to divide the market function into several sections, the Youhan market just has one big route for the flow of customers, it is a circle in the middle of the space, while stalls open along both sides of the circle, this kind of design gives a clear vision of the market from either corner of the layout. Not only the ground floor, the other two floors of the market function use the same layout arrangement, which enables the new users of the market to adapt to the environment quickly without getting lost.



Figure 42. The flower market between the two buildings

The Youhang market building has five floors including a rooftop sport field, due to the age of the design back to the early 20th century, a public parking system is not considered in this market building, except for a vendor parking space in the west of the market. What is a good thing is, in 2008, when the government started to regenerate the east side land for the vendors' building in order to govern other vendors selling groceries outside the market, it decided to add a parking system in the vendor's market. Even so, it is still not so convenient for driving customers, because of the connecting system between the vendor's market and the main multifunctional market building.

The spatial order of the layout of the Youhan market could be described as following: entrance, along the stalls, to the transportation space, then to the vendors or functions. Owe to the location of entrances and transportation functions, some more vendors could be seen by the customers before they brought all the things they wanted. In addition, due to the three entrances on the three sides and open structures of the staircase which are the main vertical transportation method in this market, the market function appears to

be more open to the customers and pedestrians outside the market, letting them easier to get access to use the market function. While on the other hand, the design of the staircases is not friendly to the elderly and customers shopping on rainy or windy days, maybe trying to get a better air circulation system to get rid of the uncomfortable smells in the market, in practice, people more prefer to use escalators than the staircases.

Being the earliest built multifunctional market building, the layout of the Youhan market shows a more open attitude to the market function and a better idea of using natural light and air circulation system, compared to other multifunctional market buildings which rely on the electricity lighting systems and fresh air system, although nature light and air circulation system is not the only method in current Youhan market. Users of the market don't need to conduct the point-to-point concept; they could visit the vendors at the same chance and have more chances to get the whole Figure of the market. There is still a disadvantage of the layout, the staircases and the vertical transportation system which they represent, not only the inconvenience but also the functionalism they insist, the separated relationship of market function and transportation function in physical space leads to the isolated conditions with other function in the market building. The public activity rooms are sealed in their own space, and the sports fields also are surrounded by barbed wires, there are no interactions or even eye contact through the patio in the middle of the building. But due to the good design of layout and perfect location, the Youhan market is a good example to show what elements matter in further research.

6.5.3 Usage rate

Floor	Function	Facility	N1	N2	P.
Ground	Wet market Flower market	Elevators, Restrooms, Weight checking, Guard	35	35	100%
First	Vegetable market, Soy products market	Elevators, Weight checking	30	28	90%
Second	Meat market	Elevators, Restrooms	34	30	90%
Third	Activity Rooms	Elevators, Restrooms	15	15	100%
Fourth	Sports field	Elevators	8	4	50%

Table 23. Usage rates of stalls in the Youhan market²⁰

The stalls in Youhan market also have different types of the sizes like other markets, while having a lower number of stalls per floor than other market buildings, vendors tend to have more space for working and customers seem to feel more comfortable in the passageway in the middle which is at least 4m in width (Figure 43), on the other hand, it requires more area and space to support this mode of the design of the market. Generally, the stalls in Youhan market have two basic types, one is a small size which is 4mX4m, and the bigger one is twice as large as the small one. According to field research, the big one is just like combing two small units together, the vendor of the stall could bid for the two units for their own business, so in this market, it could be considered that there is one basic type of the stall and there are different types of combination, except some stalls in the corner, they are in triangle space. This also

²⁰ N1: number of stalls or rooms provided; N2: number of stalls or rooms occupied; P: percentage of occupied rate. The data of this table relied on the situations during gathering the information, the situations of markets varied according to different time periods, especially after the pandemic.

happens in the meat market and vegetable market, no matter what the functions, the basic space of the units is the same, Compared to other market buildings, the vegetable vendors have much more space to show their products.

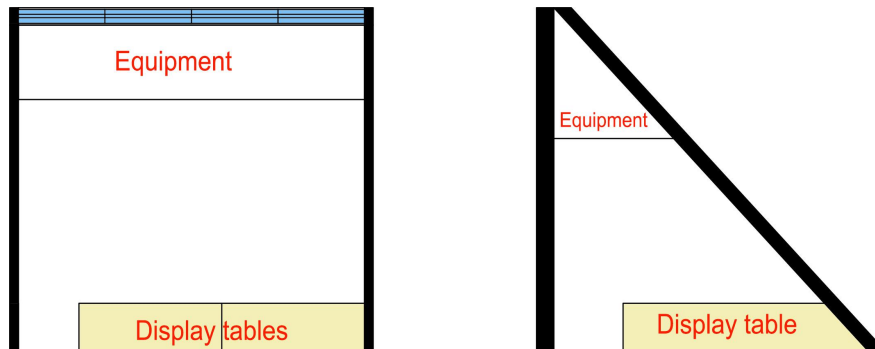


Figure 43. The layout plan of a basic stall in the Youhan market²¹

The layout of a stall is similar to each other, there is a display table on the façade of a stall, if a vendor had two units, he would have two display tables, but they could not be moved to place together. The basic systems of water and electricity are around the back of a stall. In the façade of a stall, there are also three parts, in the bottom is the drainage system and the space which vendors usually use to place their equipment like boxes and containers; in the middle is the space is the important part for interaction between vendors and customers, there are display tables and lightning system, people talk and discuss between these systems; on the top is the information boards and hanging structures (Figure 44). In the Youhan market, the information boards are usually signboards of vendors. Different from other multifunctional market buildings, the width of the passageway in Youhan market is much larger, so customers have more space to have a better view of the information boards, but vendors still don't put much effort into the information boards.



Figure 44. The width of a passageway in Youhan market

²¹ The layout plan on the right represents a special type of stall in the corner of the building.

The usage rates of the stalls in Youhan market are at a high level, according to field research and observation, there are few empty stalls in the market and most of the stalls are in good conditions. Although the numbers of customers on the first floor and the second floor are largely smaller than the number of customers on the ground floor where the wet market is, the operation situations of those stalls are still in normal condition, few empty stalls could be found.

Not only the market functions, the usage rates of other functions in the Youhan market including the activity room and sports fields are also at a relatively high level, during the field research, the sports fields which are used for basketball and badminton are occupied by residents, but the basketball fields are the most welcomed (Figure 45). According to the information boards in the public activity centre, there are many organisations or individuals booking rooms for classes or activities. There are other functions in other parts of the Youhan market, such as the vendors' building, Compared to the functions in the main building, the other functions don't have higher usage rates, and these conditions are not included in the discussion of the market functions.



Figure 45. The basketball fields in Youhan market

The usage rates of stalls in Youhan multifunctional market building are obviously better than other multifunctional market buildings, this may be due to the location of the market which has many residential areas around or maybe because of the spacious design of the market building which provides a better experience of shopping in the market. What causes the better situation of the Youhan market than the others would be discussed after further field research.

6.6 Short conclusions

After the pilot study of multifunctional market buildings from the questionnaire and the observation aspects, a brief understanding of the general conditions of the market and the attitudes of customers and

residents could be made.

The locations of multifunctional market buildings are usually selected in the residential areas, or the place that used to be residential areas, as a result, the transportation conditions of the market buildings are quite convenient for walking customers, but not all are friendly to driving customers due to the facilities and locations. There are some municipal services around the market buildings, while they could not help much with the market functions. The location selection of the market buildings by the supervisor which is the government shows concerns about treating the multifunctional market building as an essential municipal supporting facility for the community around and thinks the needs of residents could support the operation of the market functions.

According to the observation and information research, the designs of the multifunctional market buildings have the following common points:

1. The spatial order of the market building is the same: from entrances to the vertical transportation functions, and finally to certain functions or vendors (Figure 46). It is a simple logic of point-to-point idea, there are no overlaps or joint space between separated functions of the multifunctional market building, in addition, there is also no designed space or structure for public interaction function, such as a meeting point and resting places. From physical aspects, the vertical transportation functions which are usually staircases and escalators connect and separate the different other functions, making it unable for eye contact or physical contact between different functions.

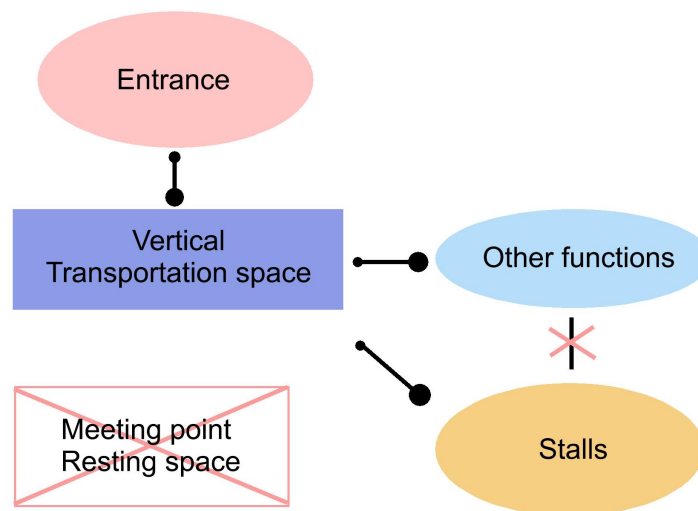


Figure 46. The spatial order of functions in multifunctional market buildings

2. The arrangements of functions in multifunctional market buildings are almost the same, with market functions at the bottom and other functions at the top. The wet market is on the ground floor, the meat market and vegetable market are above the wet market, the sports fields and top floor gardens are on the top floor, and in the middle of market functions and sports fields lays the activity centre or library which sometimes could have both, the parking space locates depending on the design of the building, sometimes being underground, sometimes on the upper floors (Figure 47). The design of the locations of different functions shows the focus on market function, especially on the wet market, the arrangement of other functions does not seem to be reasonable, especially the sports fields on the rooftop which are unusable on rainy days or high-temperature weather

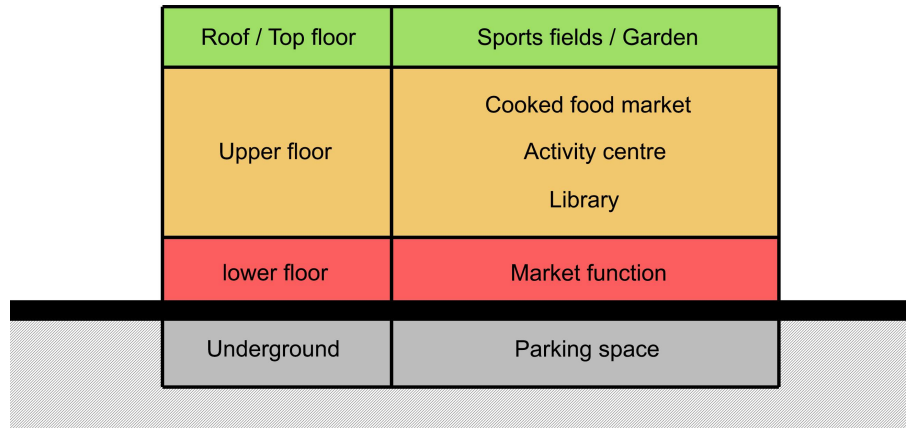


Figure 47. Locations of different functions in multifunctional market buildings

3. The space designs of the market function are similar to each other, there is a main passageway lined in a circle at the outermost layer of space, with some passageways connecting between the main passageway divide the space into several sections (Figure 48), and the stalls space is arranged along the passageways. Due to the irregular shapes of the space in some market buildings, the space of the market is misleading and complex to customers, especially unfriendly to new users, and leading to some disadvantages to certain stalls and vendors.

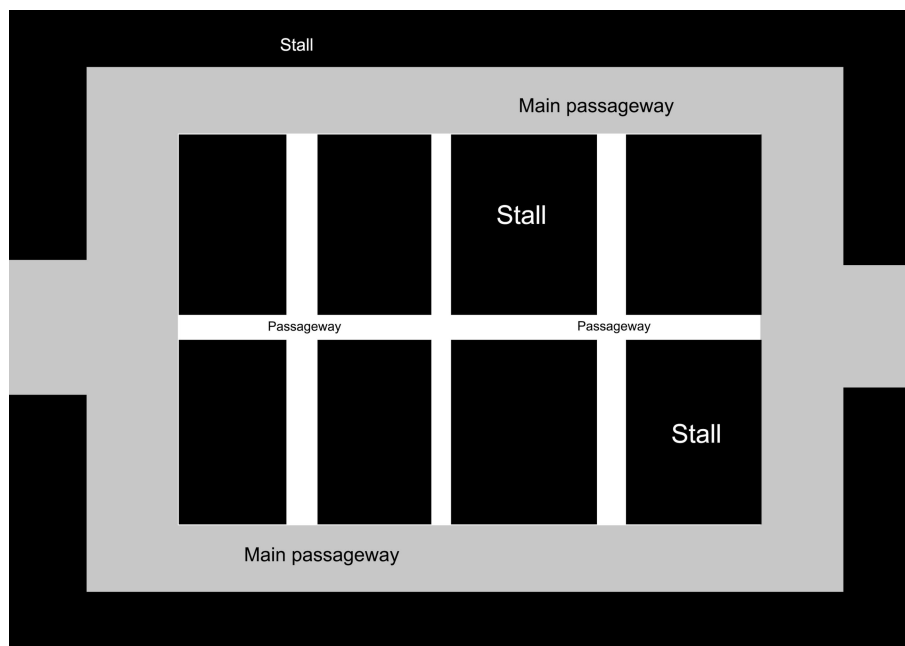


Figure 48. General layout plan of market function in multifunctional market buildings

The designs of the stalls in the markets vary in different multifunctional market buildings, no matter the sizes or the structures, these stalls in markets could be concluded into three types according to the functions of the stalls. The size of a basic stall unit could vary from around 2.5mX2.5m to around 4mX4m, the design of a stall could have a little different in different functions, the stall for the vegetable market has a display table with different display levels; the stall for meat market has a larger display table with some structures to hang the meat and related products above the display table, there is also a water supply system or a wash basin in the deep corner of the stall; the stall for the wet market also has a large

display table, and basic water supply system (Figure 49). The basic design of the unit doesn't have many differences except for the basic facilities, the size of the stall for the vegetable market is usually the smallest. The basic façades of the stalls are the same, it could be divided into three parts, at the bottom is the water drainage system and space under the display table, on the top of the façade are the information boards and hanging system such as air ventilation systems, the information boards show the information about prices and vendors, in the middle of the space is the display surface and the lightening system, the middle space is the most important area for interactions between the vendors and customers (Figure 50).

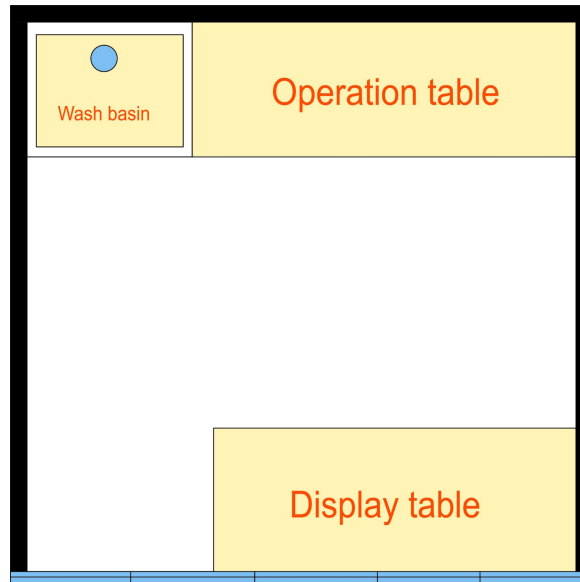


Figure 49. The layout plan of a basic stall in the multifunctional market buildings

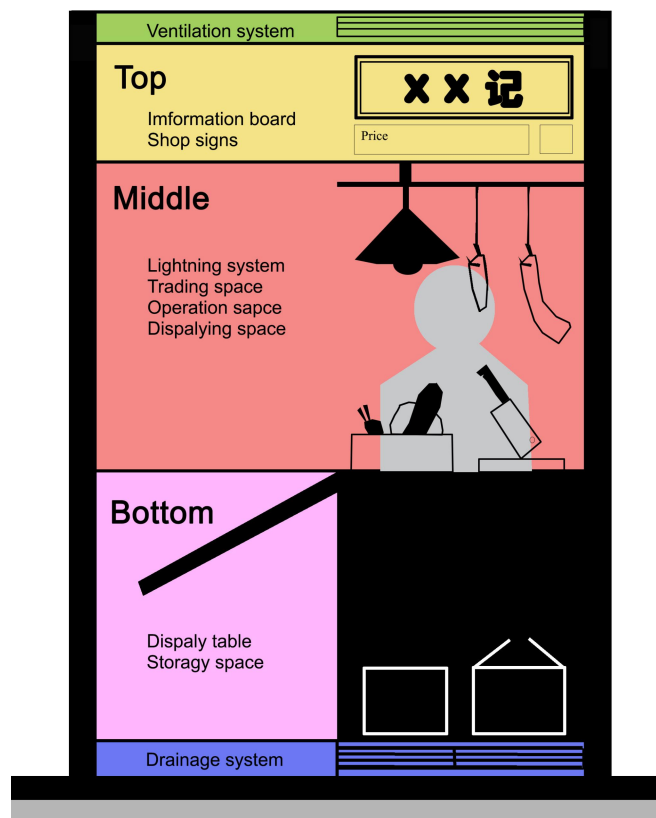


Figure 50. The design of the façade of a basic stall in a multifunctional market building

Although in the pilot study, there is no research directly related to vendor elements, the usage rate of functions in multifunctional market buildings could show some aspects of the attitudes of the vendors and the conditions of the stalls in these markets. The usage rates of the wet market are the highest among the market functions, one reason may be the easy access to the ground floor. The usage rates of the meat market and vegetable market are almost the lowest among all other functions, except some abandoned ones. There is an interesting phenomenon about the usage rates of functions in multifunctional market buildings, the usage rate of the market function is higher as the number of the customer in this market function is larger, whether the usage rate has a positive correlation relationship with the number of the customer needs to be substantiated by further data on market.

About the customer element, the idea of the multifunctional market buildings and market function in Macau could be concluded as following points:

1. Most of the residents think the market function is necessary for daily life, but they tend to go to the market building no more than twice or once a week. The location of the market building is close to a large number of residents within 15 minutes walk, few go to the market by bus, and some people drive to markets.
2. In the view of customers, the attractive points of multifunctional market buildings are freshness, wider choices and lower prices. Being one of the users of market buildings, customers could raise the experience of buying products and tangible benefits from vendors as the advantage aspects of the market building, on the other hand, most of the pieces of advice for improvement are about the environment and facilities of the market buildings which poor environment condition and lacking facilities such as parking lots. Though the attractive points and dissatisfied points, it could say that the customers are not quite pleased with the facilities of the market building and the current condition management. Obviously, the design of the multifunctional market building could be divided into the good aspects of the markets, although little about the space of the market building is mentioned by customers, they chose the good design of the function over the experience of shopping with 59.1%.

There are some other small conclusions about the customers' attitudes toward multifunctional market buildings, for example, which market buildings they usually choose to go shopping in and how they think about the municipal market services provided by the government. All these results could express the evolution of the multifunctional market buildings in view of the customer element.

Through the questionnaire and field observations, the pilot research gives a brief Figure of the multifunctional market buildings in the market system with three elements, the supervisor, vendor, and customer elements have different attributes to the multifunctional market building.

The supervisor element of the multifunctional market buildings is the government, except for the maintenance and some other outsourcing services, the design of the market building could clearly show the understanding and opinions of supervisors on market functions. The supervisor tends to design the market building in a standardization mode, with the same kind of arrangement of functions, the same logic of spatial order, and the same design of space and stalls. The functions chosen to be combined with the market function are the functions that can be used by a large range of people, regardless of identities and statuses, the supervisor may treat the multifunctional market building as a supporting facility for surrounding communities, becoming a community centre. On the other hand, the standardized mode limited the functions according to different situations, and the designs of the space and function are not suitable for users, for example, the vendors of the vegetable markets tend to have more boxes and goods than the space of a basic unit could be filled, as a result, the stalls of the vegetable market seem to be too crowded while other stalls are full of space. Not to mention the other stalls of different functions, the

vendors all need their unique equipment for operation, such as tanks for wet markets and refrigerators for frozen foods, the standardized mode is fair to every vendor, but not suitable for the real operation of all the vendors individually. The relationships between market functions and other functions are separated by vertical arrangement and transportation space, although other functions may bring potential customers to market function, the design does not consider the interactions between these functions as they are separated, it means combining municipal services together does not make all function better, for example, the sports field in some multifunctional market buildings don't work well. Considering the standardized mode of space design and physical aspects of the building, the attitudes of the supervisors prefer ruling to govern, they tend to treat the market function as a problem more than a tool for urban development, this is thought that could be found in all governments though the review of the market development in Macau. It also substantiates that the supervisor element dominates the process of the market not only the design of space and function but also the operation, being the key element in the system of the market.

What attracts the customer element are tangible benefits, through the pilot research, the participants show their interest in freshness, low prices and more choices, but not much about the vendor element is mentioned in their answers. Compared to what the supervisor considers, the customer thinks differently, they are satisfied with the vendor's aspects while giving advice about improving the environment and facilities, these aspects are not completely covered in the view of the supervisor element.

The aspects of vendor elements are not much covered in the pilot research, the relationships between vendors and other elements and the attitudes of vendors will be discussed in further research.

Chapter 7 FIVE SENSES OF MARKET

The five senses research is a piece of brief sensory cognitive research on how customers use their five senses to learn about market space when having activities in markets. This research aims to cover the research on space of market function before the evaluation of multifunctional market buildings in Macau.

The pilot research of multifunctional market buildings focuses on the general ideas of markets from customers and current situations, it gives some objective information about how people use the markets and the functions of these markets. On the other hand, according to the phenomenology and cognitive psychology in architecture, the cognition of the markets doesn't just rely on the objective aspects of the customer, the subjective thoughts and feelings form the parts of core ideas of markets in their minds and motions. To get a deeper understanding of the markets and subjective images of feelings of markets, a short questionnaire is added before the POE research would be made. This short questionnaire puts efforts into the five senses of the market in the view of customers, trying to present the deep ideas of the market through smelling, hearing, touching, sight and tasting. In addition, the result of the short questionnaire would also tell how people learn and remember the market and the atmosphere, it helps to design a better built environment for the market. distinguishing the advantages and disadvantages of current multifunctional market buildings in further research.

The normally built environments usually interact with human beings through the senses of touch and vision, but the market, due to the activities and functions inside, could influence users through all the five senses of a man. The smells of food, the feeling of touching the products, the tastes of free samples, etc., these aspects help people to feel and learn the different markets despite the designed functions and space. The questionnaire is divided into five sections according to the five senses, each section has three questions to investigate the attitudes of residents toward each sense. The questions are about three aspects, one is about the attitude of the sense in markets, one is about the elements that remind people of the market through the sense and the last one is about how to improve the markets and experience through this kind of sense. These questions only give a brief idea of the relationships between the five senses and the physical aspects of the markets, improving the cognition of markets in Macau with a different method.

The questionnaire got 113 pieces of answers, analysing the result of this questionnaire, the effects of the five senses are obvious to the users of the markets, more than 80% of participants choose "Yes" when being asked whether senses are important in market activities or whether they would use senses in activities in markets. This means people treat or think at least one sense except for the sense of vision is important in their learning of market functions. In the question of the final part, when being asked to arrange the rank of the five senses according to the importance of the "sense of atmosphere" in the market, the result shows that people chose the visual sense over the other senses just the same as the common knowledge, but surprisingly, the sense of smell is at the second place, with the average point closing to the point of visual sense (Table 24). 36.28% of the participants chose the sense of smell being the top and 33% marked it as the second, while 40.71% of the participants chose visual sense at the top and 36% placed it in second place, with over 70% people ranked these two senses as the top two sense important to the atmosphere of the markets, senses of smell and visual are crucial in the process of people learning and remembering the market space. The other three senses rank third, fourth and final place with no doubts, sense of hearing has an average of 2.64 points and 36.46% of people put it in third place, the sense of touch with an average point of 1.86 and 42.02% of the participants grade the fourth place, the sense of taste has 1.46 point and 54.88% thought it should be the least. The sense of taste is limited by sanitation and other reasons, it is reasonable to see the sense influences little the market activities, but on the other hand, being a common action to touch a thing in the market, it needs more information and analysis to explain why the sense of touch is not important in the market activities.

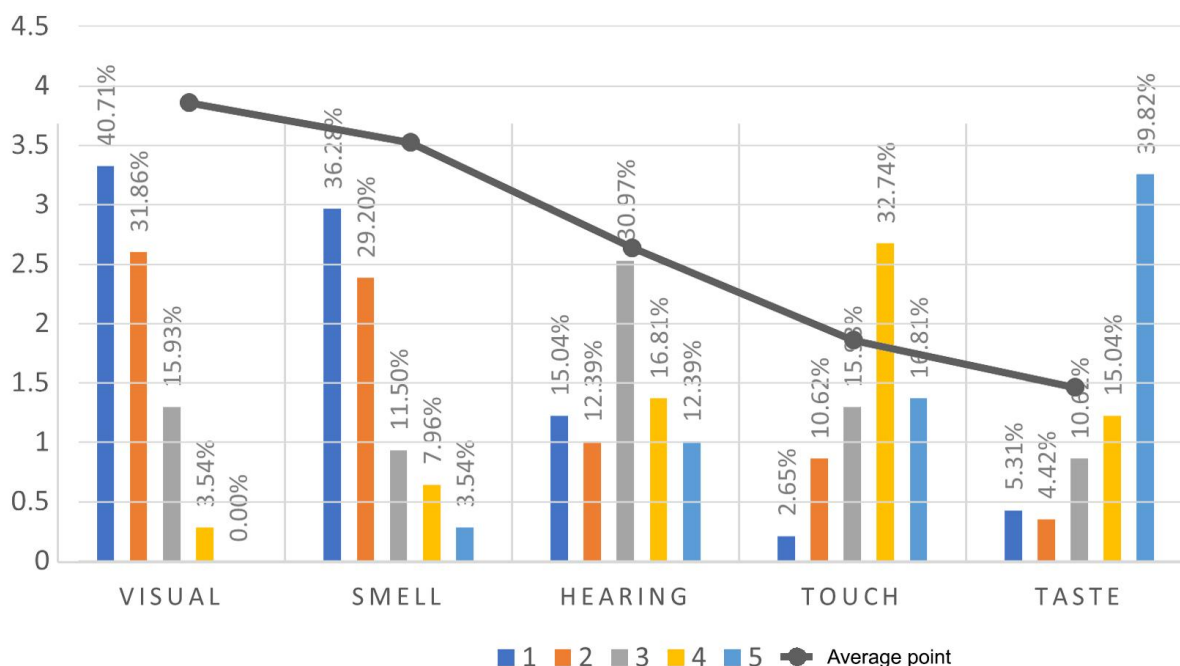


Table 24. The ranking of five senses in market activities

The elements which the participants were asked to choose whether they would remind participants of the markets are not random, these options are divided into three aspects: vendor aspects, customer aspects and architecture aspects, according to the three elements in the system of the market. Due to the lack of the appearance of other factors related to the supervisor element, the elements of architecture, structures and facilities are the only part to represent the supervisor element. If cross analysing these results of the options with the ranking of the five senses, it could give an answer to which element matters the most in the market activities (Table 25). The factors related to the vendor element take up 8 places out of the top 10 factors that matter in the market, with the last two being related to the supervisor elements. The top factor that the participants thought was important in learning and remembering the market is the smell of aquatic products, which means the sense of smell plays a much more crucial role in the atmosphere of the market than normal built environments or architecture, and this may be a result of the designs of the markets putting more focus points on the wet market functions, discussed in preview sections about the phenomenon of the wet market on the ground floor, moreover, there are four factors about senses of smell in the top 10 rankings. On the contrary, when being asked preferring which kinds of markets, about 60.18% of participants chose low and very low levels of the strongness of smells and over 86.72% of the answers express the tendency to smell good in the market atmosphere, while the smells of aquatic products or meat products are awful and very difficult to get rid of.

No.	Elements	Percentage of selected	Weight of sense	Value	Related element
1	The smell of aquatic products	0.8319	3.52	2.928288	Vendor
2	Information about vendors	0.6814	3.86	2.630204	Vendor
3	The smell of meat	0.6991	3.52	2.460832	Vendor
4	Vendor	0.6283	3.86	2.425238	Vendor
5	Product	0.6195	3.86	2.39127	Vendor
6	The smell of dried products	0.531	3.52	1.86912	Vendor
7	The smell of vegetable	0.5133	3.52	1.806816	Vendor
8	Vendor's cry	0.6637	2.64	1.752168	Vendor

9	Facility	0.4425	3.86	1.70805	Supervisor
10	Lightning system	0.4248	3.86	1.639728	Supervisor
11	Chatting with vendors	0.6175	2.64	1.6302	Customer
12	The sound of cleaning and the food processing	0.5841	2.64	1.542024	Vendor
13	Equipment	0.3805	3.86	1.46873	Vendor
14	Actions	0.3805	3.86	1.46873	Customer
15	Architecture	0.3805	3.86	1.46873	Supervisor
16	Chatting with other customers	0.5487	2.64	1.448568	Customer
17	The smell of fruit	0.3982	3.52	1.401664	Vendor
18	Street view	0.3628	3.86	1.400408	Supervisor
19	Signs	0.3451	3.86	1.332086	Supervisor
20	Customer	0.3274	3.86	1.263764	Customer
21	The touch feeling of products	0.6372	1.86	1.185192	Vendor
22	The sound of other customers	0.4248	2.64	1.121472	Customer
23	The sound of loading, unloading and passing in	0.4159	2.64	1.097976	Vendor
24	The smell of delicatessen	0.3097	3.52	1.090144	Vendor
25	Other cooked food	0.6372	1.46	0.930312	Vendor
26	The smell of flowers	0.2478	3.52	0.872256	Vendor
27	The sound of vendors' equipment	0.3274	2.64	0.864336	Vendor
28	Vegetable	0.5664	1.46	0.826944	Vendor
29	The touch feeling of the facilities	0.4248	1.86	0.790128	Supervisor
30	Fruit	0.531	1.46	0.77526	Vendor
31	The touch feeling of the structures	0.4159	1.86	0.773574	Supervisor
32	The physical interaction with vendors	0.4071	1.86	0.757206	Customer
33	Sui mei	0.4425	1.46	0.64605	Vendor
34	The smell of vendors	0.177	3.52	0.62304	Vendor
35	The smell of garbage	0.1681	3.52	0.591712	Supervisor
36	The touch of money	0.3097	1.86	0.576042	Customer
37	The sound of the ventilation system	0.1593	2.64	0.420552	Supervisor
38	The physical interaction with other customers	0.1858	1.86	0.345588	Customer
39	Dessert	0.2035	1.46	0.29711	Vendor
40	Condiment	0.1947	1.46	0.284262	Vendor
41	The sound of the elevator	0.0619	2.64	0.163416	Supervisor
42	The sound of the administrators	0.0442	2.64	0.116688	Supervisor
43	Others	0.0354	1.46	0.051684	
44	Others	0.0177	2.64	0.046728	
45	Others	0.0088	3.86	0.033968	
46	Others	0.0177	1.86	0.032922	
47	Others	0.0088	3.52	0.030976	

Table 25²². The influences of different elements in market activities

²² 'Weight of sense' was gotten from the results of the ranking of five senses. 'Value'='Percentage of selected' * 'Weight of sense'. Colour in the table referring as following: Brown: Visual; Green: Smell; Blue: Hearing; Red: Touch; Purple: Taste.

The sense of touch is the second most important sense next to the sense of vision, but in the atmosphere research, it shows less influence on the participants. When talking about the factors of sense of touch in the market, nearly half of the answers chose the touch feeling of the structures and facilities which could represent the supervisor element, around the medium choosing level among all the factors regardless of the senses, but after crossover with the average point of sense of touch, these two factors only rank at the 28th and 30th places in total 46 factors, lower than the taste of vegetable and smell of flowers, in the last one-third of the different options. This result shows that the sense of touch plays a very small part in helping people to recognize and remember the space of the market, while the architecture and facilities occupy a large part of the design process and focus points.

Despite the sense of touch, the other factors in the category of supervisor element could be found in the first half of the ranking list, but all these five factors are in the view of sense of visual, including facilities, lightning system, architecture, street view and signs, this shows that the supervisor elements mostly affects people through the sense of sight, especially though facilities and things related with vendor elements. For example, the information factor which ranks second is the information about the vendors, such as signboards and price lists, although this factor is an element in the vendor aspect, these facilities and equipment are provided or supported by supervisors.

If using the average point of the ranking of the five senses which is 3 multiplied by 0.5 which represents over half of the people would choose the factor as an important element to remind of the market, it gives an average value of 1.5 which could judge whether the factors are important to form the atmosphere of the markets. The first twelve factors match the requirement of the value, among them, four factors are about the sense of smell, five factors belong to the sense of vision, and three factors are under the category of the sense of hearing, while nine factors are related to the vendor element. These results could give a brief idea of the atmosphere of a market which helps people to learn and remember the market, and it is mainly made up of smell, visual and hearing factors of vendor elements, and a small amount of supervisor and customer elements.

Apart from the factors about the atmosphere of the markets, in this questionnaire, the results based on the multiple choice questions which include No.8, No.11, No.14, No.17 and No.20 could show which aspect participants prefer to improve (Table 26). According to the average point of the answers, the top point with 4.292 indicates the most aspect that people want to improve is a more hygienic environment, over 53% of the people want to have a clearer and health atmosphere during usage of the markets. The intentions to improve the architecture and facilities aspects rank sixth and eighth places, according to the distances between the average points and the standard of average weight which is 3 points. on the other hand, people showed little interest in improving aspects related to hearing aspects, "loudness", "communication with others" and "sources of sounds" occupies three places in the last five rankings. On the contrary, three aspects related to the sense of visual were chosen in the first five places, as well as in the first five places of average points of the desire for improvement, while the other two are "more hygienic environments" and "strongness of smells".

	As	Pp	Np	Ws	Value	Abs(3)	Ev	Efficiency
See more at a glance	3.8230	0.6549	0.0619	3.8600	2.6145	0.8230	0.5390	4.8511
Unobstructed view	3.7611	0.6549	0.0354	3.8600	2.2358	0.7611	0.4984	4.4859
Brighter	3.7876	0.6903	0.0354	3.8600	2.3945	0.7876	0.5437	4.4044
Strongness of smells	2.2478	0.0619	0.6018	3.5200	1.9917	0.7522	0.4527	4.4000
More colors	3.4956	0.4690	0.0708	3.8600	0.9480	0.4956	0.2324	4.0785
More vivid	3.5310	0.5044	0.0619	3.8600	1.0883	0.5310	0.2678	4.0632
Smell good	3.6637	0.5752	0.1327	3.5200	1.5506	0.6637	0.3818	4.0615
Sources of smells	2.4071	0.1062	0.5221	3.5200	1.2375	0.5929	0.3096	3.9973
More hygienic	4.2920	0.8053	0.0354	1.4600	2.4373	1.2920	1.0405	2.3424
Comfort of facilities	3.7168	0.6372	0.0708	1.8600	0.9557	0.7168	0.4567	2.0925
Comfort of structure	3.6018	0.5752	0.1062	1.8600	0.6736	0.6018	0.3462	1.9458
Chances of touching products	3.3097	0.3717	0.1504	1.8600	0.1784	0.3097	0.1151	1.5500
Communicate with other	3.2389	0.4159	0.1770	2.6400	0.1507	0.2389	0.0994	1.5166
Loudness	2.8938	0.1239	0.1947	2.6400	0.0298	0.1062	0.0207	1.4400
Chance of having a taste	3.2655	0.3894	0.1593	1.4600	0.1029	0.2655	0.1034	0.9955
More products to taste	3.2566	0.3982	0.1504	1.4600	0.0962	0.2566	0.1022	0.9409
Sources of sounds	2.9381	0.1504	0.2035	2.6400	0.0101	0.0619	0.0126	0.8035
Physical interaction with people	2.8850	0.2655	0.3186	1.8600	0.0246	0.1150	0.0367	0.6717

Table 26²³. The attitudes towards some improvement aspects in markets

²³ As= Average score (Average score given by participants).

Pp=Positive percentage (The percentage of participants chose positive improvement).

Np= Negative percentage (The percentage of participants chose the negative improvement).

Ws= Weight of sense (According to ranking of five senses).

Abs(3)= Absolute value of average score away from score of no improvement.

Although the results tell that people want to improve visual factors and other factors, the direction of improvement is different, participants choose to improve the factors of the sense of vision in a positive direction, they want more brightness and have an unobstructed view of sight in the market while most participants select more negative or backward options in the aspects about the sense of smell and hearing. Though the value point of positive weight, the first five options are the following aspects: 1. More hygienic environment; 2. Brighter; 3. Seeing more in a glance; 4. Unobstructed view; 5. The comfort of facilities. Analysing these options, a large portion of people tend to have more information with eyes and more comfortable environments in their ideals of market activities. On the other side, in the list of value points of negative weight, the first five options are the following: 1. Strongness of smells; 2. Sources of smells; 3. Physical interaction with people; 4. Loudness; 5. Sources of sounds. In these five options, the value point of aspects of sense of smell is much higher than other options, this shows the smelling problems are the most focus points in the minds of residents which they truly want to improve, while there are two other factors related to the sense of hearing. Though the negative weight point, it could tell more participants want to change the current situation of smell problems and hearing environment, although more than 96.43% of the answers thought communication with others is important in the markets, over 70% show their desire for fewer chances of physical interactions with people and communicate with other, this becomes another conflict point in the five senses research, somehow, it could be explained that people think communications with vendors are important, not with other elements.

The positive values and negative values could tell the attitudes of the choices of most people, describing whether they want these aspects of markets to be improved in a positive or negative direction. Furthermore, after using the positive and negative weights to multiply with the weights of ranking of the five senses which express the importance of each sense, the results become the lists of positive value and negative value, these two lists measure the weight of positive and negative improvements on each aspect according to the five senses of participants in market activities. In the positive value list, the factors related to the sense of visual rank the highest places, the only different factors in the first five rankings are the environment of the good smell and hygienic environment, which means a little positive improvement in sense of sight and the good smell would have better influence than other improvements in other factors related to the other senses. It's the same principle in the list of negative values, the factors related to the senses of smell and hearing rank high in the top ten places. the two factors "strongness of smells" and "sources of smells" have a much higher value than other factors, this is similar to the order presented in the list of the negative weights, the other high-rank factors represent the negative or backward improvements in factors of sense of smell and hearing would work better than other negative improvements in another factor. But due to the low factors that meet the requirements of the average points of the negative direction improvement, there are only five options that could be legal in the list of negative values, compared with the other three options, the factors related to the sense of smell work most efficient in the negative improvement effects.

Considering the variance of the options in the table, the highest five ones are: "smell good", "physical interaction with people", "chances of touching products", "sources of smells" and "communication with others". The answers to these questions vary more greatly depending on the attitudes of the participants than other questions. But these still can't describe the big picture of the importance of these improvements. If an average point of 3 is selected to measure the degree of participants satisfied with the current situation, crossing with the weight of ranking of each sense, the answer given is an average value

$$\text{Value} = \text{Abs}(3)^2 * W_s.$$

Ev= Expected value= $\text{Abs}(s) * P_p$ (If more people chose positive improvement, then use P_p value here, otherwise use N_p . The Expected value meant how much did participants desire on the most wanted improvement.)

Efficiency= $\text{Value}/\text{Ev} = W_s * \text{Abs}(3) / P_p$ (If more people chose positive improvement, then use P_p value here, otherwise use N_p . The efficiency meant how efficient it was when this aspect was improved. Under the same amount of improvement, the higher value meant that this aspect could more satisfy requirement of participants.)

of improvement, this numerical value could show how useful it is to improve these factors in the markets to influence the people through the five senses, the smaller the figure is, the less useful the option is. The factors related to the sense of hearing, taste and touch seem to be less useful than other factors, especially the options under the sense of hearing. People care less about the environmental improvements in hearing and taste, such as loudness and the number of the source of the sounds. There are two special factors needed attentions, one is the “physical interaction with people” and the other is “communicating with others”, this means people are quite satisfied with the current situations of social interactions or they don’t care much about the social interaction aspects in the markets, combining the list of negative value where the “physical interaction with people” ranks highly, this tells that people don’t care about the degree of the physical interaction with people when they use the market functions, while they may be context with the condition of communication with others with words and gestures.

Through the analysis of the attitudes of participants towards the improvement of different aspects of the markets, these conclusions could be made:

1. A more hygienic environment is the most wanted improvement by people in the questionnaire, the other factors that participants cared about the most are the factors about the sense of vision, such as brighter environments and unobstructed eye views. Some factors related to the senses of smell and touch are always important improvement options next to the sense of vision. This result is corresponding to the finding in the previous detailed elements discussion which also shows that the senses of smell and vision are crucial to the atmosphere of the markets, influencing the learning and cognition of customers.
2. According to the efficient value of improvement, the most effective improvements in markets are around the senses of smell and visual. The most useful one is the “Seeing more in a glance”, this indicates the consideration of doing the design about the sight of the customers should be put more attention than other aspects, such as facilities. the other top six options are the following: the 2nd place is unobstructed view; the 3rd place is the brighter environment; the 4th is the strongness of smells; the 5th place is more colours; the 6th place is more vivid colours; the 7th place is the environment of good smells. Although the improvements in these aspects are all effective, the directions of improvements are different, the improvements in the senses of visual are positive, while improvements in the sense of smell are negative. This result also substantiates that most people think the smelly problem is the primary problem in the market needed to be rectified.
3. There are two conflicts that could be found through the analysis of the expectation of the improvements. The first one is that people prefer to have fewer smells and better smells in markets, while in the previous discussion, the smells of aquatic products and meat play an important role in the cognising process of the market environment, it would be a problem to keep the functions of sense of smell in markets while at the same time improving the environment of smell in the markets. The other conflict is about communication problems, when answering the question of whether it is important to communicate with others in markets, 69.03% answered “Yes” and another 27.43% chose “Yes, but only with vendors”, but the result of the current analysis shows that people care less about the positive improvements on communication environment, furthermore, a part of the participants tend to have fewer chances of physical interactions.

Except for these conclusions, there are some other small relationships or connections between different elements. For example, the participants who thought the smell of flowers could remind them of the markets were different from other participants in many aspects. The ranking point of the sense of touch in the five senses is 2.5 judged by those 28 participants, the score is much higher than the average point of sense of touch which is 1.86. Furthermore, in the question of whether would touch things in the markets,

the people who were keen on the smell of flowers tended to touch things in markets more than other participants, 75% of people chose "Yes" and another 21.43% said "Yes, but not actively", while in the whole samples, 52.21% of the answers are "Yes" and in the rest, there are 30.09% of people prefer "Yes, but not actively", this indicates those would be reminded of the market by the smell of flower would have more open attitudes facing interaction and more active in touching things in the markets. This phenomenon also is substantiated in the seventh question of whether it is important to communicate with others in markets, among the 28 participants who cared about the smell of flowers, 85.71% of them thought it was an important aspect of markets, and only 10.71% chose "Yes, but only with vendors", on the contrary, 69.03% of all the participants said "Yes" while another 27.43% thought communication was only important with vendors, that means those who chose that the smell of flowers could remind them of the markets show more open attitudes to social communication not only by words or gestures but also in physical aspects, such as the sense of touch. The same situations happen in those who chose the option "the smell of fruits", but the tendency is not as obvious as the smell of fruit.

People who chose to see more in a glance at the very high-level show that they also cared about the feeling of touching the structure and facilities, 40.74% chose the very high-level option and 40.74% chose the high-level option in the comfort level of architecture, while 44.44% chose the very high option and 37.04% chose the high level in the comfort level of facilities, more than these, 55.56% of those participants thought the touch feeling of the facilities could remind them of the market. the same phenomenon is also shown in those who want an unobstructed view of sight. This may tell that those customers who care about the view of sight would also care about the design and comfort of architecture and facilities.

Making a summary of the research on the five senses in the markets, the five senses of customer work in the market atmosphere in the following principle:

1. Two senses of people play major roles in the customers' process of learning and cognising of the markets, being crucial in participating in the operation of the atmosphere of the markets, the most important sense is the sense of visual and the second one is the sense of smell. Compared to the sense of vision which is always the most important sense in social activities, the importance of a sense of smell in market activities is different from other social activities or public functions. Furthermore, according to the results of the research, some factors related to the sense of smell could have more close connections with the markets than the factors of the sense of vision, such as the smell of aquatic and meat products. Apart from the senses, the factors in markets related to vendors' elements have much larger impacts on customers than factors related to the supervisor and customer elements. Combing these results, it is obvious that the factors related to the vendor elements and based on the senses of smell and visual are essential and crucial to help the customer to cognize the atmosphere of the markets.
2. The most efficient improvements in the markets are also about the senses of smell and vision. Efficient here means the same amount of improvement could meet the expectations of customers better than other improvements. The first three improvement aspects are "See more in a glance", "unobstructed view of sight" and "brighter environment", these results mean that the design of the sight of the customers is important in the design of the market space. Participants also show their interest in reducing the strongness and number of smells, an environment with a good smell is also effective in improvements of markets, while it may show the conflict in the sense of smell in the operation of the five senses functions in markets.

Considering these conclusions of the five senses research, the design of the architectural aspects of the markets should consider showing more the elements of vendors related to the senses of smell and visual, having some space letting customers see the markets at a higher level and get more information through smells and colours would be better than current situations of the design of the markets. For the conflicts

about the smell and communication problems, instead of the smells of aquatic and meat products, using the smell of flowers, fruits and Sui mei would also play the same role as the sense of smell in the atmosphere of markets, in addition, these smells may have other positive influence on communication conditions. On the other side, a better space design with a good view of sight and enough space may solve the communication problem in certain aspects, with less physical contact and better information. On the contrary, the factors about architecture and facilities don't have an active role in the atmosphere of the market, as well as the supervisor elements, but this does not mean that these factors could be ignored, some important factors are supported by supervisor elements, such as information boards.

Chapter 8 POE STUDY OF MULTIFUNCTIONAL MARKET BUILDINGS

The POE study of multifunctional market buildings is built up by a questionnaire, some interviews and related talks. This section has three different aims:

1. Evaluating the four multifunctional market buildings in Macau, the results could tell the advantages and disadvantages of these multifunctional market buildings, furthermore, the differences between those multifunctional market buildings may explain why participants tend to choose particular markets.
2. Comparing the results of individual interviews and the questionnaire, the problem of whether the mode of multifunctional market building works well in Macau could be answered with data and current conditions, and the conclusions could give important suggestions for design and planning aspects of future markets in either Macau or other places.
3. The final aim is to explain and substantiate the system of market, combining the results of pilot research and history reviews of the markets in Macau, and try to expound on how the multifunctional market buildings come to current conditions and some principles of multifunctional strategies, the final discussion would be made about the essence of problems about markets.

Different from previous sections, the questionnaire and interviews in the POE field research would not be discussed individually, the processed result of the questionnaire and interviews will be presented through the discussion on different topics of the situations of multifunctional market buildings, and this section is generally arranged according to the three major aims and related problems.

8.1 Evaluations of different functions

The evaluation of the four selected multifunctional market buildings consists of two parts, one is about the market function, and the other one is related to the other different municipal functions in the multifunctional market buildings, all related information was gathered by a questionnaire with quantification questions. Due to the inadequate samples of the Shalitou multifunctional market building, a large portion of the discussion topics don't include the Shalitou multifunctional market buildings, contradistinctions would be made mainly between the other three markets. According to the results (Table 27), the evaluation points of the Yingdi market had the highest average point of 2.99 in the field of market function among the four multifunctional market buildings, while the Xiahuan market got an average point of 2.84 and the Youhan market had 2.7. The evaluation included different aspects of the market functions,

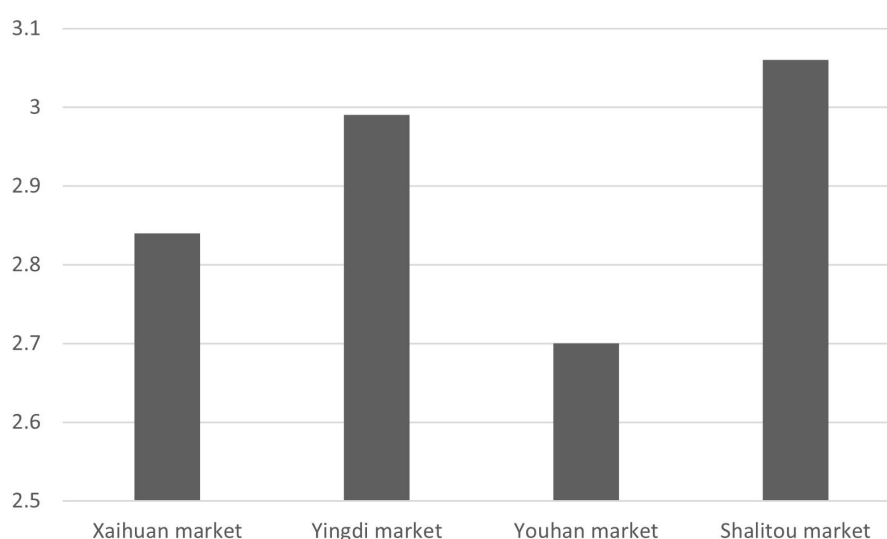


Table 27. The results of which multifunctional market building participants favoured

Such as infrastructures and vendor elements. Crossing over the previous research on the five senses, if multiplying the average points with the weights of the five senses representing which the sense of sight is the highest, the results also show the same phenomenon. The total points related to the five senses were also close to each other, the Yingdi multifunctional market building had the highest score of 63.215, followed by the Xiahuan market and Youhan market whose scores were 58.934 and 57.828. In addition, the score of the Shalitou market was 61.279 which was higher than the Xiahuan market and the Youhan market. Among these evaluation aspects, although different markets performed individually according to the real situations, the aspects which were marked with the lowest points didn't vary much (Table 28). The Xiahuan market got the lowest points in smells, the design of moving lines and noise; the Yingdi market worked badly in three aspects: prices, smells and noise, while the fourth and fifth aspects were atmosphere and government elements; The Youhan market had the same situation as the Yingdi market, having the lowest points in prices, smells and noisy aspects, the fourth and fifth lowest aspect were signs of directions and the design of the moving lines. Though the results, people normally had bad experiences with smells and noise aspects, and the designs of the moving lines and other elements related to the supervisor elements didn't satisfy most participants.

	Average score	Weight of sense	Sum
Xiahuan market			58.93352941

Lightning system	2.91	3.86	9.479705882
Ventilation system	2.79	3.52	8.385882353
Ground condition	2.68	1.86	4.267058824
Options	3.09	0	0
Infrastructure	3.09	1.86	4.759411765
Vendor	3.03	0	0
Atmosphere	3.03	0	0
Management	2.88	0	0
Signs	3.06	3.86	9.763529412
Width of passageway	2.85	1.86	4.458529412
Price	2.82	0	0
Smell	2.53	3.52	7.868235294
Design of moving route	2.68	1.86	4.321764706
Noisy	2.38	2.64	5.629411765
Yingdi market			63.215
Lightning system	3.31	3.86	10.37375
Ventilation system	3.5	3.52	9.79
Ground condition	3.13	1.86	4.824375
Options	3.13	0	0
Infrastructure	3	1.86	4.708125
Vendor	2.94	0	0
Atmosphere	2.88	0	0
Management	2.88	0	0
Signs	3	3.86	9.65
Width of passageway	2.94	1.86	4.591875
Price	2.75	0	0
Smell	2.75	3.52	8.25
Design of moving route	2.88	1.86	4.591875
Noisy	2.81	2.64	6.435
Youhan market			57.82787234
Lightning system	2.81	3.86	9.321489362
Ventilation system	3	3.52	8.837446809
Ground condition	2.7	1.86	4.333404255
Options	2.83	0	0
Infrastructure	2.72	1.86	4.372978723
Vendor	2.74	0	0
Atmosphere	2.79	0	0
Management	2.74	0	0
Signs	2.66	3.86	8.951914894
Width of passageway	2.96	1.86	4.590638298
Price	2.51	0	0
Smell	2.4	3.52	7.601702128
Design of moving route	2.66	1.86	4.313617021
Noisy	2.32	2.64	5.504680851
Shalitou market			61.27889
Lightning system	3.22	3.86	10.07889
Ventilation system	3	3.52	8.8
Ground condition	2.67	1.86	4.34
Options	3.89	0	0
Infrastructure	2.89	1.86	4.443333
Vendor	3.11	0	0
Atmosphere	3.33	0	0
Management	3.11	0	0
Signs	3.11	3.86	10.07889
Width of passageway	3.22	1.86	4.753333
Price	2.89	0	0
Smell	2.67	3.52	8.017778
Design of moving route	3.11	1.86	4.753333

Noisy	2.67	2.64	6.013333
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Table 28. The evaluation points of different aspects of the market function in the four multifunctional market buildings

After discussing the evaluations of the market functions of multifunctional market buildings, the results of participants' feelings on the other functions also showed some features of current conditions. The evaluation system of the other functions in the multifunctional market buildings includes the following aspects: environment and sanitation, infrastructures, government, space, the feeling of usage and related characteristics. The four multifunctional market buildings all have three other functions except the market function, cooked food centre, activity centre and parking function are considered necessary in multifunctional market buildings. The three markets have libraries which exclude the Youhan market. while the Youhan market has some other special functions. The results of the evaluation of these functions showed that the Yingdi market had better points in the activity centre and parking space, and the Xiahuan market worked better in the cooked food centre and library function (Table 29). The Youhan market was always ranked at the bottom of the evaluation, the common problems presented in this evaluation of the other functions in the Youhan market were related to government aspects, with the points of government aspect in other functions being much lower than scores in other aspects such as feeling. The weak point in the Xiahuan market was the environment and sanitation, the same situation happened in the Yingdi market, this sentenced the research on the five senses and previous pilot research that many people thought the environment and sanitation aspect was the primary problem needed to be handled in the multifunctional market buildings. Apart from these, there is another interesting pattern in that the points of the users' feelings are much higher than other evaluation aspects, no matter which multifunctional market building or which function in the market, this means that the subjective feelings of using the market buildings are better than objective built environments that markets provided, it could be explained by the results of the research on the five senses, for except the sense of sight, other senses such as smell and hearing are also important in understanding and remembering the activities of the markets.

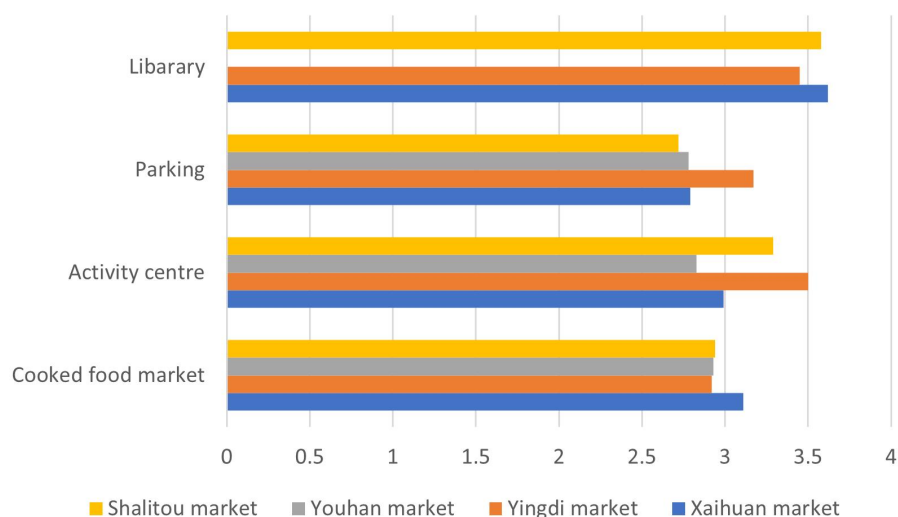


Table 29. Evaluation points of different functions in multifunctional market buildings

Apart from these basic functions, the other special functions in the multifunctional market buildings were also in the evolution process, although lacking comparison objects, these functions could be references for the future design of multifunctional market buildings. The special functions like the rooftop garden in Xiahuan market and rooftop sports fields in Youhan market got lower points than other functions in the

same markets (Table 30), the points showed the problems laid in the usage conditions under extreme weather and equipment aspects. The children's playground in Xiahuan market and the vendors' area in Youhan market performed better than the previous two functions, the points of the functions were just above the normal standard, compared to other functions.

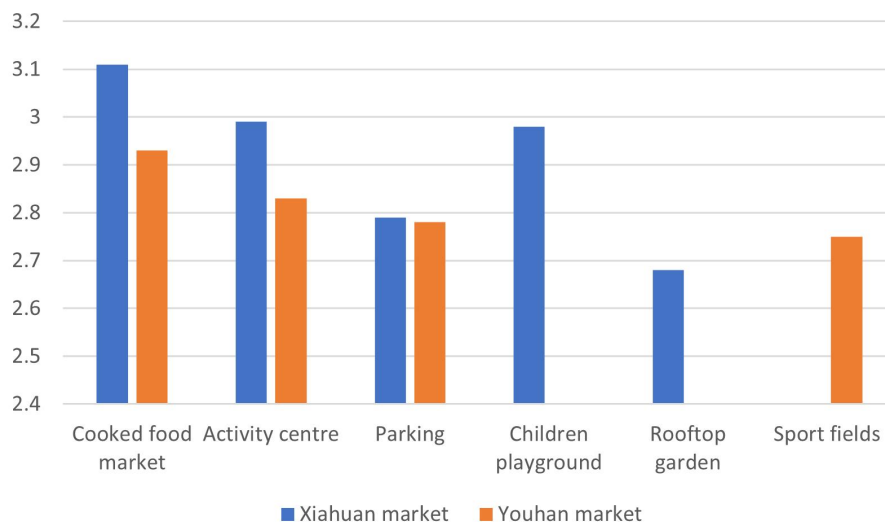


Table 30. Evaluation points of functions in the Xiahuan market and Youhan market

If combining the points of the market function with the points of other functions in the multifunctional market buildings, the results showed that the Yingdi market got the highest points in overall functions and average score, then came the Xiahuan market and Shalitou market, with the Youhan market at the bottom (Table 31). Though the evaluation results, the participants tend to be strict with the aspects which could directly impact feelings, such as smells or noise, these aspects were always marked with points lower than average standards. Although there were only a few people tick their answers with bad or very bad standards in some fields, most people hesitate between the ordinary standard and advanced standard, seldom aspects could be evaluated in good or very good standards, for example, the air ventilation system in the Yingdi market and adequacy of space in the library of the Xiahuan market. It could be told that people were quite satisfied with some objective conditions, combined with high scores in the feeling of the usage aspects, the users of the multifunctional market buildings might not be pleased with certain subjective conditions provided by the supervisor or vendor elements or some feelings of objective conditions, that was presented by the low points in aspects such as the government and smells. Overall, through the results of the evaluation tables in the questionnaire, the Yingdi market seems to be the best multifunctional market building among the four selected ones, according to the points, better than the newly built Shalitou market and Xiahuan market. Does that mean the Yingdi market works well in the mode of the multifunctional market building and could be an example of a solution for the future market? The answer is no.16 When being asked which multifunctional market building they think is the best among the four markets, most people chose the Youhan market which got the lowest points through the evaluations (Table 32), and the second selected choice was the Xiahuan market.

	Market function	Other functions	Overall
Yingdi market	2.99	3.26	3.21
Xiahuan market	2.84	3.03	3.00
Shalitou market	3.06	3.14	3.12
Youhan market	2.7	2.82	2.80

Table 31. Overall evaluation points of functions in multifunctional market buildings

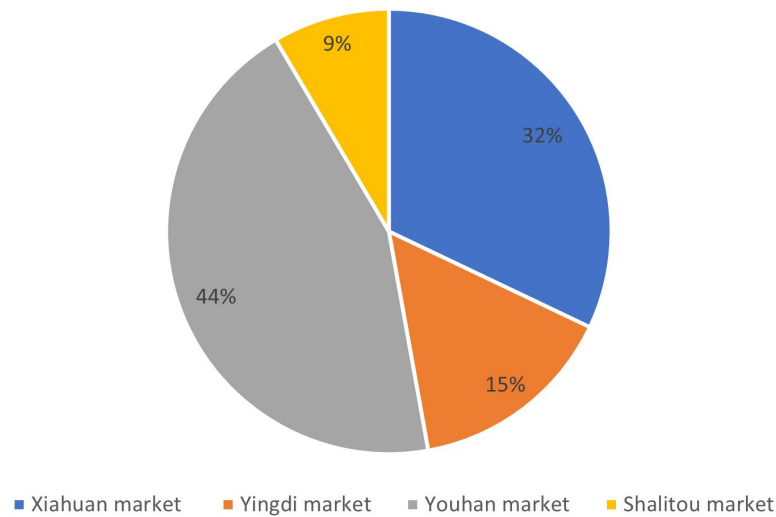


Table 32. The best one among four multifunctional market buildings according to participants

Although the evaluations of each multifunctional market building were done by the participants who chose the market, there were no specific patterns of individuals or groups. Here are the results of the evaluation of the market function of each multifunctional market building according to different age groups (Table 33), there is a tendency between the age groups and their evaluation points. Take the Youhan market as an example (Table 34), people between 18 and 30 tended to give the highest points in each aspect than any other age group, and then the age group range from 31 to 40 gave the second highest points. On the contrary, people aged 51 to 60 usually gave the lowest points in the evaluations, no matter the functions and aspects, while the age group of 41-50 gave the second lowest points. The rest of the participants were the oldest residents in the questionnaire process who gave points a little bit higher than the average score of each aspect, as a result, the relationship between ages and evaluation points could be concluded as follow (Table 35). This kind of pattern didn't only appear in the Youhan market, the same tendency also showed up in other multifunctional market buildings (Table 36), which means the background of the users of each market had obvious influences on the evaluation points and the impacts of the background factors were much greater than any other factors, so even if there were specific patterns of individuals or groups who selected particular markets, they would not influence the evaluation points in the big picture.

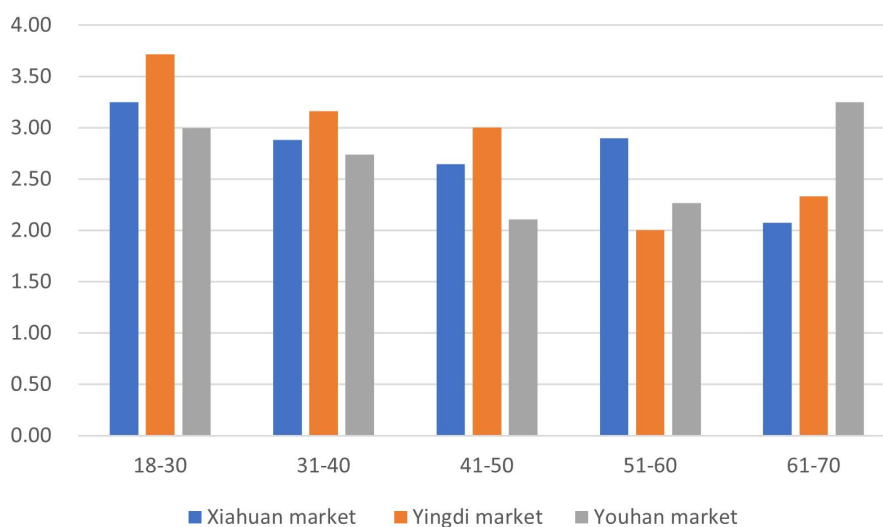


Table 33. Evaluation points of market function in the multifunctional market building

according to ages

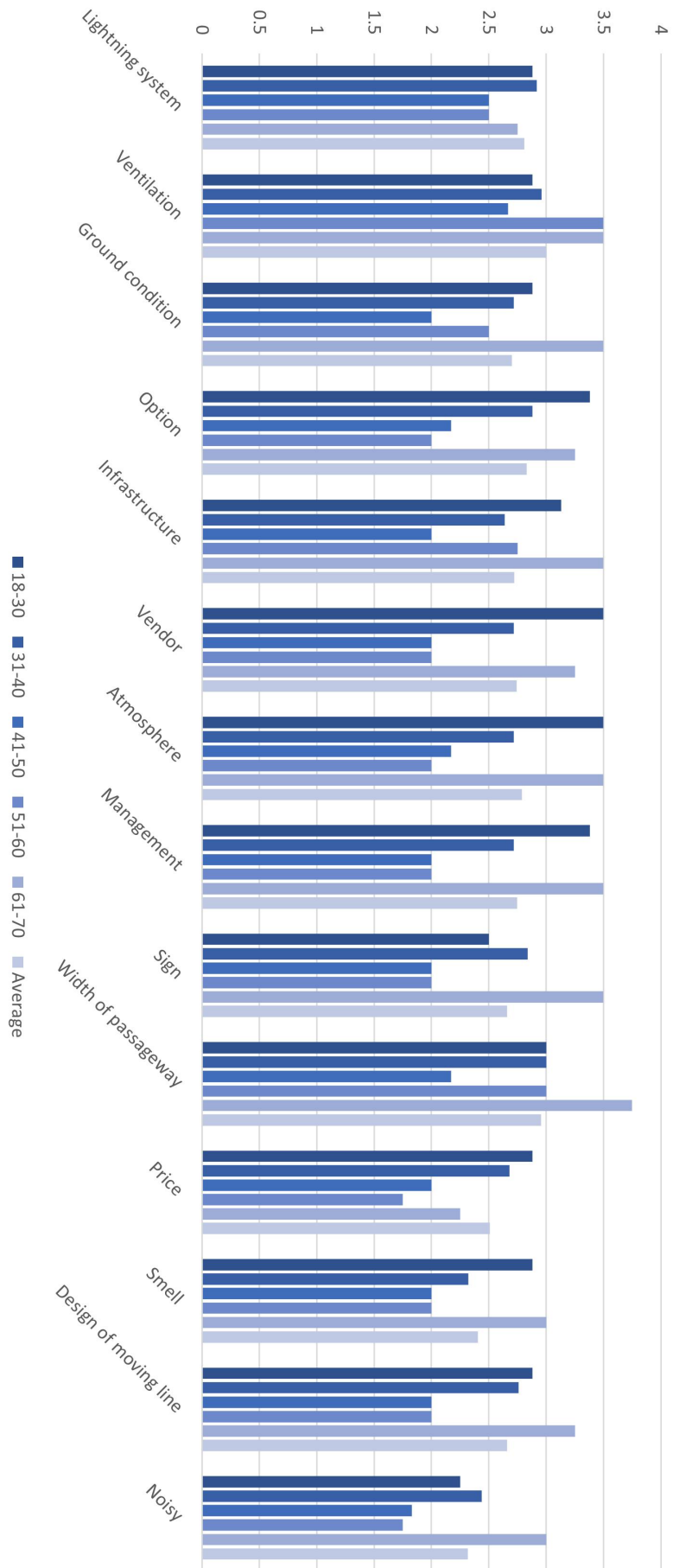
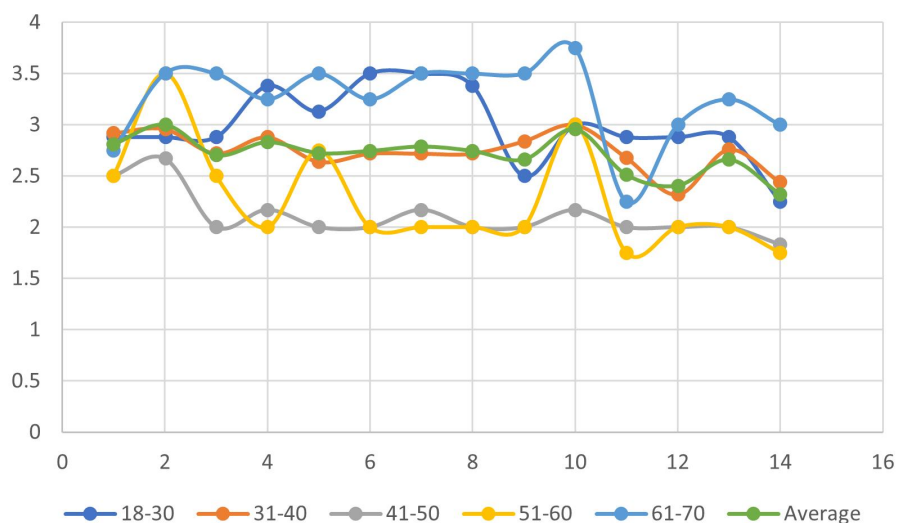
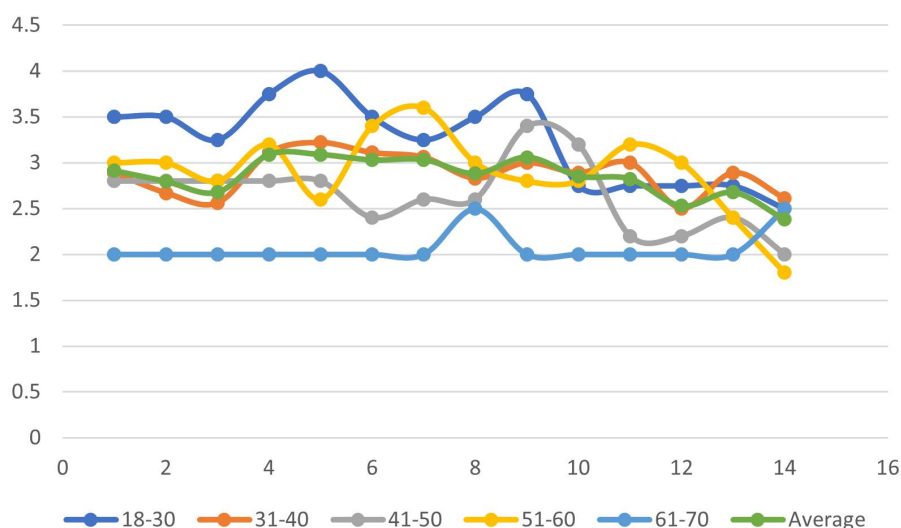


Table 34. The evaluation points of different aspects of the market function in the Youhan market according to ages**Table 35. The tendency of evaluation points of different aspects of market functions in the Youhan market according to ages****Table 36. The tendency of evaluation points of different aspects of market functions in the Xiahuan market according to ages**

Not only in age groups but also there were also certain patterns in the relationships between the amount of housework and the evaluation points. The amount of housework could show the social characters of the participants, people who are responsible for the amount of housework for one person means they could be single and have jobs to take care of only themselves; the amount of housework for two means those people could be couples; the amount of housework for three, four or more people indicates the participants could be housewives or the elderlies who responsible for the meals of the whole families. Take the Youhan market as an example (Table 37), People who were responsible for more than one person tended to give low points about market functions, this tendency changed when it came to whose amount of housework was more than four people. On the contrary, participants who didn't have to do housework or whose amounts of housework were lower than one person market higher points than the rest. As a result, the tendency in the relationships between the amount of housework and evaluation

points showed a U-turn with the amount of housework increased (Table 38). This kind of pattern seemed to be more obvious when it came to evaluating the aspects related to direct feelings, such as the conditions of the floor and smells. Though the results of the relationships between the amount of housework and the evaluation points showed that letting participants evaluate their own selected markets could show the current situations of markets, the influences of background factors were bigger than the motives to choose the markets.

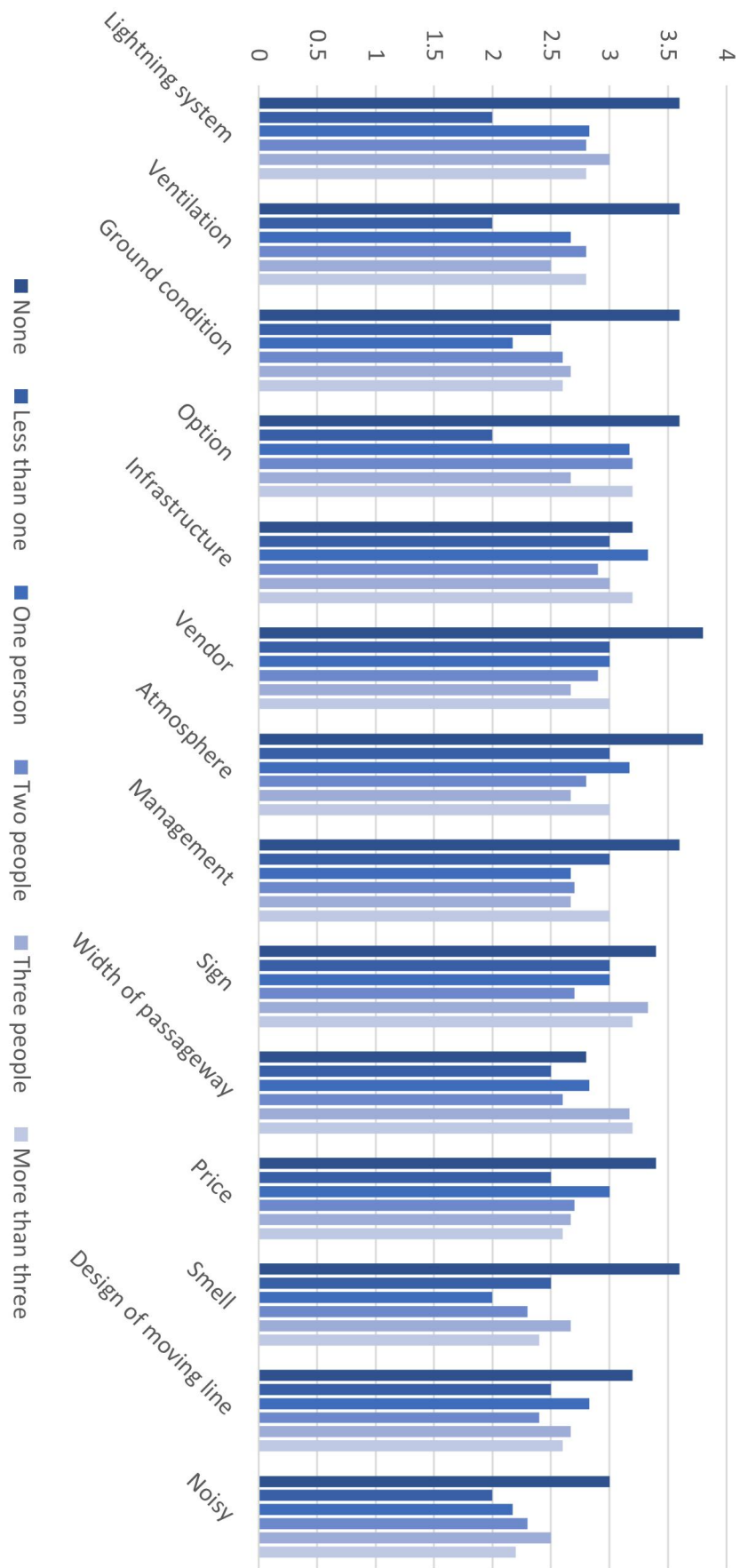


Table 37. The evaluation points of different aspects of market functions in the Youhan market according to the amount of housework responsible by participants

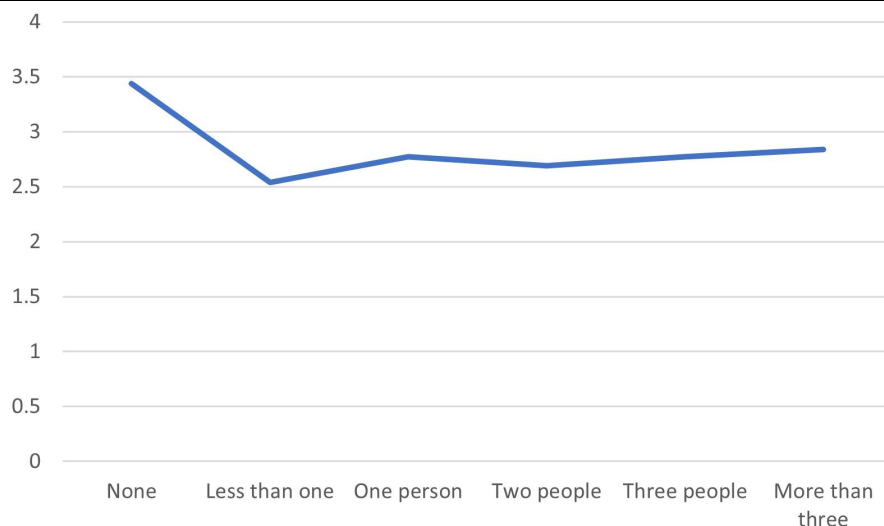


Table 38. The tendency of evaluation points of market functions in the Youhan market according to the amount of housework responsible by participants

8.2 The mode of the multifunctional market building

8.2.1 Evaluation of attitudes toward the mode

Back to the question of whether the mode of the multifunctional market building worked well in Macau, there were three different sections of the questionnaire that could give the answers. One was the questions directly asking people whether the mode of the multifunctional market building could increase the frequency rate of using the market function in the buildings; the second method was to ask participants whether they went to multifunctional market buildings more frequently than they used to, while the design and conditions of the market buildings were improvements; The final way was to compare the frequency rates of using market with other related information such as evaluation points and favoured advantages. The previous two aimed at the direct subjective ideas of the participants, and the last one was to use objective data to show the true current relationships between users and multifunctional market buildings.

The first section had two separate questions: one was asking whether the other functions in the multifunctional market buildings would increase the frequency of using the market functions (Question No.15 in Questionnaire 3); The second one was asking the users whether they would stop by the market functions in the multifunctional market buildings without planning in advance if they went to use the other functions in the buildings (The question No.65 in the questionnaire 3). The result of the first question showed 70.75 per cent of the participants thought other functions would increase the frequency of using the market functions, and the second question had a similar situation. 63.21 per cent of the answers said yes to whether they would stop by the market functions due to using other functions in the markets (Table 39). The result of this part showed that a large portion of the residents thought the mode of the multifunctional market building had positive influences on the people's willingness of using the market function, and this kind of thought may change depending on age and other background factors. In the first question, except for the age group from 51 to 60 years old, about 63.64%- 77.19% of the participants in the rest age groups thought the frequency rate would increase, but the situation had a U-turn in the

second question. About 33% of people in the age group 17 to 30 chose “Yes” when asked whether they would stop by the market function without planning if they used other functions in the buildings, the portion of “Yes” answer in other age group were 68.42%, 84.62%, 70% and 45.45% (Table 40). This indicated that most people thought the other functions in the multifunctional market buildings would increase their frequency of using the market function, but individually the attitude would be changed depending on whether using the other functions or not and their ages. The same thing happened when dividing participants by the amount of housework they were responsible for. Except for the groups that represented the amount of three people’s housework and no more than a person which 85.71% and 89.47% of the participants chose “Yes” in the first question, the rest groups had around 65% of people chose the other functions would increase the frequency of using market functions. But in the second question, the group with the amount of housework portion for none, three, four and over didn’t change compared to the first question, the rest groups changed greatly (Table 41). Only 28.57% and 38.1% of the answers in the groups of amounts for one and less than one chose “Yes” when discussing whether they would stop by market functions if using other functions in the market buildings which were 85.71% and 61.9% in the first question, on the other hand, there were 75% of the participants were responsible for the two people’s portion of housework who chose “Yes” answer. The reasons why the situations changed with the background factors of the participants could not be cleared just by handling these pieces of information, but in the big picture, most people thought the mode of the multifunctional market building would be helpful in increasing the chance of people to use the market function in the market buildings.

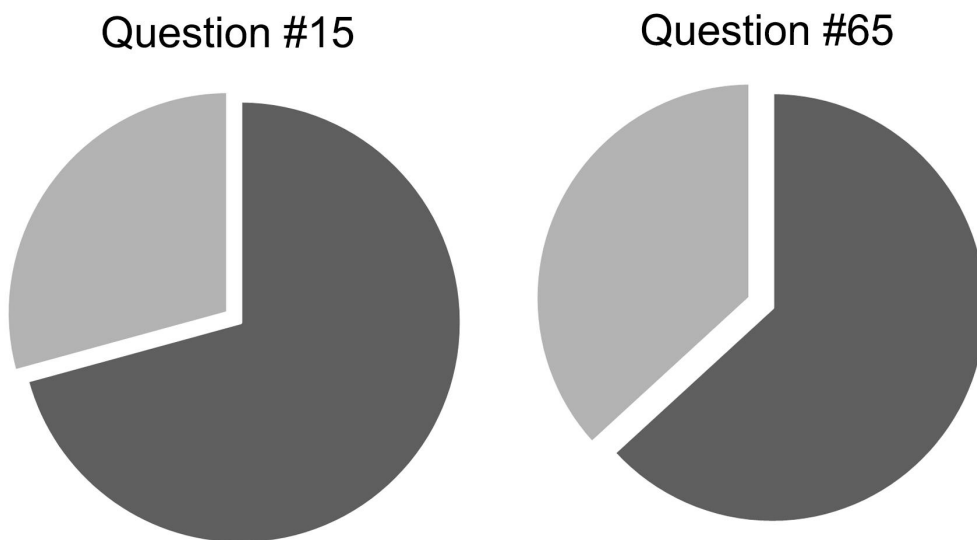


Table 39. The results of the question 15 and 65 in Questionnaire 3

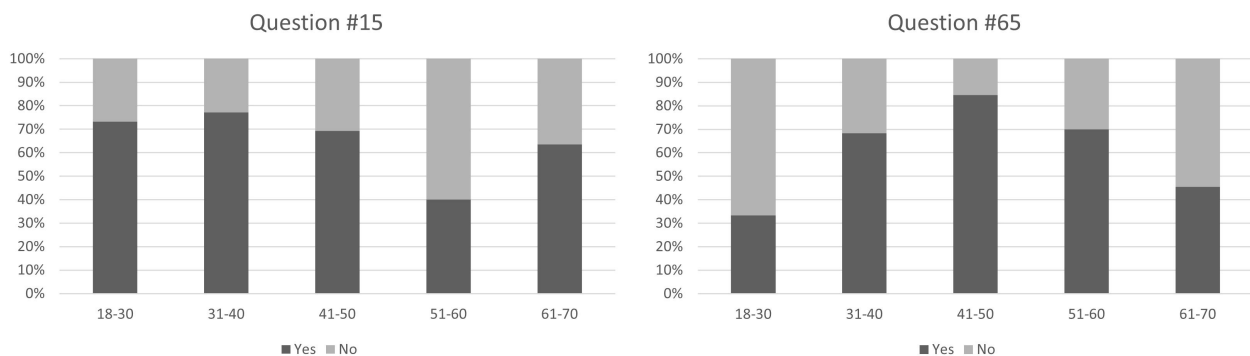


Table 40. The results of the question 15 and 65 in Questionnaire 3 according to ages

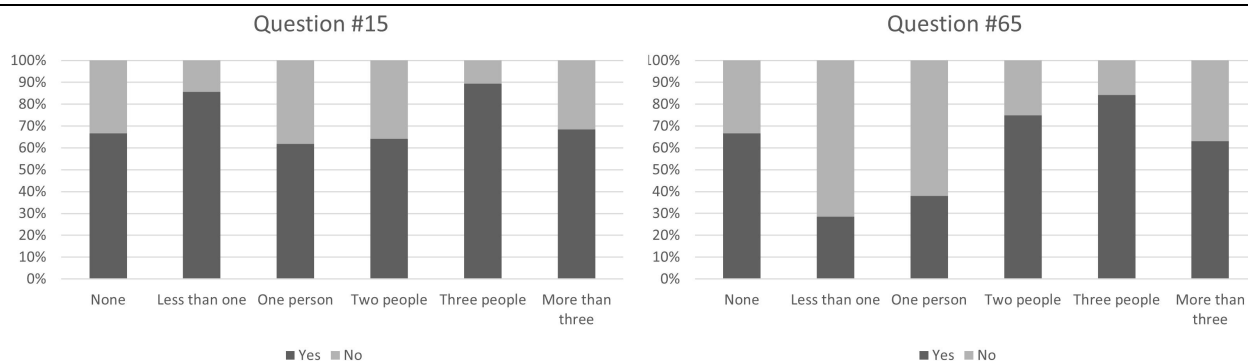


Table 41. The results of the question 15 and 65 in Questionnaire 3 according to the amount of housework responsible by participants

The second section also included two questions, one was an evaluation table measuring how people thought about the improvements in the multifunctional market buildings, in order to know whether the mode of multifunctional market building was helpful in promoting the conditions of markets (Question 66 in the questionnaire 3); the other question directly asked participants whether they have used the market functions more frequently after nearly 30 years' development of the multifunctional market buildings since 20th century (Question 67 in questionnaire 3). Different from the previous section which aimed at the subjective thoughts of the participants about the mode, these two questions could tell the changes or feelings of people's behaviour patterns under the impacts of the multifunctional market buildings.

The result of the first question showed how most people felt about the different aspects of the multifunctional market buildings that had been improved through these decades, compared to the conditions of the past (Table 42). The most recognized improvement happened in the aspects of environment and sanitation, 65.09% of the participants chose a bit of improvement and 12.26% thought it advanced greatly, while according to the previous research, it still got relatively low points in the evaluation of current conditions, this could be explained by the result of the five senses research which mentioned the improvements on the sense of sight and smell was the most effective improvements according to five senses. The aspects related to the senses of sight and smell were included in the aspect of environment and sanitation in this question. The second most selected improvement was the cooked food centre, with more than 76% of the answers regarded the changes of the cooked food centre in the multifunctional market buildings were positive and only 18.87% thought this aspect hadn't changed which was the lowest number among these aspects. There was no likely answer to explain this situation with previous information, because in the five senses research, the sense of taste ranked at the bottom in helping to learn and remember the markets, but it would be helpful in the following discussion whether the mode of the multifunctional market building worked in improving situations of markets. The third favourite choice was the architectural appearance of the multifunctional market building, in this option, there was no participant thought the changes in the architectural appearance were negative which only happened once among those aspects. It was hard to say whether the architectural appearances of the multifunctional market buildings would affect people to use the market functions or market buildings, it didn't match with the first section which had around 40% of people who didn't increase the frequency rate of using the market function depending on other functions. The aspect that had the lowest point in this question was the transportation aspect, around 50% of the answers thought the changes were positive and most of them tick the answer box of normal improvement not improved greatly, while there were 44.34% of the participants thought the conditions of the transportation around the multifunctional market building had not changed which was the high portion among all these aspects. This could show the aspect of transportation in the mode of the multifunctional market building did not reach the current expectations of most participants. The aspect of transportation largely relied on the parking function and transportation conditions around the multifunctional market buildings, these conditions could not be

easily changed after the market building was put into use, as a result, it could be explained why people did not think the aspect of transportation had been improved than other aspects, this also affected in the following discussion on the mode of the multifunctional market building. There were other three aspects all having the second lowest points in this evaluation, they were aspect of vendors, activity centre and parking function. Although they got the same points, the situations are different between these aspects, the votes on the aspect of vendors showed a tendency of polarization, 5.66% of the answers chose the condition became worse than in the past which was the highest among those aspects. The aspects of the cooked food centre and parking function showed the same situation as the aspect of transportation, part of people thought they didn't change after these decades. Throughout these results, the results of all the aspects all located in the interval of 0 to 1 which meant most people thought the multifunctional market building had improved in all aspects, but not reaching the expectation of good standards. The participants had slightly positive attitudes toward the mode of the multifunctional market building.

	Much worse (-2) ²⁴	Worse (-1)	No change (0)	Better (+1)	Much better (+2)	Average point
Architecture appearance	0.00%	0.00%	26.42%	66.98%	6.60%	0.8
Management	0.00%	1.89%	22.64%	73.58%	1.89%	0.75
Vendor	0.00%	5.66%	31.13%	57.55%	5.66%	0.63
Sanitary	0.00%	2.83%	19.81%	65.09%	12.26%	0.87
Transportation condition	0.00%	3.77%	44.34%	47.17%	4.72%	0.53
Market function	0.00%	1.89%	31.13%	60.38%	6.60%	0.72
Library	0.00%	0.94%	35.85%	54.72%	8.49%	0.71
Cooked food centre	0.00%	4.72%	18.87%	65.09%	11.32%	0.83
Activity centre	0.00%	1.89%	38.68%	53.77%	5.66%	0.63
Parking	0.00%	2.83%	38.68%	50.94%	7.55%	0.63

Table 42. Attitudes of participants towards improvements in different aspects of multifunctional market buildings through these decades

If arranging the results of the evaluation with age groups, the different attitudes and focus points of different ages could be revealed (Table 43). The youths tended to satisfy with the improvement in most aspects, they rated highly except the aspects of transportation and parking function, especially about the aspects of cooked food centre, environment and sanitation. On the hand, the middle age groups were strict about the improvements, they gave relatively low points than any other age group, the lowest point was found in the aspect of the cooked food market selected by people aged from 51 to 60, while the cooked food market function ranked the second in the positive improvement list. This phenomenon of different attitudes to the evaluations was similar in previous evaluations, but the different point was that people showed more own focus points than other questions, for example, people aged from 41 to 50 were more concerned about the improvement in the aspect of environment and sanitation and people aged from 51 to 60 were not pleased with the improvement in the cooked food centre. Except for the aspect of transportation, all age groups marked low points in this question, it seemed that the improvement of transportation was not generally accepted according to the urban development.

²⁴ The numbers in the brackets represent the scores of these options.

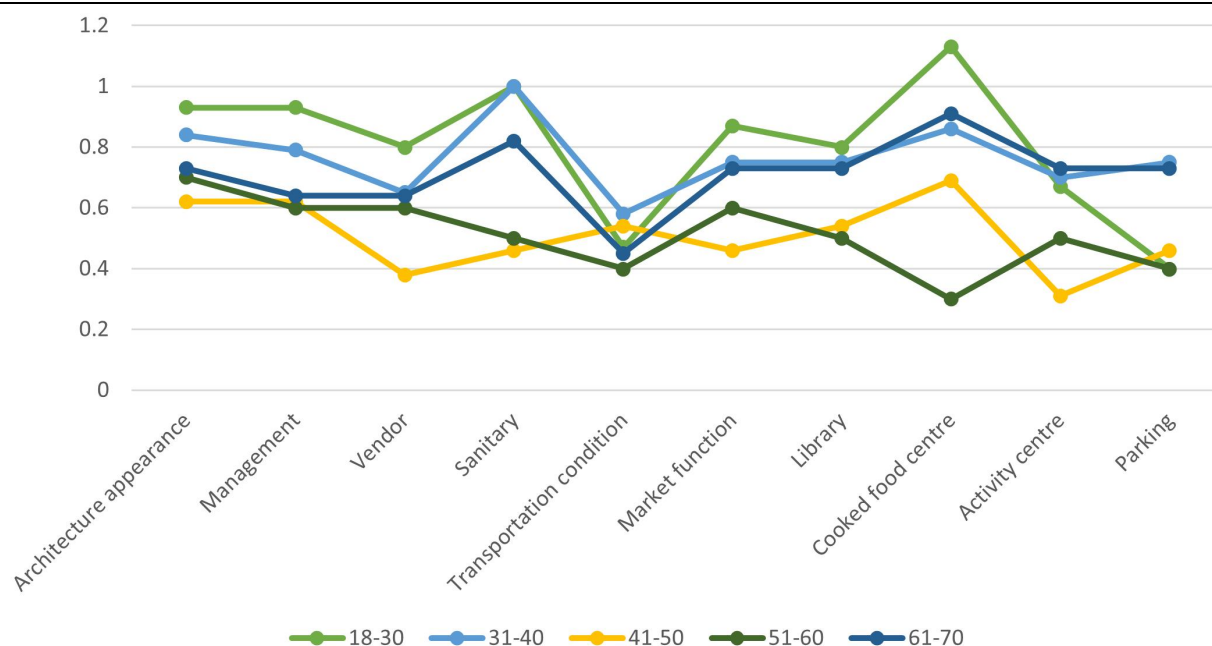


Table 43. Attitudes of participants towards improvements in different aspects of multifunctional market buildings through these decades according to ages

In the second question (question 67 in questionnaire 3), about whether people went to the multifunctional market buildings more frequently than in the past, about 42.45% of the participants said “Increased” and 40.57% people thought their behaviour patterns had not been changed, with the rest of the answers told there was a decline in times (Table 44). According to the results of the second question, the actual behaviours of people did not correspond with the result of the first question which at least around 60% of people agreed with the positive improvement of the multifunctional market buildings. It indicated that the improvements of the multifunctional market building did not have close relationships with the frequency rates of going to the multifunctional market buildings, people went to market buildings less than they intended which was mentioned in the first section where around 75% thought other functions would encourage them to use market function more frequently. Analysing the results according to the age group, the proportion of people who increased their trips to go to the multifunctional market buildings generally decreased with the ages increased, while the other options had different proportions with age groups changed (Table 45). In this questionnaire, the participants aged from 31 to 40 were the majority, if taking them as an example group, 45.61% of the people went to the multifunctional market building more often, with 35.09% saying their usage frequency of the market building not been changed, and the rest 19.3% of the participants didn't go to the multifunctional market building as often as they used to be, the situation was similar with the whole result regardless of the age differences, with fewer people increasing their visits. Generally, a large part of youths increased their frequency rates of going to the multifunctional market buildings, while this tendency decreased with ages increased, the result showed a good phenomenon to the mode of multifunctional market building that more young generation tended to become the new potential customers of the multifunctional market buildings if the functions worked well to keep these customers stay, it would create a healthy ecosystem for market functions and multifunctional market buildings.

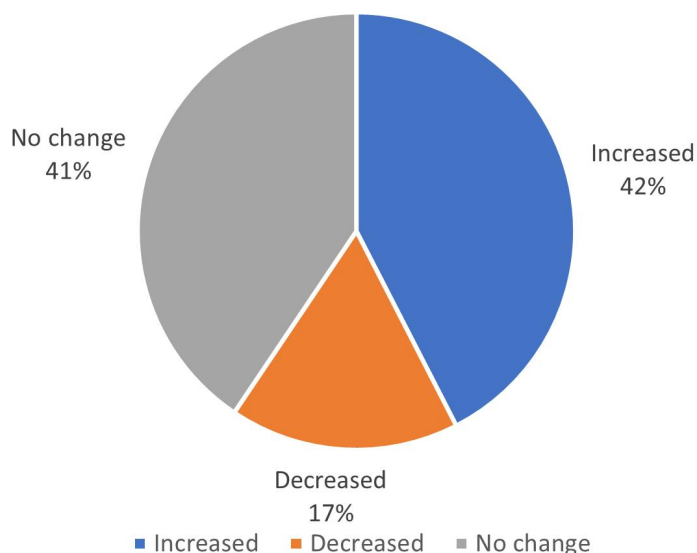


Table 44. The results of question 67 in Questionnaire 3

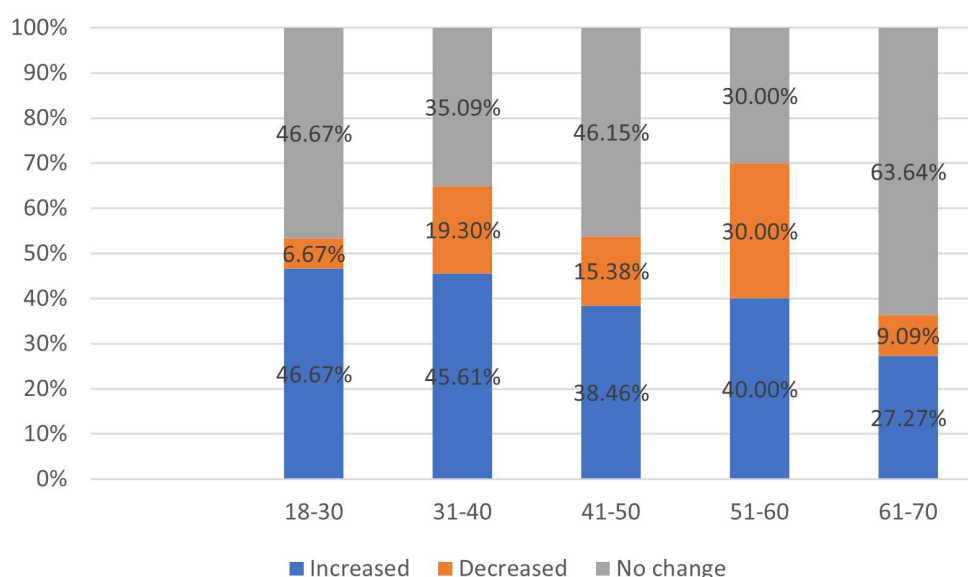


Table 45. The results of question 67 in Questionnaire 3 according to ages

Through the results of the first and second sections, both the subjective thoughts of participants and their objective behaviour patterns showed that most people had positive attitudes to the mode of the multifunctional market building, they tend to use the market building than used to be, and the improvements in different functions were recognized by the most of them. All these pieces of information showed that the mode of the multifunctional market building had had positive impacts on the market function since it was adopted in urban development, and through the improvement of the multifunctional market buildings, they tended to be attractive to the new generations. Considering these data, the mode of the multifunctional market building could be a choice in urban development and generation process for those high-density areas or a proper solution for markets facing current challenges.

8.2.2 Behaviour patterns

8.2.2.1 Conflicts between behaviour patterns and the results of the evaluation

Although it seemed that the mode of multifunctional market building was quite a success through those previous results of questions directly related to the mode, the actual behaviour patterns of the participants told a different story.

Making an example, if crossing analysis the question asking participants how long they went to multifunctional market buildings once (question No.9 in questionnaire 3) and the question asking them whether they increased the number of trips to the multifunctional market buildings (question No.67 in the questionnaire 3) (Table 46). Through the results, people's ideas changed greatly with different behaviour patterns. The group having the largest proportion of participants who increased their frequency rates of going to the multifunctional market buildings was people who went to market buildings once in half a month, with around 70% of the answers choosing the "increase" option. The other behaviour groups which also had relatively lots of people who thought the number of trips to the market building was increased were options: once a day, once two days and once half a week. Although these groups covered over half of the whole options, the number of participants was lower than 50% of the total. Over 72.64% of the whole participants in this questionnaire showed they were in favour of increasing their frequency of visiting multifunctional market buildings. In the option of once a week, once a month and once at least over a month, the number of people who chose the "increase" answer was no more than those who chose the "no change" answer, apart from this, there were more people thought their numbers of trips to multifunctional market buildings had decreased than they used to do, the proportions of this part of people were much higher than other groups, the highest one is the "once a week" group which had 33.33% of the selectors said it decreased. Handling the data in another way, among the three answers, "increase", "decrease" and "no change", participants who went to multifunctional market buildings once over a month made up over half of the "decrease" and "no change". On the contrary, the groups representing more frequency rates took up more proportion in answering "increase" occupation. Analysing these results, they indicated that people were overly optimistic about the mode of the multifunctional market building and its impacts on people's actual behaviours. People who went to multifunctional market buildings more frequently intended to go there more often than in the past, and vice versa. A more important point was the majority were people who went to the market buildings once more than a month, this meant even though most people thought they had increased their frequency of going to multifunctional market buildings, it might not have had much influence in the big picture. There was no difference between once a year and twice a year, especially in the multifunctional market buildings which aimed at providing daily life resources. In other words, the positive influence of the mode of multifunctional market building was limited and less attractive to those who did not have motives to use the market buildings at first, this would lead to fewer new customers to the market functions. Combing with the previous results, even though the mode of the multifunctional market building could attract new generations to be potential customers, it would be more and more difficult and less effective, due to the new generation being more likely to the other shopping methods which would be mentioned in following discussions.

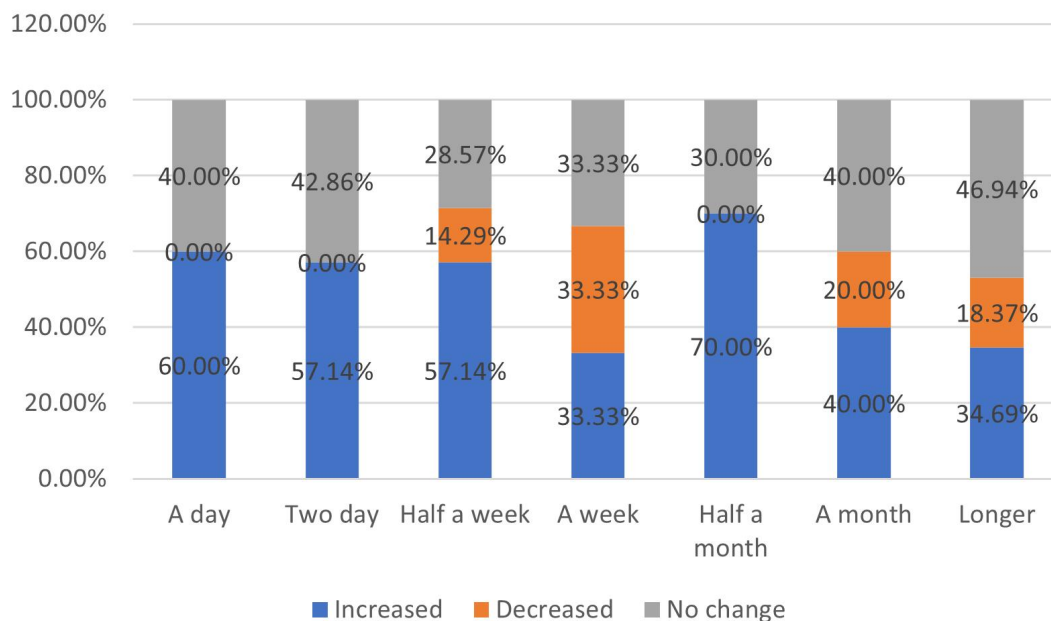


Table 46. Cross-analysis of questions No.9 and No.67 in Questionnaire 3

Not only this question could show the problems about the mode, but there were also some other data that could substantiate the problems were not concerns without bases.

Analysing another question about the behaviour patterns of people (question No.5 in Questionnaire 3), it targeted the frequency rates of participants using different shopping methods which included markets, supermarkets, online shopping, street vendors, restaurants and food shops. Though the results of the question and age group divisions, the problems of the markets were more obvious (Table 47). Among those methods of shopping for daily resources, the supermarket was the top choice on the list with a frequency rate of 3.92 and the median number represented the frequency rate of "high". The restaurant was the second selected option and the food shop was the third, on the other hand, the street vendor option was at the bottom and the market which was the main topic of this research was a little bit higher than the point of street vendor located as the second to the last. Though the answers to this question, apparently, the usages of the market were very low among the participants in daily lives, almost at the bottom compared to other modern shopping methods such as supermarkets, even lower than online shopping. If analysing previous results which showed nearly 50% of the people went to multifunctional market buildings once more than a week, it could explain why the market option got so low rank in this question, showing the actual situations of market functions that not only a small proportion of the customer would use markets frequently. The results also substantiated the challenges which markets were facing, supermarkets and other modern shopping methods had decreased the survival space of the markets and fewer people would choose markets as their regular choice for daily resources. Supermarket as the top choice on the list had 28.3% of the answer chose the "very high" option in this question which was the highest among all the methods and four times higher than those who chose "very high" in the market. The results of this question showed the behaviour patterns of normal residents in daily resources shopping, people preferred supermarkets, and restaurants over street vendors and markets, this meant although the mode of the multifunctional market building could be attractive, the effects of the mode improving the situations of markets were limited and subjective, more people still tended to pick supermarkets as their first choice in their objective behaviour patterns. Furthermore, if analysing the results with age group divisions, the situations of the market were even more worrying (Table 48). The frequency rates of using supermarkets decreased as the ages of participants increased, and the point of frequency rates of the age group from 18 to 30 was over 4 which was the highest among the age groups, the score of 4 represented people used the supermarket method at more than high level. In contrast, the

points of the market option increased while the ages of participants increased, and the points were between 2 and 3 which represented the level of low and middle. Although over 70% of people said they increased their number of trips to market functions because of the mode of the multifunctional market building, for the young generation, the difference between supermarkets and markets was huge, and the effects of the mode were weaker among these generations. The positive results in the previous section did not seem to be efficient when they were applied to people's behaviour patterns in realistic situations.

	Very low (1) ²⁵	Low (2)	Medium (3)	High (4)	Very high (5)	Frequency score	Median
Supermarket	0.94%	3.77%	25.47%	41.51%	28.30%	3.924528	High
Restaurant	6.60%	17.92%	33.96%	30.19%	11.32%	3.216981	Medium
Food shop	9.43%	17.92%	38.68%	29.25%	4.72%	3.018868	Medium
Online	16.98%	27.36%	24.53%	23.58%	7.55%	2.773585	Medium
Market	19.81%	30.19%	38.68%	5.66%	5.66%	2.471698	Medium
Street vendor	19.81%	33.96%	36.79%	8.49%	0.94%	2.367925	Low

Table 47. The results of question No.5 in Questionnaire 3

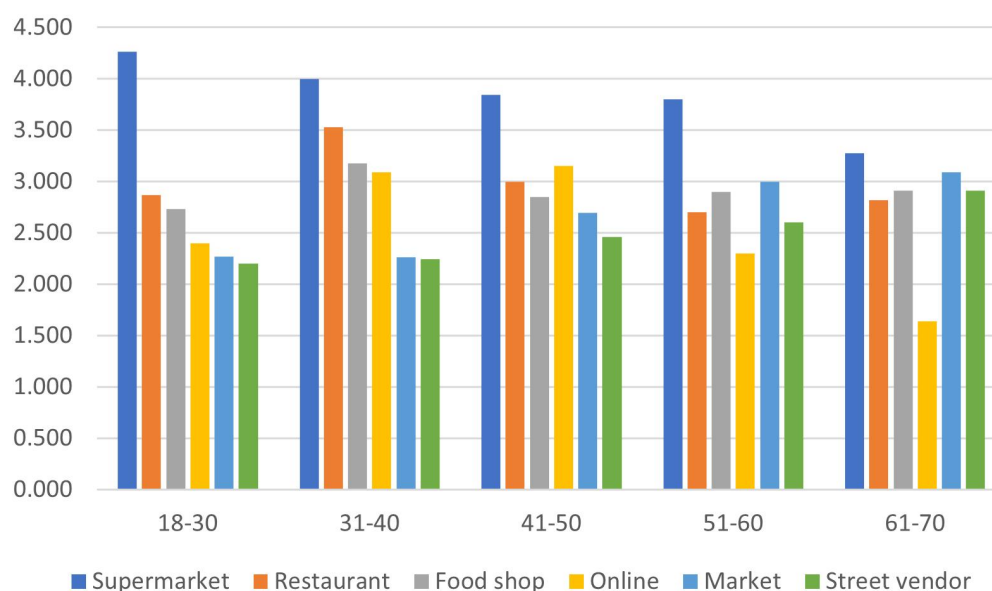


Table 48. The result of question No.5 in Questionnaire 3 according to ages

There was another problem needed to be solved that whether a multifunctional market building having a good score in the evaluation meant it worked better in daily life, in the previous section, the Yingdi market got the highest points among the four multifunctional market buildings, but according to the question asking people which multifunctional market building they were favourite (question No.16 in the questionnaire 3), the results showed a quite different situation (according to Table 32). Among the four multifunctional market buildings, the top choice of the participants was the Youhan market having 44.34% of the answers selected, while the score of the Youhan market was the last in the previous evaluations. The top score owner, the Yingdi market, was in third place with only 15.09% of participants choosing it as the best market. which was less than half of the number of people who chose the Xiahuan market. The

²⁵ The numbers in the brackets represent the scores of each options.

Shalitou market was the least favoured multifunctional market building, about 8.49% of the participants chose it as the best one, and the number was almost half of the number of the Yingdi market. Combining these two market buildings, the number of the participants who chose only occupied 23.58% of the whole, while the other two had the majority. The result showed a weird situation, the higher point in the evaluation process didn't mean people thought that multifunctional market building was better than the others in practice, on the contrary, the market with the lowest point became the best choice in this question. Although the result of this question showed an Inverse correlation relationship between evaluation points and people's selection of the best multifunctional market building, this didn't mean the mode of the multifunctional market building did not work at all. First, the evaluation points of each multifunctional market building were marked by those who chose the market building as the best one, not by all the participants, it could be different standards between each group of people with different choices. But the influences of the different groups were at a low level which was discussed in the previous section; second, people did not totally rely on the mode of the multifunctional market building to make their choice of the best one, there were other factors that could affect people to do the decisions; The third, the evaluation in the POE research only showed the attitude of users of the multifunctional market building toward the current condition of the mode, it only represented the customer element in the system of market, on the other hand, the mode of the multifunctional market building could be efficient in the other two elements. Apart from these, the result at least obviously showed the conflicts between evaluation points and the selection of people, and the mode of the multifunctional market building definitely had limited effects on people's behaviour patterns. Apparently, there were some other factors of markets more attractive than the mode of the multifunctional market building. For example, analysing the result of this question with the districts in which the participants lived (Table 49), most people who chose the Youhan market lived in the district of Nossa Senhora de Fátima (Freguesia de Nossa Senhora de Fátima) where the Youhan market located. The same situation also happened to the Yingdi market and Xiahuan market. People who lived in one district were more likely to go to the multifunctional market building in the same district. It indicated that the location factor had a huge impact on people's behaviour patterns in using multifunctional market buildings.

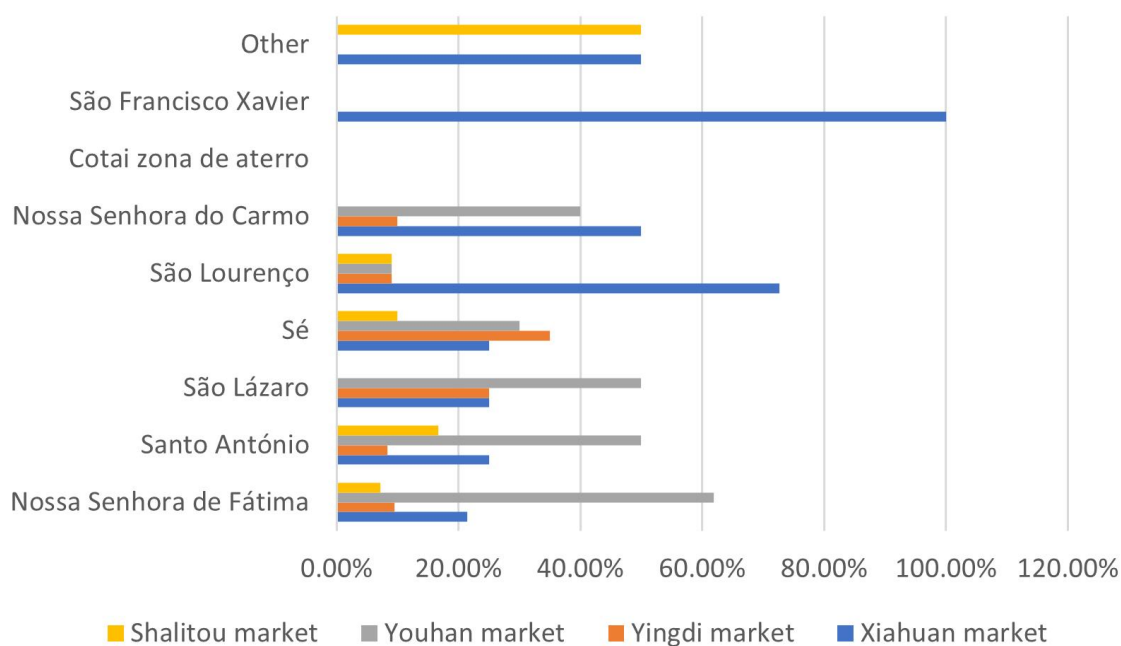


Table 49. The relationship between the districts participants lived and the best multifunctional market buildings they selected

Through these questions, the positive results made by evaluation on the effects of the mode of the multifunctional market building were questioned by the actual behaviour patterns of the participants. These conflicts showed that the mode of the multifunctional market building had limited influence in objective situations, although it got positive feedback from the evaluation of subjective attitudes to the mode, and there might not be direct relationships between the mode of the multifunctional market building and people's behaviour patterns. The reasons why people chose and used the multifunctional market buildings were based on not only the mode but also other factors, such as locations. Furthermore, the other factors might have much greater impacts on people than the mode.

8.2.2.2 The mode for market function?

Knowing the factors behind the operation of people's behaviour patterns gave a clear knowledge of why people chose certain methods and how to attract people using certain functions. Using factors and relationships with market buildings could make the evaluation of multifunctional market building more correct according to objective situations, in addition, it could tell whether the mode of the multifunctional market building worked well or not. These results would lead researchers to have a better understanding of the system of the market and find the problems which markets currently were facing, integrating the factors, the design of the market for the future could be figured which would complete the suitable mode for market functions depending on different situations.

After previous discussions, it could tell that there were other factors affecting people's behaviour patterns apart from the mode of the multifunctional market building. The factors could be location, feeling and so on. On many occasions, people would relate markets with cheap prices, so could the price be a factor which influenced people's choices?

In the questionnaire, there were two questions about the topics of prices and qualities, asking people to evaluate the aspects of prices and goods qualities in different shopping methods which included markets, supermarkets, online shopping and food shops (Table 50). Among the four kinds of daily resource shopping methods, most people thought the quality of goods in the markets was the highest, while online shopping got the lowest point in quality aspect: In the price aspect, online shopping was considered the cheapest among these four methods, and market ranked at the second place, while supermarket was regarded as the most expensive one with the point of 4.07. If dividing the evaluation points of quality by the points of the price, the result represented the cost-effectiveness of the four methods, the market was at the top of the list, and it was the only method having a cost-effective point over 1. 'Food shop' ranked second, higher than the supermarket method, and online shopping was the least cost-effective method among the four methods. According to the results of the evaluation of the four methods, the market should be the most favoured choice for customers looking for high-quality resources with low prices, but in the previous discussions, it showed that the market was the least selected option for daily resource shopping, this indicated that the price and cost-effective aspects did not have direct relationships with people's behaviour patterns, the same principle also could be applied to other methods. If analysing the same data with age group divisions, the differences between age groups could be revealed (Table 51). If focusing on the cost-effective aspects of the four methods, different age groups had their own best choice, and different age groups had different standards for evaluation. Among the five age groups, the evaluation points rated by people aged from 18 to 30 were the highest, the cost-effective points of the four methods were all above 1, while the results of the whole age groups which only one got a point above 1. Comparing the results in the same age groups, the methods getting the highest cost-effective points were not the same option, the age group from 18 to 30 rated "online shopping" as the best with a point of 1.16, the age group from 31 to 40 and people who aged from 41 to 50 showed the same interests in the market, the point of each was 1.11 and 0.923; In the age group from 51 to 60, the

shopping method which got the highest point was 'supermarket' with the point of 1; it was surprising to see the result of age group from 61 to 70 was the same as the age group from 18 to 30, online shopping showed their potential in the elderly group. But if these results did not match the choices of daily resource shopping patterns of different age groups in the previous discussion, in which all age groups chose the supermarket far more than other methods, while online shopping was only attractive to age groups from 41-50 and 51 to 60, they ranked it as the second selected choice. Though these comparisons, prices and cost-effective rates could not be one of the main factors affecting people's behaviour patterns in choosing shopping methods.

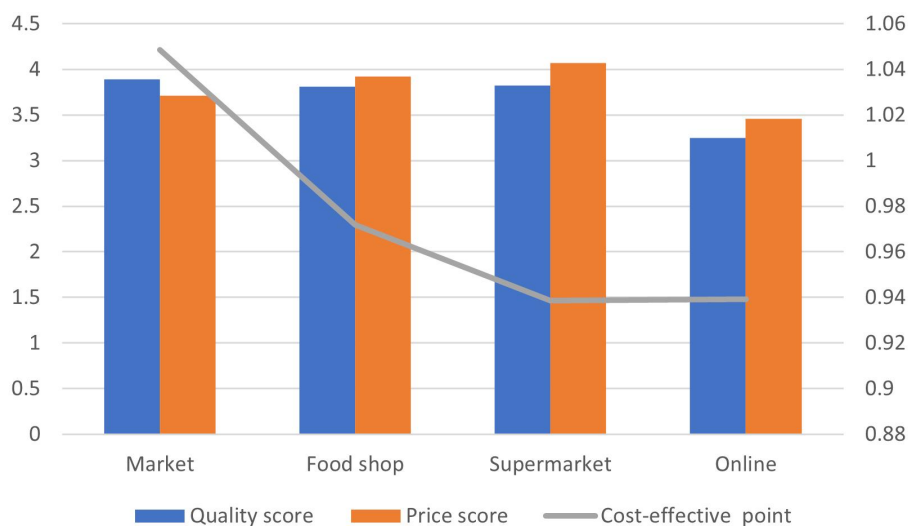


Table 50. The evaluation points of qualities and prices of four retail methods

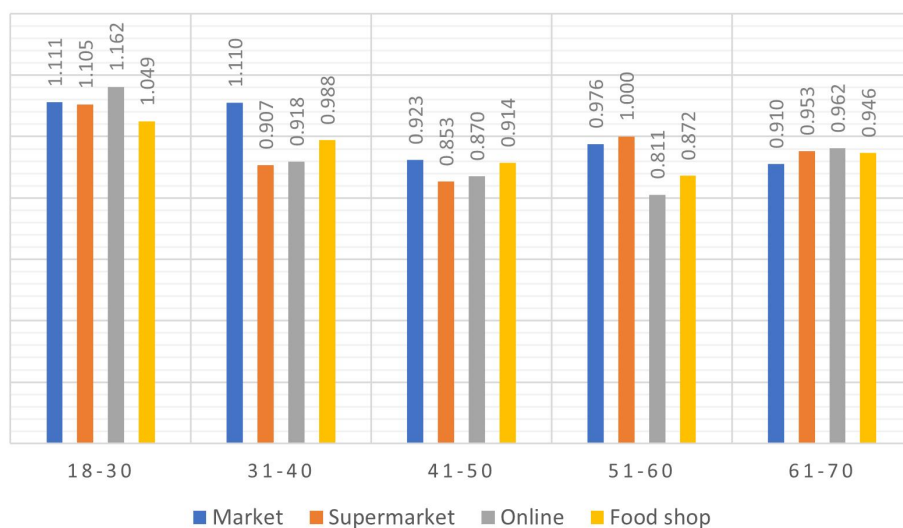


Table 51. The evaluation points of the qualities and prices of four retail methods according to ages

Except for the price and cost-effective factors, in previous discussions, there were few clues for finding factors which could affect people's behaviour patterns of selecting methods for shopping daily resources, the only general finding was the location factor. The normal benefits of markets mentioned in most research which were prices, job opportunities and local systems of variety were excluded through previous

research and discussions, people's behaviour patterns showed no connection with these advantages. But in the following discussion section, some factors which mattered to users would be revealed after analysing the results of some questions in the questionnaire and some interviews.

In this section, three main questions would be discussed, the first one asked participants which aspects of that multifunctional market building led them to choose that market building as the best one among the four selected multifunctional market buildings (question No.17 in the questionnaire 3); the second one asked people which functions of the multifunctional market buildings they had been to at least once (the question No.14, 26, 33 and 41 In the questionnaire 3); the final one asked participants if multifunctional market buildings combining with which functions could increase their number of trips to multifunctional market buildings (the question No.64 in the questionnaire 3).

The second question in this section was the easiest and simple one, asking participants whether they had used the following functions: activity centre, library, parking, sports fields, cooked food centre, children's playground and market function (question 14 in questionnaire 3) (Table 52). The results of the question showed that the most used function in the multifunctional market building was the cooked food centre instead of the market function, over 93.4% of the participants had used the cooked food centres in the four market buildings, on the contrary, the market function which was the main focus point in the mode of the multifunctional market building had 82.08% of the people had used it. The other functions included in the multifunctional market buildings had a proportion of usage rate lower than 50%, the highest one was the parking function ranked third in all functions and then came with the library function. The lowest usage rate in this question was belong to two functions, one was the sports field and the other one was the children's playground. These two functions both were outside functions, the usage rates also substantiated these two functions were not favoured by users and got low points in the previous evaluation of each function. The results of other functions were reasonable and could be explained or substantiated by other data and results, except the cooked food market, which was much higher than other functions, even higher than the market function, while it was not well-designed compared to the market function or library function. This situation showed that a special phenomenon happened in users of multifunctional market buildings that more people tended to use the cooked food centre in the market buildings than other functions in the mode of the multifunctional market building, while the market function was the core function.

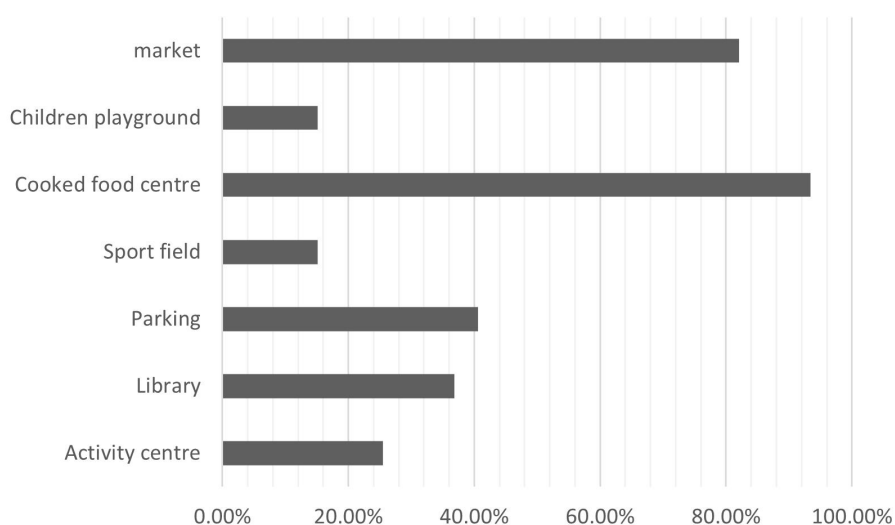


Table 52. The functions in multifunctional market buildings used by participants

The first question in this section could show what aspects of each multifunctional market building led

people to choose them as the best one among the four market buildings, the results of this question represented some reasons why people went to use certain multifunctional market buildings and which function contributed the most. The question was different to those participants who selected different market buildings, although there were differences between the multifunctional market buildings, the options in the questions could be categorized into three aspects: functions in the market buildings, objective facilities and infrastructures, and subjective feelings of usage, so different multifunctional market buildings with different functions became comparable in this question. Among the answers, each multifunctional market building showed its own advantages in the minds of its users (Table 53). In the Xiahuan market, the advantage ranked in first place was the cooked food centre which had 82.35% of the answers chose it as the advantage point leading them to pick the Xiahuan market as the best multifunctional market building. The proportion of the people who chose the cooked food centre was far higher than the other functions and aspects, the advantages ranked second and third places were parking function and transportation convenience which had the votes of 50% and 55.88%, only a bit higher than the half of the point of cooked food centre. But in the Yingdi market, the advantage point which was most favoured by the participants was the transportation convenience aspect, it had 62.5% of the answers. The advantages on the second and third place of the list were the environment and sanitation aspect, market function and cooked food centre, 50% of the answer chose the environment and sanitation aspect and the other two options both got 43.75% of the votes, a little bit lower than the environment and sanitation aspect. When discussing the Youhan market, the top choice in this question was the cooked food centre with 82.98% of people thinking it was the reason why the Youhan market was the best multifunctional market building among the four. The second selected option was transportation convenience with 57.45% of the whole answers and the third one was the parking function occupied 38.3% of the votes, it was obvious that the cooked food centre was much more important than other functions and aspects to the users. Although the number of participants who selected the Shalitou market as the best multifunctional market building was too small to summarize high feasibility conclusions, the situations of the Shalitou market had reference value to discuss the big picture of the mode of the multifunctional market building. The top choice in the Shalitou market was the vendor aspect with 77.78% of the votes, and the second one was the environment and sanitation aspect occupied 55.56% of the selections. Analysing the results of these four market buildings in this question, it was obvious that the Xiahuan market and the Youhan market had similar situations in which people thought the cooked food market was the most important advantage leading them to select those two multifunctional market buildings as the best one among the four market buildings, the second and third options were also the same which were parking function and transportation convenience. On the other hand, the participants who picked the Yingdi market as the best one chose transportation convenience as the top advantage of the market, when it came to the environment and sanitation aspect, the cooked food centre was the third choice in this market. While in the Shalitou market, the best attractive point was the vendor aspect which was quite different from other markets.

Xiahuan market		Yingdi market		Youhan market		Shalitou market	
Market	35.29%	Market	43.75%	Market	21.28%	Market	33.33%
Cooked food centre	82.35%	Cooked food centre	43.75%	Cooked food centre	82.98%	Cooked food centre	22.22%
Children playground	11.76%	Activity centre	18.75%	Activity centre	8.51%	Activity centre	11.11%
Library	23.53%	Parking	31.25%	Municipal service	6.38%	Parking	22.22%
Activity centre	8.82%	Transportation condition	62.50%	Vendors' area	14.89%	Library	0%
Rooftop garden	5.88%	Architecture appearance	12.50%	Parking	38.30%	Transportation condition	33.33%
Badminton field	0%	Management	12.50%	Rooftop sport field	4.26%	Architecture appearance	33.33%

Parking	50%	Vendor	18.75%	Transportation condition	57.45%	Vendor	77.78%
Transportation condition	55.88%	Sanitary	50%	Architecture appearance	6.38%	Management	0%
Architecture appearance	8.82%	Infrastructure	37.50%	Sanitary	29.79%	Sanitary	55.56%
Management	8.82%	Atmosphere	18.75%	Management	6.38%	Infrastructure	22.22%
Vendor	26.47%	Other	0%	Vendor	17.02%	Atmosphere	33.33%
Sanitary	35.29%			Infrastructure	12.77%	Other	0%
Infrastructure	17.65%			Atmosphere	8.51%		
Atmosphere	11.76%			Other	2.13%		
Other	2.94%						

Table 53²⁶. Advantage aspects of different multifunctional market buildings attracted participants

Except for these functions, only some of the participants selected the market function as an advantage of those four multifunctional market buildings, the market function ranked fourth in the Xiahuan market, ranked fourth in the Yingdi market, ranked fifth in the Youhan market, ranked fourth in the Shalitou market, although these ranking didn't seem to be relatively very low places, the actual proportions of the votes of market function were only one third or one-fourth of the whole amount of people, it was very small compared to the first choice in the Xiahuan market and Youhan market which was the cooked food centre having around 90% of the votes. Apart from the market function and cooked food centre, the other functions combined in the mode of the multifunctional market building had even lower proportions than the market function, ranging from around 10% to 30%, the results were especially low in the Xiahuan market and the Youhan market. Through these results, the advantages of each multifunctional market building making people think it was the best one among the four market buildings could be concluded into the following aspects: cooked food centre, transportation convenience, parking function and environment. If analysing these results with the results of best multifunctional market building selections, most people who chose the Youhan market and the Xiahuan market as the best market buildings thought the advantage points making them pick the options were cooked food centres, transportation convenience and parking function, while the other two relatively unfavoured ones had different advantage points. This indicated that some of the factors that could affect people's behaviour patterns of choosing and using the multifunctional market buildings were cooked food centre, parking function and transportation convenience, while the last two factors could be combined as the term of conditions of transportation. The other functions in the mode of the multifunctional market building were hardly regarded as the advantage points of these multifunctional market buildings by customers, and the market function was facing the same situation as well.

The third question selected in this section asked participants among given functions which of them would increase their frequency of using the market function in the mode of the multifunctional market building (question No.64 in questionnaire 3). The options in this question included about a dozen of public functions in social life, covering aspects from government-related services to business operations, meeting all kinds of needs including eating, transportation, safety and entertainment (Table 54). Among these options, the most selected one was the facilities for food and drink which had been chosen by 58.49% of the participants, and over half of the people agreed with the effects of the food and drink function. The transportation function ranked second place in this question, it got the 33.02% vote of the whole, slightly higher than the third selected option which was the shopping function having a proportion

²⁶ Red parts refer to functions in the market buildings; Green parts refer objective facilities and infrastructures; Yellow parts refer to subjective feelings of usage.

of 32.08%. the function of government services which was an important part of the mode of the multifunctional market building got the fourth place in the list, only 24.53% of participants thought it could increase their motivation to use the market function, which was less than half of the amount of those who chose the function of food, much less than the proportion of 70% which was the result of question asking participants whether other functions of multifunctional market buildings would increase their usage of market functions. This indicated the other functions of municipal services in the mode of the multifunctional market building had limited impacts on people's behaviour patterns, at least they were not the main factors of the influences. The other functions in this question that had a certain proportion of the votes were medical facilities, education facilities, amusement facilities, logistics and post facilities. If analysing the results with age group divisions (Table 55), the function of food and drink was also the top choice among all the age groups, at least 46% of people in each age group thought it could affect them to increase usage of market functions. The other functions' proportions changed with age, such as the proportions of the shopping function increased with ages increase; the transportation facilities ranked second only showed its importance in the age group from 31 to 40 and 41 to 50; the municipal service function was most selected by participants in the age groups of 18 to 30 and 51-60; the entertainment function was relatively high in the young generation age groups from 18 to 40. Generally speaking, the function of food and drink was the steadiest option wildly chosen among all the age groups, as well as the function of transportation, while the function of shopping was more picked by the elderly and the function of entertainment was selected largely by young age groups.

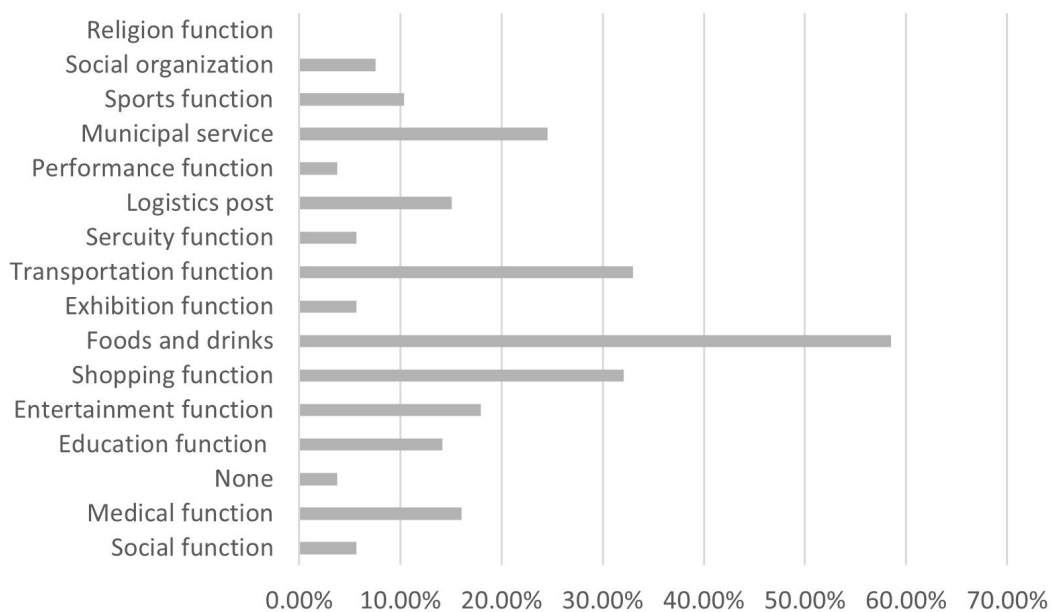


Table 54. The results of question 64 in Questionnaire 3

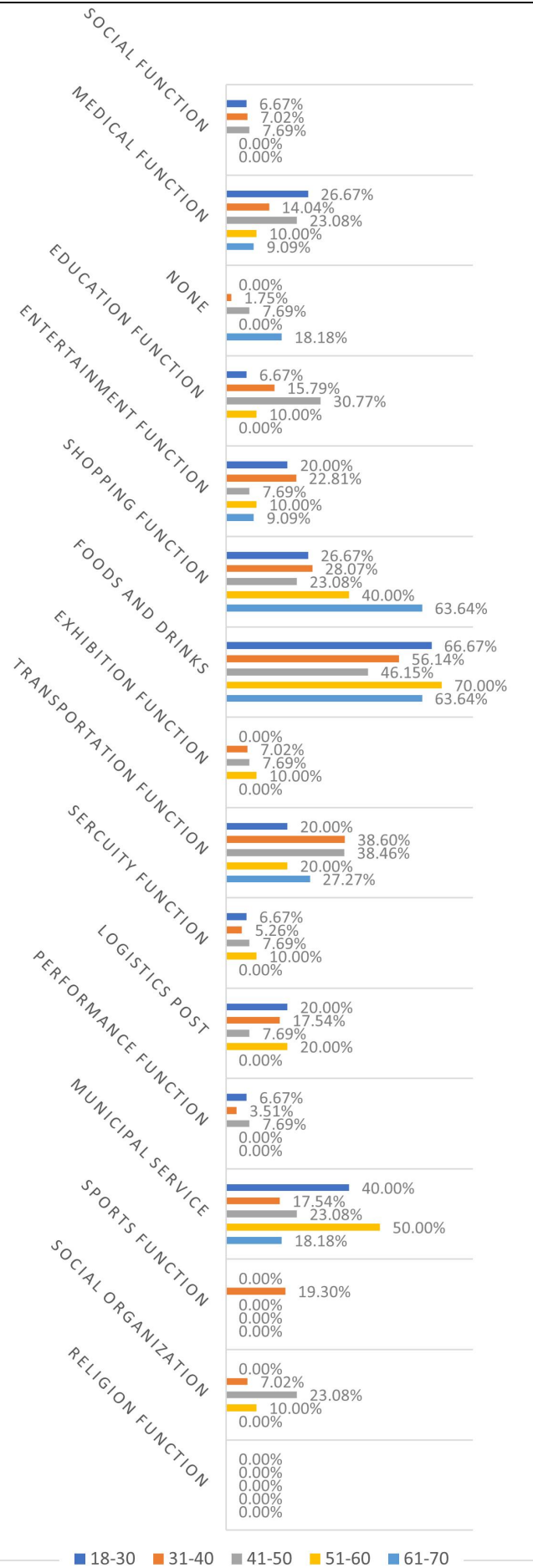


Table 55. The results of question 64 in Questionnaire 3 according to ages

After analysing these three questions, some main factors which influenced people's behaviour patterns of choosing and using multifunctional market buildings were generally revealed, though different attitudes of people towards the functions in multifunctional market buildings and other related social functions. Among these functions, the cooked food centre and parking function were the most attractive points of the multifunctional market building other than the market function. In these three questions, the cooked food centre was regarded a more important role than the market function, for example, more people used the cooked food centres than market functions; most people selected the cooked food centre as an advantage point of favoured market buildings. On the other hand, the other municipal services in the mode of the multifunctional market building were not widely welcomed by residents, a few people thought they could be the special characteristics of those multifunctional market buildings. Combining these features with previous results of people's behaviour patterns, two small conclusions could be made:

1. The cooked food centre was the most important function in these multifunctional market buildings, and it should be the main reason for most people using those market buildings, even more crucial than the market function. This phenomenon not only showed up in this section but also in other related questions. In previous discussions, the frequency rate of supermarkets was the highest among six shopping methods including markets (question No.5 in questionnaire 3), while the second selected option was the restaurant which was similar to the cooked food centre. Although the market function was the core function in the mode of the multifunctional market building, other functions were combined to be convenient to serve the surrounding residents according to the ideas of the government, the actual situations showed more people went to multifunctional market buildings because cooked food centre instead of the market function. Furthermore, the frequency rate of going to markets was one of the lowest among the methods of shopping for daily resources. These indicated the function of the cooked food centre was the main factor supporting the operation of the multifunctional market buildings. It should be called the mode of multifunctional cooked food centre, not the mode of the multifunctional market building.
2. The condition of transportation was the main concern which affected people's behaviour patterns in choosing markets or shopping methods. The condition of transportation could be separated into two aspects: parking function and transportation situations which were both involved in previous discussions of this section. These two aspects were the most picked factors affecting people's behaviour patterns of going to the multifunctional market buildings, other than the functions. The effects of transportation conditions could also be substantiated in other questions, take question No.5 as an example again. The shopping methods with more convenience in transportation all had a high ranking on the list. As previously mentioned, the transportation conditions of a multifunctional market building could hardly be changed after it was put into use, the parking system and surrounding transportation were all designed with the multifunctional market building, so the transportation conditions of the market building should not become worse in the evaluations, but the result showed people were not satisfied with the transportation conditions of current multifunctional market buildings. That was because the transportation conditions of other shopping methods improved, people preferred the supermarkets within five minutes walk without any transportation to these multifunctional market buildings needing extra transfer. The location factor mentioned in previous discussions was also implied in the aspect of transportation situations affecting people's behaviour patterns in choosing shopping methods.

In some interviews, when asking interviewees why they used the cooked food centres in the multifunctional market buildings, the following reasons were raised:

"The cooked food centre has many choices, so I can choose different dishes for a meal every day."

"Being an office employee, I can't go home to have lunches and it has too many troubles to prepare the meals in advance. It's a good choice to have lunch in a cooked food centre near the office."

"Family members don't want to cook at the weekend, so we come here (cooked food centre) to cope with a meal."

"Some prices of the dishes here (cooked food centre) are lower than a form meal in some restaurants, so I became a regular customer of the stalls."

"I was studying in the library on the upper floor, it's convenient to complete meals here (cooked food centre)."

...

Analysing those reasons, it could be found that the reasons why people used cooked food centres were seldom related to the market function. In addition, from a logical point of view, the function of the cooked food centre conflicted with the market function, the users of the cooked food centre tended to complete their meals, so they would have fewer intentions to use the market function to buy food or resources. In other words, the cooked food centre and market function provide the same function and service in two different aspects: cooked and uncooked, and in current situations, people chose cooked over uncooked. This also meant even without the market function, the rest functions in the mode of the multifunctional market building could also work well and be suitable for the aims of the government which was the supervisor element.

The condition of transportation was a general description of the factor heavily influencing people's behaviour patterns of choosing markets or other shopping methods, it could be divided into two aspects or even more detailed aspects, but these would not be further discussed in this research. Besides, the transportation conditions of multifunctional market buildings usually could not change dramatically, due to the original aims of the market buildings, and the effects of transportation conditions were relatively not direct, people considered the multifunctional market buildings depending on the transportation conditions of other similar shopping methods. As a result, the transportation conditions being a factor influencing people should be a main relative factor, but not a factor that could directly intervene in choice selections. On the other hand, the dissatisfaction with current transportation conditions and people's caring about the parking functions and the convenience of transportation showed that current multifunctional market buildings definitely had weakness points related to the transportation aspect, those factors could be transportation-related elements in other aspects of the multifunctional market buildings or surrounding environments, such as accessibility of the streets or timetables of the bus stops.

8.3. Effectiveness of the mode of the multifunctional market building

After the discussions of the factors and elements affecting people's behaviour patterns, this section is back to analysing the successfulness of the mode of the multifunctional market building, discussing whether it worked well and whether it was a good option for market-oriented urban development, according to results of the questionnaires and interviews in the pilot research and the POE research.

If considering the results of evaluations in the questionnaire, the mode of multifunctional seemed to be effective with positive points marked by participants. But the problem with the evaluations had been mentioned in the previous discussions, participants score the points through their subjective feelings and the mode of multifunctional market building was limited when was put into practice. On the other hand, according to the system of market discussed in the theory part of this research, the evaluation of the effectiveness of the mode of the multifunctional market building should be made in three different dimensions: the supervisor element, vendor element and customer element. The evaluations in the POE

research were made by customers, so it lacked evaluations in view of supervisor and vendor elements. Although there were no formal data about official evaluations or reviews on the mode of the multifunctional market building, the government's attitude towards the multifunctional market buildings in use could show the current situation of the operation of the mode.

In the view of the supervisor element in the mode of the multifunctional market building, the current situations of the multifunctional market buildings in Macau were quite satisfied according to the aims and objectives of the design and planning. In previous research on the history of markets in Macau, the most primary and basic aims of designing the current mode of the multifunctional market building could be concluded in two aspects: The first reason was to provide basic social services for surrounding residents, including municipal services and life necessities; The second reason was about the market function, the government wanted to enclose the space of market function, in order to prevent the social lives from the interferences of market functions such as noises, smells, and dirty water. So, if just considering these two aims, the current conditions of the multifunctional market buildings had generally fulfilled them. In the questionnaire, when being asked whether the mode of the multifunctional market building could increase the frequency rates of using municipal services (question No.14 in questionnaire 1), most people chose the "Yes" answer, but among these answers, about 57.1% proportion thought the reason of increasing the usage was the mode of the multifunctional market building making those municipal services easy to be found, not other reasons such as saving time or energy. The first aim was accomplished. About preventing the market function from interfering with urban space, the architectural design of multifunctional market buildings implemented this intention, the close-distance design of façades and upper floor arrangement of functions made things like noises and smells completely enclosed in the space of a market building. This kind of design had the same principles as the government used to have, it not only stopped the inside of the market function from going outside but also cut off the interfaces between the market function and outside urban space, leaving a monotonous and cold face toward social lives. The second aim was also completed. Combing these pieces of information and results, the mode of multifunctional market building was a success in the view of the government aspect, which was the supervisor element, as it had fulfilled the basic aims and got positive feedback from customers and residents. On the hand, the mode had not taken the appeals of other elements into account, losing the connections with real social lives.

In the view of the customer element in the market system, with the previous discussions, the effects of the mode of the multifunctional market building were limited according to the actual behaviour patterns of customers, and the results may be different when it was put into practice. In addition, the results of the POE research showed that the cooked food centre actually was the most successful function in the mode of the multifunctional market building, instead of the market function. In the urban life aspect, people tended to use the supermarket and some other shopping methods instead of the market, due to the effects of transportation conditions on people's behaviours. Considering these current situations, the mode of the multifunctional market building could hardly be regarded as a success in the view of the customer element in urban life situations. Although the evaluation of the POE research showed positive results of attract new customers to use the market function in the multifunctional market buildings, considering the tendency of increasing change with age and low usage of market function mentioned in previous sections, the effects of the mode of the multifunctional market building were not mainly generated by the market function. So, the mode of multifunctional market building was not a successful design for the customer element in current conditions, furthermore, the mode could not promote the market function, on the contrary, it might have negative effects on the market activities.

After pilot research, the POE research and the history research, it was obvious that the mode of the multifunctional market building had different results evaluated by the supervisor and customer elements. Temporarily, it lacked the evaluations and attitudes from the vendor element to make the evaluation more complete according to the system of the market. While in the POE research, some descriptions of the

vendors were given by the interviewees who were regular customers of multifunctional market buildings. "The numbers of vendors declined than before in the multifunctional market buildings, some stalls are always empty throughout the year."

"The prices of some products in markets are even less attractive than supermarkets."

"Some vendors moved to other places to continue the business, despite the low fee of the stall in multifunctional market buildings, the number of customers also became lower."

...

There was another phenomenon that happened in urban space that could be related to the vendor element of the market system. Many vegetable chain shops showed up on some main streets in Macau. Normally, it cost much to have a business on the main street, especially for vegetable shops which are relied on the mode of small profits but quick turnover, so markets were important to many vegetable vendors because of the low cost of rents. This phenomenon indicated that vegetable vendors might be hard to continue business in multifunctional market buildings and find a new way to have better conditions for business, selecting main streets showed the importance of transportation conditions to those vendors. Combining the words from the customers' aspect, the vendor element also showed an unpleased attitude toward the mode of the multifunctional market building, but the negative impacts of the mode were larger on vendors than on customers.

Analysing the mode of the multifunctional market building through the system of market, the three elements of the system gave their own evaluations according to their aims and interests, combining these results and precious discussions, conclusions could be drawn about the mode, measuring the effectiveness of it:

1. The key problem of current markets was not related to the architecture or urban design aspects, it was about the people's behaviour patterns which had been changed through social development. This was shown in the POE research, the factors and problems raised by the customers were transportation conditions and the cooked food centre, as mentioned in previous sections, these factors could not be changed when the multifunctional market buildings were put into use. These problems were relative, they would show up when the conditions of the external environment changed, and this time, people's behaviour patterns of shopping (trading) were changed with the cars, the internet and other things. People tended to choose shopping methods with better transportation conditions. The prices, cost-effective, other functions combined with the market, space of market and other related factors, had been discussed and evaluated in the POE research and showed no strong relationships with people's behaviour patterns, as a result, the key problem that the markets were facing did not come from the design of market or things inside the market, it came from the essence or the nature of the markets. As mentioned in the theory chapter, the function is a combination of certain human behaviours and related built space, and markets are public spaces where sellers are allowed to sell by supervisors. The changes in human behaviours led to changes in the external environment, and then the problems pumped up. This does not mean that the design of the market in architecture and urban aspects has no mistakes or problems, only because they were not key problems or main factors. On the other hand, if some measures could be applied to improve the situations of people's behaviour patterns in markets, the conditions of markets would be improved.
2. The mode of the multifunctional market building may work fine, but it did not operate under the effects of market function, instead, the mode might have negative effects on the market function in the multifunctional market buildings. The negative influences mainly came from the supervisor element of the market system, applied in the design and operation of the market function. As discussed in the field research, the design of architecture was not friendly to the interactions between the market and other urban spaces and functions, the space design of the stalls and market didn't take people's behaviour patterns into consideration which was the key problem of the markets. In the aspect of operation and governing, the government of Macau separate those rights and

responsibilities of the markets through policies and regulations. The fewer and fewer the affairs to take on by the supervisor element, the less and less attention to be put to the situations of the market, in other words, the mode of multifunctional market building was completely designed through the supervisor element, and the government cared more about what it cost rather than how conditions of the markets were. Under these circumstances, the mode of multifunctional market building was not friendly with market function, or to say that the mode of the multifunctional market building could work well without the market function.

Chapter 9 DISCUSSION AND CONCLUSIONS

9.1 The follow-up conclusions after field research

The results of the field research gave a detailed idea of the mode of multifunctional market building in Macau, presenting the current situations of these market buildings, and finally figuring out the problems about the mode. But the field research in the previous chapter had its limitations, without factors of vendor element and direct attitudes of government element toward the design of markets, in this chapter and following discussions, some more conclusions would be made other than problems of the mode of the multifunctional market building.

These conclusions would include an analysis of the mode of multifunctional market building from other aspects combined with the future planning and changes that happened after the finish of the field research in this research, suggestions for improving the mode of the multifunctional market building when facing existed challenges, and other pieces of advice for designs of the market in urban space according to results of sensory and philosophy research. In the following sections, the discussions of markets are not limited to the mode of multifunctional market building or other modes of designing markets, there would be some examples of market regeneration projects to be raised in related discussions and possible suggestions for market development upon current situations.

9.1.1 Suggestions for the mode of the multifunctional market building

9.1.1.1 Advantages and disadvantages of the mode of the multifunctional market building

According to the previous research, the mode of the multifunctional market building had disadvantages in these aspects according to the results of the field research:

1. The design of the market buildings, the more closed space the buildings were, the more unfavourable the mode was for the market function.
2. The arrangement of functions, the arrangement of market functions and other functions in the mode of multifunctional market building was not proper not only for market function but also for the whole system of the market building. In questionnaire 3 of the field research, there was a question asking people whether there were negative impacts of market function on the other functions in the multifunctional market buildings, about 70% of the participants indicated there were these kinds of negative impacts in every market building, smells, noises and too crowded were the top three selected options in the question (Table 56). The arrangement of functions in the mode of multifunctional market building was not totally reasonable and scientific, and the design didn't take all related factors into consideration, just sticking to the aims of the supervisor element as closely as possible.
3. The management aspect in the mode of multifunctional market building in Macau cared less about the market function. Though the policies and management model of the government, it showed little interest in governing the market, on the other hand, it decentralized a lot of power and responsibility of the supervisor element, such as cleaning and security. In recent news, the government tended to outsource

the power of operation to companies, which would make the management of the mode of the multifunctional market building become more difficult while the power was so separated. As a result, improvements in market function would become more complicated when they would involve different parts with conflicts in interests, while the most needed in the mode of the multifunctional market building is the cooperation between these different functions. There would be no unity when the supervisor element falls apart.

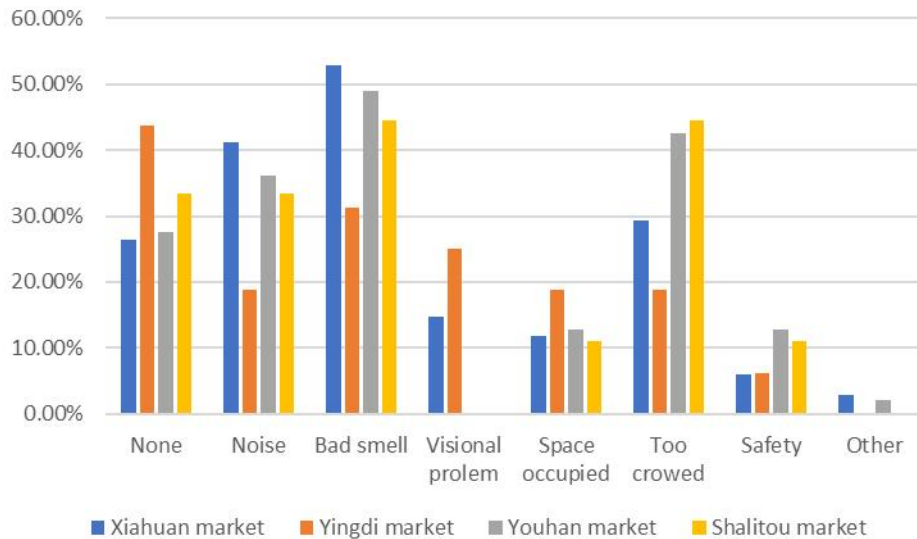


Table 56. Attitudes toward negative impacts of market function on other functions in multifunctional market buildings

Although there were those disadvantages in the mode of the multifunctional market building, most problems were related to the supervisor element which was the government side in Macau, this meant these disadvantages could be both universal and individual, compared to other markets. So, it is not proper to conclude that the mode of multifunctional market building is a bad method in the development of markets. On the contrary, these disadvantages could become advantages in another way.

The advantages of the mode of the multifunctional market building could be concluded into the following points:

1. It is helpful in high-density areas. This mode was adopted in Macau and Hongkong, largely owing to these places being high-density cities, and there was less space for public functions than in other places. Arranging different functions in a vertical direction will largely reduce the amount of occupied space used for supporting the system of markets, especially suitable for high-density areas and supervisors who are limited by the amount of space that could be applied. For example, the mode of a vertical multifunctional market building could be adopted for generation projects taking place in city centres where it is hard to obtain land, saving space for different functions in suitable places which are relatively high-density.
2. The mode of multifunctional market building truly attracts more people to use different functions in the market building and increases potential customers of those functions, although the effect of the mode is limited according to the results of the field research. This feature is crucial to the market function, it was mentioned in previous chapters that the market function was a non-guided public function, different from medical and other municipal services, the market function needed a flow of people to increase the chances of people using the function. Combing with other municipal services,

there were more potential customers of market function after the mode of multifunctional market building was applied to use. It needs to be noted that the effect of the mode depends on the specific situation that happened in reality.

3. The mode of multifunctional market building is friendly to the supervisor element of the market system, especially those who want a diversity of functions in businesses. Taking the supervisor element of multifunctional market building in Macau as an example, the government as the supervisor element wanted to combine market function with municipal functions, in order to create a community centre for satisfying all needs of surrounding residents and applying the mode of multifunctional market building almost fulfilled the aims of the government.
4. Making market function not isolated from urban space as it used to be. Due to noises and smells, the markets with daily resources were always separated from other urban spaces, which was an aim of the supervisor element of multifunctional market building in Macau, with other functions, the market function could be connected with surrounding urban space through architecture space. In other words, people could use market buildings without the intention of using market function.

Although these advantages and disadvantages points were concluded from all the multifunctional market buildings, they could both be universality and individuality, every case has its own special features of advantage or disadvantage points according to its conditions. People could find these advantages and disadvantages in other multifunctional market buildings including those non-vertical styles, but the effects of these aspects and degrees of influence depended on the designs and situations. The situations In Macau showed these disadvantages were largely related to subjective aspects such as management, while the results of objective aspects presented the mode of the multifunctional market building worked fine in attracting customers and improving diversity. The degrees and scopes were limited by the planning of placing more emphasis on the supervisor element which was the government in this situation. This meant the mode of the multifunctional market building could be applied in other market-related regeneration or development projects, it was the main idea in regeneration projects of markets which would be discussed in the following section. Discussing these advantages and disadvantages of the mode of the multifunctional market building, the conclusions could be useful to give suggestions for the mode of markets and design principles, not only from the view of the multifunctional market but also for other styles of the market, in two different aspects: the market system and spatial logic of the market.

9.1.1.2 Suggestions

The suggestions for the mode of the multifunction market building could be concluded in two directions, one focused on the market function itself and a second one aimed at the mode of the multifunctional market building. The targets of suggestions were classified by the three elements of the market system, 'supervisor, vendor and customer', different element had their own strategies and pieces of advice according to disadvantage points and possible developments in the mode of multifunctional market building or individual elements. The following suggestions were arranged in the order of the market system, the detailed recommendations could be both actual methods and concepts or principles.

For the supervisor element, the government of Macau could still treat the mode of the multifunctional market building as a method to attract people to visit marketplaces, as the results showed the mode had relatively low effects on making customers use market function more than before. But based on the answers of different age groups, its attractive degree to the young generations might not maintain normal operations and vitality of markets. If continuing the current orientation, the best suggestions would be changes in the design of the market space. Though the conclusions of five sense research in the field

research, the senses of smell and sight had great contributions to people's learning of activities in markets, the most effective improvements in market function would be 'See more in a glance', 'unobstructed view of sight' and 'brighter environment', good smells would increase favours of using market space as well. It was quite easy to apply these improvements in designing a normal market space, while it needs some adjustments for them in the multifunctional market building in Macau, due to the attitude of the supervisor element. As mentioned in previous discussions, the attitude of the supervisor element in the market system of Macau, that was to say the government, showed their determination to prevent the outside public space from the dirty environment of market space which led to the same principles of management applied in the past. The more intentions in isolating the space of the market, the more closure the market space was, which was also shown in the history review, the design of current multifunctional market buildings was completely separated from outside public space, only connecting with transportation space, that was the same as what the spatial orders of multifunctional market buildings showed. Compared with the attitudes of the supervisor element, the improvements in space would have few conflicts with the principles of management. To improve the user's satisfaction with market space, the design of market space should adopt large space with less supporting structures, giving a more open vision for customer, enabling them to see items which they cared about, such as signs of prices and directions; Other than electrical lightning system used in current condition, the natural sun light should be brought into the market space to have a brighter environment, at the same time, this kind of design could increase the chances of communication between market space and outside public space, which was the most missing part in current design; the current ground floor of multifunction was space for wet market, which was the main source of dirty smells and environments, to carry out improvements and meet the attitudes of supervisor element, the ground floor could be designed for vendors who sell flowers, fruits and cooked foods which have better smells and environment conditions, this kind of arrangement was also good to the mode of multifunctional market building with customers' favour of cooked food centre.

No matter which suggestions or improvements, they only worked in the design of the market space, while on a larger scale, under the context of urban space, the mode of the multifunctional market building had more impact on residents' usage of the market function.

Following the current policies and principles of the supervisor element, it would be unlikely to change the mode of the multifunctional market in a short period of time. For current the mode of the multifunctional market, the suggestions for it focused on improving the operation and combination according to the results of the field research. The combination of municipal services and market function was arranged in the view of the supervisor element, it was convenient and effective for the supervisor providing basic services for surrounding and managing these public functions, while the design of the mode considered less about how the combination work and maintenance. In the field research, the results showed that the cooked food centre worked best among all the functions, the interactions between different functions were separated by transportation space. Considering these pieces of information, on one hand, the cooked food function should be regarded as the most important function in the mode of the multifunctional market, in other cases of market regeneration, importing new cooked food function space was always a successful method. While on the other hand, the results showed that the market function was not the main reason for customers to use the multifunctional market buildings, therefore, the mode of the multifunctional public building could work without the market function, considering the passive attitudes of the supervisor element, using other retail functions such as supermarkets to replace markets for grocery supplement in the mode would also be a solution, actually, there were already some related cases in Macau, not to mention, in the current situation, the design of relationships between market space and other functions has no different with other retail functions like supermarkets.

Consisting of using the mode of multifunctional market building in urban development, the supervisor element should consider the conditions and situations of the regeneration projects. From the research, it

could tell that the application of the mode of multifunction market building was suitable when meeting the following situations: 1. Limitation on land usage, such as in the centre of a developed city; 2. The supervisor element wants to space servicing for certain targets or aims, such as the elderly; 3. Special topography in the city, such as differences in height or connecting different buildings. There could be other occasions to use the mode of multifunctional market building in Macau to design other multifunctional markets, but obviously, the vertical design of the mode was the biggest passive factor in the mode. On one hand, the vertical transportation space could separate market space from other public spaces, stopping the interferences from market functions and easy for people to find their destinations, on the other hand, it cut down the possible interactions between different functions and space, working against the original intentions of the mode of the multifunctional market which was to increase the possible usage rate of market function with other public functions and to regenerate markets. For the supervisor element in Macau, they could abandon the current mode of the multifunctional market building to maintain the market activities in the city, substituting it with normal market mode, like street markets and fairs which all worked well in current situations, especially festival fairs. Minimizing the working time of the market and categories of goods would also help to settle the market in the correct position, when people tended to use supermarkets and online shopping, the less occupying of space and time could release the public space for other possibilities, special or temporary markets such as farmer market and wet market all had successful cases in other places. In Macau, the special markets for foreign cuisines and normal wet markets would be the best choices for a market of this kind, general grocery market in the current mode of multifunction costs too much different resources with less effective than special markets.

Talking about the vendor and customer elements in the system of market, the suggestions were simple, because the mode of multifunctional market building was not related to these two elements. They belonged to the core interaction in the market function, the space of the stall was the only space they could control, and the trading process was the only interaction they involved. For vendors, the suggestion was to make full use of the space of stall, the decorations and behaviours could partially make up for the disadvantage points of the design of market function and the mode of the multifunctional market building, feedbacking the behaviour patterns of customers and vendors to the supervisors, working good for further improvements on the mode of the multifunctional market building. For the customer element, there was no suggestion to force them to do something to improve the conditions of the markets. It was glad to see still many people would like to use the market function as a retail method, it was unavoidable for more people to turn their interests to others, trading was a permanent social interaction in human behaviours, but the market as a relationship to represent and rule the trading interaction would be disused, as well as the marketplaces to take place the trading.

9.1.2 Contributions to knowledge

After making the conclusions from the field research and giving some suggestions for the multifunctional market buildings according to the results of this research, the outcomes and conclusions of this research could be told, as well as the contribution to knowledge.

From previous discussions, the mode of the multifunctional market building used in Macau could be concluded into the following features: 1. Multifunctional market buildings always have parking functions, market functions, cooked food centres, activity centres and rooftop gardens; 2. These functions of multifunctional market buildings are vertically located from underground to the top, and the market functions are always designed on the ground floor of the building; 3. The relationships between different functions are connected by vertical transportation space, which makes the functions become individually with each other. 4. The multifunctional market building is located in the place which used to be the main

residential area or space that used to be traditional market. These features explain the multifunctional market buildings in Macau could represent a kind of multifunctional market designs among the different generation projects on markets, other than other types, such as horizontal expanded markets.

The results of this research showed this kind of multifunctional market building highly relied on cooked food centres among those public functions, on the other hand, the market function does not get many benefits from this kind of design. The research on the history, sensory cognitive research and POE research shows the multifunctional market building in Macau are in the following situations: 1. Market building is not the first choice of grocery shopping of residents in Macau, people tend to buy things in supermarkets or by online shopping, while the market is normally the second or the third choices; 2. The market function in the multifunctional market does not have a close relationship with other functions, the cooked food centre being the most welcomed function did not largely improve the situations of the markets. As a result, this kind of design of multifunction market building does not fundamentally help markets facing the challenges; 3. Due to the pandemic and other retail methods, the multifunction market buildings worked as a community centre, but the market function is facing declining, some empty stalls in markets and more street food shops appeared around the markets, showing more fierce challenges and different attitudes from customers.

Other than the results of the field research and suggestions for future developments of the market and multifunctional market, this research also has contributions to knowledge in the following aspects:

1. Explaining and establishing the market system in the urban design aspect, which includes three elements: supervisor, customer and vendor, and key relationships between each other. This kind of system discussed in Chapter 3 could also be applied to other public functions and space in urban design, such as hospitals and museums. In this system, the relationships between the supervisor and the other two elements show and explain the research gap in current research situations which focus on individual elements' effects on markets and ignore the key influences of supervisors on market activities.
2. Having a piece of history research on market development in Macau, showed the process of market evaluation and explained how the markets in Macau become current conditions and what the key elements affected the process. The history of market development in Macau shows a special market development under the cultural background of Chinese and European cultures, which is different from most other markets in current pieces of research. The supervisor of markets had ideas and knowledge of European culture, while vendors and customers used to behaviour patterns under Chinese culture, the markets in Macau showed the supervisor as the key element in the design and maintenance of markets in Macau. The results also explain why the multifunctional market building appeared in Macau and how it could be a special kind of multifunctional market to be researched.
3. The sensory cognitive research discussed in Chapter 7 is an experiment to research on effects of senses in market activities, trying to understand the markets in a different way other than POE research and subjective judgments from customers. The five sensory research on the market shows that the sense of smell also has a huge impact on the process of understanding market space except for the normal sense of sight. Sensory cognitive research might be a method to connect the space of architecture and human activities other than subjective scoring systems in field research, which also could be applied in other public functions, but especially effective in studies in markets because of the sense of smell.

9.1.3 Stakeholders of the research.

The stakeholders involved in this research could be divided into two categories, one kind of stakeholder is people who are interested in markets in the research aspect, such as researchers who also treat markets as their research objects.

This research could explain the system of the market through the urban design aspect and introduce a process of studying markets. Researchers and organizations who do studies on markets, especially focusing on how to develop markets in current situations, would be glad to see the results of this research and use them to have a further understanding of markets from different aspects. From previous discussions of previous research on markets, researchers more concentrated on a single element and the benefits of markets from social dimensions, usually regardless of the whole system of markets and the relationships between elements. Through the systems and modes mentioned in this research, they might treat markets not only as an economic activity but also as a landscape of structures of social power.

In the field research aspect, in previous studies of the market, people usually used questionnaires and interviews to study market space and activities, these results always relied upon subjective judgements from customers, which could not show the big picture of markets. The sensory cognitive research method used in this research could explain the relationship between markets and customers differently, except by their subjective judgements. Five senses could also show how people understand market space and activities through space and architecture, establishing more connections between the design of market space and human behaviour patterns. Researchers having their studies on the design of markets or other public spaces would also be interested in this research process and results.

The second kind of stakeholders who would be involved in this research are those related to market activities in practice. According to the discussion in chapter 3, people involved in market activities are classified into three elements, supervisors, vendors and customers. This classification method is also workable for the stakeholders.

In supervisor elements, the government would be the major stakeholder in this category. Related to ownership and regulations, the market is always a basic economic method and social activity in urban life. When facing the pandemic and fierce challenges from other retail methods, governments are considering redeveloping market space to revitalize markets or local communities, some good projects have been conducted, but more exploration and experiments are needed to meet different requirements and situations. The multifunctional market is one of the most used methods to redevelop markets in current conditions, as a result, the conclusions and suggestions of this research would give the governments some ideas and advice to design proper multifunctional market buildings under different cultural backgrounds, especially to the government of Macau. The results could also be a reference for further market development projects in mainland China, while the cultural backgrounds of the markets are similar to Macau.

Regarding the vendor element and customer element, although the supervisor element takes control of the market in establishing and construction phases, the other two elements could be involved in the maintenance process. Vendors could learn from this research how to attract customers from the five senses and how to find a market space which works well for vendors' activities. Customers would find their value in market activities in this research, they are not involved in market activities unintentionally, and people could express their intentions and claims through the behaviour patterns.

Expect those stakeholders mentioned above, the organizations related to markets, such as NABMA, would also be interested in this research. They intended to help and give advice to other parts of the markets to

maintain a good environment for markets. In this research, they could learn more about markets from supervisors or customer aspects, in further research, these would help them establish a proper mode or system for market design and maintenance, as well as patterns for market studies.

Not only for social organizations but also the same situation would also work for some companies which treat markets as operation objects. They sometimes take charge of market operations instead of the government, sometimes create their own private markets, or sometimes they are hired by the government to maintain the parts of operations in market activities. From this research, these companies could understand how to design or maintain good multifunctional markets and what should they do when they are in the role of supervisor element.

Overall, the main stakeholders of this research would be governments and related researchers, it could also be useful to market companies and social organizations related to markets. The major contributions in this research would interest them would be the system of market and the results of evaluations of multifunctional market buildings in Macau. The key effects of the supervisor element in market activities and how people use the five senses to understand market space could also be helpful to some stakeholders, not only in the research of markets but also in practice use of designing multifunctional market, while vendors and customers could be affected by the outcomes of this research.

9.2 The criticisms, limitations, and future possibilities of the research

9.2.1 The criticisms of the research

The most crucial criticism of this research was the missing part about the vendor element. According to the previous research on the market system, it was obvious that there were three main elements in the system of market, customer element, supervisor element and vendor element. During the research, the supervisor element was always mentioned as the most important one in the system, the effects of the supervisor element and how the supervisor element was formed were the major topic in the theory discussion. In the field research section, the customer element was the key source of information about the mode of the multifunctional market building, there were two pieces of research focusing on users' satisfaction and opinions, discussing the customer element and its relationship with the market system. Due to the limitation of time and break out of the pandemic, although the vendor element had been mentioned in the discussion of the market system, the data and true situations of this element were not substantiated in field research, and it was hard to explain or make conclusions on how vendor element works and its relationship with other elements in the system of the market. In the original research plan, there was a part of research on vendor element, by asking vendors in the multifunctional market buildings in Macau about their lives and opinions, the answers and information database could tell how vendor element worked in the mode of the multifunctional market building and its role in the system of the market. In some other pieces of research on the market, no matter whether related to architecture or not, in practice, the original research plan was not completely carried out as supposed, only some interviews were made to get ideas and opinions from vendors in the POE research, as the number of the related interviews was limited, they could not show the entire view of the vendor element, not to mention explaining the roles and relationships related to the vendor element. As a result, one-third of the theory on the market system could not be substantiated, leading to the research not being totally completed and seeming to be more focused on supervisor and customer elements to handle the problems of the market

and the mode of the multifunctional market building. Compared to other criticism points, the missing field research on vendor elements is the most crucial one to the whole thesis, especially in the theory discussion section.

One of the other criticisms which are important to the thesis was weak research on policy aspects of multifunctional market building in Macau in the history review section. The policy aspect was an essential part of the evidence to indicate and explain the importance of the supervisor element in the system of market, on the other hand, the history of policy changes related to markets in Macau could show and expound the history of markets in Macau, giving answers to the questions including how the mode of multifunctional market building was adopted and how those multifunction market buildings were designed, in the view of supervisor element. The policy research could involve several aspects in the operation of the mode of the multifunctional market building, from regulations for vendors to laws for the management of markets, from designs of market buildings to details of market operation, from encouraging activities in markets to holding temporary festival fairs, policy contexts could give the detailed background of markets and related public functions. According to these pieces of information, the research on policy aspects from the government of Macau could help to solve at least the following questions: how the multifunctional market buildings were designed, how the multifunctional market buildings were operated, how the mode of multifunctional market building was adopted in Macau, and what were the attitudes of the government of Macau towards multifunctional market buildings and other types of market. Due to limited time and confidentiality principles, not enough information was gathered from the government and related organizations in this research. Although some interviews and reviews on literature publications had been made to gather historical information on the market evaluation process in Macau, in order to discuss the history review of markets in Macau, the information found through these methods was not able to discuss larger topics such as why the mode of multifunctional market building was adopted and how the multifunctional market buildings were designed. The supervisor element was the most important one in the theory of market system, responsible for founding and managing the market function, lacking of policy research led to the shortcomings of the research on the supervisor element in the system of market, in the current situation, the effects and roles of the supervisor element were mainly explained and described through information and data from customer elements and second-hand information sources.

There was a minor criticism of the research which could have negative effects on the conclusions, it came from the structure of theory research on the market. When discussing the theory of market system in this research, the market was divided into several levels depending on human behaviours, the inner core was the trading actions, and then the supervisor element created the public atmosphere to form the market, these elements were inside the system of the market. Moreover, the other public or non-public functions discussed in the multifunctional market buildings were outside of the system, as a result, there was a gap between the system of market and other functions combined with the market function. In the field research period, these two parts were also discussed separately, the sensory cognitive research on the five senses and pilot research on conditions of multifunctional market buildings focused on the elements inside the system of market, that was the market function itself, while the later field research and POE research discussed the functions outside of the market system in the mode of the multifunction market building. Due to the discrete, there were no enough interactions between the system of market and other functions in the multifunctional market building, although there were few questions about how people treated the connection between market functions and other functions in the multifunctional market buildings during the POE research, the answers to these questions were negative, a large portion of people thought market functions had some negative impacts on those other functions, and most answers indicated food and drink function (also could be called cooked food centre) could increase opportunities to use market functions, the debates on relationships between market function and other public functions were still too weak to give conclusions to improve the mode of multifunction market building focusing on market function. The research could give suggestions for designs of market functions or how to form a

multifunctional market, but the theories supporting the relationships between other functions and market functions were not enough, so it is hard to make some conclusions about designing the market function with other public functions in practice.

These criticisms would affect the conclusions in this thesis, but they were not able to straight change the conclusions that the effects of the five senses on market functions and cooked food functions was the main element to support the markets among all other public functions. Criticisms raised here indicated the inadequate comprehensiveness of the research, both on theories of the market system and empirical evidence to those theories. Improving these criticism points could give a better understanding of the market function and the modes of the multifunctional market, from a more dialectical point of view. The main structure of the thesis was not influenced by these criticism points, and there were also some other criticisms in other parts of the thesis which could make the research more diverse and suitable for facing current challenges of the market and future urban development.

9.2.2 The limitation of the research

This research on multifunctional market building was limited in several aspects. The most important one was about the research object, multifunctional market building. As mentioned in the previous introduction, a multifunctional market building is a limited social phenomenon that happened under certain cultural backgrounds, especially in Southeast Asia, such as Macau and Hong Kong. Although this kind of market could be categorized as a special kind of mode of multifunctional market building, according to previous theory research and field research, in the core of the theory, compared to others, the system of the market in the multifunctional market building in Macau did not alienate, it was just a mode of the market combining with some other public functions, the only differences might depending on government authority and more government services. Being the research object, it could not represent other multifunctional modes of the market and other forms of markets in different cultures and regions. On the other hand, the number of cases in the case study for the mode of multifunctional market building was limited, only four cases could be found in Macau to represent the mode, although it showed all possibilities in the current situation, the conclusions could not even cover all the cases in southeast Asia, they only showed a typical mode of multifunctional market building in Macau adopted by the government.

Due to these limitations on research objects, the conclusions of the research were bounded by certain cultural backgrounds and design concepts. After the field research, there were two conclusions, one for market function, and one for the mode of the multifunctional market building. The first one was the design suggestion for market function, it should put more focus points on the senses of smell and sight than before, a unobstructed vision and good smell atmosphere might encourage more people to use market function; the second one indicated that the main attractive point in the mode of multifunctional market building in Macau was the cooked food centre, people tended to use multifunctional market buildings because of the food and drinks rather than raw food materials, and cooked food function was more effective than other public functions including market function and government services, that was cooked food function was the only answer to why the mode of the multifunctional market building worked well currently, in another word, multifunctional market buildings could work without market function. These two conclusions might be influenced by cultural backgrounds and regions, although in other cases of multifunctional market cooked food and drink function was also an attractive point, it hard to say it had the same important position as it was in these four cases in this thesis. In future research, more cases from other places and discussions involving cultural backgrounds would be applied to break these kinds of limitations in this research.

Another major limitation was the research participants groups in the field research, due to the pandemic

and regulation limitations, the groups of people involved in field research showed their features in different elements. The first related element was nationality, although different nationalities other than Chinese were the minority in Macau, they played quite important roles in market activities. People who came from northeast countries such as Vietnam and Philippino used to go to the market for food and groceries, because of the freshness and cheap prices, and many vendors in the market sold different special materials for foreign cuisine, serving these residents. But in the field research in this research, there were no participants of other nationalities, and all of the answers were given by Chinese (some might be residents of mainland China, some worked in Hongkong, and some lived abroad). The causes for this situation were mainly related to the pandemic situation, many foreign temporary residents chose to return to their own countries during the pandemic period, so not enough foreign residents were involved in this field research. For the same reasons, the ages of participants in the field research were also limited, to prevent direct unnecessary contact with others, more online methods were used in the field research for questionnaires and interviews. Most participants were aged lower than 50 years old, there were no answers from people aged over 70, and much data fell on young ages such as 30 to 40 years old. No matter nationality or age, although the missing parts did not affect the results due to the minor portion, these pieces of data could show some interesting stories about multifunctional market buildings from different views. For example, how do foreigners regard the mode of multifunctional market building with other markets? How do the elderly use multifunctional market buildings with other functions? These limitations might cover some secret concepts from mainstream thinking in Macau.

Except for the limitations on research objects and research participant groups, one more limitation was the objective contribution of the research. The research focuses on discussing the function arrangement of the multifunctional market building and the related history or theories, the most of contributions in this thesis were favoured by research projects and theory discussions. As a result, the contribution of this research could not completely cover the design aspect of markets, although some suggestions on designing markets had been made in previous discussions, it was hard to put all those suggestions into practice. Not only the contributions but also the applications of the contributions are limited in the designing aspects, to solve this limitation, some more studies on the designing of the market in space and construction aspects could be made in future research.

These limitations of this research mainly came from two parts, the limitation of the topic itself, like the limitation about the cases, or limitations from the special period of the pandemic, like the participants of field research. But neither of them would affect the conclusions in this research, they were belonging to the extension and derivative parts of the research, and further discussions related to these limitations might improve the application and development of this thesis.

9.2.3 The future possibility of the research

9.2.3.1 Possibility of application

According to the research aims previously mentioned:

1. The first aim is to understand the definition of 'market' and establish a general idea of the market system.
2. A Second aim is to learn and comprehend the history of the 'market' in Macau and get the reasons why the mode of multifunctional food markets was imported.

3. The final aim of this research is to show the current condition of multifunctional food markets in Macau.

Based on these aims, the thesis could be applied in the following situations:

1. At the micro level, the thesis could help to improve and develop the mode of multifunctional market building in Macau, as well as other types of markets. Through the case study of four multifunctional market buildings in Macau, the advantages and disadvantages of the current situations of the mode were relatively revealed through POE research and sensory research. According to the results of these pieces of research, the design of market function space could be enhanced through aspects of senses of smell and sight rather than just focusing on infrastructure and function arrangement. For the mode of the multifunctional market building, it could consider the balance between market functions and municipal services, and properly using the attractive points of cooked food centre to help to lead flows to use market function more often. In other words, if the government insisted on the mode of the multifunctional building as a community centre to provide essential services for surrounding residents, the mode could replace market function with other similar functions such as supermarkets and food shops, which had already been used in some new urban development cases. The application of this research could not only be used in the space design of market function and the mode of the multifunction market building but also be helpful in settling the system of retail commercial.

Market function with fairs and other retail functions consist of the system of retail commercial, the current situation of market function could show the possibility of other retail methods. Compared with other retail functions, the market function had its own disadvantages and disadvantages, in the research, the results showed its low attraction to youth generations, even relying on the freshness and cheap prices, people prefer supermarkets and food shops, not to mention online shopping being the most convenient retail methods. Under these circumstances, market function in Macau could be treated as a retail method more similar to fairs, with less time and space occupied, the usage of space might be more focused on certain categories and be more flexible. Although the market function is a substantive public function, it was influenced and corporate by other retail methods. Though the results of research on market function, setting a suitable retail system for Macau could be the most fulfillable application for this thesis.

The history review in this research could also set a brief timeline for market development in Macau, not only from the past but also as an extension of the current situation. The research on the history of market evaluation in Macau showed the attitudes of supervisor elements to the market in different periods of time. They all showed their intentions to solve the smell and environmental problems of markets, these intentions showed in the design of the market buildings and space of different functions. The review of history showed in what situation the mode of the multifunction market building could be applied and what should be noticed when the mode of multifunctional market building was applied in urban development.

2. At the macro level, this research showed a common situation that all kinds of public functions could face and how to study the related problems. As mentioned in the previous discussion of the theories part, the market function is a kind of public function had the same structure of concepts, with supervisor, customer and provider (vendor in the system of the market) elements. As a result, the current situation and problems the market faces could also happen to other public functions, especially municipal services which usually have the same supervisor element as markets. From the research, it could be told that the supervisor element was the key part of the system of public function and influence the space and patterns of human behaviours, the majority of problems public functions face could be solved by making changes in supervisor elements to fulfil the needs of the vendor and customer elements. At the same time, learning from the mode of the multifunctional market building could give some lessons to other public functions applied to be multifunctional when people thought

it was one of the best methods to maintain the vitality and longevity of space and functions. For example, when a plaza or square needs to be regeneration to revive from low active situations, the designer or planner could consider the food and drink function as the top choice other than the retail market or municipal services. That is not to say that the cooked food function is the only best option for multifunctional space, the design should be considered according to cultural backgrounds and other realistic factors, and other functions might work better in certain conditions and combinations. The results of the research were to raise problems about the mode of multifunctional space when it became popular to use multifunctional space to deal with social problems, not all the modes of multifunctional space would work fine with any functions combinations just depending on preferences and assumptions, the results need to be examined from time to time with the development of societies and changes on human behaviours.

3. This research could lead market function to be a method in the urban revolution. Facing urban problems, streets were treated as a method against capitalism in the urban revolution. For the Chicago School of Sociology, public space is also a way to form new communities during the cultural integration process, which was considered to be the key to solving social problems. Being a kind of public space like a street, the potential powers of market function were hardly mentioned in any research. In this research, the discussion on the system of the market showed the three elements and their relationships with human behaviours, the results indicated market could be the public space to reform the relationships between residents and capital, furthermore, the connections between space and human behaviours could be a proper practice occasion for urban revolution facing mobile ages.

9.2.3.2 Possibilities for future research

The possibility of future research of this thesis could be developed into two aspects, one is extensive research on criticisms and limitations of this thesis. According to previous discussions, this kind of extension research could also be divided into two categories, the first group is to bring more cases and data into the research process. This kind of research was aimed to solve the criticisms and limitations of low cases, limited data and missing field research, with an improved database, the conclusions of this thesis would be completer and more substantiated by more convincing pieces of field evidence. Due to the pandemic period during the research, this part of the research is quite crucial to cover the disadvantages and directly influence the conclusions. The second group is to fulfil the discussions of theories from different views, such as the vendors' aspect and policy reviews, with further pieces of research on certain fields, the uncomplete discussions of theories in this research could be accomplished, which would better support the conclusions of the research.

The second aspect is extensive research on other topics related to this research, there are also two groups in this kind of research. The first group use the same research methods and processes to discuss the markets in other regions and under different cultural backgrounds. As mentioned in previous discussions, the cultural backgrounds were the largest limitation to this research, and one of the aims and objectives of this research was to establish a suitable theory to study phenomena about markets, studying different kinds of markets in other regions with a variety of culture features is a logical option. Correspondingly, this kind of research could complement and perfect the conclusions or processes of this research. The second group of extension research is to use the conclusions and theory of this thesis to study other public functions, extending the theory system to the field of urban space. The system of the market used in this thesis is a general one which could be used by other public functions, the three elements (supervisor, vendor, and customer) and the relationships between them also could be applied in other systems. Further extension research of this kind would explode the field outside of the market function, with more

information and conclusions on other public functions, it could more possibly reveal the key conflicts of urban problems which public functions are facing are the unmatched relationships between cognize of supervisor element which is tightly bounded with capitals and ever-changing behaviour patterns of customer element representing the majority.

The previous kind of future research is much more important to this thesis, it could correct and replenish the research in time and be more useful in practice use, while the latter one would lead the theories and research methods to another dimension, more helpful in discussing the social problems happened or related with urban space. No matter which kind of further research, all need to be discussed and analysed relying on the research theories and research methods in this research.

Bibliography

- Adelzadeh, A. Socio-spatial persistence of bazaars in historical cities of Iran: The Tabriz bazaar.
- Andreatta, S., & Wickliffe, W. (2002). Managing farmer and consumer expectations: A study of a North Carolina farmers market. *Human Organization*, 61(2), 167-176.
- Banerjee, T. (2001). The future of public space: beyond invented streets and reinvented places. *Journal of the American planning association*, 67(1), 9-24.
- Benhabib, S. (1992). Models of Public Space: Hannah Arendt, the Liberal Tradition, and Jurgen Habermas' in Calhoun, C.(ed) *Habermas and the Public Sphere*.
- Borucka, J., Czyż, P., Gasco, G., Mazurkiewicz, W., Nałęcz, D., & Szczepański, M. (2022). Market Regeneration in Line with Sustainable Urban Development. *Sustainability*, 14(18), 11690.
- Bratt, M. (2010). Reviving London, ON: The Role of the John Labatt Centre and Covent Garden Market (master's thesis, University of Waterloo).
- Bromley, R. D. (1998). Market-place trading and the transformation of retail space in the expanding Latin American city. *Urban Studies*, 35(8), 1311-1333.
- Bruster, D. (2013). The Representation Market of Early Modern England. *Renaissance Drama*, 41(1/2), 1-23.
- Casson, M., & Lee, J. S. (2011). The origin and development of markets: A business history perspective. *Business History Review*, 85(1), 9-37.
- Chen, L., Cheng, Q., Zhao, H. (2020). 我国菜市场发展概况及政策建议 [The Development Situation and Policy Suggestion of Vegetable Market in my country], *China National Conditional and Strength* (11), 4.
- Chen Ming (2016). 活力公共空间打造——国外菜市场更新的启示 [Creating Vibrant Public Space: Inspiration from the Renewal projects of Foreign Vegetable Markets], *Proceedings of the 2016 China Urban Planning Annual Conference (06 Urban Design and Detailed Planning)*.
- Communities and Local Government Committee. (2008). *Market Failure: Can the traditional markets survive*.
- Crespi-Vallbona, M., & Dimitrovski, D. (2016). Food markets visitors: a typology proposal. *British Food Journal*.
- Crewe, L. (2001). The besieged body: geographies of retailing and consumption. *Progress in Human Geography*, 25(4), 629-640.
- Curl, J. S., & Wilson, S. (2015). *The Oxford Dictionary of Architecture*. Oxford University Press, USA.

- Degen, M. M., & Rose, G. (2012). The sensory experiencing of urban design: The role of walking and perceptual memory. *Urban studies*, 49(15), 3271-3287.
- Ding, Y. (2015). 菜市场公共服务设施空间布局规划探析 ——以武汉市江汉区为例 [Research on spatial planning of public services infrastructures in markets: taking Jiangnan District of Wuhan as an example], *Proceedings of the 2015 China Urban Planning Annual Conference (11 Planning Implementation and Management)*.
- Dobraszczyk, P. (2012). Victorian market halls, ornamental iron and civic intent. *Architectural History*, 55, 173-196.
- Duruz, J. (2004). Adventuring and belonging: An appetite for markets. *Space and Culture*, 7(4), 427-445.
- Emerson, R. M. (1987). *Social exchange theory*.
- Emerson, R. M. (1976). "Social Exchange Theory". *Annual Review of Sociology*. 2: 335-362.
- Francis, M., & Griffith, L. (2011). The meaning and design of farmers' markets as public space an issue-based case study. *Landscape Journal*, 30(2), 261-279.
- Franck, K. A. (2005). The city as dining room, market and farm. *Architectural Design*, 75(3), 5-10.
- Ferdous, F. (2012). The spatial analysis and morphological evolution of the 'Bazaar Streets' and urban structure of Dhaka city. *Urban Design International*, 17, 206-220.
- Gabunia, Tio. "Social Interaction Types & Examples (Sociology)." *Helpful Professor* (2023).
- García, B. (2004). Urban regeneration, arts programming and major events: Glasgow 1990, Sydney 2000 and Barcelona 2004. *International journal of cultural policy*, 10(1), 103-118.
- Gharipour, M. (2012). *The Bazaar in the Islamic City: Design, Culture, and History*.
- Ghafoorikoohsar, E. (2016). *Urban Micro-Publics as a Social Regeneration Strategy: Exploring the Socio-Cultural Dimensions of Retail Marketplaces in Greater Manchester*.
- González, S., & Dawson, G. (2015). Traditional Markets under threat: why it's happening and what traders and customers can do.
- González, S., & Waley, P. (2013). Traditional retail markets: the new gentrification frontier? *Antipode*, 45(4), 965-983.
- Gordon, K. E. (2010). 'The market sets the price': determining prices in a Bolivian marketplace. *Journal of the Royal Anthropological Institute*, 16(4), 853-873.
- Greenough, Horatio. *Form and function: remarks on art, design, and architecture*. Univ of California Press, 1969.
- Guimarães, P. P. C. (2018). The transformation of retail markets in Lisbon: an analysis through the lens of retail gentrification. *European Planning Studies*, 26(7), 1450-1470.

- Hallsworth, A., Ntounis, N., Parker, C., & Quin, S. (2015). *Markets matter: Reviewing the evidence and detecting the market effect*. Manchester, UK: Institute of Place Management, Manchester Metropolitan University. Retrieved October, 1, 2015.
- Heidegger, Martin. "Poetry, language, thought." Trans. Albert Hofstadter. New York, NY: Perennial Classics (2001).
- Hiebert, D., Rath, J., & Vertovec, S. (2015). Urban markets and diversity: Towards a research agenda. *Ethnic and racial studies*, 38(1), 5-21.
- Hinrichs, C. C., Gulespie, G. W., & Feenstra, G. W. (2004). Social learning and innovation at retail farmers' markets. *Rural sociology*, 69(1), 31-58.
- Hong, Bo (2013). 对菜市场回归公益性的思考和建议 [Thoughts and Suggestions on Returning of the Vegetable Market to Public Welfare], *Reform & Opening*, (2X), 44-44.
- Hu, Shuangjing (2014). 当代北京旧城菜市场空间研究 [Research on Public Markets in Contemporary Beijing Old City], (Doctoral dissertation), Tsinghua University, China.
- Hughes, J. M. (2010). The role of supervision in social work: A critical analysis. *Critical Social Thinking: Policy and Practice*, 2(1).
- Hulme, A. (2018). Importing the night market: urban regeneration and the Asian food aesthetic in London. *Food, Culture & Society*, 21(1), 42-54.
- Hussain, S. (2019). Sensory Marketing Strategies and Consumer Behavior: Sensible Selling Using All Five Senses. *IUP Journal of Business Strategy*, 16(3).
- Ikioda, F. O. (2013). Urban markets in Lagos, Nigeria. *Geography Compass*, 7(7), 517-526.
- Janssens, F., & Sezer, C. (2013). Marketplaces as an urban development strategy. *Built Environment*, 39(2), 169-171.
- Johnston, J., & Szabo, M. (2011). Reflexivity and the Whole Foods Market consumer: the lived experience of shopping for change. *Agriculture and Human Values*, 28, 303-319.
- Jones, P., Hillier, D., & Comfort, D. (2007). Changing times and changing places for market halls and covered markets. *International Journal of Retail & Distribution Management*, 35(3), 200-209.
- Kartal, A. N. (2021). Sensory urban mapping: a case study of Istiklal Street, Istanbul with the method of 'sensewalking' (Doctoral dissertation, University of Nottingham).
- Lao, J., Lv, Z. (2019) 澳门街市建筑 (1750-1950) [Macau Market Buildings (1750-1950)], The Heritage Society.
- Li, Xinxue (2021). 古城复兴视角下的菜场更新改造设计探究——以苏州双塔市集为例 [Research on the Renewal and Renovation Design of Vegetable Market from the Perspective of Ancient City Revival——Taking the renovation of Suzhou Shuangta Market as an example], *Interior Architecture of China* (5),2.
- Liang, Mingyi (2017). 基于用户反馈的澳门街市的功能复合化研究 [Research on multiple functions of the Macau Market Based on User Feedback] (Master's dissertation), Huaqiao University, China.

- Liu, C., Liu, Z. (2016). 基于居民空间行为数据分析的菜市场布局研究——以天津市北辰区为例 [Research on vegetable market layout based on data analysis of residents' spatial behaviours: Taking Beichen District of Tianjin as an example], Proceedings of the 2016 China Urban Planning Annual Conference (04 application of new technologies in urban planning).
- Lefebvre, H. (2003). *The urban revolution*. U of Minnesota Press.
- Liu, Xiao (2016). 社区多功能复合型公共菜市场设计——唐家湾菜场设计 [Community Multi-functional Compound Public Vegetable Market Design: Design of Tangjiawan Vegetable Market], (Master's thesis), Shanghai Normal University, China.
- Logozar, B., & Schmit, T. M. (2009). *Assessing the Success of Farmers' Markets in Northern New York: A Survey of Vendors, Customers, and Market Managers* (No. 639-2016-41956).
- Lynch, K. (1964). *The image of the city*. MIT press.
- McMillan, J. (2003). *Reinventing the bazaar: A natural history of markets*. WW Norton & Company.
- Mehdipour, A., & Rashidinia, H. (2013). Persian Bazaar and Its Impact on Evolution of Historic Urban Cores-the Case of Isfahan. *The Macrotheme Review*, 2(5), 12-17.
- Mele, C., Ng, M., & Chim, M. B. (2015). Urban markets as a 'corrective' to advanced urbanism: The social space of wet markets in contemporary Singapore. *Urban Studies*, 52(1), 103-120.
- Miles, S., & Paddison, R. (2005). Introduction: The rise and rise of culture-led urban regeneration. *Urban studies*, 42(5-6), 833-839.
- Morales, A. (2009). Public markets as community development tools. *Journal of Planning Education and Research*, 28(4), 426-440.
- Morales, A. (2011). Marketplaces: Prospects for social, economic, and political development. *Journal of Planning Literature*, 26(1), 3-17.
- Naicker, M. S., & Rogerson, J. M. (2017). Urban food markets: A new leisure phenomenon in South Africa. *African Journal of Hospitality, Tourism and Leisure*, 6(3), 1-17.
- Oldenburg, R. (1999). *The great good place: Cafes, coffee shops, bookstores, bars, hair salons, and other hangouts at the heart of a community*. Da Capo Press.
- Pottie-Sherman, Y., & Hiebert, D. (2015). Authenticity with a bang: Exploring suburban culture and migration through the new phenomenon of the Richmond night market. *Urban Studies*, 52(3), 538-554.
- Pourjafar, M., Amini, M., Varzaneh, E. H., & Mahdavinejad, M. (2014). Role of bazaars as a unifying factor in traditional cities of Iran: The Isfahan bazaar. *Frontiers of Architectural research*, 3(1), 10-19.
- Preiser, W. F., White, E., & Rabinowitz, H. (2015). *Post-occupancy evaluation*. Routledge.
- Project for Public Spaces. (2003). *Public Markets as a Vehicle for Social Integration and Upward Mobility—Phase I. Report: An Overview of Existing Programs and Assessment of Opportunities*.

- Ruelas, V., Iverson, E., Kiekel, P., & Peters, A. (2012). The role of farmers' markets in two low income, urban communities. *Journal of Community Health, 37*(3), 554-562.
- Rousseau, J. J. (1964). *The social contract* (1762). Londres.
- Starkey, Phyllis. (2009) Market Failure? Can the Traditional Market Survive? Ninth Report of Session 2008-09 / House of Commons, Communities and Local Government Committee.. House of Commons Papers. Session 2008-2009; 308.
- Seamon, D. (Ed.). (1993). *Dwelling, seeing, and designing: Toward a phenomenological ecology*. SUNY Press.
- Sheng, Qiang (2016) 菜市场的等级与路网层级结构——对北京三环内菜市场的空间句法分析 [Market hierarchies produced by scale-structure in movement networks: spatial study on the distribution and size of all food markets within the Third Ring of Beijing], *Huazhong Architecture, 35*(6), 20-25.
- Schappo, P., & van Melik, R. (2017). Meeting on the marketplace: on the integrative potential of The Hague Market. *Journal of Urbanism: International Research on Placemaking and Urban Sustainability, 10*(3), 318-332.
- Sommer, R., Herrick, J., & Sommer, T. R. (1981). The behavioral ecology of supermarkets and farmers' markets. *Journal of Environmental Psychology, 1*(1), 13-19.
- SUZUKI, M., & ALMAZAN, J. (2015). THE EFFECTS AND MANAGERMENTS OF STREET MARKETS IN GREATER LONDON. *Journal of Architecture and Planning (Transactions of AIJ), 80*(709).
- Tiemann, T. K. (2008). Grower-only farmers' markets: public spaces and third places. *The Journal of Popular Culture, 41*(3), 467-487.
- Urban, H. B. (2001). The marketplace and the temple: Economic metaphors and religious meanings in the folk songs of colonial Bengal. *The Journal of Asian Studies, 60*(4), 1085-1114.
- Wang, Xiaotian (2021). 广州历史城区菜市场空间发展策略研究 [Research on the spatial development strategy of food market in Guangzhou historical districts], (Master's thesis), Guangdong University of Technology, China.
- Watson, S. (2009). The magic of the marketplace: Sociality in a neglected public space. *Urban Studies, 46*(8), 1577-1591.
- Wittman, H., Beckie, M., & Hergesheimer, C. (2012). Linking local food systems and the social economy? Future roles for farmers' markets in Alberta and British Columbia. *Rural Sociology, 77*(1), 36-61.
- Wu, J., Chen, Y. (2017). 东亚大城市菜市场发展经验及其借鉴 —— 以中国香港、中国台湾和新加坡为例 [Learning from Wet Market Development in East Asian Metropolis: Cases of Hong Kong, Taiwan Districts and Singapore], *Urban Planning International, 32*(6), 91-98.
- Xing, Cheng (2012). 传统菜市场在城市复兴中的作用 [The Role of Traditional Market in Urban Revitalization], (Doctoral dissertation), Hefei University of Technology, China.
- Ye, Nong (2016). 澳门街市 [Markets in Macau], Joint Publishing (Hong Kong) Co., Ltd.

Yin, P. N. Food Market and Cultural-led Urban Regeneration: An Experimental Project in Taipei City, Taiwan. "

Yu, Jian (2016). 上海市中心城菜市场发展策略探索 [Research on Strategies of Improving Markets in the Inner-city of Shanghai], *Shanghai Urban Planning Review* (6), 111-115.

Yuan, Zuoxin (1997). 香港街市考察与启示 [Hong Kong Street Market Investigation and Enlightenment], *China Business Administration Research* (6), 47-48.

Yun-Myong Yi, and Tae-Hyoung Tommy Gim. (2018). "What Makes an Old Market Sustainable? An Empirical Analysis on the Economic and Leisure Performances of Traditional Retail Markets in Seoul." *Sustainability* 10.6: 1779. Web.

Zasada, K. (2009). *Markets 21: A policy & research review of UK retail and, wholesale markets in the 21st century*. The Retail Markets Alliance, UK.

Zhao, L., Liang, X. (2016) 哈尔滨老道外菜市场的“复兴” [The "Renaissance" of Harbin Laodao Foreign Food Market], *Shaxi Architecture*, 42(31), 16-17.

Zhang, Haozhi (2018). 成都市社区菜市场空间活力设计研究 [Research on the Design of the Vitality of the Community of Vegetable Market of Chengdu] (Master's thesis), Chengdu University of Technology, China.

Zhong, J., & Zeng, Y. (2004). 从自然通风谈室内菜市场的健康设计 [Healthy Design for Inartificial Aeration of Indoor Food Market], *Chongqing Architecture*, (1), 29-32.

APPENDICES

Questionnaire 1

澳门街市综合大楼使用情况问卷调查

简介 Introduction

十分感谢您能参与此次问卷调查。

此次调查为非公开匿名问卷，问卷的总体结果数据会应用于街市研究中，希望您能尽可能给予真实的信息。本次问卷主要调查现有的澳门街市综合大楼使用情况以及市民对街市的态度，有助于寻找出目前街市综合大楼存在的问题，并促进新的街市更新方式的形成。

此问卷中提及的街市综合大楼仅包含以下街市：
营地街市，下环街市，祐汉街市，沙梨头街市，台山街市

Thank you very much for participating in this survey.
This survey is a non-public anonymous questionnaire. The overall result of this questionnaire will be used in research on markets in Macau. It would be very kind of you to give information as correct as possible. This questionnaire aims to know the situations of food markets buildings in Macau and the attitudes of residents toward municipal services buildings. The results of this questionnaire would help to find existing problems of markets and new theories or methods for urban regeneration of markets.

The food market buildings involved in this questionnaire only include following markets:
Mercado de S. Domingos Municipal Complex, S. Lourenço Municipal Market Complex, Bairro Iao Hon Municipal Market, Patane Market, Tamagnini Barbosa Municipal Market Complex.

***必填**

1. 您平日是否会去街市综合大楼吗? Have you ever gone to market building? *

请仅选择一个答案。

是 Yes 跳至第 4 题

否 No 跳至第 15 题

否, 但会去其他一般街市 No, but I go shopping in other markets.
跳至第 15 题

2. 您前往居所最近的街市综合大楼需要花费多久? How long does it take for you traveling to the nearest food markets? *

比如: 步行5分钟, 自驾5分钟; Example: 5min on foot, 5min by bus

3. 您觉得澳门市政署的管理职能在街市综合大楼方面是否履行到位? Do you think Institute for Municipal Affairs of Macau work well in operating food markets? *

请仅选择一个答案。

是 Yes

否 No

跳至第 15 题

关于街市综合大楼使用情况

About markets

4. 您的性别? Male or Female? *

请仅选择一个答案。

男 Male

女 Female

5. 您来自哪里? Where are you from ?
比如: 菲律宾, 广东, 珠海; Example: Philippine, Portugal

6. 您的年龄? How old are you? *

请仅选择一个答案。

0-18

19-25

26-35

36-40

41-60

60以上 over 60

7. 您一周内会去几次街市综合大楼? How often do you go to food markets in a week? *

比如: 从不, 一周一次; Example: never, once a week

8. 您会选择在每日的什么时间去街市综合大楼? What time of a day do you go to the markets? *

比如: 早晨, 17: 00; Example: morning, 5pm

9. 您主要使用哪些街市综合大楼? (多选) Which food market buildings do you usually go to? (multiple choice) *

请选择所有适用项。

营地街市 Mercado de S. Domingos Municipal Complex

下环街市 S.Lourenço Municipal Market Complex

祐汉街市 Bairro Iao Hon Municipal Market

沙梨头街市 Patane Market

台山街市 Tamagnini Barbosa Municipal Market Comple

10. 您觉得街市的哪个方面更重要? Which is more important? *

请仅选择一个答案。

购物体验 Experience of shopping

功能便利 Good function design

11. 您会使用街市综合大楼里的其他政府功能吗? Do you use other municipal services in the food market building? *

请仅选择一个答案。

是 Yes 跳至第 12 题

否 No 跳至第 15 题

跳至第 15 题

街市综合大楼的其他政府功能使用情况

The usage situation of other municipal services in food market buildings

12. 在街市综合大楼您会使用哪些其他政府功能? Which municipal services in food market buildings did you use? *

请选择所有适用项。

图书馆 Library

运动设施 Sports facilities

熟食中心 Food court

社区服务中心 Community service centre

康乐中心 Leisure centre

停车 Parking lots

13. 您觉得街市综合大楼内的功能是否会产生互相干扰? Do you think functions in food market building could interfere each other? *

比如: 无, 图书馆安静受到影响; Example: None, noisy

14. 您觉得市政综合大楼是否提升政府服务的利用率? Do you think the municipal services buildings improve the utilization of municipal services? *

请仅选择一个答案。

- 是, 节约了时间和人力 Yes, saving time and energy
- 是, 便于寻找 Yes, easy to find
- 是, 其他 Yes, other reasons
- 否, 市政服务是否使用和所在空间无关 No, using services is not related with locations
- 否, 空间并不好用 No, services are easy to use
- 否, 其他 No, other reasons

跳至第 15 题

街市的必要性

The necessity of markets

15. 您觉得 街市 对于三常生活是必须的吗? Do you think the food markets are necessary in daily lives? *

请仅选择一个答案。

- 是 Yes 跳至第 18 题
- 否 No 跳至第 20 题

16. 你觉得 街市 最具吸引力的地方是? Which aspects of the food markets attract you? *

比如: 无, 价格便宜, 食材新鲜; Example: none, cheap price, freshness

17. 您觉得现在澳门街市综合大楼需要改进的是? Which aspects of food markets in Macau do you think need to be improved? *

比如: 停车设施, 环境; Example: parking, environment

跳至第 20 题

18. 您觉得 街市 的哪些方面对日常生活是必要的? Why do you think markets are necessary in daily life? *

比如: 更多选择, 创业的机会; Example: more choices, opportunities for starting bussiness

19. 您觉得街市综合大楼是否必要? Do you think food market buildings are necessary in daily life? *

请仅选择一个答案。

是 Yes

否 No

跳至第 20 题

您的意见

Your advices

20. 您对澳门的街市综合大楼或本次问卷有什么意见建议吗? 谢谢~ Do you have any other suggestions on multifunction food market buildings in Macau or this questionnaire? Thank you very much.

感谢，勿忘
提交~
Thank you
and don't
forget to
submit~

感谢您的耐心和配合，本研究会保障您的信息安全。
十分感谢如果您能分享这份问卷，让更多的澳门居民参与本研究中，期待澳门会有更好的街市。

问卷链接: <https://forms.gle/TarryNJLBntE4LoR6>

Thank you for your patience and cooperation, your information safety is our priority.

It would be grateful if you could share this questionnaire, letting more residents of Macau know and participate in this research. Hoping there would be better markets in Macau in future.

link of this questionnaire:

<https://forms.gle/TarryNJLBntE4LoR6>

Questionnaire 2

澳門街市感受問卷調查

Questionnaire on the feelings of markets in Macau

簡介

Introduction

十分感謝您能參與此次問卷調查。

此次調查為非公開匿名問卷，問卷的總體結果資料會應用於街市研究中，希望您能盡可能給予真實的資訊。本次問卷主要調查市民對街市的態度和感受，有助於研究者找出澳門街市目前存在的問題，並促進新的街市更新方式的形成。

Thank you very much for participating in this survey.

This survey is a non-profit anonymous questionnaire. The overall results of this questionnaire will be used in related research on markets in Macau. It would be very kind of you to give information as truthfully as possible. This questionnaire aims to know the attitudes and feelings of residents toward municipal markets. The results of this questionnaire would help to find existing problems of markets and new theories or methods for the urban regeneration of markets.

[M]= [multiple choices question]

1. 您去過澳門街市買東西嗎?

Did you go shopping in the markets of Macau? *

是 Yes

否 No

2. 與其他購物空間相比，您覺得澳門街市是否有特色?

Compared to other shopping spaces, do you think markets in Macau are unique? *

完全没有
特色 No
unique at
all

1

2

3

4

5

非常有特
色 Very
unique

3. 您覺得街市是否存在“氣氛”一說?

Do you think there are atmospheres in markets? *

是 Yes

否 No

4. 您覺得“氣氛”對街市是否重要?

Do you think atmospheres are important to markets? *

是 Yes

否 No

5. 您會因為“氣氛”好壞而選擇街市嗎?

Would you choose which market to go to depending on the atmosphere? *

是 Yes

否 No

6. 以下哪些些聲音能讓您想到街市? [多选题]

Among the following sounds, which ones would remind you of the markets? [M]*

- 商販的叫賣聲 Vendor's cry
- 商販的清洗聲和處理食材聲音 The sound of cleaning and the food processing
- 商販上下貨和過往的聲音 The sound of loading, unloading and passing of vendors
- 商販器材的聲音，比如水泵 The sound of vendors' equipment, such as a water pump
- 和商販聊天的聲音 Chatting with vendors
- 和其他顧客聊天的聲音 Chatting with other customers
- 其他顧客的聲音 The sound of other customers
- 電梯聲音 The sound of the elevator
- 通風聲音 The sound of the ventilation system
- 管理員聲音 The sound of administrators
- 其他 Others _____*

7. 在街市裡，您覺得和他人交流是否重要？

Do you think it is important to communicate with others in markets? *

- 是 Yes
- 否 No
- 是，但只和商販 Yes, but only with vendors

8. 在聽覺方面，您更喜歡怎樣的街市？

In terms of hearing, what kinds of markets do you prefer? *

	非常低 Very low	低 Low	中等 Medium	高 High	非常高 Very high
喧鬧程度	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Loudness					
聲音數量 Sources of sounds	○	○	○	○	○
與他人交流機會 Communication with others	○	○	○	○	○

9. 您是否會因為氣味問題而選擇街市?

Would you choose the markets according to the smell? *

- 是 Yes
- 否 No

10. 以下哪些氣味能讓您想到街市? [多选题]

Among the following smells, which ones would remind you of markets?[M]*

- 水產商品的氣味 The smell of aquatic products
- 乾貨商品的氣味 The smell of dried products
- 肉禽商品的氣味 The smell of meat
- 水果的氣味 The smell of fruit
- 鮮花的氣味 The smell of flowers
- 熟製品的氣味 The smell of delicatessen
- 蔬菜的氣味 The smell of vegetable
- 垃圾的氣味 The smell of garbage
- 商販身上的氣味 The smell of vendors
- 其他 Others _____*

11. 在嗅覺方面，您更喜歡怎樣的街市?

In terms of smell, what kinds of markets do you prefer? *

	非常低 Very low	低 Low	中等 Medium	高 High	非常高 Very high
--	-----------------	----------	--------------	--------	------------------

氣味濃 Strongness of smells	○	○	○	○	○
氣味數量 Sources of smells	○	○	○	○	○
氣味好聞 Smell good	○	○	○	○	○

12. 您會在街市中觸摸東西麼嗎?

Would you touch things in the markets? *

- 是 Yes
- 否 No
- 是, 但不主动 Yes, but not actively

13. 以下哪些觸感能讓您想到街市? [多选题]

Among the following tactile sensations, which ones would remind you of the markets?[M] *

- 商品的手感 The touch feeling of products
- 與商販接觸 The physical interaction with vendors
- 與其他顧客接觸 The physical interaction with other customers
- 街市的建築 The touch feeling of the structures
- 街市的設施 The touch feeling of the facilities
- 錢幣的觸感 The touch of money
- 其他 Others _____ *

14. 在觸覺方面, 您更喜歡怎樣的街市?

In terms of touch, what kinds of markets do you prefer? *

	非常低 Very low	低 Low	中等 Medium	高 High	非常高 Very high
建築觸感舒適 Comfort of structure	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

設施觸感舒適 Comfort of facilities	○	○	○	○	○
更多商品觸摸機會 Chances of touching products	○	○	○	○	○
與人接觸 Physical interaction with people	○	○	○	○	○

15. 以下哪些視覺因素會讓您想到街市? [多选题]

Among the following elements, which ones would remind you of the markets?[M]*

- 商品 Product
- 商販 Vendor
- 設備 Equipment
- 商販相關資訊, 比如招牌, 價格表 Information about vendors, such as signboards and price lists
- 顧客 Customer
- 交易動作 Actions during trading
- 建築 Architecture
- 設施 Facility
- 指示牌 Signs
- 燈光 Lightning system
- 街景 Street view
- 其他 Others _____*

16. 以下哪些視覺因素對您影響最大[多选题]

Among the following elements, which ones affect you most in the markets?[M]*

- 商品 Product
- 商販 Vendor
- 設備 Equipment
- 商販相關資訊, 比如招牌, 價格表 Information about vendors, such as signboards and price lists

- 顧客 Customer
- 交易動作 Actions during trading
- 建築 Architecture
- 設施 Facility
- 指示牌 Signs
- 燈光 Lightning system
- 街景 Street view
- 其他 Others _____*

17. 在視覺方面，您更喜歡怎樣的街市？

In terms of visuals, what kinds of markets do you prefer? *

	非常低 Very low	低 Low	中等 Medium	高 High	非常高 Very high
色彩更多 More colours	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
更明亮 Brighter	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
色彩更鮮豔 More vivid	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
視野無阻擋 Unobstructed view	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
一眼能看到的事物更多 See more at a glance	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

18. 您會在街市品嚐食物嗎?

Would you taste foods in the markets? *

- 是 Yes
- 否 No
- 是, 但不主动 Yes, but not actively

19. 以下哪些味道能讓您聯想到街市? [多选题]

Among the following flavours, which ones would remind you of the markets?[M]*

- 燒味 Sui mei
- 蔬菜 Vegetable
- 其他熟食 Other cooked food
- 點心 Dessert
- 調味品 Condiment
- 水果 Fruit
- 其他 Others _____*

20. 在味覺方面, 您更喜歡怎樣的街市?

In terms of taste, what kinds of markets do you prefer? *

	非常低 Very low	低 Low	中等 Medium	高 High	非常高 Very high
更多品嚐機會 Chance of having a taste	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
更多可嘗的商品	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

More products to taste					
更衛生的環境 More hygienic	○	○	○	○	○

21. 通過街市的“氣氛感”重要性，對五感進行排位的話？

Among the five senses, which is the order according to the importance of the "sense of atmosphere" in the market?

[排序題，請在中括号內依次填入數字]

[Ranking question, please fill in the numbers in brackets] *

聽覺 Hearing

嗅覺 Smell

視覺 Visual

觸覺 Touch

味覺 Taste

22. 您覺得哪個因素最影響您對街市的感受？

Which factor do you think influences your perception of the market the most? *

此處指一個詳盡的因素，比如商品的觸感。This refers to a detailed factor, such as the tactile feel of the product.

23. 您對澳門的街市或本次問卷有什麼意見建議嗎？謝謝~

Do you have any other suggestions on markets in Macau or this questionnaire?

Thank you very much.

Questionnaire 3

澳門街市綜合功能問卷調查

Questionnaire on multifunctional market building in Macau

簡介

Introduction

十分感謝您能參與此次問卷調查。

此次調查為非公開匿名問卷，問卷的總體結果資料會應用於街市研究中，希望您能盡可能給予真實的資訊。本次問卷主要調查市民對澳門街市市政綜合大樓的態度和感受，有助於研究者找出澳門街市目前存在的問題，並促進新的街市更新方式的形成。

Thank you very much for participating in this survey.

This survey is a non-profit anonymous questionnaire. The overall results of this questionnaire will be used in related research on markets in Macau. It would be very kind of you to give information as truthfully as possible. This questionnaire aims to know the attitudes and feelings of residents toward multifunctional market buildings in Macau. The results of this questionnaire would help to find existing problems of markets and new theories or methods for the urban regeneration of markets.

注意事項：

Precautions:

為了您寶貴的時間，如果您不曾去過任何一個澳門街市市政綜合大樓，請您務必不要參與此問卷調查，謝謝配合~

For saving you precious time, if you have never been to a municipal multifunctional market building in Macau, please do not participate this questionnaire. Thank you for your cooperation.

顏色與簡稱：

Colour and abbreviation

綠色

Green

街市區域=街市=菜市場、海鮮市場、肉市場

Market function=Market=Vegetable market, seafood market, and meat market

黃色

Yellow

市政大樓=街市市政綜合大樓

下環街市=下環街市市政綜合大樓

營地街市=營地街市市政綜合大樓

祐漢街市=祐漢街市市政綜合大樓

沙梨頭街市=沙梨頭街市市政綜合大樓

Municipal building=municipal multifunctional market building

Xiahuan market=Xiahuan multifunctional market building

Yingdi market=Yingdi multifunctional market building

Youhan market=Youhan multifunctional market building

Shalitou market=Shalitou multifunctional market building

紅色

Red

問題重點

Important points of the questions

S=Single choice question

M=Multiple choice question

1. 您的年齡是? [单选题]

Your age? [S]*

- 小於 18 歲 Under 18
- 18-30 歲
- 31-40 歲
- 41-50 歲
- 51-60 歲
- 61-70 歲
- 71-80 歲
- 大於 80 歲 Over 80

2. 您所在的區域: [单选题]

Which district do you stay in? [S]*

- 花地瑪堂區 Our Lady Fatima Parish
- 花王堂區 St. Anthony Parish
- 望德堂區 St. Lazarus Parish
- 大堂區
- 風順堂區
- 氹仔-嘉模堂區 Our Lady Of Carmel's Parish
- 路氹城 Cotai
- 路環-聖方濟各堂區
- 其他 Other

3. 您大約負責幾人份的家務? [单选题]

The amount of housework you are responsible for? [S]*

- 不負責 None
- 不足一人份 Less than the portion of a person
- 一人份 The portion of a person
- 兩人份 The portion of two
- 三人份 The portion of three people
- 四人份以上 Over the portion of four people

4. 您去街市是否有同行者? [单选题]

Do you have companies when going to markets? [S]*

是 Yes

否 No

5. 您在以下地點購置食物的頻率是[矩阵单选题] *

食品商店包括凍肉店、蔬菜店、水果店等

How often do you buy food in the following places? [S]

	非常低 Very low	较低 Low	中 Medium	较高 High	非常高 Very high
街市 Market	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
超市 Supermarket	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
小販 Individual vendor	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
食品商店 Food shop	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
食肆 Restaurant	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
網購 Online shopping	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

請您為品質打分：[矩阵量表题]

Please grade for qualities[S] *

	非常低 Very low	低 Low	中 Medium	中上 Bit over medium	高 High	非常高 Very high
街市 Market	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
超市 Supermarket	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
網購 Online shopping	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
食品商店 Food shop	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

6. 請您為價格打分：[矩阵量表题]

Please grade for prices: [S] *

	非常低 Very low	低 Low	中 Medium	中上 Bit over medium	貴 Expensiv e	非常貴 Very Expensive
街市 Market	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
超市 Supermarket	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
網購 Online shopping	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
食品商店 Food shop	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

7. 您覺得其他購物方式能否替代街市？比如超市、小販 [单选题]

Do you think other shopping methods could replace market function? Such as supermarkets and individual vendors. [S] *

能 Yes

不能 No

8. 您多久去街市市政綜合大樓一次? [单选题]

How often do you go to the multifunctional market buildings once? [S] *

- 一天 A day
- 兩天 Two days
- 半周 Half a week
- 一周 A week
- 半月 Half a month
- 一月 A month
- 間隔更長時間 Longer

10. 您多久去街市市政綜合大樓的街市區域一次? [单选题] *

How often do you use the market function in the multifunctional market building once?
[S]

- 一天 A day
- 兩天 Two days
- 半周 Half a week
- 一周 A week
- 半月 Half a month
- 一月 A month
- 間隔更長時間 Longer

11. 您一般何時去街市市政綜合大樓? [矩阵多选题]

When do you usually go to municipal multifunctional market buildings? [M] *

	早晨 Morning	上午 Forenoon	下午 Afternoon	傍晚 Evening	無 None
工作日 Weekday	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
週末 Weekend	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

12. 您一般何時去街市市政綜合大樓的街市區域? [矩阵多选题]

When do you usually use the market function in the multifunctional market building?

[M] *

	早晨 Morning	上午 Forenoon	下午 Afternoon	傍晚 Evening	無 None
工作日 Weekday	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
週末 Weekend	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

13. 街市區域所在的樓層影响您的意願: [矩阵量表题]

The floor of the market function affects your willingness to use: [S] *

	無意願 No	意願低 Low	勉強 Normal	略有意願 Intended	有意願 Willingly
一樓 Ground floor	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
二樓 First floor	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
三樓 Second floor	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
四樓 Fourth floor	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
五樓 Fifth floor	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

14. 您曾使用过以下哪些市政大樓的區域？ [多选题]

Have you ever used the following functions in multifunctional market buildings? [M]

*

- 社區活動中心 Activity Centre
- 圖書館 Library
- 停車場 Parking
- 運動場 Sports field
- 熟食中心 Cooked food centre
- 兒童遊樂場 Children playground
- 街市 Market function

15. 您覺得市政大樓的其他區域是否增加了您使用街市區域的頻率？ [单选题]

Do you think the other functions in multifunctional market buildings would increase your frequency of using the market function? [S] *

- 是 Yes
- 否 No

16. 您覺得以下哪個街市市政綜合大樓最好？ [单选题]

Which municipal multifunctional market building do you think is the best? [S] *

- 下環街市 Xiahuan market
- 營地街市 Yingdi market
- 祐漢街市 Youhan market
- 沙梨頭街市 Shalitou market

若在 16 題中選擇了 **下環街市**，請回答以下問題：

If you chose the Xiahuan market in question 16, please answer the following questions:

17. 您選擇 **市政綜合大樓** 最好，由於以下優點： [多選題]

Among the following aspects, which are the advantages making you choose the Xiahuan market as the best multifunctional market building? [M] *

- 街市區域 Market function
- 熟食中心 Cooked food centre
- 兒童遊樂場 Children playground
- 圖書館 Library
- 活動中心 Activity Centre
- 天台花園 Rooftop garden
- 羽毛球場 Badminton field
- 停車場 Parking
- 交通便利程度 Convenience of transportation
- 建築外觀 Architecture appearance
- 管理 Management
- 街市商販 Vendors of market
- 衛生環境 Sanitary
- 基礎設施 Infrastructure
- 氛圍 Atmosphere
- 其他 Other _____ *

18. 請您為下環街市的街市區域各方面評分[矩阵量表題]

Please grade these aspects in the market function of the Xiahuan market [S] *

	非常差 Very bad	差 Bad	一般 Normal	有優點 Advantages	好 Good	非常好 Very good
照明 Lightning	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
通風 Ventilation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
地面 Ground condition	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
可選種類 Closeable option	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
基礎設施，比如電 梯，廁所 Infrastructure	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
商販 Vendor	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
氛圍 Atmosphere	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
管理 Management	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
指示 Sign	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
通道寬度 Width of passage	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

價格 Price	○	○	○	○	○	○
氣味 Smell	○	○	○	○	○	○
購物動線設計 Design of route	○	○	○	○	○	○
吵鬧程度 Noisy	○	○	○	○	○	○

19. 您大約多久使用下環街市下列其他區域一次：[矩阵单选题]

How often do you use the following functions in the Xiahuan market? [S]*

	從不 Never	一年 A year	一月 A month	兩周 Two weeks	一周 A week	兩天 Two days	每天 A day
熟食中心 Cooked food centre	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
圖書館 library	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
活動中心 Activity centre	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
停車場 Parking	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
天台花園 Rooftop garden	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
兒童遊樂園 Children playground	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

20. 請您為下環街市的熟食中心評分：[矩阵量表題]

Please grade for the cooked food centre in Xiahuan market: [S] *

	非常差 Very bad	差 Bad	一般 Normal	有點優點 Advantage	好 Good	非常好 Very good
衛生環境 Sanitary	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
基礎設施 Infrastructure	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
商販 Vendor	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
管理 Management	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
空間充足程度 Enough space	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
使用感受 Feeling	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

21. 請您為下環街市的圖書館評分：[矩阵量表题]

Please grade for the library in Xiahuan market: [S] *

	非常差	差	一般	有點優點	好	非常好
	Very bad	Bad	Normal	Advantage	Good	Very good
衛生環境 Sanitary	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
基礎設施 Infrastructure	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
安靜程度 Noisy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
管理 Management	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
空間充足程度 Enough space	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
使用感受 Feeling	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

22. 請您為下環街市的活動中心評分? [矩阵量表题]

Please grade for the activity centre in Xiahuan market: [S] *

	非常差 Very bad	差 Bad	一般 Normal	有點優點 Advantage	好 Good	非常好 Very good
衛生環境 Sanitary	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
預約方便 Booking	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
基礎設施 Infrastructure	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
管理 Management	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
空間充足程度 Enough space	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
設備條件 Equipment	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
使用感受 Feeling	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

23. 請您為下環街市的天台花園評分：[矩阵量表題]

Please grade for the rooftop garden in Xiahuan market: [S] *

	非常差 Very bad	差 Bad	一般 Normal	有點優點 Advantage	好 Good	非常好 Very good
衛生環境 Sanitary	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
基礎設施 Infrastructure	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
管理 Management	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
空間充足程度 Enough space	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
設備條件 Equipment	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
惡劣天氣可使用程度 Extreme weather	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
危險安防 Safety	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
使用感受 Feeling	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

24. 請您為下環街市的停車場評分：[矩阵量表题]

Please grade for parking function in Xiahuan market: [S] *

	非常差 Very bad	差 Bad	一般 Normal	有點優點 Advantage	好 Good	非常好 Very good
衛生環境 Sanitary	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
基礎設施 Infrastructure	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
管理 Management	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
停車位充足程度 Enough parking lots	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
便利程度 Convenience	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
使用感受 Feeling	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

25. 請您為下環街市的兒童遊樂園評分? [矩阵量表题]

Please grade for children's playground in Xiahuan market: [S]*

	非常差 Very bad	差 Bad	一般 Normal	有點優點 Advantage	好 Good	非常好 Very good
衛生環境 Sanitary	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
基礎設施 Infrastructure	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
管理 Management	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
空間充足程度 Enough space	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
危險安防 Safety	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
使用感受 Feeling	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

若在 16 題中選擇了營地街市，請回答以下問題：

If you chose Yingdi market in question 16, please answer the following questions:

26. 您選擇營地街市市政綜合大樓最好，由於以下優點： [多选题]

Among the following aspects, which are the advantages making you choose the Yingdi market as the best multifunctional market building? [M] *

- 街市功能 Market function
- 熟食中心 Cooked food centre
- 活動中心 Activity centre
- 停車場 Parking
- 交通便利程度 Convenience of transportation
- 建築外觀 Architecture appearance
- 管理 Management
- 街市商販 Vendors of market
- 衛生環境 Sanitary
- 基礎設施 Infrastructure
- 氛圍 Atmosphere
- 其他 Other _____ *

27. 請您為營地街市的街市區域各方面評分[矩阵量表題]

Please grade these aspects in the market function of Yingdi market [S] *

	非常差 Very bad	差 Bad	一般 Normal	有優點 Advantages	好 Good	非常好 Very good
照明 Lightning	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
通風 Ventilation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
地面 Ground condition	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
可選種類 Closeable option	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
基礎設施, 比如電 梯, 廁所 Infrastructure	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
商販 Vendor	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
氛圍 Atmosphere	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
管理 Management	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
指示 Sign	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
通道寬度 Width of passage	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

價格 Price	○	○	○	○	○	○
氣味 Smell	○	○	○	○	○	○
購物動線設計 Design of route	○	○	○	○	○	○
吵鬧程度 Noisy	○	○	○	○	○	○

28. 您大約多久使用營地街市下列其他區域一次：[矩阵单选题]

How often do you use the following functions in the Yingdi market? [S]*

	從不 Never	一年 A year	一月 A month	兩周 Two weeks	一周 A week	兩天 Two days	每天 A day
熟食中心 Cooked food centre	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
圖書館 library	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
活動中心 Activity centre	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
停車場 Parking	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

29. 請您為營地街市的熟食中心評分：[矩阵量表題]

Please grade for the cooked food centre in Yingdi market: [S] *

	非常差 Very bad	差 Bad	一般 Normal	有點優點 Advantage	好 Good	非常好 Very good
衛生環境 Sanitary	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
基礎設施 Infrastructure	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
商販 Vendor	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
管理 Management	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
空間充足程度 Enough space	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
使用感受 Feeling	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

30. 請您為營地街市的圖書館評分：[矩阵量表题]

Please grade for the library in Yingdi market: [S] *

	非常差 Very bad	差 Bad	一般 Normal	有點優點 Advantage	好 Good	非常好 Very good
衛生環境 Sanitary	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
基礎設施 Infrastructure	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
安靜程度 Noisy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
管理 Management	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
空間充足程度 Enough space	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
使用感受 Feeling	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

31. 請您為營地街市的活動中心評分：[矩阵量表題]

Please grade for the activity centre in Yingdi market: [S] *

	非常差 Very bad	差 Bad	一般 Normal	有點優點 Advantage	好 Good	非常好 Very good
衛生環境 Sanitary	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
預約方便 Booking	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
基礎設施 Infrastructure	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
管理 Management	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
空間充足程度 Enough space	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
設備條件 Equipment	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
使用感受 Feeling	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

32. 請您為營地街市的停車場評分：[矩阵量表题]

Please grade for parking function in Yingdi market: [S]*

	非常差 Very bad	差 Bad	一般 Normal	有點優點 Advantage	好 Good	非常好 Very good
衛生環境 Sanitary	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
基礎設施 Infrastructure	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
管理 Management	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
停車位充足程度 Enough parking lots	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
便利程度 Convenience	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
使用感受 Feeling	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

若在 16 題中選擇了祐漢街市，請回答以下問題：

If you chose Youhan market in question 16, please answer the following questions

33. 您選擇祐漢街市市政綜合大樓最好，由於以下優點：

Among the following aspects, which are the advantages making you choose the Youhan market as the best multifunctional market building? [M] [多选题] *

- 街市功能 Market function
- 熟食中心 Cooked food centre
- 活動中心 Activity centre
- 市政功能 Municipal service
- 小販區 Vendors' area
- 停車場 Parking
- 樓頂運動場 Rooftop sport field
- 交通便利程度 Convenience of transportation
- 建築外觀 Architecture appearance
- 衛生環境 Sanitary
- 管理 Management
- 街市商販 Vendors of market
- 基礎設施 Infrastructure
- 氛圍 Atmosphere
- 其他 Other _____ *

34. 請您為佑漢街市的街市區域各方面評分[矩阵量表題]

Please grade these aspects in the market function of Youhan market [S] *

	非常差 Very bad	差 Bad	一般 Normal	有優點 Advantages	好 Good	非常好 Very good
照明 Lightning	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
通風 Ventilation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
地面 Ground condition	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
可選種類 Closeable option	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
基礎設施, 比如電 梯, 廁所 Infrastructure	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
商販 Vendor	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
氛圍 Atmosphere	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
管理 Management	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
指示 Sign	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
通道寬度 Width of passage	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

價格 Price	○	○	○	○	○	○
氣味 Smell	○	○	○	○	○	○
購物動線設計 Design of route	○	○	○	○	○	○
吵鬧程度 Noisy	○	○	○	○	○	○

35. 您大約多久使用祐漢街市下列其他區域一次：[矩阵单选题]

How often do you use the following functions in the Youhan market? [S]*

	從不 Never	一年 A year	一月 A month	兩周 Two weeks	一周 A week	兩天 Two days	每天 A day
熟食中心 Cooked food centre	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
活動中心 Activity centre	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
停車場 Parking	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
小販區 Vendors' area							
天台運動場 Rooftop sport field							

36. 請您為祐漢街市的熟食中心評分：[矩阵量表題]

Please grade for the cooked food centre in Youhan market: [S]*

	非常差 Very bad	差 Bad	一般 Normal	有點優點 Advantage	好 Good	非常好 Very good
衛生環境 Sanitary	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
基礎設施 Infrastructure	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
商販 Vendor	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
管理 Management	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
空間充足程度 Enough space	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
使用感受 Feeling	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

37. 請您為祐漢街市的停車場評分：[矩阵量表题]

Please grade for parking function in Youhan market: [S]*

	非常差 Very bad	差 Bad	一般 Normal	有點優點 Advantage	好 Good	非常好 Very good
衛生環境 Sanitary	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
基礎設施 Infrastructure	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
管理 Management	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
停車位充足程度 Enough parking lots	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
便利程度 Convenience	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
使用感受 Feeling	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

38. 請您為祐漢街市的活動中心評分：[矩阵量表題]

Please grade for the activity centre in Youhan market: [S] *

	非常差 Very bad	差 Bad	一般 Normal	有點優點 Advantage	好 Good	非常好 Very good
衛生環境 Sanitary	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
預約方便 Booking	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
基礎設施 Infrastructure	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
管理 Management	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
空間充足程度 Enough space	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
設備條件 Equipment	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
使用感受 Feeling	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

39. 請您為祐漢街市的天台運動場評分：[矩阵量表題]

Please grade for rooftop sports fields in the Youhan market: [S] *

	非常差 Very bad	差 Bad	一般 Normal	有點優點 Advantage	好 Good	非常好 Very good
衛生環境 Sanitary	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
基礎設施 Infrastructure	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
管理 Management	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
空間充足程度 Enough space	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
設備條件 Equipment	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
惡劣天氣可使用程度 Extreme weather	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
危險安防 Safety	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
使用感受 Feeling	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

40. 請您為祐漢街市的小販區評分：[矩阵量表题]

Please grade for vendors' area in the Youhan market: [S]*

	非常差 Very bad	差 Bad	一般 Normal	有點優點 Advantage	好 Good	非常好 Very good
衛生環境 Sanitary	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
基礎設施 Infrastructure	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
管理 Management	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
便利程度 Convenience	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
選擇數量 Closeable options	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
使用感受 Feeling	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

若在 16 題中選擇了沙梨頭街市，請回答以下問題：

If you chose Shalitou market in question 16, please answer the following questions

41. 您選擇沙梨頭街市市政綜合大樓最好，由於以下優點：

Among the following aspects, which are the advantages making you choose the Shalitou market as the best multifunctional market building? [M] [多选题] *

- 街市功能 Market function
- 熟食中心 Cooked food centre
- 活動中心 Activity centre
- 停車場 Parking
- 圖書館 Library
- 交通便利程度 Convenience of transportation
- 建築外觀 Architecture appearance
- 街市商販 Vendors of market
- 管理 Management
- 衛生環境 Sanitary
- 基礎設施 Infrastructure
- 氛圍 Atmosphere
- 其他 Other _____ *

42. 請您為沙梨頭街市的街市區域各方面評分[矩阵量表題]

Please grade these aspects in the market function of Shalitou market [S] *

	非常差 Very bad	差 Bad	一般 Normal	有優點 Advantages	好 Good	非常好 Very good
照明 Lightning	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
通風 Ventilation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
地面 Ground condition	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
可選種類 Closeable option	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
基礎設施, 比如電 梯, 廁所 Infrastructure	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
商販 Vendor	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
氛圍 Atmosphere	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
管理 Management	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
指示 Sign	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
通道寬度 Width of passage	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

價格 Price	○	○	○	○	○	○
氣味 Smell	○	○	○	○	○	○
購物動線設計 Design of route	○	○	○	○	○	○
吵鬧程度 Noisy	○	○	○	○	○	○

43. 您大約多久使用沙梨頭街市下列其他區域一次：[矩阵单选题]

How often do you use the following functions in the Shalitou market? [S] *

	從不 Never	一年 A year	一月 A month	兩周 Two weeks	一周 A week	兩天 Two days	每天 A day
熟食中心 Cooked food centre	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
圖書館 library	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
活動中心 Activity centre	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
停車場 Parking	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

44. 請您為沙梨頭街市的熟食中心評分：[矩阵量表題]

Please grade for the cooked food centre in Shalitou market: [S] *

	非常差 Very bad	差 Bad	一般 Normal	有點優點 Advantage	好 Good	非常好 Very good
衛生環境 Sanitary	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
基礎設施 Infrastructure	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
商販 Vendor	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
管理 Management	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
空間充足程度 Enough space	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
使用感受 Feeling	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

45. 請您為沙梨頭街市的圖書館評分：[矩阵量表題]

Please grade for the library in Shalitou market: [S] *

	非常差	差	一般	有點優點	好	非常好
	Very bad	Bad	Normal	Advantage	Good	Very good
衛生環境 Sanitary	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
基礎設施 Infrastructure	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
安靜程度 Noisy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
管理 Management	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
空間充足程度 Enough space	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
使用感受 Feeling	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

46. 請您為沙梨頭街市的活動中心評分：[矩阵量表題]

Please grade for the activity centre in Shalitou market: [S] *

	非常差 Very bad	差 Bad	一般 Normal	有點優點 Advantage	好 Good	非常好 Very good
衛生環境 Sanitary	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
預約方便 Booking	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
基礎設施 Infrastructure	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
管理 Management	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
空間充足程度 Enough space	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
設備條件 Equipment	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
使用感受 Feeling	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

47. 請您為沙梨頭街市的停車場評分：[矩阵量表題]

Please grade for parking function in Shalitou market: [S]*

	非常差 Very bad	差 Bad	一般 Normal	有點優點 Advantage	好 Good	非常好 Very good
衛生環境 Sanitary	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
基礎設施 Infrastructure	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
管理 Management	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
停車位充足程度 Enough parking lots	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
便利程度 Convenience	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
使用感受 Feeling	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

整體性：

Integrity:

整體性指要素之間相互依賴、相互聯繫或相互制約。

Integrity refers to interdependence, interconnection or mutual restriction between elements.

以下問題與整體性有關，謝謝~

The following questions are related to integrity.

48. 您覺得下環街市的街市區域是否會對其他功能造成如下的負面影響？ [多选题]

Do you think market function in the Xiahuan market has negative impacts on other functions? [M] *

- 否 No
- 噪音 Noisy
- 異味 Bad smells
- 視覺問題 Visual problem
- 佔用空間 Space occupying
- 過多人流 Crowdy
- 安全因素 Safety problem
- 其他 Others _____ *

49. 您覺得營地街市的街市區域是否會對其他功能造成以下負面影響？ [多选题]

Do you think market function in the Yingdi market has negative impacts on other functions? [M] *

- 否 No
- 噪音 Noisy
- 異味 Bad smells
- 視覺問題 Visual problem
- 佔用空間 Space occupying
- 過多人流 Crowdy

安全因素 Safety problem

其他 Others _____ *

50. 您覺得祐漢街市的街市區域是否對其他功能造成以下負面影響？ [多选题]

Do you think market function in the Youhan market has negative impacts on other functions? [M] *

否 No

噪音 Noisy

異味 Bad smells

視覺問題 Visual problem

佔用空間 Space occupying

過多人流 Crowdy

安全因素 Safety problem

其他 Others _____ *

51. 您覺得沙梨頭街市的街市區域是否對其他功能造成以下負面影響？ [多选题]

Do you think market function in the Shalitou market has negative impacts on other functions? [M] *

否 No

噪音 Noisy

異味 Bad smells

視覺問題 Visual problem

佔用空間 Space occupying

過多人流 Crowdy

安全因素 Safety problem

其他 Others _____ *

52. 您覺得下環街市的各區域是各自獨立的？ [单选题]

Do you think each function in the Xiahuan market is independent? [S] *

是 Yes

否 No

53. 您覺得營地街市的各區域是各自獨立的？ [单选题]

Do you think each function in the Yingdi market is independent? [S] *

是 Yes

否 No

54. 您覺得祐漢街市的各區域是各自獨立的？ [单选题]

Do you think each function in the Youhan market is independent? [S] *

是 Yes

否 No

55. 您覺得沙梨頭街市的各區域是各自獨立的？ [单选题]

Do you think each function in the Shalitou market is independent? [S] *

是 Yes

否 No

56. 您覺得下環街市的各區域之間關係： [单选题]

The relationships between elements of the Xiahuan market? [S]*

- 相互影響（正面） Positive
- 相互影響（負面） Negative
- 相互無影響 No relationship
- 有正面亦有負面影響 Both positive and negative

57. 您覺得營地街市的各區域之間關係： [单选题]

The relationships between elements of the Yingdi market? [S]*

- 相互影響（正面） Positive
- 相互影響（負面） Negative
- 相互無影響 No relationship
- 有正面亦有負面影響 Both positive and negative

58. 您覺得祐漢街市的各區域之間關係： [单选题]

The relationships between elements of the Youhan market? [S]*

- 相互影響（正面） Positive
- 相互影響（負面） Negative
- 相互無影響 No relationship
- 有正面亦有負面影響 Both positive and negative

59. 您覺得沙梨頭街市的各區域之間關係： [单选题]

The relationships between elements of the Shalitou market? [S]*

- 相互影響（正面） Positive
- 相互影響（負面） Negative
- 相互無影響 No relationship
- 有正面亦有負面影響 Both positive and negative

60. 您覺得下環街市是否具有整體性? [单选题]

Do you think the Xiahuan market has integrity in design? [S] *

是 Yes

否 No

61. 您覺得營地街市是否具有整體性? [单选题]

Do you think the Yingdi market has integrity in design? [S] *

是 Yes

否 No

62. 您覺得祐漢街市是否具有整體性? [单选题]

Do you think the Youhan market has integrity in design? [S] *

是 Yes

否 No

63. 您覺得沙梨頭街市是否具有整體性? [单选题]

Do you think the Shalitou market has integrity in design? [S] *

是 Yes

否 No

64. 您覺得和以下哪些功能結合能增加您同時去街市區域的可能性？ [多选题]

Among the following functions, combined with which would increase your frequency of using the market function in multifunctional market buildings? [M] *

- 社交功能 Social function
- 醫療設施 Medical function
- 無 None
- 教育設施 Education function
- 遊樂設施 Entertainment function
- 購物功能 Shopping function
- 飲食設施 Food and drink
- 展覽設施 Exhibition function
- 交通設施 Transportation function
- 治安設施 Public security
- 物流郵政 Logistics and post
- 演出設施 Performance function
- 政府服務 Municipal service
- 體育設施 Sports function
- 社團機構 Social organization
- 宗教設施 Religion function

65. 您會因為使用街市市政綜合大樓的其他區域而順便去街市區域嗎？ [单选题]

Would you use market function due to using other functions in the multifunctional market buildings? [S]*

是 Yes

否 No

66. 您覺得在以下方面，和以前相比，現在的街市市政綜合大樓是變好還是變差了？ [矩阵量表题]

Compared to situations in the past, have the current situations of multifunctional market buildings become worse or better? [S] *

	變差很多 Much worse	變差 Worse	沒變化 No change	變好 Better	變好很多 Much better
建築外觀 Architecture appearance	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
管理 Management	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
街市商販 Vendors	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
環境衛生 Sanitary	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
交通便利 Transportation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
街市區域 Market function	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

圖書館 Library	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
熟食中心 Cooked food centre	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
活動中心 Activity centre	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
停車場 Parking	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

67. 和以前相比，您去街市市政綜合大樓次數變多還是變少了？ [单选题]

Compared to the past, do you go to multifunctional market building less or more? [S]

*

- 變多 Increased
- 變少 Decreased
- 不變 No change

68. 您對澳門的街市市政綜合大樓或本研究有什麼意見和建議？ [填空题]

Do you have any suggestions for this research or multifunctional market building in Macau?

Interview

Time

Place

Details of interviewee

List of questions (optional) :

How often do you use the market function in multifunctional market buildings?

Which multifunctional market building do you choose?

How do you usually buy food?

Which elements of the market attract you?

What do you usually buy in the market?

Which element do you think matters most in market activities?

Why do you think ___ market is the best among all?

Why do you think the market function in ___ market is the best?

The relationships between market functions and other functions in multifunctional market buildings.

Which aspects do you think the multifunctional market buildings needed to be improved?

Which function would encourage you to use the market function?

What reason would encourage you to use market function more often?

Other reasons and advice

Thoughts about activities around markets

Thoughts about other retail methods.