

This is an Open Access document downloaded from ORCA, Cardiff University's institutional repository: <https://orca.cardiff.ac.uk/id/eprint/156335/>

This is the author's version of a work that was submitted to / accepted for publication.

Citation for final published version:

Dewi, Ova Candra, Fradani, Nadya and Flynn, Andrew 2022. People and space: customers and traders walkway in a traditional market. *International Journal of Architectonic, Spatial and Environmental Design* 16 (2) , pp. 163-181. 10.18848/2325-1662/CGP/v16i02/163-181

Publishers page: <https://doi.org/10.18848/2325-1662/CGP/v16i02/163-...>

Please note:

Changes made as a result of publishing processes such as copy-editing, formatting and page numbers may not be reflected in this version. For the definitive version of this publication, please refer to the published source. You are advised to consult the publisher's version if you wish to cite this paper.

This version is being made available in accordance with publisher policies. See <http://orca.cf.ac.uk/policies.html> for usage policies. Copyright and moral rights for publications made available in ORCA are retained by the copyright holders.



# People and Space: Customers and Traders Walkway in a Traditional Market

Ova Candra Dewi,<sup>1</sup> Universitas Indonesia, Indonesia  
Tengku Nadya Putri Fardani, Universitas Indonesia, Indonesia  
Andrew Flynn, Cardiff University, United Kingdom

*Abstract: This paper identifies how the relationship among objects, the diversity of activities, human senses, and space in traditional markets can influence – by constraining or enabling - users (e.g., traders and customers) via walkways in that space. The design of the market gives opportunities to the users to explore and use the existing space and shows how the occupations of the walkways change throughout the day. At the same time, the organization of the market space limits users' flexibility, but it does not determine how users act toward space. The merchants and customers will decide how to use and access the space through how it is organized, their senses, and experiences. In the traditional market, walkways (walkway space) are commonly used in flexible ways with another purpose to circulate. This research carried out observations on the walkway spaces at Kemiri Muka (KM) and Sukatani (S) traditional markets in Depok City, West Java, Indonesia to understand how people use such spaces. Theories about space, place and the relationship between design and the life of the street markets were analysed in the study. The results show that the traditional market management needs to better understand traders and customer's behavior and interpretation toward their use of walkway space in the markets.*

*Keywords: Flexibility, Space, Traditional Market, Functional, Human senses*

## Introduction

Traditional market is a place where people gather to carry out various activities such as socializing and trading. Markets are part of the urban activity (Aliyah, Setioko, and Pradoto 2017); they are more than merely a place for the trading (an economic function), as they also provide a means to connect with socio-cultural interactions (Pamardhi 1997; Tanuwijaya and Wirawan 2015). The nature of economic and social relationships will be partly shaped by how markets are organized and what can happen in their spaces. Traditional markets in Indonesia generally consist of simple buildings (Sumintarsih, Suyami, Ambar, and Sujarno 2011) with different walkway spaces. The Oxford dictionary defines a walkway as a passage or path for walking along, often outside and raised above the ground. On the one hand, a linear layout can be found, which is the easiest for people to find their way around and, on the other hand, the grid is the most difficult one (Natapov, Kuliga, Dalton, and Hölscher 2020). Thus, in practice, people try to overcome the constraints of layout and seek out linear pathways.

The management and regulations of markets contribute to both allow and restrict the use of walkways. For example, one of the problems in walkway space is waste treatment systems. While the rules require waste management within the markets, insufficient infrastructure, improper bin collection system, poor route planning, and lack of information about the waste collection schedule are some things that occur frequently. Challenges over the collection of waste can then affect its treatment (Hazra and Goel, 2009; Moghadam, Mokhtarani, and Mokhtarani 2009). In a traditional market, there is no regulation regarding the boundary of space that is supposed to be followed by the merchant/trader. As a consequence, they can freely use the walkway space to accommodate their needs and show a lack of awareness of their surroundings to pursue their personal gains by compromising the community interest. Some merchants do not even consider the impact of their behavior on the density of walkways and the distance between customers. The condition in which the merchant, as a space user, utilizes the space is based on their interpretation of how space should be used to accommodate their needs. They are constantly present in the markets, and can remake space for

---

<sup>1</sup> Corresponding Author: Ova Candra Dewi, Department of Architecture, Faculty of Engineering, Universitas Indonesia, Depok, West Java, 16424, Indonesia. email: ova.candewi@ui.ac.id.

their purposes; space for traders is flexible (FarokhiFirouzhi 2019). The question is: will the merchant's use of space interfere with that of the other users?

According to Guthey, Whiteman, and Elmes (2014), our senses help us experience objects in space. Whether or not we are consciously aware of it, objects in the place where we live or work impact our behavior, beliefs, and knowledge (Ralph 1976). This means that the various objects and activities found in walkway space influence the interpretation and behavior of its users, which can be both described and interpreted as well as a thought in normative terms: is this a good or a bad way to shape the way we move through the walkways? Previous research by Kelley (2020) examined the London market in the nineteenth century and found a circumstance where an informal space was produced by organic outbreaks of micro-entrepreneurship in London's streets. Kelley's research shows whether people's behavior is shaped by the space around them or contrariwise, it certainly depends on a great extent of power relations and societal norms. The Londoners shaped the space to their purposes and had no established right to occupy the street. Through the way the Londoners shape the space, the streets can make a sense of enclosure by the qualities of the light, sounds, and crowd (Kelley 2020). This study enriches the knowledge of walkways in the traditional markets in Indonesia and how the walkways are shaped by merchants' needs and senses. This study was conducted to identify how the relationships among objects, diversity of activities, human senses, and space in traditional markets influence the way that merchants can acquire walkway space in a flexible way.

## **The definition and function of traditional market**

The traditional market is typically a public rather than a private space (Santoso 2008). Markets are oftentimes located at many key points, such as crossroads, public squares, or streets (Kim 2001). A market is a place where merchants as suppliers of goods can meet their customers (Kim, Lee, and Ahn 2004). As time passes by, the market becomes established, it loses its transient or temporary quality and spaces within the market and to a certain extent, it becomes formalized. For instance, there can be places where goods are stored and distributed from one place to another (Belshaw 1981). Similarly, the physical form of the traditional market developed from an open platform to a stall, and then to a simple state-owned building (Sumintarsih, Suyami, Ambar, and Sujarno 2011). In other words, structures and the organization of space become more permanent (e.g., merchants have their 'fixed' space at which they can sell their products). As a result, customers know where to locate individual traders. Sumintarsih and colleagues (2011) added that in Indonesia, traditional markets are distinguished from one another based on their scope of service and the type of goods that are offered. Although traditional markets vary from one another, customers can invariably recognize them from more modern markets because of their distinctive way of retailing. There are two types of traditional markets in Indonesia based on the form of market, an open-air marketplace with the linear format and a market in a public building with a grid format.

## **Senses and Interpretations of Space**

Our use of space recognizes boundaries, some of those boundaries may be physical but others may be based on a variety of factors such as socio-cultural norms, routines, or perceptions of safety or risk. For instance, the smell of spices in a market may stimulate fond childhood memories or fear of allergies, while noises there may draw out a sense of excitement and vibrancy or make them feel overwhelming and disconcerting. The lack of walls and boundaries in traditional street markets make all sides open facade but the extended horizontal and vertical space of the stalls, provide display in three dimensions and create a sense of enclosure in unison to the openness (Kelley 2020). People tend to avoid physical contact with strangers or objects that are foreign to them (Canetti 1962), but the sense of enclosure in

openness gives the feeling of protection and security that influences people to reduce their concern for their surroundings and their tendency to avoid physical contact. At this moment, when viewing a market, everything seems equal, all belonging to the market differences do not matter. Even though everything may appear equal, it does not mean that people have zero tendencies to avoid physical contact. The fear of being touched is diminished when in a dense crowd, the body pressed to other bodies, so that people no longer notice who it is touching them (Canetti 1962).

People behave in a space based on their interpretation of the values and physical qualities they feel in such a space (Turner and Turner 2006). The meaning gained from the experience of the five senses creates an abstract value of a space based on people's interpretation, such as 'this space feels magnificent' or other expressions that refer to something abstract. In some cases, for instance, because of our social interactions and cultural norms, we share experiences of spaces and in other instances, our perceptions of space will be more fragmented. Therefore, spaces can have significance for people (Sime 1986) and contribute to the meaning of place (Ralph 1976). People experience the quality of a place, and this is not only the physical quality but also includes people's perceptions of a place (Turner and Turner 2006).

### **People, Space, and Flexible Use of Space**

The diversity of activities that occur in space need not unduly interfere with the main activities or purpose of such space but will result in space being used in flexible ways (Gallion and Eisner 1983; Lefebvre 1991). Space can be changed to adjust for activities, but the change does not sufficiently impact the hierarchy of the building because it is not changing the system (Gallion and Eisner 1983; Dluhosch 1974). The flexible use of the space is where the user's interpretation of space is to the fore (FirouziFarokhi 2019).

In this interpretation of flexibility, it means that when a person is inside of a space, they can sense and create a meaning based on their perceptions of the space. Thus, using the space is based on their interpretation of the space to accommodate their needs and that they have the formal or informal authority to be able to reorganize space to meet their needs. Such conditions can be seen in the walkways of traditional markets, which are no longer merely spaces for people to circulate. Considering the various activities that take place in the traditional market, walkway/walkway space allows different possibilities for the people/users to interpret the meaning of that space. It is therefore important to better understand how people think of and use such spaces. According to Carmona (2003), spatial flexibility can be analyzed from three aspects, namely: (i) changes in activities based on space and time, (ii) the ability of space to adapt to environmental changes, and (iii) consistency of extra space to cope with environmental changes. Figure 1 shows the relationship between humans, space, and flexibility in the walkway (walkway space) of the traditional market.

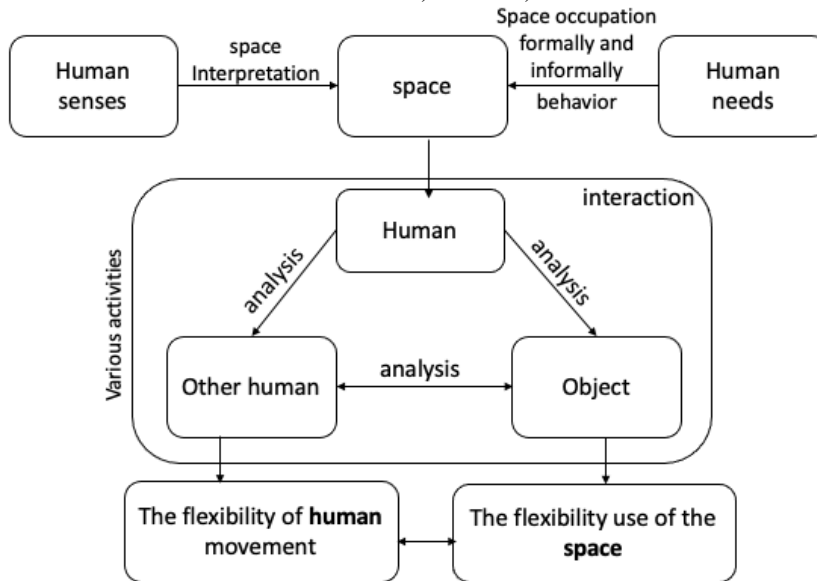


Figure 1: Diagram of relations between human, space, and flexibility

Source: Elaborated by Dewi from Lefebvre (1991), Carmona (2003), and FirouziFarokhi (2019)

## Method

This research carried out observations on the walkways (walkway spaces) at Sukatani (S) and Kemiri Muka (KM) in Depok City, West Java, Indonesia in April and November 2019. The two traditional markets were chosen because they represent markets that are commonplace, space that are well used by local people for shopping and socializing and so give an important insight into how space may be used. The condition of the walkways in both markets for these two months is similar to the other months. KM and S have different building types. S is a market in a public building with a grid format. The building is divided into several zones based on the type of goods. The building in S traditional market is deliberately used as a designated benchmark for a new type of market. Consequently, these kinds of markets have different types of access compared to KM. The observation in each market was conducted in two spots, namely the main walkway and the secondary walkway. The field observation maps the activities that took place in the market, the interaction between people, people-objects, and people-space. Since the purpose of the data collection was to understand how space is being used and reconfigured in more flexible ways, practically people's behavior needed to be at the center of the data collection. Other data collection methods, such as questionnaires or interviews, would have required the market user to reconstruct their movements through space. Therefore, in this type of data collection, the market user may have omitted some of the more routine activities that they undertake or overemphasized those that were highlighted by questions.

Since the waste can sometimes be an uncomfortable subject for people to talk about, the observational approach allowed us to identify how they averted their eyes, which may otherwise have been concealed, while discussing the formal and informal uses of space by people and objects. The data is analyzed using spatial mapping based on the operating hour to reveal the actual activity. Mapping is conducted in three steps, namely (1) observing the diversity of activities that occur in both markets that have different contexts, (2) observing the space and activity conditions on 3 occasions which represent the daily cycle of the market, and (3) analyzing the ability of space in terms of its flexibility based on the result of tracing the diversity of activities and comparing the condition of spaces.

## The Case Studies: Kemiri Muka (KM) Sukatani (S) and Sukatani (S) Traditional Markets

Kemiri Muka (hereinafter referred to as “KM”) and Sukatani (hereinafter referred to as “S”) traditional markets serve the sub-district areas. Both markets sell various types of goods such as fresh fish, different types of meat, vegetables, fruit, clothing, and household equipment. They open every morning and close in the afternoon. Locals always come in the morning to buy fresh ingredients as meat and vegetables will begin to rot at noon. As a result, some merchants sell their goods at a predetermined price based on daily demand. Almost all activities in both markets take place on the walkway space, which includes customers' activities. They walk from one stall to the next using the walkways. Moreover, the walkways are used by merchants to transport goods to their stalls by market clerks to perform management tasks such as cleaning. Nevertheless, not all walkway space is fully utilized. Customers, for example, use the space to engage in brief social interactions with other customers, whereas merchants store their belongings or use the walkway space as a workspace. Because of the differences in the characteristics of the walkway spaces in both markets, distinguishing between an indoor walkway space and an outdoor walkway space is helpful.

KM is an open-air traditional marketplace with a linear format. The market consists of many small stalls without a spatial organization for the different types of goods; rather, it is a market where different types of stalls are combined. The fresh fish stalls can be found alongside household equipment stalls. The merchants in this market usually prepare to open the stall from 05:00 a.m. and customers begin to come at that exact moment too. Along with the trading activities as the main event, other sub-activities such as loading and unloading goods and waste treatment take place too. As an open-air market, the streets used for market activities are also used by local people to go to the main streets. All activities occur from the beginning of opening hours until the closing hours although do so with different frequencies depending on how busy the market is at the time.

Figure 2 maps the route of activities and the nodes represent the place occupied in KM. The size of the nodes presents the amount of space occupied, and the arrow symbol represents the movement direction of the activities. The results of space mapping show that the movement of activities collide with each other in the perimeter of the market and there are two types of streets with different dimensions. First, the market's perimeter is surrounded by a five-meter-wide street. All market activities happen in this street, and while the market is in operation it dominates the activity of the street. This street can be recognized as the main walkway for customers based on its width and form that surrounded the market. In the mapping diagram, the main walkway looks crowded with activities while in fact, it is only crowded at a certain moment. These moments occur when multiple activities happen and clash with each other at the same time and space. As a result, the flow of customers – their movement – decreases because of the activities of other objects that occupy that space. The secondary streets vary in width, ranging from two meters to three meters. The streets divided the market into sections and connected the south part of the market to the north. Streets are recognized as the secondary walkway in this market and the movement of customers flows to this walkway when the main walkway is blocked. When trading is quieter people do not tend to move to secondary walkways. There is always the possibility that the congestion of people and goods in walkways can be disruptive and lead to outbursts such as where an individual feels irritable or hostile to the behavior of the crowd. An attempt will be made to shatter the crowd (Canetti 1962). In this case, customers shouting together or making a noise with their vehicle horn.

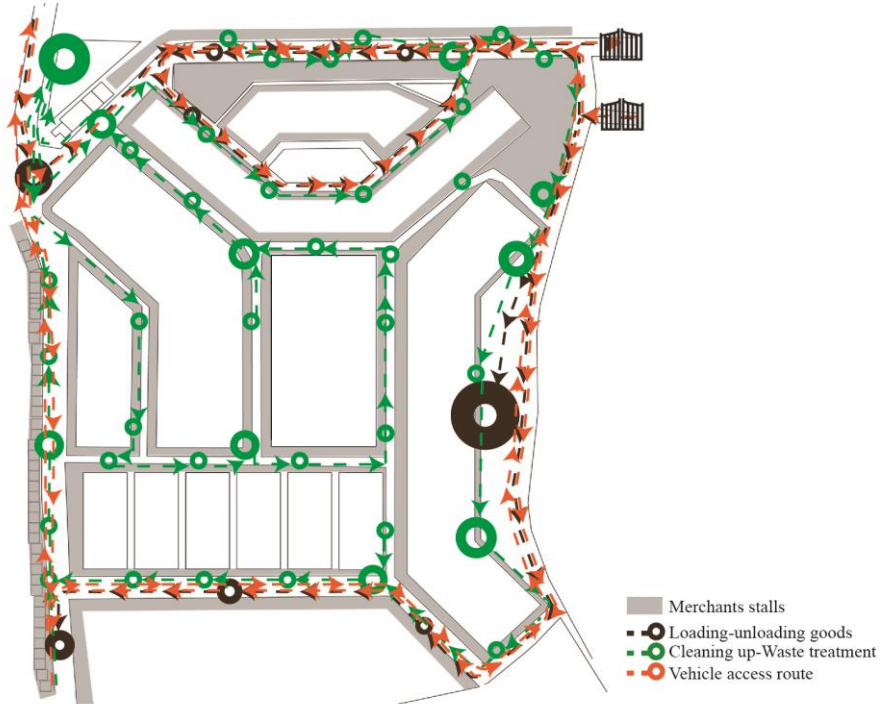


Figure 2: Kemiri Muka (KM) traditional market plan and the mapping of activities route

*Source: Fardani*

S is located in a single building with an additional structure standing adjacent to it. Almost all activities in this market take place inside, and the walkway is clearly defined by a permanent border. Figure 3 shows the plan of the S market. The market has multiple entrance gates. People and vehicles use the entrance gates to enter the market area, but only people can enter the building. The dashed line in Figure 3 shows the route where activities take place. Loading and unloading activities, as well as vehicle access, take place around the perimeter of the market's building, while waste treatment activity occurs within the market area. As most trading activities in the S market take place inside the main building, determining which are the main and secondary walkways will be limited to the indoors. The building has a grid-like structure, with walkways acting as the grid. The main and secondary walkways are classified based on the dimensions and direction of the grid. The main walkway is defined as the center grid that divides the building in half and connects the main entrance to the building's end. The main walkway also includes the grid that shares the same width as the center grid that divides the stalls. Furthermore, the grids that divide the stalls into blocks with a smaller width than the center ones are identified as secondary walkways.

Figure 3 depicts only waste treatment activity that occurs concurrently with the trading activity inside of the building. While it might seem that a dense crowd was invisible in the first place, in fact it did not. Even if only two activities are taking place at the same time, certain conditions cause a dense crowd to form. Outside the main building, another crowd is created too by unloading activity and passing vehicles that collide with each other. Unlike KM, S has a well-organized space, so that the crowd outside this market is not as dense as it is in KM. The crowd that forms outside does not obstruct the walkway leading to the market building's entrance; on the contrary, the crowd inside the building is extremely dense and makes it difficult for customers to move around.



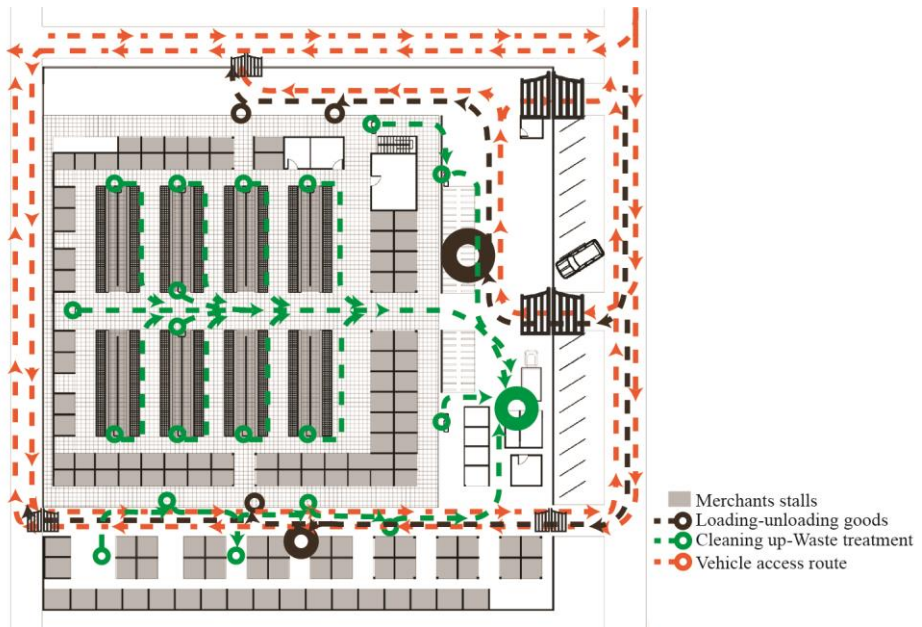


Figure 3: Sukatani (S) traditional market plan and the activities route mapping

*Source: Fardani*

The timeline and moments when activities happen and at the same time clash with each other in both markets can be seen in Figure 4. This Figure shows the different patterns of activities that happen in both markets. The red dashed line represents the period when the dense crowd appears and vanishes multiple times in the main walkway, while the green line represents the period when there is no crowd even though two or more activities occur in the space at the same time. It is striking that the two markets show many similarities in crowding and people congregating but our more nuanced analysis also reveals that the two markets also have distinctive features. The dense crowd created on the secondary walkway at the KM market is different from that in S.



Figure 4: Timeline of activities in Main and Secondary walkway in both markets



Following the result of comparing the activities timeline in both markets (Figure 4), it was found that three stages represent the daily cycle of the market: namely the early stage, intermediate stage, and closing stage. These stages occurred in three timestamps; the early hours from opening hour around 05:00-08:00 a.m., 08:00-10:00 a.m., and 10:00 a.m. - closing hours. One moment from each period is selected to describe the condition of the walkway, which means there were three selected moments. On the basis of this condition, the analysis of space and human movement was conducted to identify the flexibility and limits of the traders' use of space.

Approximately at 5:00 a.m. when it was still dark, the merchants arrived then started unloading their goods at KM. In the main walkway, they organized their stalls. They stacked the wooden boxes and turned them into a table for display or used kibble and foam boxes. They laid the box out along the main walkway, taking up some of the space. Furthermore, they built an additional structure with a lengthy log to hold the tarpaulin and positioned the log at an angle, jutting out towards the main walkway. They did this to protect the goods from rain and heat. However, this structure inadvertently covered a portion of the walkway and made the streets appear to be narrower, and provided a sense of enclosure. Box trucks and pickup trucks are alternately parked along the main walkway. They unloaded their goods and transported them using carts or manually to their stalls. Concurrently, vehicles of local people who visited the markets began to pass through the main walkway and some customers came to get fresh goods. Vehicles and people were crowding the walkway, making it difficult but still possible to pass. The crowd was not dense, customers were still able to notice who pressed against their bodies. This was the circumstance during the first early hours until after the market opened.

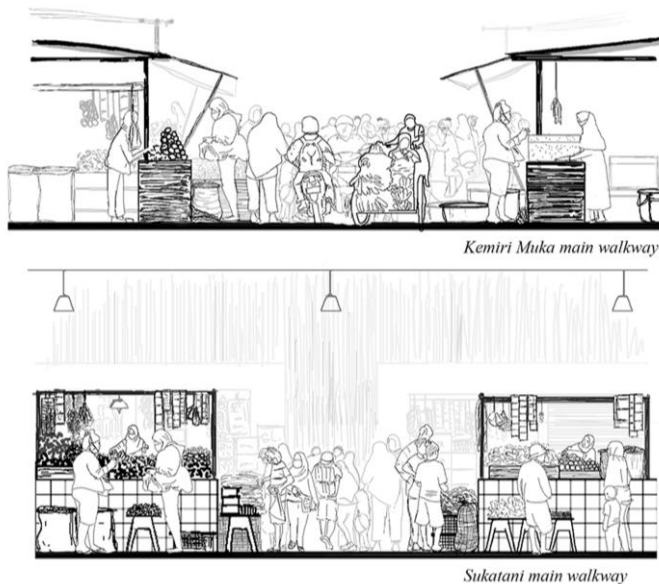


Figure 5: The condition of the main walkway in two traditional markets around early stage

Source: Fardani

Around 07:00 a.m. the number of visiting customers and passing vehicles reached its peak in KM, and some merchants were still unloading their goods in the main walkway. Vehicles, customers, merchants, and goods occupy the main walkway concurrently, this is the time when the crowd reaches its dense (Figure 5). The intensity of movement in the main walkway completes the sense of enclosure, eliminating the sensation of being outside the building. It is manipulating the senses to create a feeling of safety and comfort. At this moment customers and

vehicle users can not notice anymore the persons who pressed and touched their body, they lose their feelings of fear to each other, and their movement has a determination that is different from their usual behavior. When a customer turns towards the secondary walkway to get away from the crowd, other customers instinctively follow that movement even if they are aware that it is a long way to reach their destination. It appears that the movement from some of them is transmitted to others (Canetti 1962).

The opening time for S opened is 06:00 a.m, an hour later than KM. The market clerks opened the gate at dawn to allow merchants to prepare their stalls. In S, the merchants have fixed stalls which should have limited their chance to expand the display space. This is not the case, though. They still line up their goods along the main walkway, place the goods in the container above the chair or other containers such as sacks, kibbles, and plastic bags. They even made a hanger from a lengthy log and installed it in their stalls vertically and horizontally. The commodities loading occurred in a short period, merchants manually transported their goods from outside of the building to their stall. Some merchants open the sack in the main walkway before displaying it in their stall (Figure 5). They do this because their stall is narrow and only provides two accesses to enter the rear of the stall. This makes it difficult for them to go inside and outside when displaying items. The crowd in the main walkway starts when the number of customers increases but merchants have not finished unloading and displaying their goods. At the main walkway which also serves as the main entrance, customers directly meet merchants that are opening their merchandise. Merchants, goods, and customers occupied the main walkway in S at the same time. The trading process could occur here without having to go to the stall, making the walkway full of trading processes. This causes the crowd to reach its density in the main walkway at an early stage in S. However, the created dense crowd in S does not give the same feeling as those at the KM market. It is intense, but then without a sense of enclosure even though it is occurring in the building. It is because the building has a high ceiling and there is no tarpaulin blocking the view vertically.

The crowd appears and vanishes following the growth of activities that take place. As a result, the dense crowd occurs several times in a relatively short period. At KM main walkway, the merchants complete their unloading goods activities at around 8:00 a.m. before the market clerks begin their activity to clean up and pick up the waste. Due to its large area with a lot of waste, the market clerks cannot wait until the market closes to do that. They will require a significant amount of time to thoroughly clean up all areas of the market. The number of customers decreases as they tend to arrive early in the morning to buy fresh ingredients. However, it does not necessarily mean that the walkway space has returned to its original function. In KM, merchants stack their waste along the edge of the walkway space without sorting or using containers, resulting in waste that is scattered throughout walkways and heap piles of waste at some points in the walkways. The market clerks will then pick up their trash with a handcart that they pushed along the walkways.

The market clerks and their equipment, such as carts for waste collection, have largely replaced the existence of the box truck before. Even though garbage carts and box trucks are not the same in terms of size, both have a significant impact on the flow of human movement on the walkway. The box trucks stop at some nodes and occupy a large area in a period without moving. It blocks the flow of movement and creates a crowd at the nodes. The garbage cart, on the other hand, takes up less space than a box truck and moves through the walkway, but it moves and stops unexpectedly. It blocks and distracts the movement of other activities (Figure 6), causing the dense crowd to occur multiple times more than before, even though the number of consumers decreases. For some customers who visit this market regularly, the limited accessibility, as well as the obvious presence of waste materials, are deemed as normal.

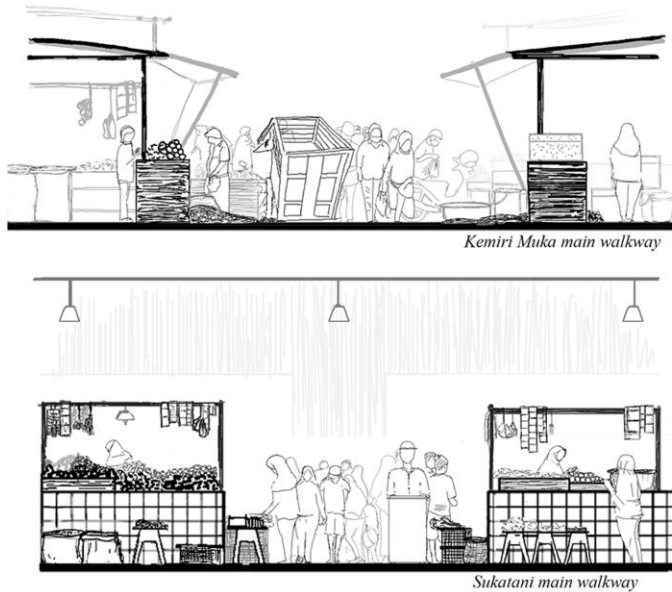


Figure 6: The condition of the main walkway in two traditional markets around the intermediate stage

Source: Fardani

Waste treatment at S, on the other hand, occurs every three hours. To collect waste, a small portable bin is used which takes up little space in the walkways. As a result, the market users (merchants and customers) have a different perception of the market and its spaces, and also different attitudes toward waste disposal. Normally, the market clerk does not treat waste when the number of customers is increasing. However, the number of customers grows until midday during the weekends. Consequently, waste generation increases as well, and the bins become too full to be used. As a result, the waste must be treated in-between busy times. When the market clerk treats the waste, they bring the bin through the main walkway, cutting through many customers who are in the process of trading. The dense crowd is created when the market clerks do this concurrently with the increasing number of customers. On weekdays, the waste treatment occurs when the number of customers decreases. Hence the crowd does not become as dense as it might otherwise do. Customers can still pass one another relatively easily and individuals are able to slip through the crowd.

The market activity is nearly completed as it approaches noon. Most of the merchants ran out of goods or already met the target sales, thus they loaded their leftover goods and closed their stalls. Few merchants, perhaps those who are most successful, will have taken down the additional structure that they built, while other traders remain open until the afternoon. In KM, merchants who already close the stall collect the waste in piles and line it up along the main walkway. The market clerks do another round to pick up the waste, and this time the vehicles pass through easily in KM's main walkway. They continue to perform the same activities at the same time and in the same location. However, no crowd is created as the number of people participating in the activities and occupying the space decreases. As shown in figure 7, KM has significantly more spaces which benefited vehicle accessibility. In S, the main walkway is clear from customer activities. Customers decrease to zero, the merchants get ready to close the stall, and the market's clerks clean up the walkway and perform another waste treatment again. Sometimes the merchants interact with each other, they get out from their stalls and gather at the main walkway. While standing or leaning against the stall, they talk to each other. Some of them even interact while smoking their cigarettes. Both market's main walkway is used for commodities, waste, and some time use for social interaction, but these activities change over time. In KM the crowd feels so intense and provides a sense of enclosure as they occupy the vertical and horizontal space of the main walkway. In S, the crowd is intense too and the flow

movement is stuck at some nodes. But the market as S does not provide a sense of enclosure, rather it's like being stuck with people in an open space. The high ceiling and transparent roof of the S building give a sense of openness, especially when there are only a few customers.

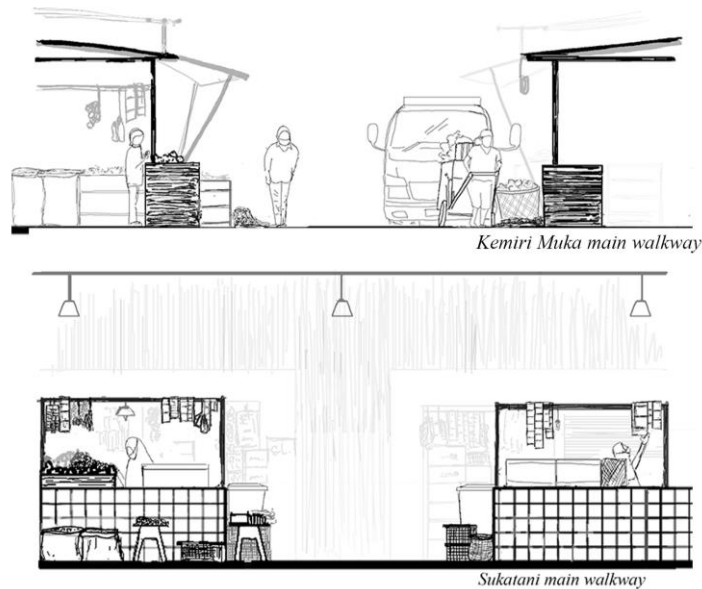


Figure 7: The condition of the main walkway in two traditional markets around the closing stage

Source: Fardani

Having examined the use of space in the main walkways, we now consider what happens on the secondary walkways. When the merchants in KM begin to open their stalls on the secondary walkway, the walkway becomes crowded. The merchants in the secondary walkway sell similar goods with the main walkway but not all goods are the same. The busiest hours for trading happened earlier than in KM's main walkway (Figure 4). Customers will visit the stalls on the secondary walkway first before proceeding to the stalls in the main walkway as the stalls in the secondary walkway are smaller than those in the main walkway, making the unloading goods process completed sooner. Even though they are aware that the walkway is narrow and dominated by merchants who bring their goods to the stalls, some customers keep coming with their motorcycles, and some vehicle users pass through this walkway to reach the other side of the market faster (Figure 8a). The merchants in this walkway extend their space toward the walkway and build a permanent structure. Additionally, they set up their stalls with tarpaulin and use the rope to tie it up to another permanent structure. The narrow walkway becomes narrower than before. These are the reasons why it becomes crowded sooner than in the main walkway. The dense crowd lasts long enough, similar to the condition in the main walkway. The customers feel this enclosure in the walkway when the dense crowd is created. They lose their awareness; unconcerned when their body comes into contact with the vehicle, goods, or other customers. The number of customers continues to increase, making the dense crowd grow along the walkway, rather than at certain nodes. This occurs to the point where other customers hesitate and vehicle users choose not to pass this walkway again. When all the stalls in this walkway have finished unloading the goods, the dense crowd begins to unravel. The vehicles are starting to pass the walkway again, and trading activity remains at its peak until 7:00 a.m. before it slowly decreases, when the customers are aware that the merchant's goods availability becomes more limited. Hence the customers start to explore the stalls in the main walkway.

Figure 8 depicts the condition of the secondary walkway at the early stage (a) and intermediate stage (b) in KM and S. In S (Figure 8a), the activity pattern in the early stage at the secondary walkway is similar to the one in the main walkway. Not only the stall conditions are the same, everything is simply the same as in the main walkway. Thus, the characteristic of crowds in the secondary walkway is the same in the main walkway, reaching its highest density when the customers increase, and goods occupy the space.

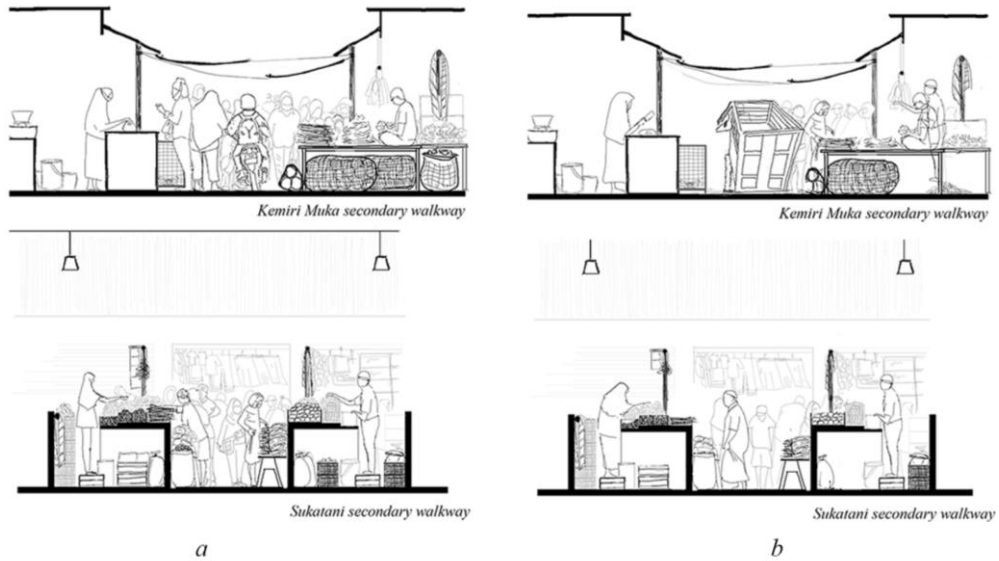


Figure 8: The condition of secondary walkway in two traditional markets at the early stage (a) and intermediate stage (b)

Source: Fardani

Around 09:00 a.m. the market clerks started their waste treatment activity in the secondary walkway at KM. At the same time, some customers keep arriving even though the total number of visitors is decreasing. A few vehicles were beginning to pass the walkway again. That was how the dense crowd was created here. Customers found it difficult to move around without having contact with any objects or people (Figure 8b). The garbage cart occupied the narrow walkway, and it blocked half of the walkway's width. They must take turns to pass through the area occupied by the garbage cart. At unplanned times, the waste treatment activities are conducted by merchants. A few merchants independently pushed the pile of their waste to the side of the main walkway when they closed the stall. In a notable difference from KM, the condition of the crowd in the intermediate stage is stagnant at S secondary walkway. The dense crowd is only created at some nodes and appears sporadically when waste treatment activities are carried out. In S, the secondary walkway space was not used as space for pile up the waste temporarily. Mobility and trading practices in the secondary walkways were, therefore, very much influenced by what was happening in the main walkways: it will get busy when the main market spaces are busy.

By noon, the trading activities on the secondary walkway were nearly complete. Most merchants close their stalls and store their leftover goods. Only vehicle users will use the walkway until the evening in KM. In S, the walkway is completely free of activities and customers. Figure 9 shows the secondary walkway condition in the closing stage at both markets. After observing the market, it appears that the main walkway and secondary walkway in S are simply different in size and this affects the flows of people and materials.

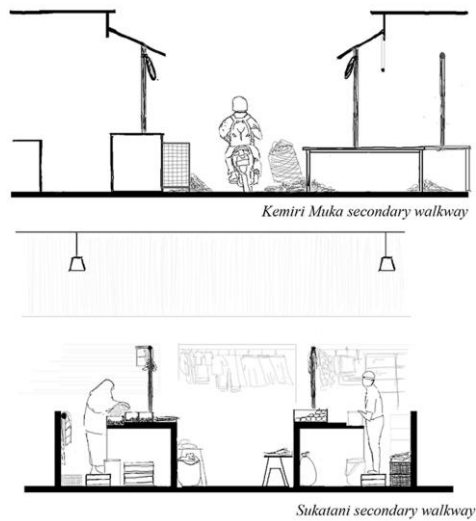


Figure 9: The condition of the secondary walkway in two traditional markets at the closing stage  
 Source: Fardani

The observations (and Figures) show that walkway spaces serve several functions, including mobility, trading, storage, waste management, and socializing. While walkways are formally intended for mobility, informal activities are performed by the traders for commercial purposes. As a result, merchants have exploited the walkway space by misusing it as a multifunction space. How merchants extend their space creates a sense that influences customer movement. This is obvious in the KM market. The merchants there extended the space by utilizing additional semi-permanent structures, such as a roof covering that is simple to install and display tables that are easy to move. These limit the horizontal and vertical space in the walkway, providing a sense of enclosure, even though there is no wall to separate the stalls from each other. The disorienting natural light that refines, the limited space to walk and the sound from the crowd gives an intense feeling which influences customers and vehicle users behavior.

### The Flexibility in the Use of Space in Traditional Market's Walkways

As stated by Gallion and Eisner (1983), the variety of activities that occur concurrently will result in the flexibility in the use of space. The question is, did space flexibility occur in these two markets? Based on the field data, the market's diversity of activities and flexibility in space use can be seen immediately. Tracing the condition of the walkway on three separate occasions is required to demonstrate the flexibility of space use. Figure 10 and figure 11 depict the state of the main walkway space in both markets. It portrays the changes in the accessibility of the walkway overtime. According to Gallion and Esiner (1983), the flexibility of space use does not affect the building's hierarchy. Figure 10 depicts the space changes that occurred because of the merchants' flexible interpretation of the main walkway space purpose in KM. Merchants put objects freely in this space to fulfill their needs without considering others. The white areas in the figure show that the goods dominated the main walkway. In KM, users also park their vehicles and dispose of their waste in the walkway space alongside the commodities. As a result, vehicles and waste became an unmeasured variable, causing a drastic change in the use of space. It demonstrates that the object and space were used in a lively way. Furthermore, it

can be concluded that dynamic space flexibility occurs here. This depends on the changes in the object's position, vehicle, and customer movements that occur frequently over a period of time.

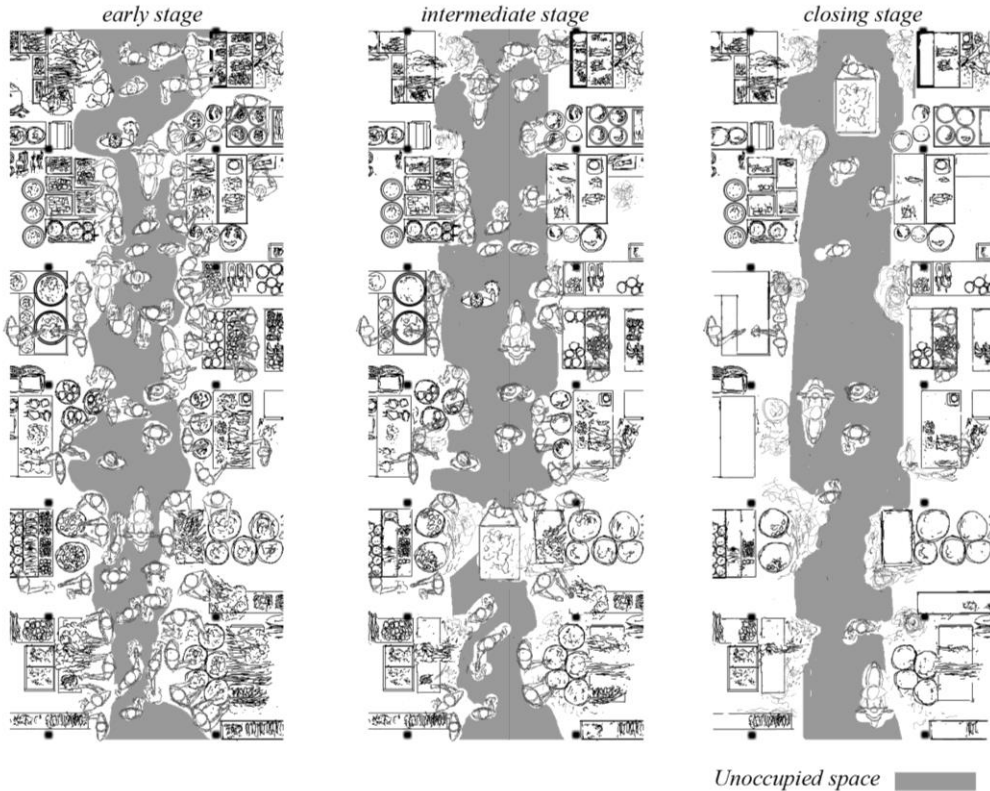


Figure 10. The changes of occupied space in the main walkway of KM

Source: Fardani

Other questions that arise are: how about the changes of space in the indoor walkway? Does it have the same condition as the outdoor one? Figure 11 tracing the condition of the indoor walkway in S based on the three stages. In the early stage, the condition of the S walkway is slightly similar to the KM walkway. Merchants occupied the walkway space to display the goods. Fortunately, due to its location inside the building, no vehicles can pass through. As a result, the misuse of walkway space is limited to activities that occurred inside the building, such as unloading goods activity and waste treatment activity. This makes the change in this space less dynamic than it is in the KM walkway. The stalls which are made of the semi-permanent wall also limit the merchant to expand the display space excessively towards the walkway.

The changes in space conditions become more orderly and directed here as proven by the tracing result of occupied space in the early and intermediate stages. It demonstrates that merchants line up their goods along the walkway's perimeter only to the extent that they can expand the space for the display of goods. Merchants are unable to extend it further to the center of the walkway as they are aware that they have already exceeded the space limit that has been set. It is possible to conclude that space flexibility does occur in S main walkway more subtly compared to KM.



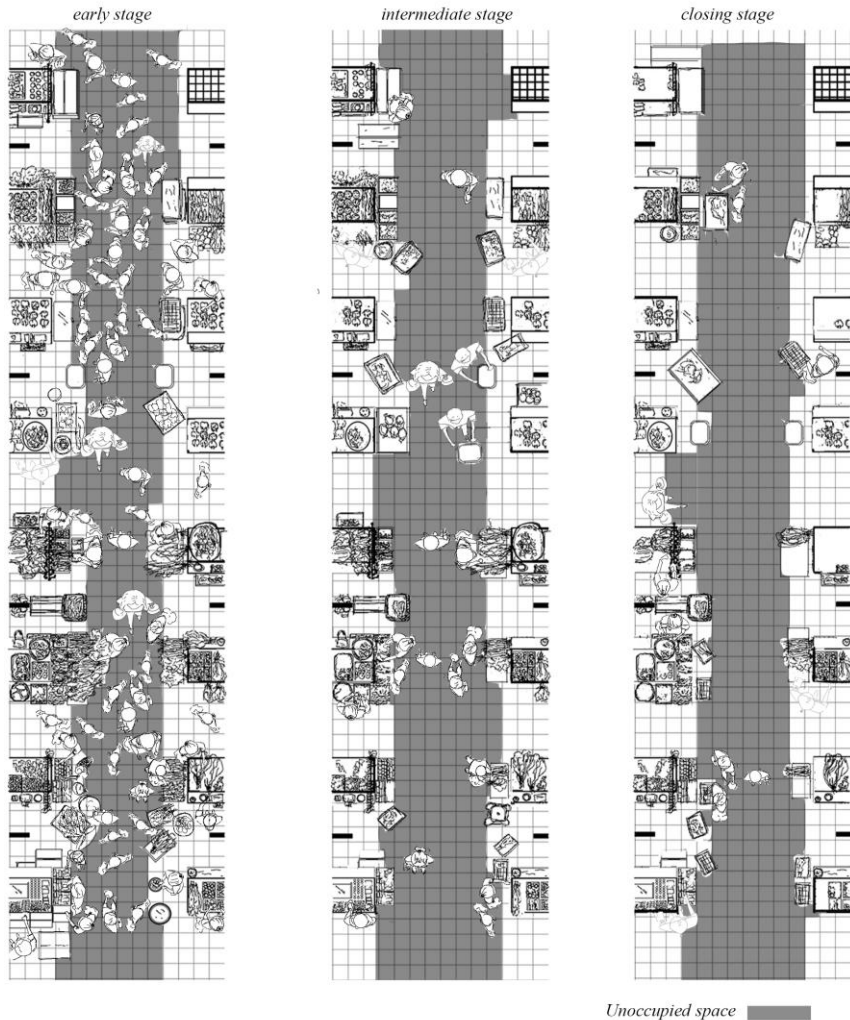


Figure 11. The changes of occupied space in the main walkway of S  
Source: Fardani

## The limits to merchant's appropriation of space

In theory, other activities such as waste collection should not obstruct the walkway space (Nadya and Dewi 2020). Figures 10 and 11 show that merchants in both markets behave similarly when it comes to walkway space. The merchants took advantage of the potential of walkway space as a multifunctional space, specifically as an extension of their commercial space. The ability of merchants to appropriate space for their purposes, on the other hand, is limited. What factors constrain merchants' use of space? And how do merchants use space to their advantage? Figure 12 depicts a comparison of indoor and outdoor walkways conditions to answer these questions properly.

Merchants freely organize their goods in the early stages of KM. They simply place the goods and their belongings where they see fit, as long as their commodities can be placed nearby. They intentionally take the space yet unintentionally reshape the walkway, changing it from a straight line to an organic shape. Thus, the dimensions of the walkway become varied,

with some sections being narrow while others being wide. How far will they go to occupy other space? They will stop when their goods completely fit into the space that they wish to secure. An idea of the economic benefits that traders are seeking to gain through their flexible acquisition of space would be to conduct a cost-benefit analysis. In this case putting a monetary value on using the walkways for display goods and multiplying it by instances after day. This would arrive at a rather staggering sum (Whyte 1980). The factor that constrains them to use the space is tangible boundaries as in the S market. The merchants' stalls in S are permanent and serve as the boundaries. As illustrated in Figure 12, the changes of unoccupied space and customer movement in S are more subtle and well organized than in KM even though the merchants in S occupy some space in the walkway too. Thus the use of a permanent stall provides a perimeter for space that merchants can use.

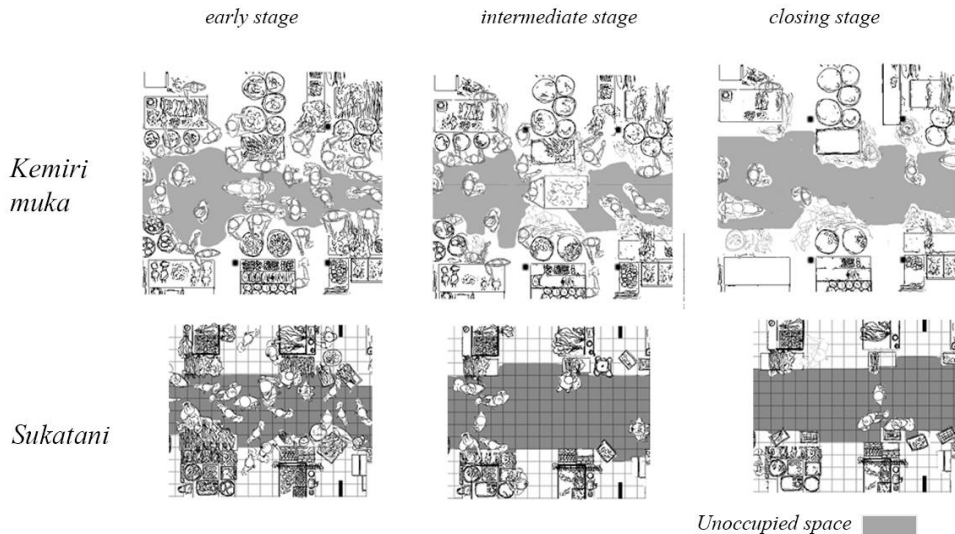


Figure 12. The comparison of changes in unoccupied space in the KM and S main walkways

Source: Fardani

Crowding occurs early in the opening of the markets and later on. Figure 12 shows the crowd stuck in some sections of the KM walkway as the space reaches its limit to serve its multiple functions, such as a place for display goods, customers movement, and a place for the pile of waste. The production of waste extends the space used by the merchants and limits merchants' ability to extend their space for trading activities in the intermediate stage in KM (Figure 13). Even though the pile of waste occupies a significant amount of space, it does not mean that waste is the main factor for the spaces to reach their limit. It was the merchants that caused the space to reach its limit. If merchants use the space properly without occupying the walkway, the space would not reach its limit. Hence crowding occurs not only in the early stage of the market but beyond that time as well.

After comparing both markets, the second factor that causes the space of the walkway to reach its limit is vehicle movement, which, in addition to merchants, is the main factor that causes this circumstance. In KM, the walkways are sometimes occupied by customers and vehicles. Soon after the market opened, when the number of customers was increasing, some customers came with their vehicles, passed through the walkway. Customers who drive take up more spaces than customers who walk and so help to make the market more congested. With conditions becoming more congested, customers who walk trying to move from one place to another through the crowd find the space was limited and difficult to pass through (Figure 13b). They will make destructive attempts in response to the dense crowd by, for instance, pushing other people's bodies. They neglect the condition where their bodies are pressed against each

other as they deem the crowd as an accepted part of the market and the social practices that accompany it. This lack of physical distance between market regular customers is probably an acceptable social practice within that space, but it raises health or sanitary concerns among new customers.

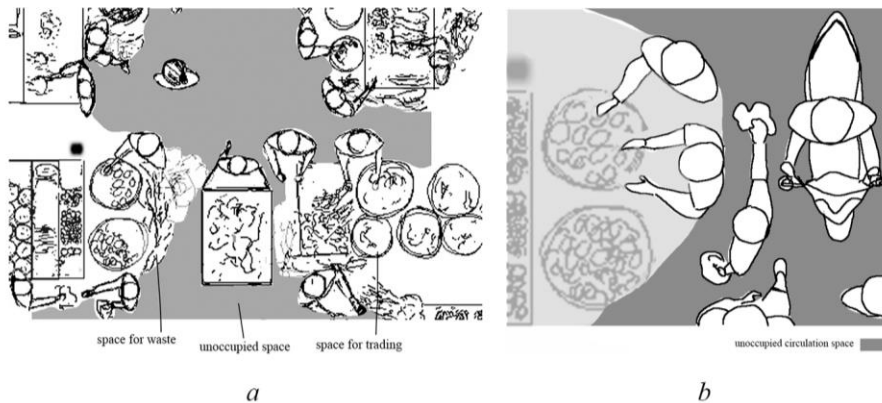


Figure 13. the limits of flexibility in walkway space

Source: Fardani

According to Aliyah and colleagues. (2017), spatial flexibility encourages other activities without interfering with the main function. However, there are temporary disruptions to walkways that change the movement of people and can quickly increase or decrease crowding. Trading space is constantly appropriated and contested by various sets of activities and users. Flexible uses of space are vital points of analysis, as demonstrated by both markets. The space can be occupied differently for similar purposes. S has a good layout – this design separated customer and waste activities – and utilized a good access control system. By way of contrast, KM lacks a separate space for merchant waste, and trading activities take place without proper facilities for merchants and customers.

## Conclusion

Currently, there is only limited research available that discusses how merchants seek to (temporarily) acquire space in traditional street markets. Merchants seek to use space in flexible ways, overcoming formal designations or rules, as they use space to expand their commercial activities, including the management of waste. In the context of Indonesian traditional street markets, the flexibility in the use of space for traders can be seen in the walkway space. The traders use their authority to acquire this space temporarily and flexibly. This study points out that the limits to the acquiring of flexible use of space by market traders begin to loom when multiple activities take place simultaneously in that space. During these times, traders are competing with other users for scarce space and have only limited opportunities to further expand to the walkways. KM is moving closer to the limits by which traders can acquire space stalls. The variety of activities, objects, space, and human senses in these studies shows a relationship that influences each other. In this case study between KM and S markets, the variety of activities including trading, social interaction, waste processing, and cleaning. While the cleaning activities by market clerks and trading happened at the same time, these two activities will influence each other. A stool is needed to display the goods, so the merchants put it in the walkway that should be cleaned by the market clerk. In turn, the market clerk faces difficulty cleaning such space and is unable to reach the area with the usual tools. They will

then decide to use the usual way by using the same tools or trying to find a new way that involves a new object, so the cleaning activity still takes place without disturbing other activities. This relationship, regarding human movement and the use of space, is one of the causes that lead people to use walkways as multifunctional spaces.

This study drew heavily on observation as a form of data collection. It enabled a detailed and sensitive collection of data that was sympathetic to the multiple activities that take place in traditional markets with their permanent stalls. We were able to show how traders acquired space, but that acquisition was never permanent; it would eventually perish and disappear, depending on the activity level in the market. The diversity of activities and the dimension of space are factors that must be considered in the future design of markets to reduce the opportunities for traders to acquire space at the expense of other market uses. For future studies, the authors suggest conducting observations in traditional street markets with non-permanent stalls. In this way, it can be seen whether or not those non-permanent stalls provide more effective ways to manage traders' acquisition of space. Furthermore, extending these studies into the health field can give more insights into customers, traders, waste collectors, and market managers' perceptions of the role that physical distancing might have in the improvement of hygiene and health.

### Acknowledgment

This study is developed from the undergraduate thesis by student in the Departement of Architecture, Engineering Faculty, Universitas Indonesia, Tengku Nadya Putri Fardani, in 2019.

## REFERENCES

- Aliyah, Istijabatul, Bambang Setioko, and Wisnu Pradoto. 2017. "Spatial Flexibility in Cultural Mapping of Traditional Market Area in Surakarta (A Case Study of Pasar Gede in Surakarta)." *City, culture and society* 10: 41-51. <https://doi.org/10.1016/j.ccs.2017.05.004>.
- Belshaw, Cyril Shirley, and Frans Seda. 1981. *Tukar-menukar Tradisional dan Pasar Modern*. [Traditional Exchange and Modern Markets]. Jakarta: Gramedia.
- Carmona, Matthew, Tim Heath, Taner Oc, and Steve Tiesdell. 2003. "Urban Spaces-Public Places: The Dimensions of Urban Design." Boston, MA: Architectural Press.
- Canetti, Elias. 1962. "Crowds and Power". New York: The Viking Press.
- Dluhosch, Eric. 1974. "Flexibility/Variability and Programming." In *Industrialization forum*, 6 (3-4), 39-46.
- FarokhiFirouzi, Hanieh. 2019. A Review on Flexibility in Architecture. *International Transaction Journal of Engineering Management, & Applied Sciences & Technologies*, 10(6), 779–786. <https://DOI: 10.14456/ITJEMAST.2019.71>.
- Gallion, Arthur B., and Simon Eisner. 1963. *The Urban Pattern: City Planning and Design*. 2<sup>nd</sup> edn. New York: Van Nostrand Reinhold.
- Guthey, Greig Tor, Gail Whiteman, and Michael Elmes. 2014. "Place and Sense of Place: Implications for Organizational Studies of Sustainability." *Journal of Management Inquiry* 23 (3): 254-265. <https://doi.org/10.1177/1056492613517511>.
- Hazra, Tumpa, and Sudha Goel. 2009. "Solid Waste Management in Kolkata, India: Practices and Challenges." *Waste Management* 29 (1), 470-478. <https://doi.org/10.1016/j.wasman.2008.01.023>.
- Kelley, Victoria. 2020. "London's Street Markets: The Shifting Interiors of Informal Architecture." *The London Journal* 45, (2) : 189-210. <https://doi.org/10.1080/03058034.2019.1703432>.
- Kim, Ju Il, Chang Moo Lee, and Kun Hyuck Ahn. 2004. "Dongdaemun, a Traditional Market Place Wearing a Modern Suit: The Importance of the Social Fabric in Physical

- Redevelopments." *Habitat International* 28(1): 143-161. [https://doi.org/10.1016/S0197-3975\(03\)00036-5](https://doi.org/10.1016/S0197-3975(03)00036-5).
- Kim, Ju Il. 2001. A Study on the Reformation of the Traditional Clothing Markets in Seoul. *The Journal of Korea Planners Association*, 36(2), 235–256.
- Lefebvre, Henri, and Donald Nicholson-Smith. 1991. *The Production of Space*. Oxford: Blackwell.
- McAndrew, Francis T. 1993. *Environmental Psychology*. Thomson Brooks/Cole Publishing Co.
- Moghadam, Mohammad R.A., Nader Mokhtarani, and Babak Mokhtarani. 2009. "Municipal Solid Waste Management in Rasht City, Iran." *Waste Management* 29 (1): 485-489. <https://doi.org/10.1016/j.wasman.2008.02.029>.
- Nadya, Tengku, and Ova Candra Dewi. 2020. "Design Positions of Waste Utility System that Shaped the Human Movement Patterns in Traditional Markets." In *IOP Conference Series: Earth and Environmental Science*, 402 (1). <https://doi.org/10.1088/1755-1315/402/1/012009>.
- Natapov, Asya, Saskia Kuliga, Ruth Conroy Dalton, and Christoph Hölscher. 2020. "Linking Building-Circulation Typology and Wayfinding: Design, Spatial Analysis, and Anticipated Wayfinding Difficulty of Circulation types." *Architectural Science Review* 63, no. 1: 34-46. <https://doi.org/10.1080/00038628.2019.1675041>.
- Pamardhi, Rizon. 1997. *Planning for Traditional Javanese Markets in the Yogyakarta Region*. Sydney: University of Sydney.
- Relph, Edward. 1976. *Place and placelessness*. Vol 67. London: Pion.
- Santoso, Jo. 2008. *Urban Javanese Architecture; Cosmos, Culture and Power* (1st ed.). In E. A. Y. Hastarika (Ed.). Jakarta: Postgraduate Degree of Urban Planning of Tarumanegara University.
- Sime, Jonathan D. 1986. "Creating Places or Designing Spaces?." *Journal of Environmental Psychology* 6 (1) : 49-63. [https://doi.org/10.1016/S0272-4944\(86\)80034-2](https://doi.org/10.1016/S0272-4944(86)80034-2).
- Sumintarsih, Taryati, Suyami, Ambar Adrianto, and Sujarno. 2011. *Eksistensi Pasar Tradisional [The existence of traditional markets]*. Yogyakarta: Kementerian Kebudayaan dan Pariwisata
- Tanuwijaya, Gunawan, and Yohannes Richo Wirawan. 2015. *Creative-Sustainable Market Design in Malang. The 2nd International Conference Planning in the Era of Uncertainty: Sustainable Development*.
- Turner, Phil, and Susan Turner. 2006. 'Place, Sense of Place and Presence'. *MIT Press Journals*. 15 (2) : 204-217. <https://doi.org/10.1162/pres.2006.15.2.204>.
- Whyte, William H. 1980. *The Social Life of Small Urban Spaces*. New York: Project for public space. Washington, D.C.: Conservation Foundation.

## ABOUT THE AUTHORS

**Ova Chandra Dewi:** Lecturer, Department of Architecture, Universitas Indonesia, Depok, Jawa Barat, Indonesia

**Tengku Nadya Putri Fardani:** Student, Department of Architecture, Universitas Indonesia, Depok, Jawa Barat, Indonesia

**Andrew Flynn:** Professor, School of Geography and Planning, Cardiff University, Wales, United Kingdom.