

Effectiveness of Circulation Path-Based Human Movement: Redevelopment Concept of Susumbolan Traditional Market, Tolitoli

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Abstract—Traditional markets have an important role in fulfilling the needs and economic activities of the community in an area. Traditional markets are also the leading choice for local people regarding shopping and social interaction. However, with many shortcomings in terms of effectiveness, activities in the market have decreased the comfort level and caused users to feel uncomfortable shopping in Traditional Markets. This also happens in the Susumbolan Traditional Market because of the traders' poor zoning arrangement, the small circulation path size, and poor integration with surrounding functions cause Human Movement in the Susumbolan Traditional Market to experience problems. This causes buyers to be lazy when going around the market to choose goods, and it impacts many traders' stalls that buyers rarely pass. Therefore, redevelopment is needed for several aspects, such as zoning traders, the size of the circulation path, as well as technical aspects, such as waste treatment and waste water treatment.

Keywords— Behaviour Setting, Human Movement, Mapping Activities, Redevelopment.

I. INTRODUCTION

People use their bodies, which are live material forms, to engage their senses and perceive the world around them. As it moves through the environment's fluid medium, this living form reflects thoughts. This process shows itself as the endless flow of experience, which is influenced by a variety of factors such as human physiology, cultural norms, and emotional factors [1].

Movement is the act or process of moving people or objects from one place or position to another [2]. Movement occurs in our daily lives because we will always move reflexively or with a specific purpose. Movement does not have a particular pattern or rule because it happens based on the brain's performance in responding to what is happening around us [3].

Movement in architecture is interpreted as a circulation system that refers to the paths and routes planned for people to move through space (Fig. 1). Circulation systems play a role in building layout and spatial organization as they form the framework that connects all the program elements within a building and locate and define what constitutes interior and exterior space. Circulation is the element that organizes and connects different parts of a building [4]. Circulation is the element that organizes and connects different parts of a building.

Circulation flow can be defined as a link that binds the rooms of a building or a series of spaces inside and outside so that they become connected. [5]. It is a concept that captures the experience of moving our bodies around the building, three-dimensionally and through time. Overall, the circulation is designed and curated to control people's movement within the space.



Fig.1. Illustration of Movement

Circulation problems in the Susumbolan Traditional Market based on Human Movement / Human Activities are occasionally the main problems that occur in the market. In the context of this Traditional Market, the habits of the Tolitoli people in the buying and selling process and the needs of consumers and traders are a challenge in producing the best circulation system that can be applied to this Traditional Market without losing the Traditional impression in it. Therefore, a Behaviour Setting design approach is needed to identify the social and cultural habits of the Tolitoli people (Fig. 2).



Fig. 2. Existing Susumbolan Traditional Market
(Google maps, 2024)

According to Roger Barker in Zeisel [6], behaviour is the co-determination of the relationship between the environment and behaviour patterns that cannot be separated. According to Barker, Behaviour Setting is human behaviour in a reciprocal relationship with its environment. Behaviour Setting can be defined as the interaction between an activity and the setting in which it occurs. Barker (1968) [7] and Lang (2010) [8] reveal several variables of behaviour setting, namely the existence of repetitive activity patterns in the form of behaviour patterns in a particular environment or environmental setting. Synomorphy, or the relationship between activity patterns and the environment, exists, and there is a certain period [9].

II. DESIGN METHOD

In the case of the Susumbolan Market Area, two areas have different functions and characters, namely the terminal area and the market area (Fig. 3). At the beginning of the development, the terminal function was placed right next to the market area so that users from outside the city who came using public transportation could easily access the market area.

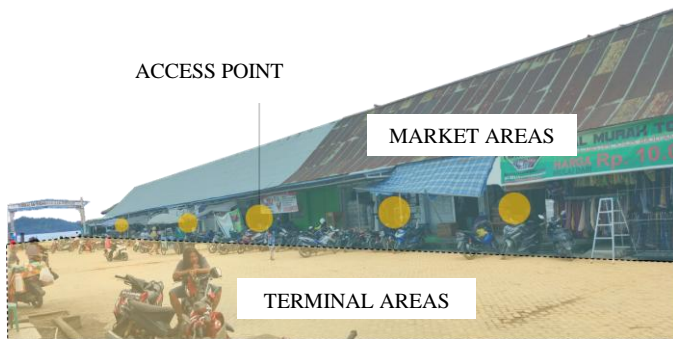


Fig. 3. Terminal and Market Area Boundaries

However, in its use, the terminal area needs to function optimally due to the continued increase in private vehicle users. As a result, the terminal area is currently used more as a parking lot and selling area during "Pasar kaget". Users prefer to park in this area because of the easy access to the market area, especially in the most visited areas, namely the fish and vegetable area. With the problems or issues that are the basis of this design, the Framework or Framework that is appropriate to use is Force-Based which is based on the impetus of the problems that occur in the design object. The method used in the design process of redevelopment of Susumbolan Traditional Market is by conducting surveys and observations and using quantitative analysis methods carried out in a naturalistic.

Furthermore, the Juxtaposition method was chosen to perfect the redevelopment process to increase user awareness of clear boundaries in the zoning of market functions. The Juxtaposition method helps the designer explore how history or culture and modern architecture can be combined to create an architectural experience. The design implementation can be the adjacent placement of two or more contrasting shapes, surfaces, forms, materials, or spaces to increase visual interest,

especially if the character or quality of each element is preserved, which can attract the user's attention [10].

III. RESULT AND DISCUSSION

Based on the results of field data and analysis, the design process is divided into several stages to detail the formal and technical needs of the market area.

A. Stage 1: Classification of space needs & connectedness

The current condition of the classification (zoning) of needs in the Susumbolan Traditional Market is only distinguished by wet and dry goods type. Therefore, the Badan Standarisasi Nasional (BSN) [11] will develop the classification based on zoning criteria. (Table 1 & Fig. 4)

TABLE 1. Zoning Classification of Goods Types

No.	Criteria	Requirement Type III	Suitability level	Assessment norms
4.	Zoning	- Wet food - Dry food - Ready to eat - Non food - Poultry slaughter	Main	Markets that have met 60% of the requirements of the "zoning" criteria are considered to have met the criteria



Fig. 4. Redevelopment Zoning Classification Goods Type

After clearly knowing the spatial relationship generated from the matrix, the next thing that needs to be known is the activity program. It aims to discover what activities occur in the market and its relationship with the functions around the market (Fig. 5).

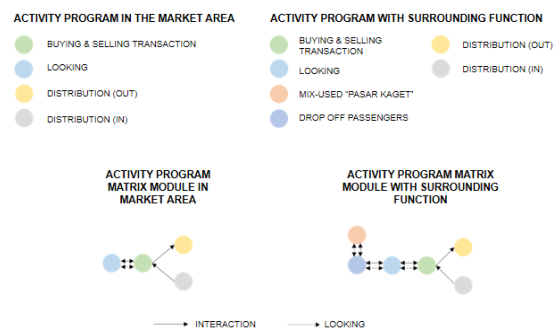


Fig. 5. Module Matrix in Market Area & Surrounding Function

B. Stage 2: Site Iteration

Determining Market Entry and Exit Access Points

The aim is that goods distribution activities that usually use tools such as carts or trolleys do not disturb and reduce buyers' comfort in buying and selling in the market.

The reduction in the number of circulation accesses from

the direction of the terminal aims to create a contrasting boundary between the terminal and the market, which is exacerbated because the terminal area is more often used as a parking area compared to the market front area which should be a parking area for the market (Fig. 6).



Fig. 6. Access in and out of Market

Determining the Circulation Direction Within the Market

Based on the culture in the Tolitoli community in shopping activities, namely the nature that wants to be fast and efficient in shopping. So, a unidirectional circulation path is needed, such as a cul-de-sac type of lot, so that it has ample space for the selling area and the size of the main circulation path is also larger (Fig. 7).

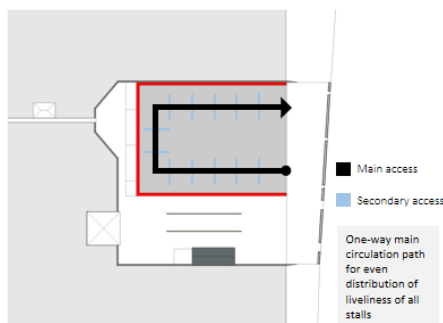


Fig. 7. Circulation Direction Inside the Market

Determine zoning classification needs

As described in the needs classification matrix. Based on the supporting theory of Cultural mapping (Fig. 8).

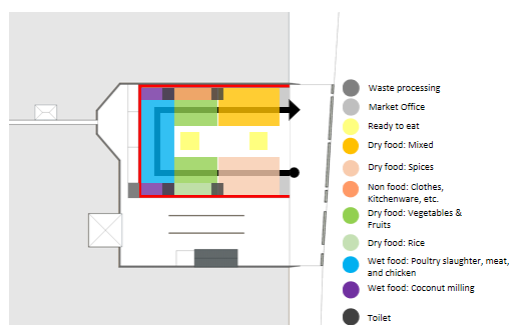


Fig. 8. Zoning Classification of Trade Types

Determine the activity relationship program

Application of relationship matrix module within the market area and function around the market (Fig. 9 & 10).

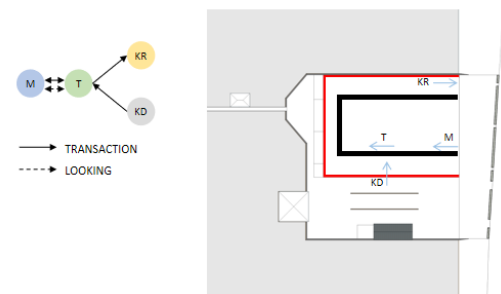


Fig. 9. Application of Activity Relationship Matrix Module in Market Area

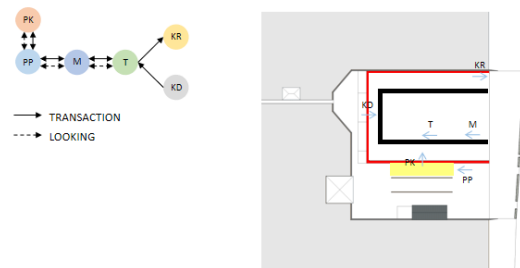


Fig. 10. Application of Activity Relationship Matrix Module with Market Surrounding Function

Utilization of Inner Market Area

Determine the distribution of stall types (kiosks—loss) based on the current number of traders and the placement of open spaces (waiting and ready-to-eat areas) to become a vista and a source of natural lighting and air circulation.

C. Stage 3: Exploration of formal concepts based on matrices and modules

Size of circulation path

Based on the type of circulation path used in the concept, namely the main circulation path and secondary circulation path, the size of the path used based on user proxemics is social distance and public distance. Social distance is 1.20 - 3.60 m and public distance is 3.60 - 7.60 m. [12]

Concept of a 'Pasar Kaget' Area

The terminal area has the potential to terms of a large enough area. With a relatively moderate activity level, the terminal area has three lanes to streamline circulation in the terminal and market area. With the size of the parking area, it can also be used as a parking area for loading cars and the "Pasar Kaget" area. This is made in consideration of the period "Pasar Kaget" period and the loading of goods, which only lasts a few hours, from 1 am to 6 am (Fig. 11).



Fig. 11. Concept of "Pasar Kaget"

Kiosk & Los Form

The kiosk stalls' current condition requires redevelopment

in terms of shape and layout. The redevelopment involves changing the merchandise layout to make it tidier but still the same as the current condition so as not to interfere with the existing circulation path. It also involves adding ramps and wind catcher facilities to increase user comfort during buying and selling. The kiosk stalls' construction system uses modules with a steel frame structure. The stalls' maintenance is intended to be quick, and they can be added or reduced in number as part of the supporting theory of Spatial Flexibility (Fig. 12).

The non-permanent los stalls need to be redeveloped by levelling them so buyers do not have to squat during transactions, traders still have a los area to hold the merchandise, and traders can continue to sit in selling as is the current condition (Fig. 13).

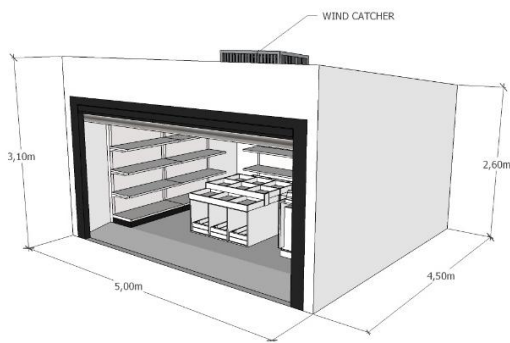


Fig. 12. Concept of Kiosk

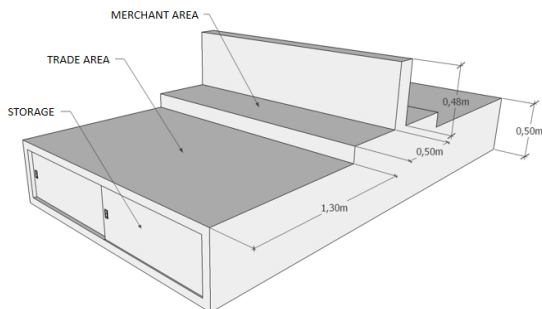


Fig. 13. Concept of Los

IV. CONCLUSION

The Susumbolan Traditional Market Redevelopment process is designed based on the existing Behaviour Setting and the needs of users (distributors, traders, and buyers), which are then developed using the Juxtaposition method to create a good and smooth buying and selling process. The design results will represent ideas based on the flow of problem issues, facts in the field, the context around the area, and user behaviour settings. In the design process, more detailed ideas are needed to realize the design criteria and concepts described above to honestly answer the issue of design problems, namely Human Movement.

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