

MANAGING PASSENGER MOVEMENT FLOW WITH GREEN CONCEPT AREA: TERMINAL 2, SOEKARNO- HATTA INTERNATIONAL AIRPORT

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Abstract: Airport has rapidly developed for the last several decades. It occurs as the result of the increasing of people who use airline services, especially at “Soekarno-Hatta International Airport”, the focus of this study. It couldn’t be avoided that as the continuous development is still in progress, there will be many problems come along. Moreover, the main problem is the management of passengers’ movement flow at Terminal 2 Soekarno Hatta International Airport. The uncomfortable condition of parking area at the terminal building should have a special attention. Therefore, we will conceptualize the flow of passengers from parking area to security checkpoint 1 at Terminal 2 integrated with a green concept. The parking building will be integrated with Terminal 2 building. The focus of this study is creating a smooth flow of passengers and a comfortable circumstance of the parking building including the paths that contain cultural entertainment and a green park waiting area. This study used analysis method for indicating the concept as a new solution strategy of managing the Terminal 2 passengers’ movement flow. **Keyword:** Passengers’ Movement Flow, Green Concept, Solution Strategy, Cultural Entertainment, Airport Terminal.

Introduction

An airport terminal is a building in airport where passengers transfer between ground transportation and the facilities that allow them to board and disembark from aircraft (Wikipedia, 2017). Surely the demand of smoothness, safety, and comfort (Dhio, Analisis, & Kepuasan, n.d.) from the passengers is high in the process where the passengers transfer between ground transportation and the facilities. The growth in number of passengers was significant from year to year, especially the passengers at Soekarno-Hatta International Airport. In 2016, passengers in Soekarno-Hatta International Airport reached 95 million passengers, consisted of 80,4 million domestic passengers which were raised by 16,97% and 14 million international passengers which were raised by 8,16% compared to 2015 period (BPS, 2016) and it will raise significantly during the peak season (Ricardianto, Djajaputra, Martono, & Introduction, 2017) . As the result, the smoothness, safety and comfort in the process of transferring

passengers from ground transportation to the terminal, and the facilities provided at Soekarno-Hatta International Airport have become a center of attention which is considered important to be taken care because it is affecting the smoothness of passengers flow movement.

According to (Qiang, Jia, Xie, & Gao, 2014) one of the factors that affecting the airplane turn time is passengers boarding time. The passengers averagely spend their time on the terminal around 48% of their time just for moving from one point to another point (Takakuwa & Oyama, 2003). If the passengers take too much time to board the airplane because of the bad flow of passengers' movement which is arranged by the airport management, the delay of the flight will occur. Furthermore, the loss of passengers may happen due to the lateness of check in. Certainly, airport management does not expect this to happen. The focus is on the passengers' movement on parking area to security checkpoint 1 Terminal 2 Soekarno-Hatta International Airport. For example, the flow starts from the parking area when the passengers bring their baggage. It will be troublesome when passengers carry their own baggage from the parking area to terminal building through paved road because it can damage the baggage. Even, they have to pay attention to the surrounding when they are at the parking area because there was car passing by beside them to find parking space. Another problem that may occur is the ineffective facilities on parking area, the waiting area for those drivers who do not accompany the passengers to the terminal building or those who wait for their family member. They choose to wait on their car because waiting in the parking area is too hot and uncomfortable. This thing looks trivial, but it should be given attention for comforting the passengers and non-passengers.

There are several things that affect the smoothness of passengers flow movement, one of them is the age and gender of the passengers (Pitchforth, Wu, Fookes, & Mengersen, 2015). Therefore, the study will conceptualize a parking building that can make the passengers flow movement smoother from parking area to security checkpoint 1. The writer chose Terminal 2 Soekarno-Hatta International Airport because international flight departure

and arrival are in here. Terminal 2 is apart from Terminal 3 where airline companies joined sky teams are located. Besides, the writer will add “Green Concept” area to raise the comfortable level of passengers.

Background: Soekarno-Hatta International Airport

Soekarno-Hatta International Airport is located in Java island and serves Indonesia's capital city, Jakarta. The airport is located in Tangerang, 20 km to the Northwest of Jakarta. All international and most domestic flights land here. The airport code comes from Cengkareng, the district of the airport which is often called by Cengkareng Airport. The airport is the busiest in Indonesia, and the 12th busiest in the world that can give services to passengers since 2011 (Sari, 2015), with more than 60 million passengers stepping in each year. As it serves Jakarta, Indonesia's government and economic centre, it is the hub for major airlines that fly to other cities in Indonesia (Triposo, n.d.).

Terminal 2 is the second terminal built, finished in 1991. The terminal is located in the northern side of the airport, across from the Terminal 1. It has three sub-terminals, labelled as D, E and F, each of which has seven gates and 25 check-in counters.

As depicted in figure 1, there was a big portion of land used for parking area. There are 24 row of parking space (D1-D8, E1-E8, and F1-F8) in the parking area. As we know that each flight has specific gate assigned for them to board the airplane. Although some passengers can park at the parking space near the gate listed on the ticket. There is always some passengers who park their car far away from the gate listed on the ticket.

Having a parking area that has many row of parking space, make Terminal 2 able to accommodate a lot of cars which passengers need to transport their belonging from their home to the terminal with their companion (friends, family, driver). The location which the passenger park their car can determine the congestion within the terminal area before the passengers enter the security check point 1.



Figure 1.

Method

Data

Data was drawn from three sources for this article. The first data is the Terminal 2 plan that we got from various credible website. The second data is from observing the condition of Terminal 2 that we conducted together to gather the data. The third data is the analysis regarding about the condition of terminal 2.

Those three data sets were combined by researching the condition and the passengers' flow movement in Terminal 2 based on Terminal 2 plan and analysis.

Variable

There are six variables as our object observation for this journal, that is:

1. Terminal 2 Condition : Finding information and observing Terminal 2 area, so that we can conceptualize new smooth passengers' flow movement.
2. Parking Area : Observing the capacity and condition to get sufficient data for creating new concept of parking building.
3. Passengers : Observing the natural behaviors of passengers in Terminal 2, the observation will be grouped based on age and gender to know their willingness or power to walk from parking area to terminal building.

4. Time : Observing and predicting the ideal required time to reach Terminal 2 from parking area.
5. Market : Observing to determine the intensity of passengers or non-passengers who passing by those tenants.
6. Public Transportation : Observing to know what kind of public transportation that passing by Terminal 2 to help to transport the passengers, so we can design new path for smoothing the movement flow in Terminal 2 area.

Problem and Solution Analysis

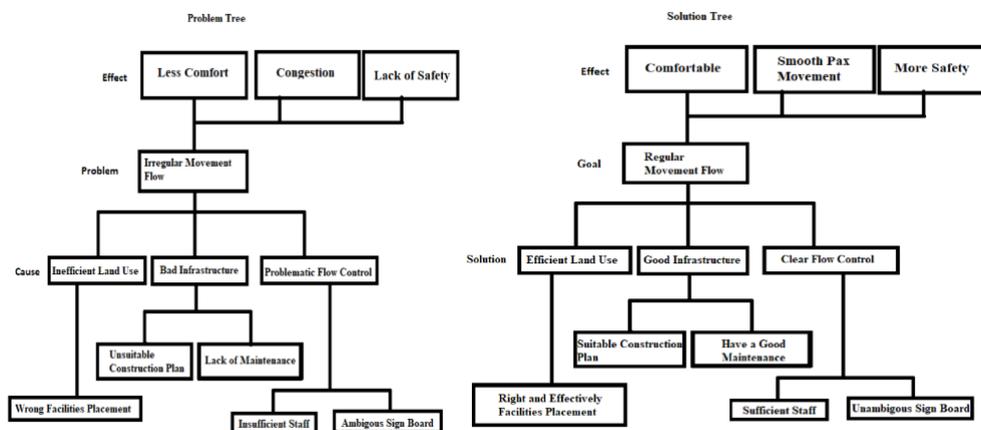


Figure 2.

The analysis of this problem tree is prioritized on irregular movement flow. It is the main subject of this journal discussion that we try to solve.

This problem was caused by several reasons; the first is the inefficient land use. It happened because wrong facilities' placement, like the placement of the toilet room and separator between parking area D, E, and F with not clear way sign, the solution that we decided is to upgrade the parking area to a parking building where in this parking building, almost all the area is used for parking space and with some area is having a purpose to entertain the passengers and non-passengers.

The second cause is the bad infrastructure. It happened because of unsuitable construction plan for the present condition of the terminal which was got denser now and lack of maintenance for infrastructure. The condition caused bad condition of the road which caused a delay in the

passengers' flow movement. The solution we propose is from the parking building that we conceptualize will be suitable for the condition of Terminal 2 now and for the future with regard to the adequate infrastructure which can help the passengers' flow movement smooth with required maintenance schedule.

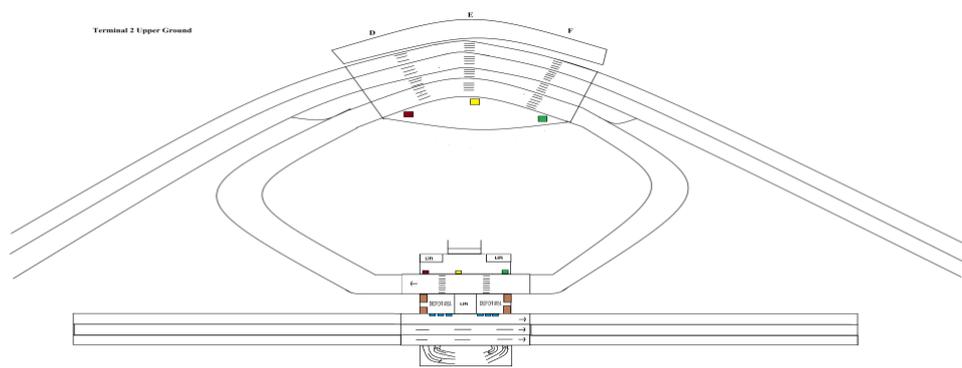
The third cause is problematic flow control. It happened because of the lack of staff that help and guide the passengers from parking area to terminal building. Another cause of this problem is the ambiguous sign boards that confuse the passengers. The solution the writers propose is adding more personnel and appoint them to the right place to help the passengers to reach the terminal gate on their ticket. Furthermore, the writer will make new passengers' flow movement as precisely as possible so that the flow from parking building to terminal building is smooth and directed.

Discussion and Result

Objective

As we found the problems and the solutions, we will conceptualize a new movement flow strategy and the new building concept that support it to solve the problem in movement flow while fulfilling the high demands of passengers to smoothly, safely, and comfortably when in the process where the passengers transfer between ground transportation and facilities.

New Building Concept and Flow Strategy



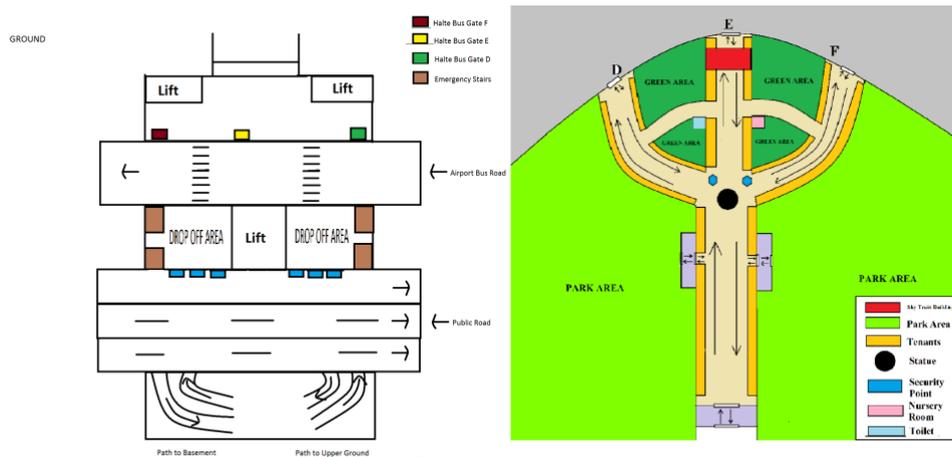


Figure 3.

As we looking at the figure 3, to access Terminal 2 there are 3 ways that can be done by passengers or non-passengers. The first, dropping off passengers in the area drop off area in the parking building and then after that they go through the connecting tunnels or airport bus ride. The second, that passenger cars can choose to park their cars in the parking lot L1-L2 or B1-B2 then the same as the first way, they have to connect again through the connecting tunnel or airport bus ride. And the last way is to drop the passengers directly at the terminal through the direct drop off area in Terminal 2 but have to pay in order to access the special path to direct the direct drop off area. There's 4 transportation that can access direct drop off area such as private car, Damri bus, airport taxi, and sky train.

From the parking lot to the connecting tunnel between the parking lot and the terminal, there is a gray area that works to dry clothes and other object when exposed to rain and clean up dirty footwear. Then after the gray area, there is a metal detector for safety reasons. Then passengers will enter the connecting tunnel where there are tenants who sell souvenirs and food that is cheaper than those in the terminal building. To the left and right of the tunnel there is a park area that serves as a recreation place for passengers as well as for relevant who escort or pick up passengers. There is also a gray area between the tunnel and park area. Then there is a junction that separates the path from each terminal. As we designed this tunnel for entertain purpose, it will surely raise the passengers and non-passengers comfortable

feeling. Along with the raise of comfortable feeling, it will also affecting the buying decision (Kingdom, Simarmata, Keke, & Panjaitan, 2016) because comfort is one of the factor that greatly affecting the buying decision.

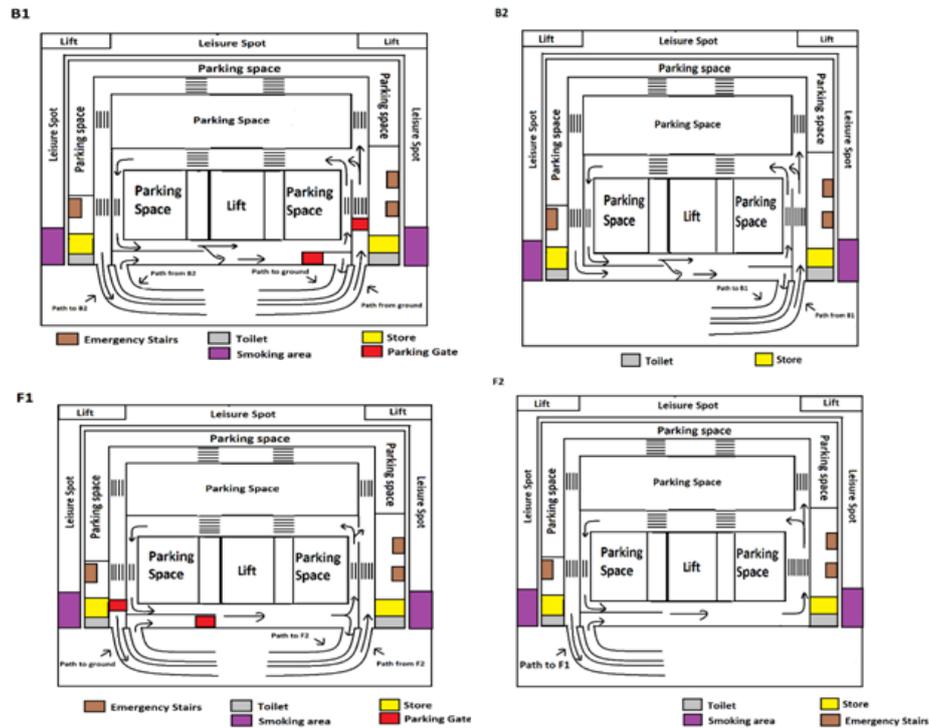


Figure 4.

After accessing the path to B1 or F1, passenger cars will pass through the parking gate first, before passing through the gate, passenger cars can choose the parking slot independently to make it easier for them to find the location of the parking without having to walk around the parking lot to find parking space empty.

When the car has been parked, passengers can directly access the elevator to the connecting tunnel on the ground floor or they can just sit in the leisure spots. On the B1 and B2 leisure spot, it will be designed with walls painted by artists who take the initiative to donate their work, which fits into the wall and a good lighting unto the wall in order to look aesthetic, there will be a bench seats too so that people can rest there and enjoy the scenery wall or take a photo.

On the F1 and F2 leisure spot, it will be designed with tinted glass wall so the people can enjoy the green park and terminal scenery, and there will be railing too before the wall to ensure the safety purpose so the passenger can safely enjoy it. We have an expectation that the leisure spots can balance the flow of movement on the other floor, coupled with food store facilities, smoking area, and toilet. Then so the level of comfort for passengers and non-passengers will increase. And land use will be fully utilized efficiently.

System Implementation

Inside the parking lot, there will be a system when the driver takes the parking ticket, they can choose the parking slot they want. So, there will be no circumstances where the car that has passed through the gate parking gate is difficult to find parking that still empty. On the ground before going up to the F1 floor or down to B1, there will be notice board of the remaining parking slot availability information. The development of this system has been applied on booking the ticket plane, train or cinema. If the system is applied to the parking lot, it will smooth the flow of movement in the parking area.

In the connecting tunnel between the parking lot and the terminal, there is a gray area. The area is located before entering the tunnel from the parking and from the park area. This place will be used to dry clothes and other objects when exposed to rain and clean up dirty footwear. In this tunnel there is a security point located between the branch path to the terminal D, E, and F that serves to adjust the flow and information center. And there are also toilet and nursery room facilities for both pickup or delivery, and passengers themselves.

The tenant area were also set here. On the main road we specialize for food stalls, this food stall we target to have a cheaper price than the ones in the terminal, the purpose of making this food stall is for the middle market target and below. We provided flight information display before they go through the branching road to give public services for passengers and keep the responsibilities of airport information (Kelemahan, Resky, &

Simarmata, n.d.). And then in the tenant area located on the branching road to the terminal D, E, and F we specialize this area for gift or souvenir shop. Then we targeted the tenants to sell typical souvenirs of every province in Indonesia, so there will be a 35 souvenir shops located in this branching area.

Conclusion

Due the rapid development of air transportation as the impact of high service demand (Marty, 2016). So in this paper, we conceptualize a passenger flow management by conceptualizing a new parking building. This is because the parking conditions are less comfortable and too much space is wasted. And also we pay attention to the smoothness, safety and comfort in the flow that we make. Flow is smooth and easy to understand certainly makes the passengers feel comfortable.

The other thing that underlies us to make this concept is due to inadequate facilities. Like the lack of entertainment venues to wait for the introduction or pickup so they feel bored. Not only that, we also carry the concept of Green Terminal so that passengers and visitors feel pampered by the airport in the presence of green areas that have been conceptualized. We hope that with this concept we can smoothen passenger flow, and also able to create another idea with the theme of Green Terminal Concept.

Pros and Cons

This concept is very likely to be applied. Some of the advantages we create a concept that is regular and directional flow. Because we conceptualize it as simple as possible so it's easy to understand. In this concept is also arranged in such a way. The existence of the concept of Park Area and Green Area is also able to create a new atmosphere within the airport so that the airport image is not just for the place to pick up and deliver passengers only.

But this concept has a deficiency that is an uncertain extent of estimation so that only form of estimation only. And it also requires a considerable cost and time because there has been a long parking and some

buildings and areas that have enough effect if exposed to evictions to build the concept of parking and tunnel building, such as the area of travel agencies and some statues that have been made before.

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