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Information Systems Strategic Planning At Startup Company Using Design Thinking Method

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Abstract—Like other industries, logistic services especially for inner city deliveries currently also facing immense changes due digital disruption. New technology, new competitor, new business model and customer behaviour also changed. Therefore, this startup company for logistic and especially in last mile deliveries will make an information systems to support their business by using Design Thinking (DT) approach as Information System Strategic Planning (ISSP). With Design Thinking and Personas approach, hopefully able to create a system with good user experiences and user satisfaction while using the product. The result is defined proper business flow and developing website and android applications to facilitate business activities. The conclusion of this research is Design thinking is one of alternative method that can be used to make strategic planning of information system for company, either new company (start-up) or corporate.

Keywords— *Design Thinking; Strategic Planning of Information Systems; Logistic; Start-u.*

I. INTRODUCTION

In past few years, ecommerce growing rapidly in Indonesia. Starting with online shop using instagram, facebook, bloggers as selling platform until bigger player inecommerce such as Lazada, Zalora, Blibli and others. Indonesia's e-commerce market was estimated at Rp 18 trillion (US\$ 1.3 billion) in 2015, with 37 million consumers from a total population of 255 million[1].

The growth of ecommerce in Indonesia is not aligning proportionally with current logistics system and infrastructure. Several logistics company in Indonesia still using conventional system for delivery process, validating receiver and tracking of the package. Various problems arise from the process of picking up the package from the warehouse until delivered into the buyer or customer[2].

Another problem is the lack of documentation for Proof of Delivery (POD) and still using paper as evidence. Besides that, package tracking also become problematic because the package sender (ecommerce and online shop) or package receiver (consumer) did not have ability to see the status of order history and the carrier of the package. Many problems that occur between delivery services company, consumers and sellers of the goods themselves.

This research was conducted to startup company for logistic and especially in last mile deliveries services for creating Information System Strategic Planning (ISSP) with Design Thinking approach.

Current business process in this company still manual and lack of technology implementation. Starting sender come to nearest branch until sender received notification for completed deliveries.

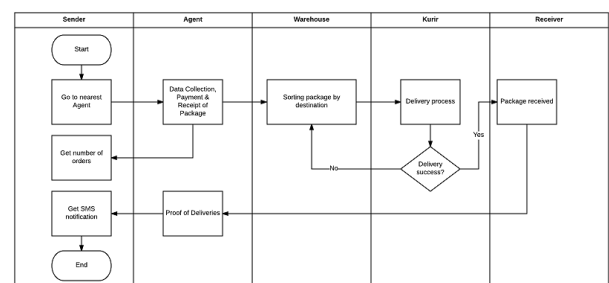


Fig 1 : Current Business Process

Problems that will be discussed in information systems strategic planning include:

1. How to plan and create integrated system application and have unique value from other competitor.
2. How to analyze the needs of applications that can facilitate the company's business operations.

To deal with those problem, a design thinking approach is used and combine with Personas in order to improve communication about the target users within the design team and with other stakeholders[3]. This study focuses on how to develop IS Strategic Planning to help startup company for logistic services have competitive advantage and added value between the competitor.

The purpose of this research is create information system strategic planning in which is align with vision and mission of this company and able to support company's business operations. Also able to analyze on business environment with observation approach, interview, personas and analyze the needs of information systems environment with Design Thinking approach.

II. LITERATURE REVIEW

Information systems is a media for people and organizations, by utilizing technology, collecting, processing, storing, using and disseminating information.[4].

Information Systems Strategy is defined as a company's needs or requests for information and systems that support the overall business strategy. An information system strategy is basically used to define and prioritize the investments required to obtain the ideal portfolio, and is expected to provide the necessary changes within resource constraints and system interdependencies[4].

Information Systems Strategy Planning is important activities to help organizations for finding companies opportunities by use information technology, determine resource requirements to capitalize on those opportunities and build strategies and workplans to realize opportunities and meet companies expectation[5].

Design thinking is the journey for something magical balance between business and art, structured and chaos, instinct and logic, concepts and execution, playfulness and formality, and control and empowerment[6].

Personas are abstractions of a set of actual consumers who share their characteristics and needs. Pesonas manifested through individual fiction presented as a collection of real consumers who have the same character with the real consumer[7].

Researchers also use previous research as a consideration in determining the methodology to be used in research.

Design Thinking is used to create an innovative data storage service to the point of market analysis, create new features and improve technological features and business models before launching into the market[8]. Design Thinking is used to create ICT-knowledge base for SMEs in South Africa[9].Design Thinking is used to design a smart city city project that ensures the participation of more detailed planning by various stakeholders (users) of the system to be built[10].Design Thinking is used to create a website that is expected to increase customer satisfaction and provide more communication to the stakeholders[11].Design Thinking is used to create hardware and software created at Apple [12].Ward & Peppard and Enterprise Architecture Planning (EAP) methods are used to improve existing information systems to achieve competitive advantage[13].Ward & Peppard is used for SI / IT Strategic planning framework at a college (STMIK XYZ) to increasing the business value and creating the competitive advantage of the college[14].Ward & Peppard framework is used to analyze the company's quadrant position using SWOT analysis and recommend refinement of 6 existing information systems and the addition of 6 new information systems to support business strategy[15].

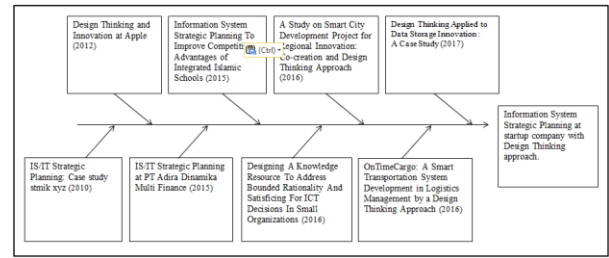


Fig 2 : Previous Research

III. SYSTEM MODEL AND METHODS

Information Systems Strategic Planning at startup company using Design Thinking approach. Design Thinking phase is consists of 3 main parts of Understand, Explore and Materialize. Sub phase from the three main parts, consisting of Empathize, Define, Ideate, Prototype, Test and Implement[16]. With Design Thinking approach, Information Systems Strategic Planning able to be achieve by six phases.

A. Empathize

Empathize phase is consists of 3 parts :observing users and their habits in their daily lives (Observe), interact with the user directly and conduct interviews (Engage), position themselves and think as the user (Immerse). Starting with indentifiying internal and external business environment by Observe, gathering information by using Google Form and think as user.

B. Define

The customer voice in this stage of the design thinking approach can be obtained by many ways. In this paper, we used the personas from both stakeholders[11]. Personas will be used for define and filter all information when we docompany .

C. Ideate

Brainstorm and exploration of creative ideas that meet the needs of users who have been identified in the Define phase. Then, each team member share ideas with one another and collaborate it.[16]

D. Prototype

Prototype phase aims to build a clear picture of the ideas that have been selected. The purpose of the prototype phase is to understand and sort through between which components can be implemented or not. In this phase also measured the impact and complexity of the prototype that has been made. Any changes made will be required feedback from all members.

E. Test

Interface demo to some users who will use such application as courier and online prospective partner. In addition to the potential application users being built, feedback is also required from the internal or team involved in the overall process.

F. Implement

Process of application development is started. Gathering and selecting technology and application will be used.

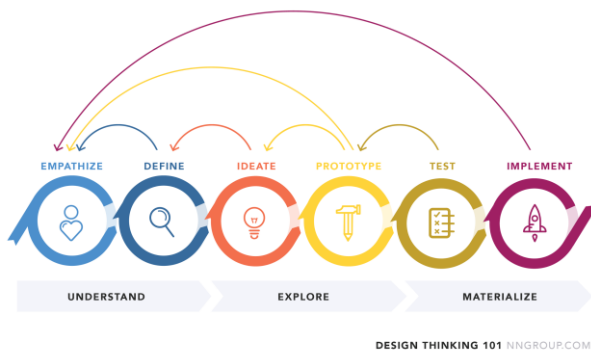


Fig 3: Design Thinking Process

IV. RESULTS

A. Empathize phase

In Empathize phase we observing 2 object, competitor and ecommerce. Observation is not only external business environment but also external IS/IT environment. Conclusion from observe ecommerce is :

- Each shipping address must have zip code, therefore it needs a mapping of zip code in the system to be built. It aims to facilitate the process of data integration with ecommerce.
- Order ID is an order number owned by ecommerce and the item tracking system does not use an Order ID from ecommerce but uses the code provided by the shipping service.
- Each ecommerce has different templates for the size of the printed receipt and the information on the receipt. The information included, among other things, the recipient's name, recipient address, Order ID, Tracking ID and barcode.

Meanwhile from competitors side in Jakarta in particular observations base on their features and services categorized by:

- Shipping costs
- Tracking system
- Proof of delivery
- Raw printed and embedded on packets sent
- API integration

This observation aims to find more value than the application to be built compared to that of competitors as company competitive advantage.

Afterthat, we ask several online shop and ecommerce sellerto fill quesioner through Google form for data validation.

Table 1 : Quesioner result

No	Question	Answer
1	How long you run an online shop business?	9 people (56.3%) have been in business for more than 1 year, 3 people (18.8%) for 6 - 12 months and 4

		(25%) are under 6 months.
2	What kind of your business category ?	43.8% in clothing & accessories, 18.8% in food & beverage, 6.3% in automotive and 31.3% for other fields.
3	What your supporting tools / device for help your business operational ?	93,8% use handphone, 87,5% use laptop, 62,5% use camera, 37,5% use printer and 50% use internet modem
4	Are you have physical store ?	81.3% do not have a physical store and only 18.8% have a physical store.
5	Where your store location ?	18.8% in South Jakarta, 12.5% in North Jakarta, 6.3% in Central Jakarta, 25% in East Jakarta, 12.5% in Bekasi and 25% in Tangerang.
6	What delivery services recently used for shipping your product ?	87.5% using Tiki and JNE, 50% using Go-Jek and Grab, 37.5% using other logistics services
7	Where your package delivery destination ?	81.3% in DKI Jakarta, 43.8% in Bekasi, 50% in Depok and Tangerang, 62.5% in other areas.
8	How often do you use logistics services for your online shop?	62.5% use daily delivery service and 37.5% once a week.
9	Do you use insurance services in the delivery process?	87.5% did not use insurance and 12.5% chose to use insurance for delivery.
10	What type of shipments do you use most often for shipping?	12.5% use 1 day service (express), 81.3% choose 2 - 3 days, and 6.3% choose 5 - 7 days.

From the results of the questionnaire, it can be used as a reference for making strategic planning of information systems. The conclusions that can be taken are:

- Almost all online shop businesses have used mobile phones, computers and printers to run their business. There is no problem in the hardware requirement to use the newapplication.
- The majority of businesses use TIKI and JNE as their shipping medium and use 2 to 3 working days delivery service.

B. Define phase

In Define phase, we uses the Personas and Empathy map methods which is stored in the Mural website (<https://mural.co/>).



Fig 4 : Personas Result.

Personas themselves are used to determine the company's vision and mission, determine the services to be provided, the more value it has, how to run the business. The question is :

1. What is it?
This question is to discuss the vision and mission of the company which will be used as a media brainstorming team in selling the resulting product.
2. What we do ?
This question is more focused on internal activities or features that will be owned by the company to support its business activities.
3. Our services
This question is to answer the services that will be provided to online shop and e-commerce partner.
4. Features
This question is to answer the features that will support the services offered.
5. Unique value
This question is to find more value than existing competitors.
6. How we do it
This question is to determine which strategy will be used to reach the previous questions.

Other problem that we found in define phase from immerce as user and observation with competitor is :

- Unclear change of status or transfer of goods from ecommerce storehouse to courier.
- Uncertainty of time for consumers will get goods purchased through ecommerce.
- Unclear recipient of goods if the recipient of goods is not the consumer itself, such as security guards, helpers, relatives and others - others.
- The process of ordering delivery services to logistics partner who is still manual (manual entry).

- The reconciliation of invoices for e-commerce is still manual and not automatic.

C. Ideate phase

From the problems that have been found in the previous phase, then made the solution presented in the form of tables like the table below:

Table 2 : Problem and Solution

Problem	Solution
Unclear change of status or transfer of goods from ecommerce storehouse to courier	Record and provide status for any change or movement of goods and displayed on the internal website.
Uncertainty of time for consumers will get goods purchased through ecommerce.	Consumers will get notified when the goods will be delivered directly by courier.
Unclear recipient of goods if the receiving goods is not the consumer itself, such as security guards, helpers, relatives and others.	Provides information to an ecommerce containing: recipient name, recipient's phone number, digital photo and signature
The process of ordering delivery service to logistics partner which is still manual (manual entry).	Create an API integration with ecommerce and upload csv files.
The reconciliation of invoices for ecommerce is still manual.	Creating an email containing bills that delivery can be set (weekly or monthly)

From the platform side will be divided into 2 parts, website app and android app. For the website itself is divided into 3 types of users based on each category, among others:

1. Admin dashboard
This website is used by internal employees to monitor the daily courier operations, adding and reducing courier, merchant and ecommerce partner.
2. Merchant dashboard
This website is used by merchants to monitoring of transactions received from ecommerce everyday.
3. Webstore dashboard
This website is used to operational monitoring of ecommerce everyday. In this case ecommerce can have multiple merchants or sellers from multiple places.

For the android app is divided into 2 parts, namely:

1. App Driver
This application will be used by courier for the process of taking and delivery of goods from webstore or merchant to consumers.

2. Merchant and Webstore apps.

This application will be used by the merchant and webstore to perform the validation process of goods that are ready to be sent (change the status of the booking to be wrapped).

D. Prototype phase

To facilitate the creation of a prototype and each member can contribute without having to do face-to-face directly, we select Moqups website (<https://moqups.com>) as online tools. The results of personas are also used to determine the style and themes of the application itself.

We chose a light blue to describe the company's image. The blue color itself reflects the reliability, stability and security in the business[17].

As for design and visualization, we chose to use material design because the material design is the philosophy of the design concept from Google that can describe how the application will look and function in mobile apps[18].

After the prototype phase is complete, the designer will tidy it up and create the interface design of the application. The results of the completed design and to facilitate the demo interface, the team put all screen and interface into the website invision (<https://www.invisionapp.com/>).

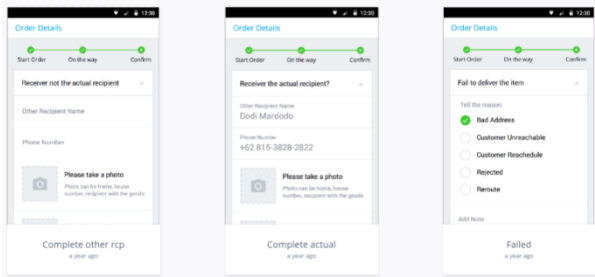


Fig 5 : Android apps Prototype

E. Test phase

The Test phase will begin when we start performing a demo interface to some users who will use the app like courier and online prospective partner. To validate the application that has been made, then we make a demo to Instagram shop.

At the end of the demo interface, the Instagram shop is given a questionnaire about the new application.

Table 3 : Test Phase Questioner Result

No	Question	Answer
1	Will the features provided by this company help your business activities?	100% replied that the features provided by this company can help their business activities.
2	What features make your business easier?	100% replied that the most preferred feature is the create order feature. Order Tracking and Invoice feature becomes the 2nd choice with each value

		of 80%.
3	What do you think about interface (UI / UX) this company website?	60% replied that the interface (UI / UX) of this company website is good and 40% answered the normal.
4	Are you easy to understand and use this application?	100% replied that that application is easy to use.
5	Do you agree with the "Wrapped" status order?	100% of user agree that by order of status "Wrapped" can reduce human error or misunderstanding between shipping service and sender.
6	Would you like if your mobile phone is used to change the status order?	80% of correspondents agree that their mobile phones are used for operational activities and status changes from Booked to Wrapped. Only 20% answered disagreeing of the question.
7	Will you use the services offered by this company?	60% of correspondents are still hesitant to use the services offered by sendos. Only 40% of correspondents will use it.
8	Are the dashboard owned by this company better than the shipping service you have ever used from the design, feature and functional side?	60% of correspondents replied that this company app is better than competitors' apps. While 40% answer may be better.

F. Implement phase

In this phase we try to breakdown technical side of application. Starting decide technology for development in back end, front end and select supporting tools.

Analyze the needs of supporting applications in the manufacture of systems that are being built based on the capabilities or skills set of existing Engineers. Although the applications used are based on the capabilities of the Engineers, but the applications used include applications that are being used by startups or other technology-based companies.

Tasks for each platform and incorporated into the Product Backlog Item (PBI). Product Backlog Item is a place to store system needs that will be presented in the product[19].

V. CONCLUSIONS

The conclusions from the Information Systems Strategic Planning at startup company are as follows:

1. Design Thinking is one of the alternative methods that can be used to create Information Systems Strategic Planning for companies, both new companies (start-up) and corporate.
2. By using Design Thinking in Strategic Information System planning, hopefully user will get good satisfaction and experience (User Experience) while using application.
3. Implementation Design Thinking at startup company still has many shortcomings, among others:
 - a. Not directly tested system built, because not yet launched in market.
 - b. The absence of iterations or product improvements based on feedback consumers who have used the application.
4. Implementation of Thinking Design may will found obstacles from top management of a company that has been growing and running in a long time and has a layered organizational structure.
5. Design thinking can be used by companies who want to make changes to the information system owned at this time and want to adjust the system information desired by the user.

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