

Service Performance Improvement of Airport Public Transportation (Case Study of Airport Bus in Terminal 3 Soekarno-Hatta International Airport)

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Abstract—The Soekarno-Hatta International Airport (SHIA) is the 18th busiest airport in the world by Airport Council International in 2018 (65.7 million Pax/year). One of the common issues in the SHIA is the low-quality service of the airport public transportation. Currently, the SHIA has collaborated with several buses, trains, and taxi providers. This study took an airport bus in Terminal 3-SHIA as a case study. In the initial observation, the implementation of airport bus services was indeed not optimal, where business process failures occurred at several service points. This study aims to identify problems of airport bus transportation services by conducting qualitative analysis on service blueprints, on application-based services, interviews with several key persons, and quantitative analysis by measuring gaps in 5 dimensions of service quality (reliability, assurance, tangibles, empathy, and responsiveness), a questionnaire was delivered to 100 respondents. The items of the service quality dimensions were analyzed with Cronbach's Alpha and statistically reliable. To find the root cause of the problem, by using Ishikawa Diagrams and 5-Why analysis. Six alternative solution programs using by the service science system approach (service-dominant logic) such as Integrated Smart Transport Mobility Apps, Redesign Service Blueprint, Fleet Management System, Role & Responsibilities Chart, Integrated People Development Program, and Digital Experience Development Program will be proposed to improve airport bus service performance.

Keywords: customer, service blueprint, service performance, service science system, transportation

I. INTRODUCTION

Indonesia's economy depends on the world's economic condition. Based on the Central Bank of Indonesia data, Indonesia's economic growth showed a positive trend from the year 2015 to the year 2018. The dynamic of economic growth shows Indonesia's economy has passed the lowest point of economic growth which was 4.88% in 2015. In 2018, Indonesia's Gross Domestic Product (GDP) achieved 5.17%, it's higher if compared to the previous year's economic growth which was 5.07%. In 2018, consumption grew up to 5.13%, compared to 2017 which grew 4.98%. It indicates people's purchasing power increases. Consumption is not only just about food or consumptive things but also includes education, health, housing, transportation, communication, and recreation. Good economic growth will encourage flight activity both domestically and internationally to increase. Indonesia is one of the countries

experiencing relatively high growth in the aviation industry. Indonesia as an archipelago country, air transportation is the main transportation in this country. From a global perspective, Indonesia is located in a very strategic position, which stretches between the Indian Ocean and the Pacific Ocean. It impacts Indonesia as an international trade center connecting Asia and Australia, as well as Europe and Asia.

Soekarno-Hatta International Airport and hereinafter referred to as "SHIA" which is operated by Angkasa Pura II (APII) as the main gateway and the main airport hub of Indonesia makes it the busiest airport in Indonesia and the 18th busiest airport in the world by the Airport Council International (ACI) in 2018. In 2018, the number of passengers using SHIA services reached 65.7 million. While the total number of air transport passengers in 2017 was 63 million passengers. In other words, the number of passengers using SHIA services increased by $\pm 4\%$. Overall the growth of the aviation industry in Indonesia is very promising with an estimated air passenger market is 270 million passengers in 2034 [1].

Based on those data, SHIA needs to anticipate those problems do not occur due to the impact of passenger growth in the aviation industry sector. In addition to causing problems with capacity, another impact that caused is the decline in-service performance. Services currently provided by airport operator include airport services, airport public transportation services, and other services. The problems that occur at SHIA are arguably very complex. In addition to the airport business scope and broad area, there are a large number of stakeholders, if it does not manage properly, there will be many problems. Service is usually related to service businesses to provide satisfaction and foster trust in customers. The importance of service to customers is a strategy to win the competition. However, it is not just enough to give satisfaction and attention to customers more than that is how to respond to customer desires to create a positive impression from the customer. Services must be supported by quality reliable human resources, good business processes, and the latest technological facilities.

In the long-term plan of the company APII, it is very clear that one of the company's targets is related to the customer satisfaction score, which in 2020 reached a score of 4.7 (ASQ) from 5 Likert scales [2]. It confirms that the APII is very concerned about the achievement of service

performance, with several strategies pursued namely the optimization of customer experience and the use of digital technology in airports, and the ecosystems.

Customer satisfaction is a feeling of pleasure or disappointment someone who appears after comparing the perception or impression of his performance under expectations, customers are not satisfied. But, if the performance exceeds expectations, the customer is very satisfied and happy. If the perceived performance is below expectations, the customer will feel disappointed, if the performance meets customer expectations, the customer will feel satisfied, whereas if the performance exceeds expectations, the customer will feel very satisfied. This satisfaction will certainly be felt after the customer concerned consumes the product [3]. Customer satisfaction is the customer's evaluation of a product or service in terms of whether that product or service has met customer needs and expectations. To be able to increase customer satisfaction, we must know what our customer wants and needs. We need involving between the customer and the product/service provider [4]. A new Dominant Logic that is different from Goods-Dominant Logic. Dominant Logic focuses on the interaction between producers, consumers, and colleagues in the supply network and value creation as parties who co-create through the collaboration process. Logic is known as "Service-Dominant Logic" [5]. The service science system concept tries to unite various perspectives by defining service as a Service Science System phenomenon, trying to unite various disciplinary perspectives by defining services as observed phenomena in the world in terms of service system with value-co creation with interactions between entities [6].

This study takes a case study of airport bus transportation services, especially in terminal 3 of SHIA, which will analyze and discuss various problems that occur in the management of airport bus transportation services until finding the alternative solutions with a service science system approach and the ultimate goal is the achievement of customer satisfaction targets at SHIA. In 2019, the target of customer satisfaction at SHIA is a 4.6 Likert scale. SHIA is the largest airport operated by APII, and terminal 3 is the main and largest terminal. At present, the APII focused on terminal 3, where various services have been provided using new digital-based concepts, by implementing airport bus transportation services to increase customer satisfaction. However, from the observations in the field, the implementation of the concept of digital-based services on bus transportation services has not been going well, the level of satisfaction in airport bus transportation services has not yet been achieved.

II. METHOD

A. Conceptual Framework

A conceptual framework is not merely a collection of concepts but, rather than a construct in each concept plays an integral role. A conceptual framework "lays out the key factors, constructs, or variables, and presumes relationships among them" [7].

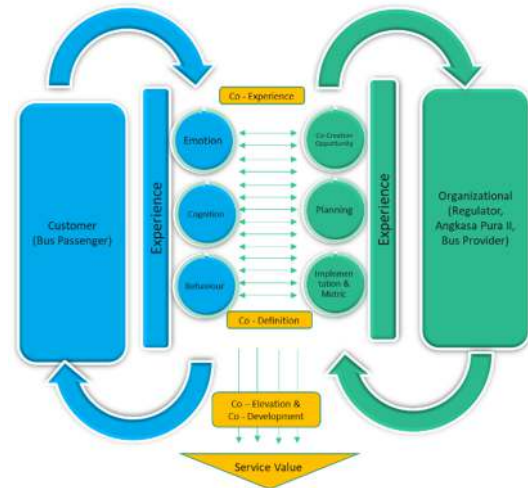


Figure 1. The Conceptual Framework [8]

The Value Co-Creation Model process in the Service System consists of 4 Co-Phase namely Co-Experience, Co-Definition, Co-Elevation, and Co-Development by involving customers and providers [8]. The conceptual framework will modify the concept of the Value Co-Creation Model Process in the Service System. In terms of bus transportation services at SHIA, the study assumed that currently, the creation of value co-creation in bus transportation services are not optimal because there has not been much involvement of customers as service users and collaboration between regulators (Ministry of Transportation), airport operator (APII), and bus provider. It caused the performance of airport bus transportation services is underperformance. In this study, the study will explore the problem or potential issues in airport bus transportation services, especially at terminal 3 of SHIA, the alternative solutions can be obtained to improve customer experience. In the current airport bus transportation service, the study assumed that the current business process has not used a good service design method. Based on the conceptual framework in figure 1, the service value that customers feel is very dependent on how well the service design and operational implementation in the field that carried out by service provider organizations (Regulator, APII and Bus Providers). Airport bus transportation service co-creation needs social interaction processes or collaboration between stakeholders (employees, regulators, customers, and providers) and airport operator company (APII). The creation of service value is through the design process and capturing customer experience by customer surveys to get the description of the customer's emotion, cognition, and behavior. The service provider company then prepares co-creation and design of service by capturing co-creation opportunities, planning (service design), and implementation & continuous measurement (metric), then combining with external perspectives.

B. Method of Data Collection and Sample Size

For survey research, the study assumed that the proportion of bus users is about 50% and the average estimated 5000 passenger/day use bus transportation. To calculate the sample size of the service user population of

airport bus transportation, the study used a simple random sampling method used by a formula developed by Lemeshow as follows [9]:

$$n = \frac{Z^2 \cdot p(1-p)}{e^2}$$

n : Sample Size

Z : Confidence Level (95% or 1.96)

p : Expected/Estimated Proportion for Bus (estimated 50% of 10,000 Pax = 5,000 or 0.5)

e : Margin of Error (10%).

TABLE 1. STATISTIC PARAMETER

Variable	Value
Sample Size	97
Confidence Level	95%
Bus Pax Population (estimated/day)	5.000
Non Bus Pax Population (estimated/day)	5.000
Margin of Error	10%

Based on the **TABLE 1**, the sample size is about **97 respondents**, but in this study will take a total of **100 respondents**.

C. Questionnaire Design

The variables used in this study are service components that can be derived from the dimensions of service [10], which are five dimensions that are very influential in determining the assessment of service quality, shown in **TABLE** . The study designed a questionnaire for survey needs, a total question is about 20. Each R.A.T.E.R dimension consists of 4 questions. Research data collection activities using instruments (in the form of questionnaires) are structured in a structured manner. The questionnaire consists of several statements accompanied by alternative answers to provide the respondents in choosing answers according to the actual situation. The scale used in this study is a Likert scale to measure the attitudes, opinions, and perceptions of someone [11].

TABLE I. DIMENSION OF SERVICE

No.	Dimension	Description
1	Reliability	The ability to carry out the promised service is reliable and accurate.
2	Responsiveness	Willingness to help and provide appropriate, fast and responsive services.
3	Assurance	Knowledge and friendliness / manners of employees and their ability to generate trust and confidence.
4	Emphaty	Concern and attention to consumers individually.
5	Tangible	Real facilities, physical appearance, equipment, employees, and communication equipment.

D. Interview Guideline

The first step is by conducting in-depth interview method is that determine the key persons to be interviewed, see **TABLE** . It is very important to get in-depth information related to the questions that will be asked to get an overview of the actual conditions in order to find solutions of bus transportation service problems. The question used a combination of open and closed questions.

TABLE II. INTERVIEWEES LIST

NO	POSITION	ROLE
1	SM of Land Transportation	Managing Land Transportation in Terminal 1, 2 & 3 at CGK
2	AVP of Service Strategy	Providing the direction for service strategy and policy making of land transportation management for all AP2 Airport
3	SM of Terminal Service & Facility - T3	Providing the daily operation bus transportation service in Terminal 3 CGK
4	Online Travel Agent	Providing E-Ticket/E-Payment system
5	Field Officer (Bus Provider)	Providing bus transportation in Terminal 3
6	VP of Infrastructure & Facility Policy	Providing the direction for strategic planning and policy making of facilities for all AP2 Airport
7	Coordinator of Project Business Digital Airport	Providing the detail information of operation and facility system that will be implemented
8	Regulator	Providing the direction for service strategy and policy making of land transportation management for Indonesia

E. Data Analysis Methods

The study used a mixed-method of research which is quantitative and qualitative. In conducting analysis, a tool is required to collect various information at the time of data collection can be processed and conclusions can be drawn to resolve problems that occur in bus transportation services in SHIA. Following are some of the tools used for analysis in **TABLE** .

TABLE III. TOOLS OF ANALYSIS

NO.	SUBJECT	ANALYSIS METHOD	PROCESS
1.	Business Environment	<ul style="list-style-type: none"> Service Blueprint In-Depth Interview Field Observation 	<ul style="list-style-type: none"> a. Fall point identification b. Qualitative Analysis
2.	Service Performance	Service Quality Survey	Using SPSS Formulation for: <ul style="list-style-type: none"> a. Validity Test b. Reliability Test c. Descriptive Statistic
3.	Problem Cause Identification	Root Cause Analysis	<ul style="list-style-type: none"> a. Ishikawa Diagram b. 5 Whys

F. Business Environment Analysis

1) Service Blueprint

From the observations in the field and based on the results of interviews with several interviewees, they stated that there was no service blueprint in bus transportation services. The study described how the current business process is running and describe it in the form of a service blueprint to identify failure points. From the results of observations in the field, it can be described the bus transportation service blueprint at SHIA and there are 5 (five) fail points that can cause bus transportation services to be bad or not effective & efficient.

2) Interview Result and Analysis

In the conduct of interviews, the study selected several interviewees related and experts in their fields. The purpose of this interview is to confirm and get the detailed information regarding the problems that occur and the desired expectations for the improvement of SHIA bus transportation services. The selected key persons are senior/middle leaders that have the responsibility in bus transportation service

management in the head office, division offices, airport branch offices and externals such as from the Transportation Ministry. The implementation of this interview was conducted on the 17th June to 8th Aug 2019 with an average duration is about 30 minutes.

G. Service Performance Analysis

1) Respondent Profile

The study had collected data through an online survey using the Survey Monkey application service and simple random sampling for this study. The questionnaires distributed to several respondents who often used the SHIA bus service and were taken at the terminal 3 bus shelter area of SHIA. The survey period is conducted by the May 13th to 17th, 2019, with a total of 100 respondents and the completion rate & validity is 100%.

2) Reliability Test

The reliability test aims to show the extent to which a measurement result is relatively consistent if the measurement repeated twice or more. In other words, reliability is an index that shows the extent to which a measuring device can be trusted or reliable. Reliability test results indicate that the item is inside this questionnaire is “**reliable** with Cronbach Alpha value 0.984 for perceived performance and 0.932 for perceived expectation (> 0.600).

3) Validity Test

Validity Test supports to test the validity of the measuring instruments used in the study. The measuring instrument used consists of a questionnaire. The technique used to test the validity of the questionnaire is by factor analysis, which consists of indicators from each research variable. The correlation between each factor compiles a questionnaire with the total score calculated and then looks at the correlation, whether it is involved in the category of high, medium or low consideration. The icons obtained are classified as low, the questionnaire is invalid, whereas if it is classified as high or moderate, the verification of the questionnaire collection indicator is valid. In this study, the study used the value of comparison corrected total-item correlation (r_{xy}) with r-table.

- If r-table product-moment < the value of r_{xy} , the instrument is “**valid**”.
- If r-table product-moment > the value of r_{xy} , the instrument is “**invalid**”.

Total a sample size of 100 and a confidence level of 95%, the r-value is 0.195. The study compared the correlation value of the correlation of the total items by 0.195, both for customers' perceptions and expectations and the data result is “**valid**”.

H. Customer Satisfaction Gap Analysis

Based on the customer's perspective, there are gaps of the customer expectations are higher than the performance of services in the field. The highest gap is the reliability dimension of -0.980 and the lowest is empathy -0.815, in

TABLE IV. GAP SCORE RANKING

NO	DIMENSION	GAP	RANK
1	Reliability	- 0,980	1
2	Responsiveness	- 0,955	2
3	Tangible	- 0,905	3
4	Assurance	- 0,845	4
5	Empathy	- 0,815	5

TABLE V. GAP SCORE RANKING EACH DIMENSION

NO	DIMENSIONS	STATEMENTS	CODE	GAP
1	Tangible	• Completeness fleet facilities	• TAN_1	• -0,960
		• Completeness of InAirport service features and vending machine features	• TAN_4	• -0,940
2	Reliability	• On Time Performance	• REL_4	• -1,260
		• Reliable bus shelter facilities & InAirport feature	• REL_3	• -0,950
3	Responsiveness	• Accuracy of information	• RES_1	• -1,250
		• Officer & facility readiness	• RES_3	• -0,890
4	Assurance	• Services that provide secure	• ASR_2	• -0,870
		• Be a trusted place	• ASR_4	• -0,840
5	Empathy	• Understand customer needs	• EMP_2	• -0,830
		• Ease of information	• EMP_1	• -0,820

According to TABLE V, it will find that the factors of each dimension that cause gaps in in-service performance.

1) Tangible:

The biggest gap in the tangible dimension is caused by incompleteness of fleet facilities (-0.960) and the incompleteness of service features in the InAirport application and the vending machine features (0.940).

2) Reliability:

In this dimension, there are gaps in the accuracy of bus departure and arrival schedules (-1.260) and the reliable bus shelter facilities & InAirport feature (-0.950). The service providers need to concern on this dimension to improve service performance.

3) Responsiveness:

In this dimension, there are gaps in the accuracy of information (-1.250) and officer and facility readiness (-0.890).

4) Assurance:

Give customer feel secure and to be a trusted place is very important. But in these dimensions, there are gaps about -0.870 and -0.840.

5) Empathy:

The provider should understand customer needs and give all of the bus information to minimize the gap. In this dimension, there are gaps between -0.830 and -0.820.

I. Root Cause Analysis

Root Cause Analysis (RCA) is a gradual analysis technique that focuses on finding the root cause of a problem, and not just seeing the symptoms of a problem. The tool used in performing Root Cause Analysis (RCA) is to use the Fishbone Diagram Analysis method. Fishbone Diagrams is known as Cause-Effect Diagrams or Ishikawa Diagrams. This tool was discovered by a Japanese quality control expert, Dr. Kaoru Ishikawa. In this final project, the study identifies RCA

based on the following categories: Policy, Plant/Technology, People, and Process. From the root cause analysis, the potential factors that contribute to the low performance of airport bus transportation services come from processes, people, and technology. this study will focus on factors that can be controlled (CF). The underlying challenges encountered from root cause analysis are how to manage the good business process, better SOP, encourage ecosystem collaboration & integration system. Therefore, to solve the problem in this study, the study will combine the findings of the analysis on the business environment (provider and analysis of customer needs), service performance analysis and root cause analysis to propose improvements in business processes to improve the quality of service and the performance of bus transportation services in Terminal 3. This improvement is expected will have an impact on increasing customer experience and customer satisfaction in Terminal 3.

III. RESULTS AND DISCUSSION

Some of the problems have been discussed, it can be summarized that 3 main points need to be pursued to improve the SHIA bus transportation services, as follows People, Process and Plant / Technology. These aspects will give an impact on the underperformance of SHIA bus transportation services. The main contributors that have not yet optimized service performance are because the company's capability is not optimal in this case the airport bus transportation service ecosystem and terms of services tend not to involve the customer, many customer needs have not been accommodated in the ongoing service business process. The efforts that we need to be carried out to improve the airport bus services, there is a consideration, namely the possibility of implementing alternative solutions with principles that are easy to implement and can be controlled. In the discussion of business solutions in chapter 3, a framework is required to solve the problem solving can be more structured and can be reached the target. Settlement in the field of bus transportation services is in line with the company's targets in the company's long-term plan in relation to customer satisfaction and the company's main program, that is millennial travel experience that focuses on the millennial (millennial traveler) customer segment through product and process portfolio development and targeting service improvements by rejuvenating operational aspects at the airport.

The Business Solution Framework used for the study refers to the service science system concept which tries to unite various perspectives by defining service as a Service Science System phenomenon, trying to unite various disciplinary perspectives by defining services as observed phenomena in the world in terms of system services with value-co creation with interactions between entities. The value co-creation through the interaction of providers and customers is supported by ICT as an enabler [12]. Besides that, considering the airport bus transportation service system involves several stakeholders it is necessary for an orchestrator which is related to the regulation, facilitation, and management of the value co-creation process [13].

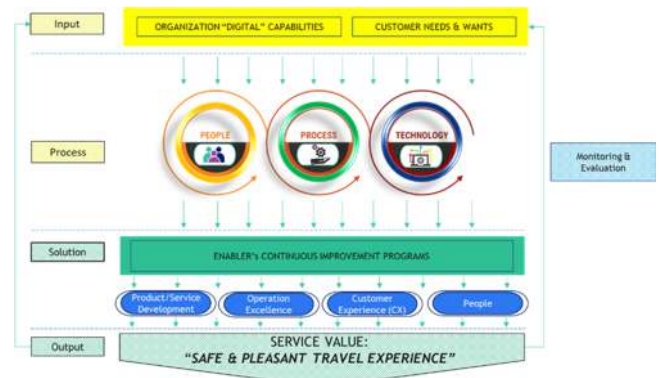


Figure 2. Business Solution Framework

From the Airport Public Transportation Orchestration Platform, the study created a business solution framework using the concepts of Input, Process, and Output models [14]. The business solution framework used in this study is divided into three parts, as follows: input, process, and output. Below are the continuous improvement programs:

- Integrated Smart Transport Mobility Apps (Proposed Prototype), this concept is an effort to integrate several application-based bus transportation services into one InAirport Apps service in the "My Transport" feature. Where later it will involve several stakeholders related to bus transportation services at SHIA, such as Travel Management Companies, E-Ticket Management Companies, Fleet Management Providers, Public Transport Providers, Integrated Solutions / Platform Providers, and Car Rental Companies;
- Service Blueprint (Customer-Centric Oriented), creating a new service design or service blueprint with the concept customer-centric oriented;
- Fleet Management System, this study, the study adopted Intel Corp's concept [15] in the implementation of SHIA bus transportation service operations for the future. In the fleet management system, it allows fleet operators to track vehicles remotely using maps and realistic displays produced from the Global Data Positioning System (GPS). This advanced technology increases the effectiveness of fleet management and efficiency by reducing workload and overall transportation costs and staff;
- Role & Responsibilities (Chart), In this alternative solution, it is necessary to divide tasks for each component of the ecosystem of airport bus transportation services, in this case, the division of duties of the regulator, the duties of the airport operator and the duties of bus providers. In implementing this bus transportation service each component of the ecosystem has clear duties and responsibilities and it is expected that there will be no more "Grey Area" related to duties and responsibilities. In the case of learning, workshop or FGD activities related to responsibility, joint role, and responsibility charts can be carried out (RACI - Responsible, Approve, Consult and Inform);
- Integrated People Development Program, collaborating the ecosystem of airport bus transportation services with the concept of "Integrated People Development Program", through learning programs, workshops or

integrated Focus Group Discussion. Later the officers who will be responsible for airport bus transportation services will follow service standards and be certified;

- Digital Experience Development Program, five keys to improving the Customer Experience, as follows:
 - Mobile Support, which is providing support services on the platform according to customer needs;
 - Live Chat, always connected with customers through live chat communication media, and willingness to accommodate customer needs;
 - Self Service, by providing self-service, the customer can save time and effort;
 - Social Support, the availability of social media for communication media or customer service;
 - Omnichannel Support, the availability of an integrated services system.

IV. CONCLUSIONS

Based on the company's vision and mission APII and the company's long term plan (RJPP) for 2016-2020, and based on the results of in-depth interviews with providers and regulators included in the airport bus transportation service ecosystem, they have a commitment in terms of improving bus transportation services at the airport Soekarno-Hatta through the service management approach. Namely by involving customers and stakeholders, implementing the latest technology and innovating to provide new experiences in the customer's journey. Terminal 3 of SHIA is a terminal built with the concept of integration, which is a magnificent modern building with digital facilities but local cultural elements remain attached to it. Through the provision of digital facilities in airport bus transportation services, namely vending machines and application-based services InAirport Apps which APII and other stakeholders collaborate and strive to provide passenger travel convenience. From the observations in the field, the implementation of bus transportation services at SHIA has not been optimal and there are some obstacles. Performance and service quality are gaps. Based on the service science management approach with the concept of S-D Logic, the study analyzes it from the perspective of the provider (ecosystem) and the customer. As well as looking for root causes of problems to identify problems, service quality gaps as well as customer wants and needs. From the conceptual framework of the study, analysis of problems from customers and organizations (providers) is carried out and exploring the quality of services and business processes as follows:

- Service blueprint, based on the results of the study that there are several fail points in the blueprint service as described in chapter 2 that can be controlled, the alternative solution needed is to redesign the existing service blueprint.
- Qualitative Data Analysis: From the interview, there are seven main points based on interview questions to explore the perspective of the interviewees. Overall, it can be concluded that the bus transportation service at SHIA terminal 3 needs a lot of improvement to make customer satisfaction standards.

- Servqual Customer Survey: It can be concluded that with the negative gap in all dimensions of bus transportation service quality, customer expectations are higher than the perception of bus transportation service performance in Terminal 3. The highest gap is the reliable dimension with -0.98 and the second-highest gap is the responsiveness dimension with -0.955 and the third highest gap is the tangible dimension with a gap of -0.905. Considering the results of the customer analysis, it can be explained that bus transportation services at Terminal 3 of the SHIA are not customer-oriented yet.
- Root Cause Analysis: From root cause analysis, potential factors that can be controlled and contribute to the performance of the Airport bus transportation service are People, Process, and Technology. After the analysis process is complete, it can be seen that the performance of the service is low due to the ability of the organization and does not accommodate the wants and needs of the customer. there must be continuous improvement in aspects of people, processes, and technology that Customer-oriented and easy to implement. Some alternative solutions will focus on:
 - Redesign UI / UX "Integrated Smart Transport Mobility";
 - Redesign Service Blueprint;
 - Implementation of the Fleet Management System;
 - Role & Responsibility Chart (RACI);
 - Integrated People Development Program;
 - Digital Experience Development Program;

Furthermore, refer to the proposed solution, it is necessary to analyze priority solutions using qualitative methods by conducting in-depth interviews with several key people. It can be concluded that the priority program that needs to be implemented first with a concept that can be controlled and easily implemented is "*Redesign UI / UX with the concept of Integrated Smart Transport Mobility*" to provide a new digital experience for airport bus transportation customers.

TABLE 2. IMPLEMENTATION PLAN

No.	Solution Program/ Activities	Timeline				UIC
		Q1	Q2	Q3	Q4	
INTEGRATED SMART TRANSPORT MOBILITY						
1	Idea Generation & Validation <ul style="list-style-type: none">• Brainstorming• Market Research• Mind Mapping• Concept testing• Requirement Gathering• Development Strategy					<ul style="list-style-type: none">• Regulator• Provider• Probris Digital Airport• Probris Digital Business• Airport Service Development• Airport Operation Policy• Commercial Service Division• Information Technology• CGK
2	UI/UX Design <ul style="list-style-type: none">• Information Architecture• Wireframing• Style Guides• Prototyping• Mockups					<ul style="list-style-type: none">• Provider• Probris Digital Airport• Probris Digital Business• Commercial Service Division• Information Technology• CGK
3	Development <ul style="list-style-type: none">• Development• Native/Cross-Platform/Hybrid• FrontEnd Development• BackEnd Development• Product Build• Testing & QA Feedback• Iterations					<ul style="list-style-type: none">• Provider• Probris Digital Airport• Probris Digital Business• Commercial Service Division• Information Technology• CGK
4	Testing & QA <ul style="list-style-type: none">• Finalizing build• Apps store submission• Analytics setup• Apps store approval• Backend deployment					<ul style="list-style-type: none">• Provider• Probris Digital Airport• Probris Digital Business• Commercial Service Division• Information Technology• CGK
5	Marketing & Maintenance <ul style="list-style-type: none">• Apps Marketing Strategy• Apps store optimization• User engagement & retention• Continuous monitoring• Releasing updates & Fixes					<ul style="list-style-type: none">• Provider• Probris Digital Airport• Probris Digital Business• Commercial Service Division• Information Technology• CGK

According to **TABLE 2**, the analysis of alternative solutions with a qualitative approach, the implementation plan will be divided into 2 stages, short-term and medium-term solutions. Short-term solutions refer to solutions that can be implemented within 3-6 months and do not need a large budget (perhaps using operating expenses). Medium-term solutions are programs that require large budget proposals to support the program and are implemented for more than six months. The general implementation plan starts with evaluating the current conditions, gathering customer & stakeholder insights, proposing improvements to new business processes, and execution.

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