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PERANCANGAN PROTOTIPE SISTEM MANAJEMEN VENDOR DENGAN METODE ITERATIVE PROTOTYPING DAN MODERATED USABILITY TEST. (STUDI KASUS : UMKM GIYOMI.ID)

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AFFIRMATION

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UNDERGRADUATE THESIS

Created in order to meet one condition to obtain the degree of
Sarjana Komputer (Bachelor of Computer Science)
on
Information Systems Department
Faculty of Information Technology and Communications
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By:

Erica Maulidina Bening
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Surabaya, 11th July 2019

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APPROVAL

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PERANCANGAN PROTOTIPE SISTEM MANAJEMEN VENDOR DENGAN METODE ITERATIVE PROTOTYPING DAN MODERATED USABILITY TEST.

(STUDI KASUS: GIYOMI.ID)

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ABSTRAK

UMKM telah memainkan peran penting bagi perekonomian Indonesia dalam dekade terakhir. Giyomi.id adalah salah satu UMKM yang bergerak dalam bidang produksi garmen untuk dijual kepada pelanggan akhir baik secara daring dan offline. *Giyomi.id berfokus pada sector garmen wanita dengan jenis proses bisnis Make to Stock. Giyomi.id menyerahkan proses produksi kepada vendor dan kegiatan pemantauan vendor hanya dilakukan melalui telepon, sehingga saat ini proses produksi sering mengalami keterlambatan dan tidak memenuhi perkiraan waktu yang telah dibuat. Bekerja dengan vendor lokal yang memiliki banyak klien lain selain Giyomi.id membuat Giyomi.id harus bekerja keras untuk menemukan vendor mana yang memberikan kinerja terbaik. Pemesanan ke vendor yang tidak didokumentasikan dengan baik semakin membuat pekerjaan Giyomi.id semakin sulit terkait dengan pengolahan data produksi dan vendor.*

Oleh karena itu, perlu dikembangkan solusi teknologi untuk mengatasi masalah manajemen vendor tersebut. Solusi yang diusulkan untuk mengatasi masalah ini adalah dalam bentuk desain prototipe sistem manajemen vendor. Prototipe dibangun berdasarkan proses produksi pada Giyomi yang telah dirancang ulang dalam penelitian sebelumnya. Merancang

prototipe dilakukan dengan metode iterative prototyping *yang memungkinkan umpan balik pengguna di setiap iterasinya.* Usability test *juga dilakukan dengan menggunakan metode* moderated usability test *untuk memastikan bahwa desain yang telah dibuat memenuhi kebutuhan pengguna dalam hal usabilitas. Heuristic evaluation dilakukan terhadap desain prototipe yang telah dibuat untuk meningkatkan desain tampilan antar muka.*

The result of this research is prototype designs of a vendor management system that are expected to produce good visual documentation that can be used as a reference for further research in developing the software.

Hasil dari penelitian ini adalah desain prototipe sistem manajemen vendor yang sesuai dengan kebutuhan user dan menghasilkan dokumentasi visual yang baik yang dapat digunakan sebagai referensi untuk penelitian lebih lanjut dalam mengembangkan perangkat lunak.

Kata Kunci: Produksi, Sistem Manajemen Vendor, Prototipe, Usability Test, Heuristic Evaluation.

DESIGNING PROTOTYPE OF VENDOR MANAGEMENT SYSTEM USING ITERATIVE PROTOTYPING AND MODERATED USABILITY TEST METHODS.

(CASE STUDY: MSME GIYOMI.ID)

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ABSTRACT

MSMEs have played an increasing role in the economy of Indonesia in the past decade. Giyomi.id is one of the MSMEs engaged in garment production to be sold to end customers through an online and offline channels. Giyomi.id focuses on women's garment sector with the type of Make-to-Stock business process. Giyomi.id hands over the production process to vendors and monitors the production activities by phone, so that currently the production process often experiences delays and does not meet the estimated timeline that has been made. Working with local vendors which have other clients besides them makes Giyomi.id have to work hard to find which vendors do give the best performance. Moreover, the production process which is not well documented makes Giyomi.id's work more to process the production data and vendors.

Accordingly, it is necessary to develop technology solutions to overcome vendor management problems. The proposed solution to get over this issue is in the form of prototype design of a vendor management system. The prototype is built based on the redesigned business process that has been made in the previous research, and also from the user stories obtained from interviews. The designing prototype was carried out with the iterative prototyping method that allows user feedback in each

iteration for improvement. The usability test was also conducted using the moderated usability test method to ensure that the design created meets the needs of users in terms of usability. Heuristic evaluation was done to the prototype design to improve the user interface design.

The result of this research is prototype designs of a vendor management system that meets the needs of the user and produces good visual documentation that can be used as a reference for further research in developing the software.

Keywords: Production, Vendor Management System, Prototyping, Usability Testing, Heuristic Evaluation.

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The author would like to express its gratitude to every related party so that this research entitled **Designing Prototype of Vendor Management System Using Iterative Prototyping and Moderated Usability Test Methods. (Case Study: MSME Giyomi.Id)** was completed in time as a condition to fulfill bachelor degree in Information Systems Department of Institut Teknologi Sepuluh Nopember, Surabaya.

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The author would like to apologize as the documentation of this research is far from being perfect, and the author is open to constructive criticisms and suggestions. Hopefully, this book can provide benefits to readers.

Surabaya, July 2019

Erica Maulidina Bening

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CHAPTER I
INTRODUCTION

This chapter presents the general description of the research covering the background, problems, scope, objectives, merit, and the relevance of the research with the sphere of Enterprise System. In addition, this chapter describes the systematics of writing with the aim to facilitate the reader to be able to effortlessly read this paperwork.

1.1 Background

A lot of evidence throughout the world reveals that Micro, Small, and Medium Enterprises (MSMEs) play a crucial role in addressing the impediments of poverty, inequality, and job creation. They are also a critical source of employment or business opportunities for low-skilled women and youth. Even, in many countries, these enterprises are an important growth engine for gross domestic product (GDP) and export of manufactured goods. One peculiarity of the Indonesian economy is that domestic economic activities are dominated by micro, small and medium scale enterprises (MSMEs). In the trade, manufacturing industry and agriculture sectors, the ratio of MSMEs to large enterprises (LEs) is very far with 99% dominated by micro and small enterprises [1]. In addition, according to the time series data officially issued by the Ministry of Cooperative and SME for the period of 1997–2017, the total number of MSMEs in Indonesia increased every year from 39.765 million units (or about 99.8% of the total business units in Indonesia) in 1997 to more than 59 million units by 2017 (or 99.9%) [2].

One MSME in Indonesia chosen by the researcher as the object of the case study for this undergraduate thesis is Giyomi.id. Giyomi.id is an MSME engaged in the production of women's garments to be sold to end customers online through website, marketplaces, or social media and offline through shops and bazaars [3]. Giyomi.id develops its own products ranging from

developing new product ideas, making product samples, producing and receiving finished goods from vendor and marketing. However, not all of the MSME business processes go as expected as there are still several obstacles in the process such as in the production process.

The production process begins with the development of ideas that continuously produce the mock-up design of the product. The process is then followed by making a production plan to determine the number of clothes to be produced, production costs calculation and production timelines that the vendors must adhere to so that products can be released to the market on time. After the planning process, the stage continues with the process of procuring raw materials, which are directly sent to the tailor. Furthermore, the tailor will work in accordance with the work order sent by Giyomi.id in the form of a paper containing the production plan.

The production process depends on third parties, which is the tailor. To monitor the work of the vendors, Giyomi.id still uses conventional methods by phone. Delays in production can sometimes occur because the vendors are not monitored and reminded about their deadlines. This leads to the disruption of the online and offline sales process and can cause financial losses to Giyomi.id. Furthermore, working with local vendors which have other clients besides them makes Giyomi.id have to work hard to find vendors that give the best performance. Giyomi.id must also consider vendor performance in deciding to continue their work relationship.

Previous research was conducted to analyse the production business process at Giyomi.id. The research proposed a redesign of production business processes, simulation of the redesigned solutions, and provided recommendations on technological solutions that can be applied. The research has not yet developed a real solution to the problems themselves.

In this research, the solution to the production process issues will be made in the form of prototype design of a vendor management system. The prototype is built based on user stories

obtained from user interviews. Designing prototype will be carried out with the rapid prototyping method that allows immediate user feedback in each iteration. User acceptance test will also be conducted using the moderated usability test method to ensure that the design created meets the needs of users and have good criteria of user experience. This prototype design is expected to produce good visual documentation and can be used as a reference for further research, which is developing the software.

1.2 Research Problem

Giyomi.id needs a picture of a system that can more accurately manage the production process that is handed to the vendors. So far, Giyomi.id has difficulty in monitoring the progress of vendors to adhere to the timeline. The works of the vendor are not monitored in a timely manner so that the vendor's completion time is frequently missed. Also, defining which vendors having a good performance is currently a difficult task to do by Giyomi.id since they do not have good documentation of every production process. On the other hand, they have to cut inefficient vendors to switch to other vendors with better performance. So, this research aims to investigate the following key research questions:

1. What was the needs and design opportunities of the Giyomi.id vendor management system?
2. How many iterations did the researcher have to gone through to find the feedback from the users?
3. How was the result of the effectiveness and efficiency of the prototype?
4. How was the result of the heuristic evaluations of the design?
5. How was the result of the prototype design that was made in this study?

1.3 Research Scope

In accordance with the research problems that have been described, as for the limitations of the research are as follows:

1. The data that were used in system design are collected and documented from the respective companies (Giyomi.id) and any third parties (vendors).
2. This undergraduate thesis is limited to the development of prototype designs with an iterative method so thus the validation phase will not be done thoroughly.
3. Performance assessment of each vendor is carried out with the criteria defined by Giyomi.id.
4. The respondents involved in the usability test are the owner, employees of Giyomi.id and users who are familiar with the production and warehousing software.

1.4 Objectives

This research aims to design a prototype for vendor management systems in MSME using iterative prototyping and moderated usability test methods.

1.5 Merits

The merits of this research are to give an overview to the users about the system that could help to optimize their production line and the results of system design can become a reference for the implementation of further system development.

1.6 Relevance

This research utilizes the knowledge obtained in Human Computer Interaction, Supply Chain Management and Software design course that were enrolled by the researcher, contributes to the objective of Enterprise Systems Laboratory shown in the diagram which are to improve Operational Excellence, Guide the Growth of Organizations and Increase Individual Productivity. Figure 1-1 describes the research objectives and research topic in Enterprise Systems Laboratory.

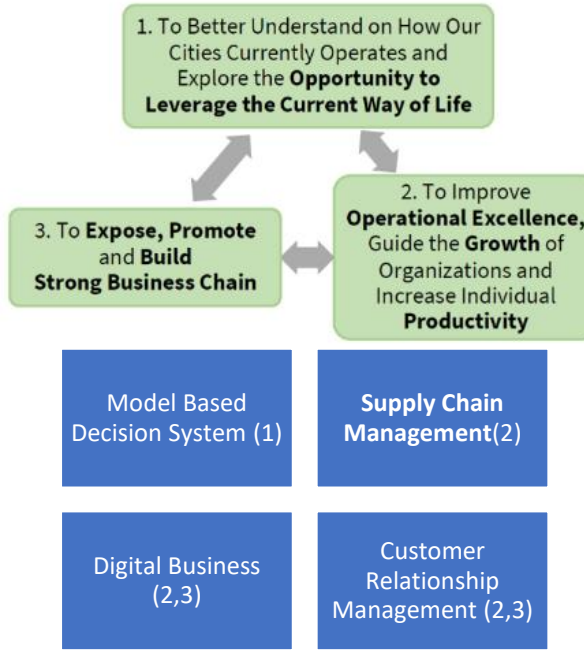

Figure 1-1. Enterprise Systems Lab Research Framework

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CHAPTER II
LITERATURE REVIEW

This chapter presents a review of the literature to be used to construct this research, which includes previous studies, basic theories and methods used for the research.

2.1 Previous Research

In this sub-section will be shown several previous studies that have relevance to the topic of this research. Those studies then will be used as the guidance to construct this undergraduate thesis as shown in Table 2.1 to Table 2.5.

Table 2.1. Designing Attendance Marking Application

Title	Designing Attendance Marking Application for Android Smartphone Using Iterative Parallel Prototyping and Iconix Process as Developing Method
Author, Year	Ashr Hafiizh Tantri, 2017
Overview of the study	This research focuses on designing an attendance marking application using iterative parallel prototyping and Iconix process development methods. The researcher tried to apply the theory from Jakob Nielsen regarding the relationship between the Parallel & Iterative Design with Competitive Testing to create high usability in the application. The prototype was built iteratively from low, medium to high fidelity prototypes. The researcher also made a system design containing use cases, UI prototypes, robustness analysis and sequence diagrams. To validate the system design that has been made, researchers use requirements traceability matrix. Researchers map system design into existing functional requirements to ensure that all functional requirements are met. [4]
Relevance	This paper has a close relationship with this study. The method in prototyping iterations ranging from wireframe to responsive UI will also be applied in this study. The boundary lies in the system design, which not each of them will be identified in this study.

Table 2.2. Designing User Experience of Woman Apparel

Title	Designing User Experience of Woman Apparel Product Search for E-Commerce Website.
Author, Year	Stanley Wijaya, 2018
Overview of the study	This research focuses on user experience for buying women's products on e-commerce website, one reason is that the sales volume of women's products is very high in Indonesia even in Asia Pacific. The researcher wanted to know the pattern that occurs when product searches are carried out by the users of e-commerce websites, as well as to know and find out the basis for choosing product filters. The researcher then developed a prototype based on these findings. The method used is parallel prototyping to immediately get user feedback and SUS score (system usability scale) to test the UX design. [5]
Relevance	This research explained prototyping method as well as the way to test the prototype to the user. This method will be used as the reference to construct the test cases and the relationship with the user needs in this undergraduate thesis.

Table 2.3 Agile Requirements Engineering with Prototyping

Title	Agile Requirements Engineering with Prototyping: A Case Study
Author, Year	Marja Käpyaho, Marjo Kauppinen, 2015
Overview of the study	Agile software development methods has become increasingly popular by claiming lower costs, better productivity, better quality and better customer satisfaction. This research discussed how prototyping can solve the challenges in agile software development method. The goal was to gain an understanding of how agile requirement engineering was practiced with prototyping and whether this helped in solving some problems inherent in agility. A case study of a one-year period large agile project was established to conduct in-depth interviews and qualitative analysis on the prototyping method performed during the project. There are few findings regarding the benefit of prototyping in agile requirement which are: managing comprehensive but low maintenance documentation, updating visual work is more motivating than textual, and achieving sufficient participation of users. [6]

Relevance	This paper explained an iterative prototyping method. Starting from gathering initial requirements, building prototype, reviewing prototype, using prototype in implementation, iteratively. This method will be used as a reference to construct this undergraduate thesis.

Table 2.4 Applying Evolutionary Prototyping Model

Title	Applying Evolutionary Prototyping Model in Developing FIDSS: An Intelligent Decision Support System for Fish Disease/Health Management
Author, Year	Xiaoshuan Zhang, Zetian Fu, Wengui Cai, Dong Tian, Jian Zhang, 2008
Overview of the study	This research has been an explorative study of an Intelligent Decision Support System development using Evolutionary Prototyping. This theory let the researcher mine deeply the users' requirement and improve the quality of the results. However, there were few drawbacks arose while implementing this concept which is: delayed feedback from users, unstable research team and unlimited research and development boundary [7]
Relevance	This research introduces the theory regarding the concept and various understanding of evolutionary prototyping as a breakthrough in software developing system.

Table 2.5 Jawa Timur Park Group Heuristic Evaluation

Title	*Analisis Usability pada Website Jawa Timur Park Group dengan* Heuristic Evaluation
Author, Year	Irsalina Khairina, Suprapto, Niken Hendrakusuma Wardani, 2017
Overview of the study	In this study, the researcher observed the usability of *Jawa Timur Park* Website using 10 heuristic evaluation principles. There were two evaluation stages conducted to better understand the problems of the website in terms of usability. From the research, it was found that the H8 - Aesthetic and Minimalist Design principles got a lot of shortcomings [8].
Relevance	This work provided the foundation in conducting the heuristic evaluation.

2.2 Theory Review

This sub-section will discuss the theories and concepts related to the topic of this research.

2.2.1 Micro, Small and Medium Enterprises

Micro business is a productive business owned by individuals and/or individual business entities that fulfill the criteria for micro-businesses as regulated in Law Number 20 of 2008 concerning Micro, Small and Medium Scale Enterprises. Small Business is a productive economic enterprise that is independent, carried out by individuals or branch business entities both directly and indirectly from Medium or Large Businesses that meet the criteria of Small Businesses.

Table 2.6. Criteria of MSMEs Business

Business size	Criteria	
	Asset	Turnover
Micro	Maximum Rp50mil	Maximum Rp300mil
Small	> Rp 50 mil – Rp 500 mil	> Rp 300 mil – Rp 2,5 bil
Medium	> Rp 500 mil – Rp 1 bil	> Rp 2,5 bil - Rp 50 bil

Medium Enterprises are productive economic businesses that are independent, carried out by individuals or business entities that are not subsidiaries or branches of companies that are owned, controlled, or become part of either directly or indirectly with Small or Large Businesses with a total net worth or annual sales proceeds. So that MSMEs are businesses categorized based on the number of assets and turnover as shown in Table 2.6.

MSMEs have a very significant role in the Indonesian economy, both in terms of the number of business units, employment, and contribution to gross domestic product (GDP). In 2011, the number of MSMEs reached 55.2 million units, which meant that 99.9% of the economic sector was dominated by MSMEs. With

that number, MSMEs absorb 101 million workers or 86.6% of the total workforce of 117.5 million and produce gross domestic product (GDP) of Rp 4.303 trillion or 57.9% of the total Indonesian GDP of Rp 7.427 trillion [9].

The object examined in this research is one of the MSMEs in Surabaya, which is engaged in garment production to be sold to end customers online and offline called Giyomi.id. Therefore, it needs to be studied the criteria for micro, small and medium-scale enterprise. Giyomi.id focuses on developing women's garment with the Make-to-Stock business process type. Giyomi.id was established in 2013 as a reseller, and in 2014 Giyomi.id business began to develop and the owner's desire to develop their products emerged by collaborating with local tailors. Starting with online business, now Giyomi.id has two offline stores in Surabaya and Malang [10].

In their business process, Giyomi.id handed part of their works to vendors, especially for production process. Hereby an explanation of the structural function of Giyomi.id as well as the parties that are involved in their production process:

1. Giyomi.id

Giyomi.id is led by a CEO who is the owner and founder of Giyomi.id. The functionals in Giyomi.id are as follow [3]:

1. Design: This functional is responsible for researching trends and designing clothes.
2. Purchasing and Production: this functional is responsible for purchasing fabric and delivering it to the sewing vendor and monitoring the production of clothing at the vendor.
3. Warehouse: This functional is responsible for the flow of goods in and out of the warehouse.
4. Admin Sales: Responsible for sales activities at Giyomi.id
5. Creative Team: There is a part of this creative team, namely content creator, graphic design and photographer. This function is responsible for creating content such as posters, photos and videos for promotion.
6. Event Coordinator: Responsible for managing the bazaar.

7. Accounting: Responsible for managing finance in Giyomi.id.

2. Vendor

In the production process, Giyomi.id entrusts the production of finished goods to the vendors. Vendors consist of tailors and washing vendors. The flow of goods from the tailors and end up at the Giyomi.id warehouse is the responsibility of the vendors, so Giyomi.id only has responsibility to provide work letters and to monitor the production.

2.2.2 User Experience (UX)

Hassenzahl [11] defined that the good UX is the repercussion of fulfilling the human needs for autonomy, competency, stimulation (self-oriented), relatedness, and popularity through interacting with the product or service. Based on ISO 9241-210 2010, user experience is considered as the perception and user reaction of the usage of a product, system or service. User experience defines whether or not the users will use the product continuously [12]. UX can then be assessed and tested to prospective users. The application testing protocol is useful as a reference and guide when conducting the usability testing process [5].

2.2.3 Prototyping

Prototyping lets the researcher to modelized an evolving design that is comprehensible to users and solicits feedback as much as possible. User involvement is very favorable to the user acceptance in the final product as they perceive that they are involved in the development of the system [13]. To better understand the workflow of prototyping methods, Käpyaho and Kauppinen [6] clearly stated the flow of rapid prototyping process they profess for their case study shown in Figure 2-1.

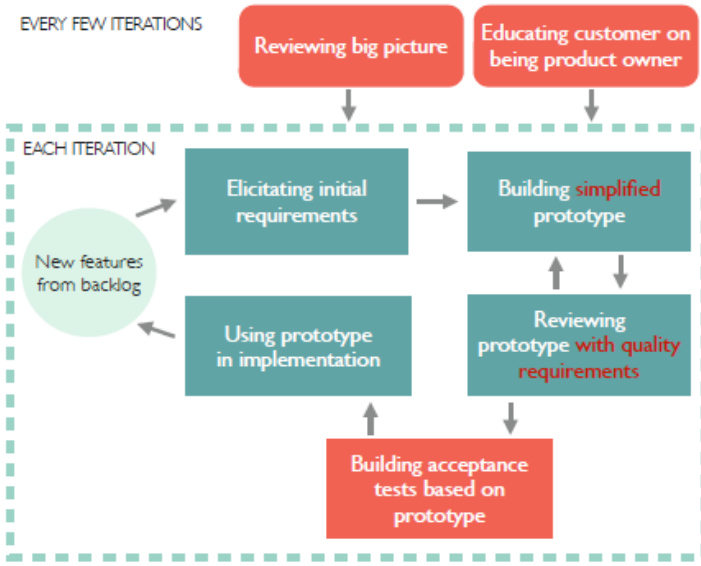

Figure 2-1. Rapid Prototyping Method

The initial trigger of the process in this case study is the existence of backlog which refers to a list of required features that was desired by the customer described as user stories. In the phase 1, requirements elicitation was carried out in the scoop of one iteration. This phase is done by doing a brainstorming session with few customers to gain some preliminary ideas of the features they wanted to implement in the following iteration. Right after the initial requirement meetings, building prototype commenced in phase 2. Followed by reviewing the prototype in phase 3. The request to change the prototype could come up in the review and will invade in the next iteration. Last in the phase 4, the implementation of prototype will be done. The prototype will be publicly published to the whole team so that the backend developers could mold the prototype to build software architecture design.

In order to be able to design a prototype, the author has found two platforms that have quite complete features, namely:

1. Axure RP

Axure RP is one of an example of rapid prototyping software tools, which provides wireframing, prototyping and specification tools needed for rapid prototyping. Axure RP provides graphical user interface for creating mockups of websites and applications. Axure RP can help users generate fast ideas to immediately improve the design and obtain direct feedback [14].

2. Balsamiq Mockups

Apart from being an industry-standard in interactive wireframe software, Balsamiq comes in plugins, web applications and desktop forms. Balsamiq Mockups is a tool to design user interface or low fidelity prototypes wireframing. Balsamiq can be used to generate digital sketches of ideas to facilitate discussion and understanding before any code is written. Collaborative work is possible using Balsamiq so that the designer and developer could share the mockups to collaborate [15].

Table 2.7. Comparison of Prototyping Platforms

Criteria	Axure RP	Balsamiq Mockups
Wireframing prototype	Yes	Yes
License	One-year student license	Free trial 30 days
Dynamix panels	Yes	No
Library	Pre-installed, online, own	Pre-installed

After observing and trying the platforms through free trial version, researcher chose to pick Axure RP as the tools used in this research based on the consideration in Table 2.7. Axure RP is a more comprehensive wireframing tool that uses a simple drag-and-drop interface yet allows users to assign multiple

states to each part of the work by creating Javascript-like conditions such as OnClick or OnLoad. Accordingly, Axure creates with the Dynamic Panels, Masters and the ability to work with different viewports [16].

2.2.4 Usability Testing

Usability testing is one example of the user research. Schumacher offers one definition [17]:

User research is the systematic study of the goals, needs, and capabilities of users so as to specify design, construction, or improvement of tools to benefit how users work and live.

Customer surveys, usability testing, A/B testing, and site visits are example of user research. Jeff Sauro and J.R Lewis mentioned to emphasize usability testing than other user researches due to the following concern [18]:

1. Usability testing remains a central way to determine whether users are accomplishing their goals.
2. Both authors have conducted and written extensively about usability testing.
3. Usability testing uses many of the same metrics as other user research techniques (e.g. completion rates can be found just about everywhere).

2.2.5 Heuristic Usability

Heuristic evaluation is a cost-effective way to evaluate user interface to find usability problems. Heuristic evaluation is the most informal method which involves usability specialists in judging whether each dialogue element follows established usability principles [19].

Jacob Nielsen discovered 10 principles of interaction design which are Visibility of system status, Match between system and the real world, User control and freedom, Consistency and standards, Error prevention, Recognition rather than recall, Flexibility and efficiency of use, Aesthetic and minimalist design, Help users recognize, diagnose, and recover from errors, and last is Help and documentation [20].

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CHAPTER III
METHODOLOGY

This chapter describes the methodology including the diagram and the descriptions of the methodology to be used in this research.

3.1 Methodology Diagram

This sub-section presents how the stages of the research systematically implemented as shown in Figure 3-1.

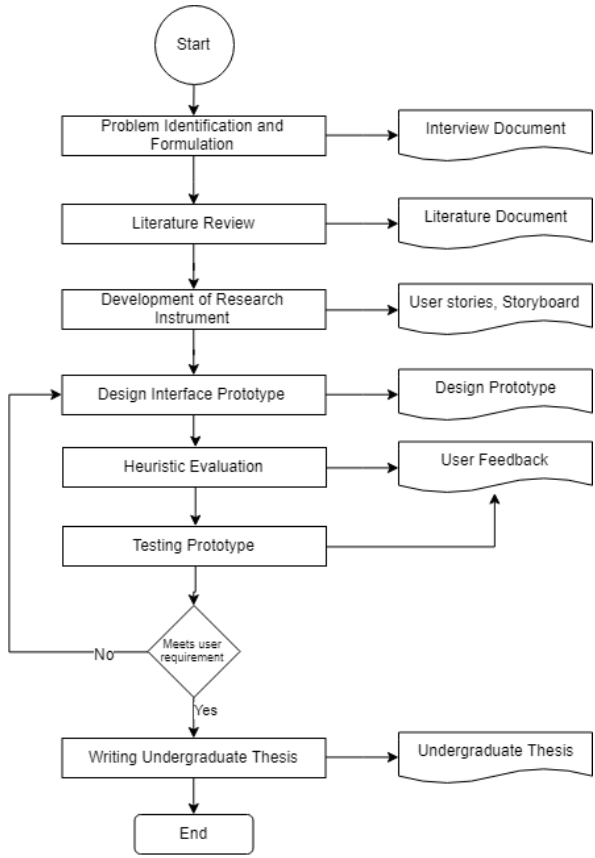

Figure 3-1. Methodology of the Study

3.2 Methodology Explanation

This sub-section presents the methodology that will be used as a guide for completing this research along with a description and explanation of each of the stages. The method used in this research is a qualitative method as it is a flexible and adjustable method to follow. While the strategy used is linear strategy to determine the sequence of steps that are simple and understandable. Figure 3 shows the stages of the research. The followings are the descriptions of each of the stages:

3.2.1 Problem Identification and Formulation

The process of identifying the problem begins by conducting an interview with the owner of Giyomi.id to better understand the problems faced by the company. This preliminary study was conducted with the aims to observe and to find the problems to be researched in this undergraduate thesis. The researcher also formulates the problem to be resolved, the limitations of the study, research objectives, the benefits of research, and the relevance of the study with the scope of the researcher.

3.2.2 Literature Review

In this stage, the literature review phase is carried out by collecting the information regarding the topic that will be raised to understand the topics and frameworks used for this research. A study is done on some literature from Scopus journal, conference paper and other scientific articles as a medium for compiling the literature review. This phase is useful to build a strong basis in conducting this research and to look for prior research on related topics. This phase deals with the basic concept of supply chain production management, dashboard, user acceptance test and especially about making mockups or prototypes for monitoring system.

3.2.3 Development of Research Instruments

Research instruments are developed to help the researcher in retrieving the necessary data regarding the research. Qualitative research will be held by conducting interviews, documents

surfing and field observations to gain information and to further develop the concept of the problem [21]. The interviews were originally meant to be conducted in both parties, Giyomi.id and the Vendor, in order to have an insight from both perspectives. Giyomi as the lead user or main user is a very important user in developing and implementing the product. Usually, this main user demands new system criteria [22].

At this stage, the required data will be defined by carrying out details of each data and the method of collecting the data. The design of data requirement is then used as a reference to collect data from related sources. This aims to clearly define the problem so that effective solutions can be constructed.

In this stage, the output will be in the form of user stories. User stories are brief and clear descriptions of a feature told from the perspective of the customer or user as the person who desires the new capability of the system [23]. The use of user stories in many software development projects has been widespread. There are few popular tools from conventional to contemporary like spreadsheets, databases, Wikis, to DotStories that have been used in creating user stories [24].

The user stories that were obtained then will be analysed to determine the user needs of this system and design opportunity based on the pain points of the current condition in Giyomi.id. This way, the researcher can draw a storyboard that gives the user an overview of the most important functionality that becomes the core of the application.

User flow can then be created to define how users take steps to achieve a certain goal, by sketching low fidelity wireframe in the form of paper prototype. By clearly declaring the flow, the researcher will be able to use it as the basis to gradually construct the prototype in the following phase.

3.2.4 Design Interface Prototype

This phase mainly focusses on developing the mockups of the system by designing the prototype. The first step in doing low

fidelity prototype was using paper prototypes as the easiest tool to gradually change the design based on the feedback from the user. As the iteration went recursively, the prototype designs were constructed gradually to make it clear for user to use it. The flow of prototyping methods is clearly pictured in Figure 3-2.
The tool used to build the mockups after paper prototype is Axure RP. This tool is very useful since we adopt rapid prototyping method. In this method, the functionality to be design will be developed in stages at each iteration [16].

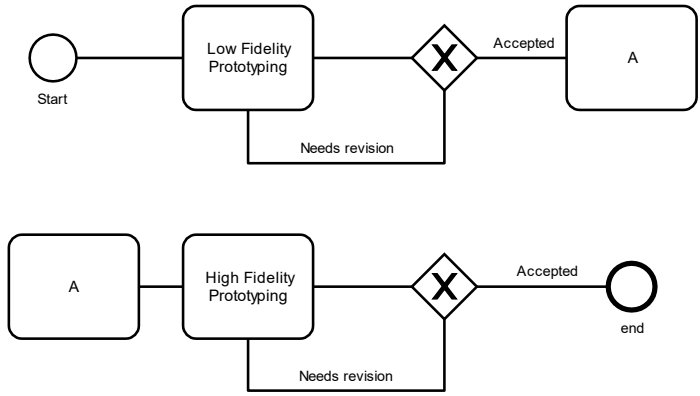

Figure 3-2. Rapid Prototyping

3.2.5 Heuristic Evaluation

Heuristic evaluation is a usability engineering method for finding the usability problems in a user interface design as part of an iterative design process. During the evaluation session, the evaluator goes through the interface several times and inspects the various dialogue elements and compares them with a list of recognized usability principles (the heuristics).

3.2.6 Prototype Testing and Validation

To ensure that the design prototype that has been made meets the needs of the user, Moderated Usability Testing was conducted. This testing method is practiced by professionals

looking to obtain feedback from monitored users. In this case, the users to be tested are the potential users from Giyomi.id and users who have experience in using production or warehousing software. Whereas the researcher here acts as the moderator for the testing.

Moderated Usability Testing or also known as Lab-based test, let the users to figure out how to complete the tasks on their own. Asking for assistance to the moderator is permitted, however the moderator generally just referred the user back to the task description. After completing all sessions, the researcher analyzed the task completion data, task times, and subjective ratings. Notes and audiotape of test sessions need to be reviewed as well. Based on this information, a master list of usability issues uncovered by the test is developed to construct new design opportunities for the following iteration [25]. The moderator could obtain immediate feedback from the users to then bring it back to the design stage iteratively.

The researcher measured the effectivity and efficiency of the design by using usability matrix for effectivity and efficiency. After all the prototype designs of the user flow have been successfully built and received well by the user, validation has been reached. This validation cannot be carried out thoroughly because the output of this project is a prototype design, which could not enter implementation phase.

3.2.7 Writing Undergraduate Thesis

At this stage, any result of the data analysis that was found will be recorded and summarized into a single document, an undergraduate thesis. Any conclusion and suggestions in this research will also be included inside the document as an input for further research. The process of writing the undergraduate thesis is highly scrutinized under the institution in order to satisfy the institution’s requirement.

3.3 Methodology Summary

The methodology summary describes the methodology carried out in this study, starting from the series of activities, objectives, inputs, outputs and methods used as found in Table 3.1.

Table 3.1. Methology Summary

Activity	Objectives	Input	Output	Methods
Problem Identification and Formulation	Observe and to find the problems to be researched in this undergraduate thesis.	Information from Giyomi	The problem, the limitations of the study, research objectives, the benefits, and the relevance of the study with the scope of the researcher	Interview
Literature Review	To understand the topics and frameworks used for this research	The problem, literature from Scopus journal, conference paper and other scientific articles	Literature review	Reviewing paper.

Activity	Objectives	Input	Output	Methods
Development of Research Instruments	To retrieve the necessary data regarding the research	Information from Giyomi, production documents.	User stories, Pain Points, Design opportunities.	Conducting interviews, documents surfing and field observations
Design Interface Prototype	To develop the mockups of the system by designing the prototype	Design opportunitites	Paper prototype, axure prototype.	Iterative Prototyping
Heuristic Evaluation	Finding the usability problems in a user interface design	Prototype	Feedback, design opportunities	Heuristic Evaluation
Prototype Testing and Validation	To ensure that the design prototype that has been made meets the needs of the user	Paper prototype, Axure prototype.	Feedbacks, design opportunities	Usability Testing

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CHAPTER IV
RESEARCH INSTRUMENT

This chapter explains the stages of defining the research instruments before proceeding to the execution stage. This stage is used as a guide in conducting data gathering. The data requirement and way to process the data will also be presented in this chapter.

4.1 Current Production Lane

This research is a repercussion of the previous study related to the problems in the production process of Giyomi.id, therefore the description of the production process is obtained from the results of a document review from this research [26]. To strengthen the results of the review, at the following stage there were also observations and interviews with Giyomi to better understand the flow of the production process while finding out the user's needs and pain points of the current process in managing the vendor.

Observations and interviews were carried out by looking at the owner's perspective as the person in charge of production. The production process begins with the creation of work order by Giyomi, which will be further called SPK (*Surat Perintah Kerja*) in this study. SPK contains information about the product that Giyomi.id wants to produce, including document creation date, name of the product, name of raw material, amount of raw material, desired amount per size, color, estimation of completion date and the vendor allocated.

After creating a new SPK, the owner will send it to certain vendor along with the raw materials and the mockup design by WhatsApp. The production is done with three main stages of work, namely cutting, sewing and finishing. When the process is running, the Giyomi owner follows up the project to the vendor to find out the progress and production constraints by phone. After the product is finished, the finished goods will be sent to the Giyomi warehouse for Quality Checking (QC). QC

is performed by the warehouse employee to check the quality of the delivered goods. If there is a reject item, the employee will ask the vendor to take back the item to be repaired first. The vendors sometimes ship the finished goods in a single shipment, but more often it is done in batch.

The results of these observations and interviews are shown in the form of BPMN from the production process which can be seen in the Appendix A. Production Process in Giyomi.id. In addition, observations and interviews were also conducted at one of the vendors. It aims to strengthen the facts that have been obtained by looking directly at the production process in vendors, which is reinforced by the discovery of production artifacts. The production artifacts found are the work order from Giyomi which will be further called SPK in this research, the pictures of mockup design, the pattern model from cutting stage and the goods receipt note, as can be seen in Appendix B. Observation Artifact.

4.2 User Needs and Desires

In order to come up with a structure or information architecture, user needs were obtained in the form of user stories as a result of the functional specifications and content requirements analysis which have been defined in the previous phase along with the research findings in mind. User stories were generated from the interviews and adjusted to operational needs based on the results of observations and document analysis.

In creating user needs, users were involved in providing feedback for further develop the stories. Feedback was used to adjust what has been analyzed from the results of interviews with the current condition, especially the context of the time, priorities of each story and for adjustment of user needs. This stage went iteratively before entering the next stage. The results of this stage are in the form of user stories. There were two users included in the stories which are the owner and the production employee, with stories grouped into four types of stories as some of them shown in Table 4.1.

Table 4.1. Sample of User Stories based on ID

ID (A)	As a (B)	I want to.. (C)	So that.. (D)
SP1	Owner	See the progress of each running SPK	I save time in checking SPK progress because the SPK progress is managed by my employee.
PG4	Owner	Add notes obtained from the results of vendor progress update of a running SPK	I can directly insert vendor evaluation notes from each update to avoid forgetting, so that further updates can be made effectively with question from the evaluation that has been made. In addition, the owner can simultaneously control the obstacles of the progress through the application to be able to shortly analyse things in production lane.
VD3	Owner	Get information about the good or bad performance of a vendor.	I can consider the possibility of continued collaboration, and the possibility for cutting vendors who have performance which is below expectations at the end of each month.
RO3	Owner	Monitor the update of ongoing SPK from the application because the update is done by the Employee.	I know in advance the possibility of ongoing SPK being overdue without asking the progress to the warehouse Employee, production Employee, or accounting Employee, so that I can instruct my Employee to intensely follow up the vendor to avoid delay in production

To further understand the stories obtained from the user, given Table 4.1 which composes of some stories taken from Appendix C. User Stories. Codes are given to all user stories to help in categorizing them. The codes were divided into 4 types with the following information:

1. SP: The stories are related to the process in documenting and managing the SPK.
2. PG: The stories are categorized based on the progress happens to the SPK
3. VD: The stories are related to vendor and their efficiency.
4. RO: The stories are categorized based on roles.

The most important part of the user story is a goal. The goals are something that the companies want their target audience to perform. The goals are here in the context of the benefits that are reflected in column D. The benefits can be in the form of long-term benefits, but the direct benefits are preferred. A clear definition of this benefit will affect the clarity of defining user needs afterward.

In creating user stories, there are few common mistakes that the researchers usually do, including:

1. The researchers do not provide code for each created user story, whereas the code can simplify the work especially in helping them to categorize user stories. The code can also make it easier for users to understand the flow when it is needed to validate the stories.
2. Column C represents what the users want, whereas column D should be about the benefit of those desires. Commonly, researchers do not clearly state those benefits from the interview analysis. The researcher often doesn't write down the immediate benefits in column D.
3. Researchers often lose context in writing user stories. Adverb of time is a very important thing to clarify the context.

This phase was iteratively done based on the feedback obtained from the users. There were additional stories in each iteration,

but there was also a reduction depending on the feedback from the user. Some of the points in user stories were excluded in this subchapter. This is because they were not aligned to the current condition from Giyomi, which then be called the desires of users. For example, when conducting the interview, the owner said that it needs for them to know the summary of the highest score vendor when they are in the "creating a new SPK" page so that they can allocate those SPK to the right vendor.

The researcher observed more on this point and found out that Giyomi holds a weekly meeting to plan the production which includes selecting the respective vendor. When holding the meeting, the Employee have not written any SPK because they just focus on what kind of products they want to produce and which vendor they want to assign. Therefore, the researcher stated that the urgency of displaying the vendor score rate in the "creating new SPK" page is so low. The users might need this information on another page with more informative details of the score obtained by the vendor to be able to compare the performance of each vendor. Other desires found while filtering the users' stories are described in Table 4.2. User Desires.

Table 4.2. User Desires

ID	Desire	Adjustment
PG7	The Employee wanted to be able to upload the bills from vendors for each finished product delivery so that they won't be confused about which SPK that need to be paid. And later they can remind financial Employee to make payments for the bills.	This point is just the desire of the user since the financial Employee doesn't directly use the application so there is no need to remind her to pay by uploading the bills to the system.

ID	Desire	Adjustment
VD5	The Employee wanted to see a summary of vendor ratings when creating a new SPK so that they could allocate the new SPK to the vendors which have a good track record.	Users have already known which vendors should be allocated through the weekly meeting, far before they make new SPK. Instead, the user needs to know the information of vendor track records on another page other than in creating a new SPK page.
VD6	The owner wanted to get the information about each production capacity of a vendor (human resources and machine) so that he could allocate new SPK to a vendor who has a suitable production capacity.	In every case before making new SPK, the management holds a meeting to discuss the product that will be procured not to mention the capacity of the vendor which will be capable of doing the production. Therefore, this point is also just the owner's desire.
SP3	The users wanted to be able to update the information of ongoing SPK because sometimes the vendor doesn't produce the exact same amount of product as it is stated in the old SPK.	This case happened rarely. After interviewing the vendor, it is found that the vendors always stick to the number of products stated in the SPK. So, this feature is just the desires of the users.
SP13	The Employee wanted to give additional processing time in making new SPK,	After conducting further interviews with vendors, it was found that the processing time of

ID	Desire	Adjustment
	especially for vendor that has to work on detailed accessories so that they can save time to calculate the estimated completion time as it will directly be added to the default completion time.	accessories was included in the sewing stage time. So, there is no need to give additional completion time for the vendor. Thus, this is just the users' desire.

4.3 Summary of User Needs

Capturing user needs is a process of engaging users to better understand their problems, processes, goals and preferences. Researcher needs to know how to extract the needs and desires of the users from these stories. Norman's work stressed the importance to fully explore the needs and desires of the users and the intended uses of the product [20].

Also, the user-needs let the researchers capture what they want to achieve with the design, not how. It encourages researchers to see needs as verbs instead of nouns that describe solution. For instance, users don't need a dashboard (noun) — they need to digest varied information in one place (verb). The nouns are possible solutions to users' needs, but it might not be the best or the only solution [27].

4.3.1 Insights

After all the desires were excluded from the needs of the user, the researcher found many stories that had similarities in several aspects. There was goal from each story that was interpreted as an insight for the emergence of those stories. Defining insights or goals help advance presumptive solutions from specific features towards deep understanding about the core problem that the user needs to solve. From this, the researcher tried to group those stories to simplify the list. All the user-needs are

summarized into the following six insights as shown in Table 4.3 [27] [28].

Table 4.3. User Needs Motivation

No	Categories	Number of Stories
1.	Do efficient work and save time in production process	10
2.	Reduce error rates	3
3.	Structured documents	4
4.	Faster communication	2
5.	Avoid confusions	2
6.	Avoid forgetting	4
Total		25

The highest number of stories for those categories is the need to do efficient work and save time in production. As for the current condition, Giyomi works manually for almost all the documents in production. Users create the SPK in Microsoft Excel, print it out and glue it in the accounting book for documentation. Giyomi wants to save time in doing all those and to make the structured document for better work on analyzing the progress of SPK and the performance of the vendor. The complete user needs which are mapped to the motivation categories can be seen in Appendix D. Mapped User Needs .

Since what is shown in this chapter is a verb, so it cannot be used as a guidance for prototyping. Therefore, it is necessary to describe the noun in the form of a proposed solution. Before being able to generate a proposed solution, researchers first described the pain points of the current conditions in the company to be able to make a clear and effective design solution. Pain points contain problems that currently occur in the Giyomi production process. Descriptions of pain points are

very crucial so that the user-needs match the current problems to further construct the design opportunities which can solve these problems themselves.

4.3.2 Pain Points

The description of pain points will further clarify the results of user needs. Pain points show the shortcomings and problems of the current production process. In this study, the pain points were associated with the user needs to find direct benefits from each need. Pain points are generated from the analysis of user needs which are then reassured by conducting interview.

Users pointed out the problems they are facing every day in the production process especially the problems related to the production progress and the performance of the vendor. For example, in the interview, it was found that users write down the SPK in excel software. From this, it is known that the users have to manually input certain values like document creation date, estimation of the completion date, vendor name, or other values for multiple times whenever they are about to make new SPK. After creating those SPK, users need to print it out and glue the paper to the accounting book. There is nothing that can be done by these books relating to monitoring the progress of SPK. Thus, this became the pain points of the production process related to the first need-finding which is to do efficient work and save time in the production process.

Table 4.4. Pain Points

Categories	Context	Pain Points
Do efficient work and save time in production process	SPK is manually made in excel	Users have to manually enter certain values multiple time. For example: document creation date, order date.
Avoid Forgetful-ness	Completed SPK will be marked “Closed” in the top of the document.	The owners forget about the vendor evaluation from each SPK they have completed

The second example for the problems in the production process was to find vendor with good performance for SPK allocation. Currently, Giyomi chose the vendor they would allocate the SPK to by looking only at the previous order history. Giyomi never properly evaluates vendors from each SPK they have completed. This is because Giyomi still does not have a good record of aspects of vendor performance evaluation. This is very related to motivation to avoid forgetting in evaluating vendors on their performance. Samples for pain points obtained in this study is shown in Table 4.4.

4.3.3 Design Opportunities

Problems that have been delivered in the form of pain points were analysed to produce design opportunities in developing a prototype. The detailed description of pain points is needed to be able to produce a solutive prototype design. From the previous example, it was stated that the users need to save time in inputting certain values when they are making new SPK, also they need to use the SPK to monitor the progress of the vendor. These pain points generated the design opportunity which is to create a page where users can write new SPK in the application which can simultaneously generate default date and have the option for the default value. All these elements can then be used as the basis for creating a design that can be used to monitor the progress of the SPK. Thus, this design opportunity meets the need-finding which is to do efficient work and save time in the production process. Example of design opportunities are shown in Table 4.5.

Table 4.5. Design Opportunities

Categories	Context	Pain Points	Design Opp	ID
Do efficient work and save time in	SPK is manually made in excel	Users have to manually enter certain values multiple time. For example: document	Creating page where users can write new SPK which simultaneously generate default date.	DO1-1

Categories	Context	Pain Points	Design Opp	ID
production process		creation date, order date.		
Avoid Forgetful-ness	Completed SPK will be marked "Closed" in the top of the document.	The owners forget about the vendor evaluation from each SPK they have completed	Adding evaluation page right after user close the status of SPK	DO6-3

For the second pain points, user needs to avoid forgetting especially in evaluating and rating the vendor performance as users need to know the rate of each vendor. These pain points generated the design opportunity which is to add evaluation page right after user close the status of SPK and to determine vendor assessment standards based on their performance during completing the SPK. There is also an opportunity to automatically calculate vendor performance rate based on the progress they have made. All the pain points and design opportunities were mapped with all motivation of user stories as can be seen in Appendix E. Pain Points and Design Opportunity

4.4 Storyboard

In this part, the researcher draws a storyboard to give the users an overview of the most important functionality that becomes the core of the application. Storyboards are used as promotional tools that provide attraction to prospective users to use this application.

In this study, two functionalities of the design were chosen to be the highlights of the storyboard. The first is the ease of updating and sharing the progress of the vendor described in Figure F-1. The design gives convenience to the Employee to update the progress from vendors to the owner, so wherever the owner is, he can monitor the performance of the vendor and at the same

time can make quick decisions for vendors with poor performance.

The second function is to provide convenience to users to find out the performance of each vendor by looking at their track record of SPK that has been completed. It is very important for the users to know their vendor performance since they often held a weekly meeting to decide which vendors to be allocated for the new SPK. With this ease, users are helped to better decide the right vendor. This highlight can be seen in Appendix F. Storyboard.

CHAPTER V
CONSTRUCTING PROTOTYPES

This chapter serves the iteration for the low-fidelity prototypes in a form of paper prototype to the high-fidelity prototypes in Axure RP software. Non-formal usability test is also explained in this chapter which was used as a method to find out the mental model of the user to recursively improve the design to further determine the suitability of the interface with user requirements.

5.1 Low Fidelity Prototyping

This stage focuses on creating a user interface design using paper prototype which meets with the users' requirement. There were two iterations to gather users' mental model that will be further explained in this stage.

5.1.1 Initial Stage

The development of a low fidelity (lo-fi) prototype was started by making a paper prototype according to the design opportunity that had been obtained. In this study, two iterations were carried out with 3 users in each iteration to obtain the problems found in the design. The iteration to gain feedback from users is also called non-formal usability test in which purpose is to know the mental model of the users. Mental model is what the user believes about the system at hand [20].

A mental model is shaped from experience, habit and thus each individual constructs their own mental model. The mental models of each individual can also be stimulated from elsewhere, for instance looking at other users' work, or talking to other users. Therefore, usability test was done separately to avoid bias with different users for every iteration.

In this stage, the constructing of paper prototype and the testing ran recursively, where the results of the testing were used as the basis for the design revision for the following iteration.

The respondents for this stage were chosen with the criteria of users who had experience in using production or warehousing software. In the first iteration, three users were selected to be interviewed to give comments to the Lo-Fi design. The identification of of each user in the first iteration is shown in Table 5.1.

Table 5.1. Respondent for First Iteration – Non-formal

No	Name	Software Used
1	Yudha Prasetya (owner)	Jubelio, Dealpos
2	Gamal Akbar	SAP
3	Fauzan Pinantyo	Odoo

In the second iteration, three different users were also selected to be interviewed to improved Lo-Fi design. The selected users were deliberately different from the previous iteration in order to give a new perspective to the user towards the improved design to avoid bias from the previous version. The identification of each user in the second iteration is shown in Table 5.2.

Table 5.2. Respondent for 2nd Iteration – Nonformal

No	Name	Expertise
1	Hipzul Ahmad Jabbar	SAP
2	M. Farchan Ramadhan	SAP
3	Niken (accounting)	Jubelio, Dealpos

5.1.2 First Iteration

In the first iteration stage, parallel prototyping was done by presenting 15 prototype design composes of design options of the login page, home pages, SPK pages, SPK details pages, create new SPK pages, vendor pages, vendor details pages, and

vendor evaluation page. Parallel prototyping means there are two design options for one type of page to give users more options to choose. The users were given the freedom to express their opinion on the two options. The first version of the Lo-Fi prototypes can be found in Appendix G. Design 1st Iteration.

Feedbacks from the users were used as the guideline to set the flow of the application and to find if something was out of detection from the users. Users were shown one by one piece of the prototype, and they were asked to state the first thing that comes to their mind when looking at those prototypes. Some users couldn't notice certain features inside the design and thus it could be noted that something was wrong with those features.

For example, among the options for homepage design as shown in Figure 5-1, all users tend to choose the first design option of the homepage because they stated that the progress bar was the feature that attracted them first, and then three squares at the top come right after. All users did not notice the existence of plus-button in the bottom right corner, and the sidebar in the top left corner. When they were asked what their expectations towards those features, users could not really understand what to explain. It means that the existence of those features was not suitable with the users' mental model. This leads to another design opportunity for design improvements.

After that, users were asked to state their expectations toward an action they might do on that page. This is how the researcher managed the flow of the application. Feedbacks from all users are documented in Appendix H. Users Feedback

As a result of the non-formal testing with the user, the new pain points and design opportunities were created to further revise the design based on the feedback. These pain points were gained by cultivating the mental model of the user, some of them might find it difficult to explain certain features or functions without explaining the whole application first to them. The summary of the shortcoming of the design along with the design opportunities as the result from the analysis from 1st iteration is shown in Appendix I. Design Opportunities First Iteration.

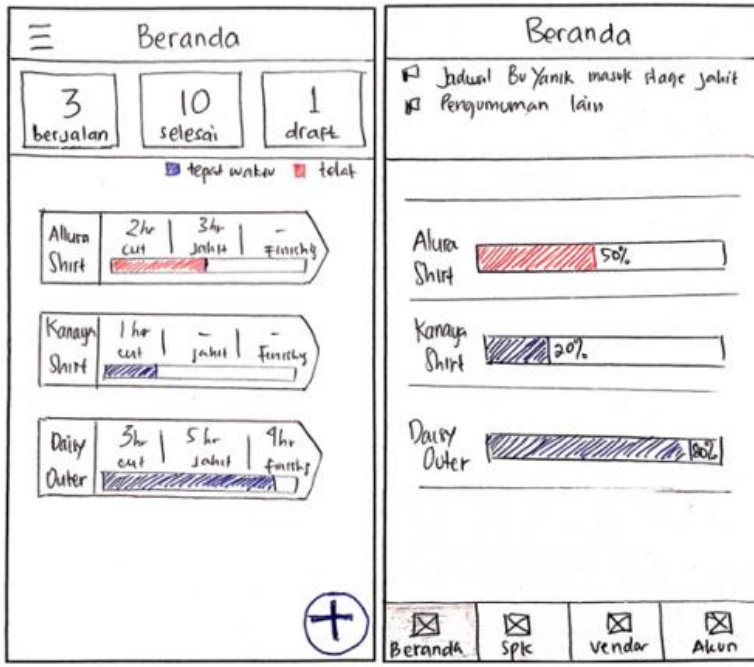

Figure 5-1. Design Options of Home Page

5.1.3 Second Iteration

Those new revised design in the second iteration were tested once more to three different users with the same method. The users were tested informally to find the gap between the users' mental model and the design. It also aimed to fix the flow of the application before entering the high-fidelity prototype stage.

From the previous iterations, there were new findings for the stages carried out in production. Users need to specify the default stages and additional stages in the production line. Default stages show the standard processes undertaken by each SPK including cutting, sewing (*jahit*), and finishing. Whereas additional stages only happen for special products, such as screen printing (*sablon*), embroidery(*bordir*) and washing.

It needs to define the duration for each of those stages to be able to automatically generate date and reminder for the deadline of production. The durations are differentiated into two periods which are short and long term. Short term durations are meant for SPK in which products are not more than 200 pieces. For SPK with the number of product of more than 200 pieces, the long-term duration will be applied. The clear definition of the completion time for each period is shown in Table 5.3.

Table 5.3. Default Stages Duration

No	Stages	Duration		Notes
		Short	Long	
1	Cutting	3	7	Default stage
2	*Jahit*	7	14	Default stage
3	Finishing	3	7	Default stage
4	*Sablon*	3	6	Additional stage
5	*Bordir*	3	6	Additional stage
6	Washing	1	3	Additional stage

The definition of each durations was based on the analysis of completed SPK and further ensured by interviewing the users. As shown in the Figure 5-2, it is shown that there was still the overall duration of production stated in the design, this gave no meaningful information to the users as they needed to know from the beginning on how's the progress of each stage. Based on the user feedback S2F1-3 in the first iteration, the prototype needs improvement as shown in Figure 5-3. Users were confused with the previous information regarding the overall duration, the information about the deadline of each stage needs to be emphasized. The revised designs in this iteration were revalidate to the user to learn more about their mental model. The results of the user review are in the form of new pain points and design opportunities as stated in Appendix I. Design Opportunities.

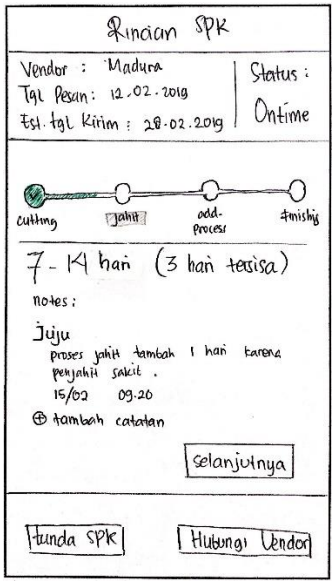

Figure 5-2. SPK First Iteration

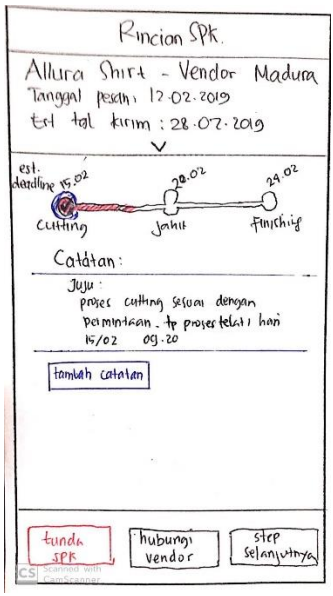

Figure 5-3. SPK Second Iteration

5.2 High Fidelity Prototyping

High fidelity prototyping was done by designing the prototype from the previous iteration using Axure RP software. There were two iterations in constructing the high-fidelity prototype as explain below.

5.2.1 Initial Stage

The first iteration for the formal usability test was done with a total of 4 users. The purpose of doing the test is to provide feedback from the users and find a recursive design opportunity for prototype improvement. Usability test was done separately for each user to learn their mental model.

5.2.2 Third Iteration

From the previous section, there were several design opportunities which leads the user to revise the prototype to be able to produce better user experience. The comparison of one design from the second iteration is shown in Figure 5-4. In this iteration, high fidelity prototype was started to be constructed. The designs from previous iteration were carried out to the development in Axure software to produce high-fidelity prototype. Then, this high-fidelity prototype was tested in a way that was slightly different from the previous iteration.

Previously researchers only conducted interviews and observations towards the mental model of the user, whereas in this third iteration the researcher used a test case to find out how users can use this application before conducting the interviews and observation towards the mental model. The method in giving test case to the users is also called formal usability testing. This aims to know how good the product is in term of usability.

The picture on the right from Figure 5-4 is the example of the prototype from the third iteration which was tested to the users to know their mental model towards the design. There were no significant difficulties experienced by users when using a prototype, but users found it irritating by the difference in laying

out the SPK draft and SPK validation in the dashboard. Users were confused by the fact that SPK that still needs validation is placed on the Account Tab, as shown in Figure 5-5, which is completely absent from their mental model. Whereas the draft can easily be found in the Home page dashboard.

Figure 5-4. Revised design of Home Page

From the previous iterations, there was new design opportunity for the aspects of vendor performance evaluation. There were three aspects that the users wanted to rate from the vendor based on their progress update which are quality, punctuality and suitability. Users wanted to give rating for vendor performance so that later they could easily identify which vendor having

good track. The definition of each aspect is further described in Table 5.4.

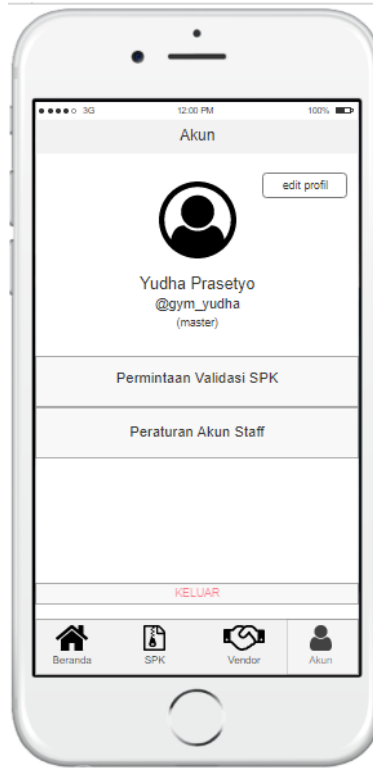

Figure 5-5. Account Tab Design 3rd Iteration

This new design opportunities were used as input for the revised design in the following iteration. In the revised design, the system lets the users to input grade with the range from 0 to 100 for each of the aspect whenever vendor has completed the delivery of finished goods. All those three aspects will be accumulated to produce overall vendor performance rate that will be displayed in Vendor list page. The picture of the revised design for three aspects vendor performance evaluation, and the picture of vendor list page displaying the overall rate of each vendor is shown in Figure 5-6.

Table 5.4. Vendor Evaluation Aspect

No	Aspect	Factors
1	Quality of Product	Stitches neatness, number of reject items
2	Punctuality	timeliness of product completion and delivery time
3	Suitability	the suitability of the initial number of items in SPK with the number of items delivered at the end

Figure 5-6. Vendor Rating

The results for the non formal usability test, or here is also called interview and observation of mental model, are presented in form of new pain points and design opportunities as stated in Appendix I. Design Opportunities. This design opportunities were used as the guideline to revise the design from 3rd iteration to be tested in the following iteration using the same method.

5.2.3 Fourth Iteration

In the fourth iteration, several design opportunities were developed to produce revised design. From the previous iteration, there was a revision in term of the placement for the validation request in the homepage. Therefore, the validation request was relocated to the homepage as shown in Figure 5-7.

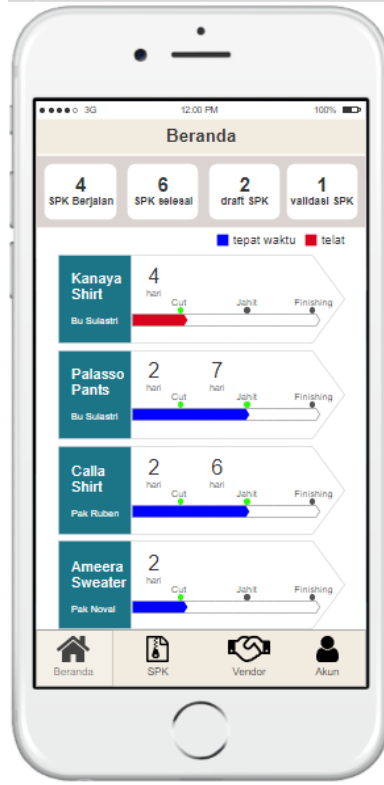

Figure 5-7. Home Page Design for 4th Iteration

The revision point from the previous iteration about the vendor evaluation page has also been revised. It is possible to do an automatic assessment of the three aspects based on the progress made by the vendor on the SPK being worked on. So that this will provide convenience for users to be able to see the results of the assessment from the vendor objectively. Although most aspects can be assessed automatically, there was an aspect that requires manual assessment because it is related to the quality of work. The quality aspect is very likely to be assessed from the number of reject items received, it can be directly generated from the system. But this aspect must also be assessed from neatness of the stitches, in which this factor is very difficult to determine automatically through the system because users must check the stitches manually as well.

Figure 5-8. Vendor Automatic Assessment

Table 5.5. Vendor Assessment

No	Aspect	Factors	Assessment	Rating
1	Quality of Product	Number of reject items returned	Rated automatically with a maximum value of 5.	% shows the percentage of reject items received compared to the total items. • 5 stars = 0% • 4 stars = <2% • 3 stars = <6% • 2 stars = <10% • 1 stars = <15% • 0 stars = <20%
		Number of reject items received	Rated automatically with a maximum value of 5.	% shows the percentage of reject items received compared to the total items. • 5 stars = 0% • 4 stars = <1% • 3 stars = <2% • 2 stars = <3% • 1 stars = <4% • 0 stars = <5%

No	Aspect	Factors	Assessment	Rating
		Stitches neatness	Assessed manually with star rating ranging from 1 to 5	Subjective evaluation based on delivered products.
2	Punctuality	Timeliness of product completion time and delivery time	Rated automatically with a maximum value of 5.	There are two overall duration which are short and long term. The maximum duration for short term is 13 days, while for the long term is 28 days. % shows the percentage delay compared to the duration of those overall duration. • 5 stars = 0% • 4 stars = <25% • 3 stars = <50% • 2 stars = <75% • 1 stars = <100% • 0 stars = <200%

No	Aspect	Factors	Assessment	Rating
3	Suitability	The suitability of the initial number of items in SPK with the number of items delivered at the end	Rated automatically with a maximum value of 5.	% shows the percentage of the items received compared to the initial number of products listed on the SPK. • 5 stars = 100% • 4 stars = <95% • 3 stars = <92% • 2 stars = <90% • 1 stars = <85% • 0 stars = <80%

The rules for vendor assessment are shown in Table 5.5, whereas the updated design is shown in Figure 5-6. In this iteration, the high-fidelity prototypes were also tested formally to the users using test cases based on the design opportunity. This usability test is further explained in the Chapter 6. Besides, non formal usability test was also conducted to produce new design opportunity as shown in Appendix I. Design Opportunities**Fourth Iteration**. In the fourth iteration there were not so many difficulties and doubts experienced by the user, so only few design opportunities that were found. The researcher decided that it was enough to iterate only for 4 times since the revision was not that much and major.

CHAPTER VI
TESTING

This chapter serves the testing done during the iteration in the high-fidelity prototype. The first testing was the formal usability test which was used as a method to measure the effectiveness and efficiency of the design. Heuristic evaluation as the second testing was also done and explained in this stage to further measure the quality of the design based on the heuristic principles.

6.1 Usability Testing

Formal usability tests were carried out using prototypes which have been displayed in Axure software from the 3rd iteration of prototype construction. Users were given a number of test cases to measure how well the design has been made. This chapter serves the testing protocol, testing scenarios, test case treacability matrix, and implementation of testing in each iteration.

6.1.1 Initial Stage

The users were tested using the test cases which have been made. The researcher who act like moderator recorded the session in audio file and took a note of every anxiety, difficulty, or doubt of the users to analyze their mental model. Each task was timed to analyze the effectivity of the design and efficiency of the test cases.

Data related to user execution time, number of errors and user satisfaction were gathered and then were analysed to decide how good the prototype in terms of usability. The shortcomings of the prototype were shown up during the tests, and they were used as the references for improving the quality of the prototypes.

6.1.2 Testing Protocol

The testing protocol is useful as a guidance in conducting the usability test process. This protocol contains steps and preparations that must be done in each iteration to get maximum results. Researchers acted as moderators in undergoing testing sessions did not allow the users to ask the way to solve the task because the method used in this study is moderated usability test method. The testing protocol are summarized in Appendix J. Testing Protocol

6.1.3 Testing Scenario

The researcher as moderator of usability test gave 12 test cases to the user at the beginning of the session. Moderator explained the goals of the testing which is to validate the prototype designs that were made whether it was clear enough for the user to use.

Test case were made based on the design opportunity from the previous chapter for it to be aligned with the solutions for the pain points of current condition in Giyomi. There are 12 test cases, each of which composes a solution of several design opportunities shown in Table 6.1. Test Case for Usability Test.

Table 6.1. Test Case for Usability Test

No	Test Case
TC1	Users show the list of all the completed SPK and mention how many, after that the users change the filter to the ongoing SPK and user mention how many ongoing SPK on the list.
TC2	User view the detail accessories of Ameera Sweater ongoing SPK
TC3	Users view the progress of Ameera Sweater SPK from Pak Noval and finish all the stage. (up to finishing stage). User mention the deadline for each stage. Users give a note in every stages with the following details:

<table>
<tr><th>No</th><th>Test Case</th></tr>
<tr><td></td><td>In step cutting:
progress lebih cepat satu hari.
In step Jahit:
benang habis. besok pagi minta dikirim benang 2 roll.
In step Finishing:
masih dalam proses setrika dan pengepakan.</td></tr>
<tr><td>TC4</td><td>User record the goods receipt of Ameera Sweater SPK from Pak Noval with the following details:

1. Batch 1
<table>
<tr><th>Product Name</th><th>Status</th><th>S</th><th>M</th><th>L</th><th>XL</th><th>XXL</th></tr>
<tr><td>Ameera Maroon</td><td>Normal goods accepted</td><td>0</td><td>15</td><td>10</td><td>5</td><td>5</td></tr>
<tr><td>Ameera Maroon</td><td>Return to the vendor</td><td>15</td><td>0</td><td>0</td><td>0</td><td>0</td></tr>
<tr><td>Ameera Biru</td><td>Normal goods accepted</td><td>15</td><td>15</td><td>10</td><td>5</td><td>5</td></tr>
<tr><td>Ameera Hitam</td><td>Normal goods accepted</td><td>0</td><td>15</td><td>20</td><td>10</td><td>5</td></tr>
</table>
2. Batch 2
<table>
<tr><th>Product Name</th><th>Status</th><th>S</th><th>M</th><th>L</th><th>XL</th><th>XXL</th></tr>
<tr><td>Ameera Maroon</td><td>Normal goods accepted</td><td>13</td><td>0</td><td>0</td><td>0</td><td>0</td></tr>
<tr><td>Ameera Maroon</td><td>Reject goods accepter</td><td>2</td><td>0</td><td>0</td><td>0</td><td>0</td></tr>
</table></td></tr>
<tr><td>TC5</td><td>Users close the status of Ameera Sweater SPK and evaluate the vendor with the following details:

1. Kualitas Pengerjaan: 96
2. Ketepatan Waktu: 98
3. Kesesuaian Jumlah Produksi: 90

And give evaluation with the following details:
barang reject 2 buah</td></tr>
</table>

No	Test Case
TC6	Adding new vendor with the following details: *Nama: Bu Kiki* *Alamat email : kiki@gmail.com* *No. telfon : 1234* *Alamat : Jalan Gebang Wetan 1*
TC7	Users sort the list of vendor from highest to lowest scores to analyze the best vendors for new SPK.
TC8	User make new SPK and save the SPK as draft. The detail for the SPK are as follows: *Nama Koleksi : Sahara Dress* *Vendor : vendor dengan nilai paling tinggi* *Jenis produk : atasan* *Detail aksesoris: lace di leher*
TC9	Users access the draft to open the recently saved SPK. Users continue to edit the SPK and send it for validation. The detail information for the draft are as follows: *Nama Produk : Sahara White* *Warna : Putih* *Kain : 100* *S: 10 , M: 20, L:20, XL:5, XXL:5* *Nama Produk : Sahara Creme* *Warna : Putih Tulang* *Kain : 100* *S: 10, M: 20, L:10, XL:5, XXL:5*
TC10	Users validate the requested SPK validation by changing the size S in Sahara Crème from 10 to 20 pcs, and users send it to Vendor.
TC11	Users show a list of SPK from Vendor Pak Ruben.
TC12	Users create a new Employee account with the details: *Nama: Kiki* *Alamat email: kiki@gmail.com* *No. Telfon:08123* *User_id: gym_kiki*

6.1.4 Traceability Matrix

Tracability matrix was made as shown in Table 6.2 to map the completeness of the relationship between the test cases and design opportunities. One test case might cover more than one design opportunity, so that no functionality should miss while doing the testing.

Table 6.2. Traceability Matrix

DO ID	TEST CASE ID											
	TC 1	TC 2	TC 3	TC 4	TC 5	TC 6	TC 7	TC 8	TC 9	TC 10	TC 11	TC 12
DO1-1								■				
DO1-2								■		■		
DO1-3			■									
DO2-1									■			
DO3-1	■											
DO3-2	■				■							
DO3-3							■				■	
DO3-4		■						■				
DO3-5			■					■				
DO3-6				■								
DO4-1												■
DO4-2			■									
DO4-3						■						
DO5-1			■									
DO5-2			■									
DO5-3							■					
DO5-4			■									
DO6-1								■	■			
DO6-2					■							
DO6-3					■							

6.1.5 Respondent Characteristics

The sample size of the testing usually depends on the purpose of the test. There are opinions that 50% of problems in usability can be identified with only 3 users in testing [29].Whereas other opinions stated that 90% of problems in usability can be identified with 5 users in the testing. In this study, four respondents for each iteration were chosen as the middle value with the criteria of the respondents chosen were users who had experience in using production or warehousing software.

In the first iteration, four users were selected to be tested in the same day but in a different session per user. The identification of of each user in the first iteration of formal usability test is shown in Table 6.3.

Table 6.3. Respondent for 1st Iteration

No.	Name	Software used
1	Imam Teguh Islamy	SAP
2	Andika Gita N	SAP
3	Fia Afina Yusviana	Odoo
4	Evia Nanda	SAP

Four different users were tested in the second iteration for the formal usability test in a different session per user. The selected users were intentionally different from the previous iteration in order to give a new perspective to the user towards the improved design to avoid bias from the previous version. The identification of of each user in the first iteration of formal usability test is shown in Table 6.4.

Table 6.4 Respondent for 2nd Iteration

No.	Name	Software used
1	Juariya (production Employee)	Jubelio
2	Fauzan Pinantyo	Odoo
3	Gamal Akbar	SAP
4	Yudha Prasetya (owner)	Jubelio, Dealpos

Choosing the same respondents could distort their mental model since mental model is also affected by someones' experience. Means that selecting the same respondents for further iteration would make it harder in understanding their expectation towards the design.

6.1.6 Testing Results

There were slightly different between the result from the first iteration and the second one. It shows increasing trend in term of effectivity and efficiency.

1. First Iteration

In the first iteration there were two respondents that could not complete some cases, the summary of the usability test form is shown in Appendix H. Users Feedback**Third Iteration**. The first respondent has failed to solve the test case number 10, which is:

Users validate the requested SPK validation.

User could not find the location of requested SPK validation. User opened the SPK list, hoping he could see the unvalidated SPK there. After 4 minutes trying, user gave up. This particular obstacle leads to the unclear design which could not accommodate the mental model of the user. The result of testing is recorded in the form of usability testing form. This record was used to analysed prototypes shortcoming to produce further design opportunities afterwards.

Whereas the second respondent found a problem happened when she tried to solve the test case number 8, which is:

User make new SPK and save the SPK as draft.

From the homepage, user could easily navigate to the SPK page as the initial flow of the test case. User also quickly noticed the button to create new SPK, and there is no indication of uncertainty nor doubt in filling the empty text box or in choosing the vendor from the dropdown list when creating the SPK. The problem was found when user spent much time in finding the

option to save those SPK as a draft. After two and a half minutes of trying, the user gave up on these task.

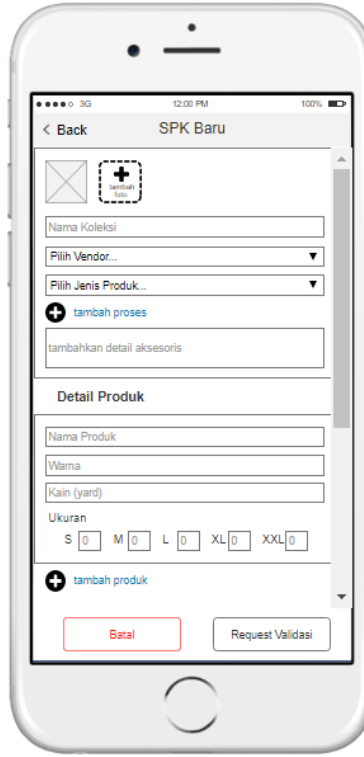

Figure 6-1. New SPK Page Design

User never thought of any possibilities of cancel button to pop up confirmation box telling the users to save the SPK they are working on. The summary result from the first iteration is shown in Table 6.5, and the feedback form for first usability test is shown in Appendix H. Users Feedback.

Although another two out of four respondents could complete all the 12 cases given, the user also had trouble in finding the option to draft New SPK. One users spent more than four minutes of trying to draft the SPK, but in the end she managed to solve the case number 10 by accidently clicking the back

button. This shows that user didn't expect at all that the back button will pop up a confirmation to draft the work, instead the user expected it to lead them to the previous page which is the SPK list. Thus, this kind of obstacles the users faced were analysed to produce new design opportunities.

The most time spent by the user in the first iteration was in test case number 4. Which is:

User record the goods receipt of Ameera Sweater SPK

This test cases indeed needed more time to solve rather than the other because users need to input a lot of text into the system. Although most of the users also suffered the same problem in inputing the amount of product received, the 4th user spent the most time in it. This leads to the indication that the design of this page needed revision. The summary of completion time from the first iteration of formal usability test is shown in Table 6.5, with the blocked cells show the failed action from the users.

Table 6.5. Completion Time from 1st Iteration

Task	Time Spent (second)			
	User 1	User 2	User 3	User 4
1	53	30	35	34
2	25	23	16	57
3	90	80	113	158
4	250	122	134	272
5	40	28	28	35
6	27	31	30	34
7	14	8	6	5
8	80	200	153	100
9	150	75	63	97
10	240	97	116	256
11	52	14	16	24
12	20	31	30	29

2. Second Iteration

The results from the second iteration shows different trend from the first one. As shown in Appendix H. Users Feedback, all the users were able to solve the task given after the design has been revised based on the design opportunities obtained from the previous iteration. Although the tested users were completely different people from the previous one, the results turned out to be good. The result from the usability testing in form of testing form. Whereas the completion time for each users to solve 12 test cases are presented in Table 6.6. As all the respondent can complete all the task and there was no significant difficulty faced by them, the researcher found it enough to conduct the usability testing for only twice.

Table 6.6. Completion Time from 2nd Iteration

Task	Time Spent (second)			
	User 1	User 2	User 3	User 4
1	42	23	28	45
2	30	17	26	49
3	140	67	64	28
4	200	100	107	125
5	32	30	31	29
6	25	18	29	24
7	5	5	6	8
8	42	60	33	35
9	100	85	63	78
10	35	23	34	64
11	18	50	15	12
12	25	32	17	26

6.1.7 Effectivity Metrics

The researcher measured the users' ability to complete tasks. Effectivity can be calculated from the completion rate of the

task [18]. The researcher gave value 1 for the task which has been completed by the users, and 0 for the failed task. Here is the calculation used to measure the effectivity:

$$Effectivity = \frac{\text{N}umber\ of\ \text{completed test case}}{\text{T}otal\ n\text{umber of test case}}\ x\ 100\%$$

1. First Iteration

The number of completed test cases per user was different from each other, as two out of four respondents could not complete all the given task. The effectivity also shows the success rate of each users for all the task they were working on. For example, the first user has failed on completing one task from all 12 test cases given. Those, the effectivity can be calculated as follows:

$$Effectivity = \frac{11}{12}x\ 100\%$$

$$Effectivity = 91{,}667\%$$

Based on those calculation, it is concluded that the first user got 91,667% of success rate. The summary of this effectivity for each users in the 1st iteration is described in Table 6.7.

Table 6.7. Effectivity 1st Iteration

User	Task Completed	Success Rate
1	11	91.67%
2	12	100.00%
3	11	91.67%
4	12	100.00%

2. Second Iteration

Since all of four users in the seconde iteration were able to complete the test case, so the success rate for all users is 100% as shown in Table 6.8.

Table 6.8. Effectivity 2nd Iteration

User	Task Completed	Success Rate
1	12	100.00%
2	12	100.00%
3	12	100.00%
4	12	100.00%

If we compare the effectiveness of the two iterations, a significant increase is found which indicates that the last revised prototype has been understood by the user in accordance with their mental model.

6.1.8 Efficiency Metrics

Efficiency measures the resources spent in relation to the accuracy and completeness with which users achieve goals. Efficiency is calculated from the time taken by the users to complete each task. The time is stated in seconds and was measured at the time the users start operating the prototype up till they finished each task. This could be done by simply subtracting the start time from the end time as shown in the equation below:

$$\text{Task Time} = \text{End Time} - \text{Start Time}$$

There were two type of efficiency measured which are time-based efficiency and overall relative efficiency.

a. Time-Based Efficiency

Efficiency based on time is taken based on the time spent by all users for each task given. Time-based efficiency can be used to measure how many part of the test the user complete per second. The formula used for this efficiency is as follows:

$$\text{Time-based efficiency} = \frac{\sum_{j=1}^{R}\sum_{i=1}^{N}\frac{nij}{tij}}{NR}$$

b. Overall Relative Efficiency

Overall relative efficiency uses the ratio of time taken by users who successfully complete tasks related to the total time taken by all users. Such equations can be represented as follows:

$$\text{Overall Relative Efficiency} = \frac{\sum_{j=1}^{R}\sum_{i=1}^{N} nij.tij}{\sum_{j=1}^{R}\sum_{i=1}^{N} tij} x100\%$$

Note:

N = Number of task given.
There are 12 cases in this case.

R = Number of respondent.
There are 4 respondents in this case.

nij = Success rate for task i from user j.
Failed means nij=0, Success means nij=1.

tij = Time needed by the respondent j to finish task i.
If users failed to finish the case, the time is measured by the time users start doing and giving up the case.

6.1.9 Comparison of the time-based Efficiency

This part serves the comparison between the first iteration result of time-based efficiency with the second iteration. Time-based efficiency indicates how many part of the test that the users could finish in a second. For example, here is stated the test result of test case 1 from all the respondents in Table 6.9

Table 6.9. Results of 1st Test Case

Respondent	Success Rate	Time Spent (second)
1	1	53
2	1	30
3	1	35
4	1	34

Time-based Efficiency:

$$Efficiency = \frac{\sum_{j=1}^{R}\sum_{i=1}^{N} \frac{nij}{tij}}{NR}$$

$$Efficiency = \frac{(\frac{1}{53} + \frac{1}{30} + \frac{1}{35} + \frac{1}{34})}{1x4}$$

$$Efficiency = 0.0275 \text{ task/sec}$$

Based on those calculations, the users could finish 0.0275 task/second or 2.75% of the task for each second they spend. Means that the greater the value of the time-based efficiency is, the better the result of the prototype, because then the users are able to solve the task quicker. The summary of the comparison for each task time-based efficiency can be seen in Table 6.10.

Table 6.10. Time-based Efficiency

Task	Time-based Efficiency (task/second)	
	1st Iteration	2nd Iteration
1	0.44	0.50
2	0.65	0.60
3	0.16	0.29
4	0.09	0.13
5	0.50	0.53
6	0.53	0.69
7	2.25	2.77
8	0.11	0.40
9	0.18	0.20
10	0.09	0.47
11	0.78	0.90
12	0.60	0.67

From Table 6.10, it can be concluded that the trend of overall time-based efficiency goes up which means the values of each of the efficiency are getting bigger. The bigger the value, means the less the time users spent to finish each task.

6.1.10 Overall Relative Efficiency

Overall Relative Efficiency measured through users who successfully completed the task in relation to the total time taken by all users. For example, for the same data from Table 6.9, the Overall Relative Efficiency:

$$Efficiency = \frac{\sum_{j=1}^{R}\sum_{i=1}^{N} nij.tij}{\sum_{j=1}^{R}\sum_{i=1}^{N} tij} x100\%$$

$$Efficiency = \frac{(1x53) + (1x30) + (1x35) + (1x34)}{53 + 30 + 35 + 34} x100\%$$

$$Efficiency = 100\%$$

The overall relative efficiency is 100%, which means that this prototype has a very good efficiency value. If the efficiency value is in the range of 85% -100% it is categorized as very good. The summary of the comparison for each task efficiency can be seen in Table 6.11.

From Table 6.11, the efficiency in the second iteration is better than the first one. All test case obtains 100% of efficiency which means the design is quite acceptable for the users. There were also no more significant pain points and design opportunities so that the researcher found out that it's enough to conduct the formal usability testing for only twice.

Table 6.11. Overall Relative Efficiency

Task	Overall Relative Efficiency	
	1st Iteration	2nd Iteration
1	100%	100%
2	100%	100%
3	100%	100%
4	100%	100%
5	100%	100%
6	100%	100%
7	100%	100%
8	71%	100%
9	100%	100%
10	66%	100%
11	100%	100%
12	100%	100%

6.2 Heuristic Evaluation

This stage serves the stages in conducting heuristic evaluation by the expert. The findings for each heuristic are stated and the final design of the application is also shown.

6.2.1 Evaluator Characteristics

There were twice iterations in heuristic evaluation which involve different evaluator for each. The criteria for selected evaluator are someone who has ever used at the least any mobile application. The detail definition of each users for the heuristic evaluation is shown in Table 6.12.

In each iteration, three evaluators were asked to give a comment for each heuristic online. The project in Axure was published online and the evaluator were given the test case from the chapter 6 to try out the prototype. The benefit of doing this iteration online is to give the evaluator freedom to comment on

prototype design that is not compatible with heuristics. The feedbacks from the evaluator are shown in Appendix K. Heuristic Evaluation Sheet.

Table 6.12. Evaluator for Heuristic

No.	Name	Iteration	Expertise
1	Yasin Awwab	1	Finalist Gemastik. Bakulan App
2	Hasan Khadiki	1	UX
3	Nur Laili Sholichah	1	Finalist Gemastik. Bakulan App
4	Bobby Ilham Akbar	2	Dashboard Visualization
5	Gabriel Linkherz	2	UX
6	Rendra Surya	2	UX

6.2.2 Results of Heuristic Evaluation

Among all the 10 heuristic princinples, the principle which gets the most evaluation is H8, then H4 follows. H4, Consistency and Standards, mentions that the system should become standard and consistent in terms of writing sentences, fonts, etc. so that the user does not need to be confused with the different situations and actions on the system.

The consistency of the language used in all parts of the application is important to precent users from being confused with different situation. Before the heuristic evaluation, some English words were found in the application, whereas the main language of the prototype is Indonesian. As shown in Figure 6-2, the picture on the left shows the previous version which still used English, and the picture on the right shows the revised version after the heuristic evaluation.

H8 is about Aesthetic and Minimalist Design. In this principles, dialogues should not contain information which is irrelevant or rarely needed. Every extra unit of information in a dialogue competes with the relevant units of information and diminishes their relative visibility.

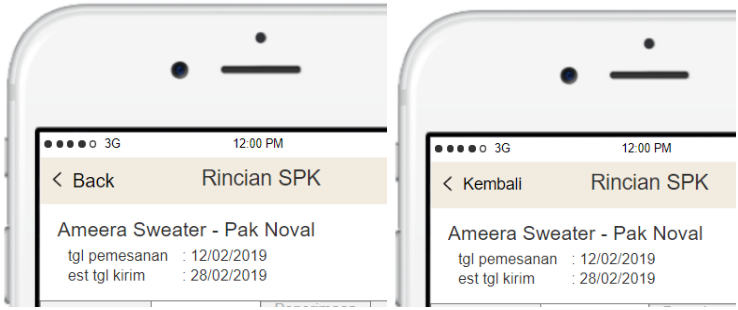

Figure 6-2. H4 Revision

In the evaluation, the evaluator found out some problem regarding this point. One of which was the problem in identifying the status of the SPK list. There was no color difference between draft, running, completed, and validation SPK. In order to make it easier for users to understand when they look it at a glance, it needs to be fixed. The comparison between the previous design and the revised one is shown in Figure 6-3. The summary of heuristic evaluation can be found in Appendix K. Heuristic Evaluation Sheet.

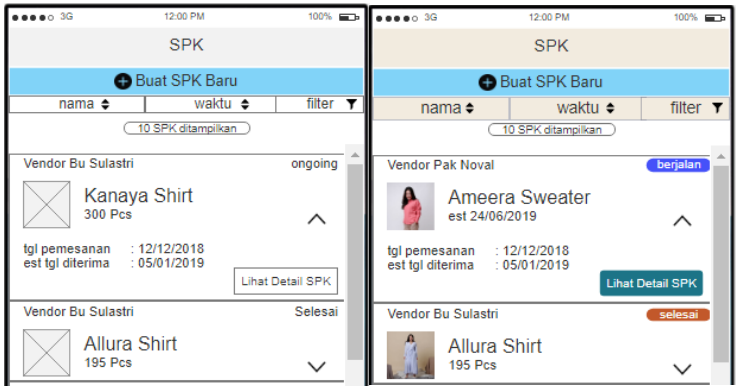

Figure 6-3. H8 Revision

In the first iteration, there were 13 evaluations in total from the expert. Most of them complains about heuristic 8 which talk about Aesthetic and Minimalist Design. Whereas in the second

iteration, there were 6 evaluations. The number was decreasing from the first iteration. All the experts' judge both from the first and second iteration can be viewed in Appendix K. Heuristic Evaluation Sheet.

Besides giving evaluaton of which heuristic having a problem, the experts also judged the severity rating of those problems. There were 5 kinds of severity rating that were used which are [20]:

0: I don't agree that this is a usability problem at all.

1: Need not be fixed unless extra time is available on project

2: Fixing this should be given low priority.

3: Important to fix, so should be given high priority.

4: Imperative to fix this before product can be released.

From the first iteration, the average of the severity rating was still more than 2 indicating that the prototype must be refined. In the revised prototype that has been tested in the second iteration, the score for severity rating decreased to less than 2. This shows that the heuristic principle has been quite well applied in this prototype. The final revised design can be seen in Appendix L. Design Comparison (Last Iterations).

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CHAPTER VII
CONCLUSION AND SUGGESTIONS

This chapter serves the conclusions of the research process that has been carried out and the suggestions proposed both for the company and for similar research in the future.

7.1 Conclusion

The development of the design has produced a high-fidelity prototype which can be used as the guideline in developing the software. The further explanations are stated as follows:

1. There were 25 user needs and 20 design opportunities which were obtained from the interview and observation session, those design opportunities were used as the guideline in making the prototype.
2. There were 4 iterations in constructing the prototype from low to high fidelity which include the feedback of different users in all iterations. The first 2 iteration was done by using paper prototype as the fastest way to make and revise the design. The last two iteration was done by using Axure software to obtain the right feedback from the user.
3. In the research, formal usability testing is used to provide an insight of how efficient and effective the design is. The testing was done by giving users 12 test cases which have to be solved with the aim to understand the mental model of the users. The usability testing was done twice, with the second iteration that shows better results than the first iteration.
4. Heuristic evaluations were done while constructing the prototype by asking evaluator to judge the prototype. There was twice iteration which heuristic 8 and heuristic 4 got the most evaluations in it. H4 mentions about consistency and standards aesthetic and H8 talks about Minimalist Design.
5. The prototype design that was made in this study can be considered to meet user expectations to give them the big picture of vendor management system design. The

prototype in this study can be considered successful, because in the heuristic evaluation process, the average severity rating is less than 2 (with a scale of 0 = not a problem, 4 = usability catastrophe) and in the last iteration of usability testing process there was no significant new pain points and there is an increasing number in effectiveness and efficiency from the previous iteration.

7.2 Suggestions

The author's suggestions for further research and development are as follows:

1. There should be further study to develop the application to be able to meet the initial problem which is to help managing vendor in Giyomi.id
2. The development could be standardized so that the outcome can be commercialized to other users which have the same business process as Giyomi.
3. Development for other platforms is recommended, especially website.

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Appendix A. Production Process in Giyomi.id

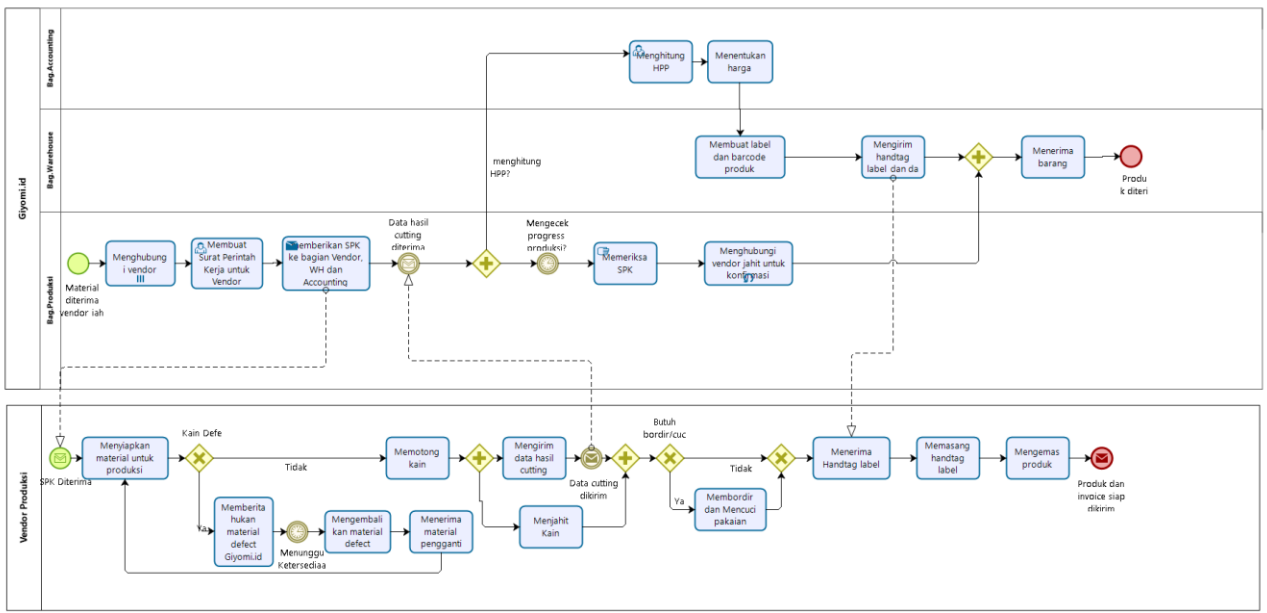

Figure A-1. Production Process in Giyomi

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Appendix B. Observation Artifact

Date of observation: June 12th 2019

Location: Vendor Bu Yanik. Sutorejo Utara VIII Blok J.

Figure B-1. Mockup Design from Vendor

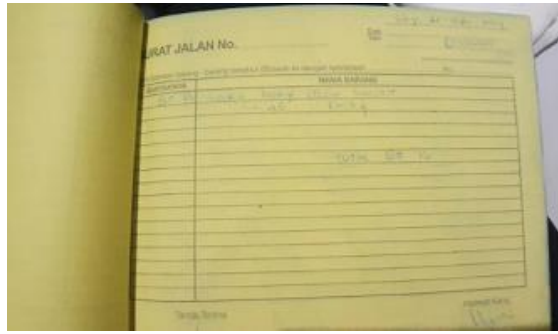

Figure B-2. Goods Receipt Note from Vendor

Figure B-3. Pattern Model from Vendor

Figure B-4. Production Room

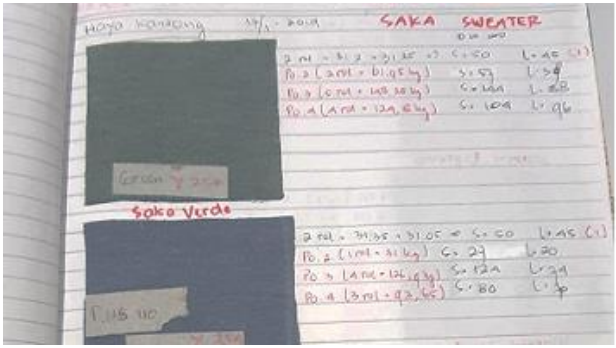

Figure B-5. SPK from Vendor

Appendix C. User Stories

Table C.1. Initial User Stories

No	ID	As a	I want to..	So that..
1	SP1	Employee	Write new SPK in the application	I can save time in writing SPK
2	SP2	Employee	Send the SPK I have made to all related parties through the application.	I can optimize my work because the new SPK that I just made can be sent directly to vendor, warehouse, and accounting Employee in one action.
3	SP3	Employee	Update the information of ongoing SPK	There will be no miscommunication between the production Employee with the accounting and warehouse section because the information in the newly edited ongoing SPK is uptodate, since it does not rule out the possibility that when the vendor enters the first stage (cutting) the number of finished products is not in accordance with the initial SPK.

No	ID	As a	I want to..	So that..
4	SP4	Employee	Draft the SPK that I am working on before it can be finalized and sent to the vendor.	if the new SPK still need to be asked for validation of the owner I can close the function to do other work in the application for multitasking.
5	SP5	Owner	Make an approval for each new SPK which has been made by the Employee	I want to recheck everything before new SPK is sent to the vendor so we can avoid mis-production.
6	SP6	Owner	See the progress of each running SPK	I save time in checking SPK progress because the SPK progress is managed by my employee.
7	SP7	Owner	See the history of completed SPK in the application.	I can use it as consideration to hold a vendor which has low work efficiency in completing certain SPK in a certain period.
8	SP8	Owner	filter all SPK based on vendor, month or status (ongoing, completed on time, completed overdue, overdue)	I can make quick analysis or decision of things related to vendor efficiency.

No	ID	As a	I want to..	So that..
9	SP9	Employee	Define the default completion time for each product type.	I can save time in inputting default value for each stages in production when making new SPK.
10	SP10	Employee	Input the detail of accessories for each product in making new SPK.	We can share information about detail of a product in SPK (collar material, type of zipper, color of studs, etc.), so that the flow of information can be done quickly if there is a Employee turnover.
11	SP11	Employee	Write the detail of accessories for each product in the new SPK in a text field	I will not be confused of the given option of accessories when I make new SPK, because most of the case the detail for each product is very different although the products are similar.
12	SP12	Employee	Upload picture of the product design in the new SPK that I made.	Vendors can have an overview of the products that must be made before mass production.
13	SP13	Employee	Give additional processing time in making new SPK, especially for vendor that	When I add more detailed accessories into a new SPK, I can save my time to calculate the estimated completion time as it will directly be added to the default completion time.

No	ID	As a	I want to..	So that..
			has to work on detailed accessories.	
14	PG1	Employee	Add notes obtained from the results of vendor progress update of a running SPK	I can directly insert vendor evaluation notes from each update to avoid forgetting, so that further updates can be made effectively with question from the evaluation that has been made. In addition, the owner can simultaneously control the obstacles of the progress through the application to be able to shortly analyse things in production lane.
15	PG2	Employee	Suspend running SPK from certain vendors so that I can insert a new urgent SPK to the vendor.	The production for urgent products can be completed on time.
16	PG3	Owner	Give different color for every type of progress that states the tolerance of delay in production.	I can understand the state at a glance to analyze the tolerance of each delay and decide whether or not I should visit the vendor.

No	ID	As a	I want to..	So that..
17	PG4	Owner	Know how many times (batches) the delivery of finished products to Giyomi is done by the vendor.	I know how many products have been entered in each batch to be able to predict the trend of the on time finished good delivery.
18	PG5	Employee	Update the status of goods received when the vendor sends the finished product to Giyomi.	It can be easier for me to report to the owner about the progress of goods receipt so that at glance it could save time to know how many products which have been received and will be received.
19	PG6	Employee	Directly write the results of quality check into the application when the warehouse Employee has performed QC when the item arrives	I can avoid forgetting to record anything and how many reject items are returned or not to the vendor.
20	PG7	Employee	Be able to upload photos of bills from vendors for each completion of finished product delivery.	I won't be confused of which SPK that need to be paid. And later I can remind financial Employee to make payments for the bills.

No	ID	As a	I want to..	So that..
21	PG8	Employee	Close the status of an ongoing SPK if payment has been made by the financial Employee to the vendor.	The owner and I will not be confused to distinguish between the completed SPK and those which have not.
22	VD1	Owner	Get information about the good or bad performance of a vendor.	I can consider the possibility of continued collaboration, and the possibility for cutting vendors who have performance which is below expectations at the end of each month.
23	VD2	Employee	Manage the information about new vendor.	I can directly choose vendor when creating a new SPK, thus it could save time because I don't need to enter the description about the vendor first.
24	VD3	Employee	Get information about the vendor in the application as information sharing center.	I do not need to ask the owner to find out the contact from the vendor whenever I want to call them to ask for update.

No	ID	As a	I want to..	So that..
25	VD4	Owner	Assess vendors with badges after the vendor has successfully completed the SPK	I can directly conduct an immediate evaluation to the vendor who has just completed the SPK before forgetting.
26	VD5	Employee	See a summary of vendor ratings when creating a new SPK.	When I allocate vendors to new SPK, I can immediately know that certain vendors have a good track record
27	VD6	Owner	Get an information about each production capacity of a vendor (human resources and machine)	I can allocate new SPK to vendor who has a suitable production capacity, so that it will have a long-term effect, which is the timeliness in completing the SPK.
28	RO1	Owner	Monitor the update of ongoing SPK from the application because the update is done by the Employee.	I know in advance the possibility of ongoing SPK being overdue without asking the progress to the warehouse Employee, production Employee, or accounting Employee, so that I can instruct my Employee to intensely follow up the vendor to avoid delay in production

No	ID	As a	I want to..	So that..
29	RO2	Owner	Have all the functions that the Employee has.	I don't have to wait for the Employee if any urgent activities need to be done immediately.
30	RO3	Owner	Know which Employee who did something in the application and when they did it	I know when and who made what, so if something wrong happens with the data, I can directly ask the responsible person without getting confused of whom to blame.

Appendix D. Mapped User Needs Motivation

Table D.1. User Needs

ID	Motivation Categories	User Needs ID	As ..	I want to..	So that…
PP-01	Do efficient work and save time in production process	SP1	Employee	Write new SPK in the application	I can save time in writing SPK
		SP2	Employee	Send the SPK I have made to all related parties through the application.	I can optimize my work because the new SPK that I just made can be sent directly to vendor, warehouse, and accounting Employee in one action.
		SP4	Employee	Draft the SPK that I am working on before it can be finalized and sent to the vendor.	if the new SPK still need to be asked for validation of the owner I can close the function to do other work in the application for multitasking.

ID	Motivation Categories	User Needs ID	As ..	I want to..	So that…
		SP6	Owner	See the progress of each running SPK	I save time in checking SPK progress because the SPK progress is managed by my Employee.
		SP9	Employee	Define the default completion time for each product type.	I can save time in inputting default value for each stages in production when making new SPK.
		PG3	Owner	Give different color for every type of progress that states the tolerance of delay in production.	I can understand the state at a glance to analyze the tolerance of each delay and decide whether or not I should visit the vendor.
		PG5	Employee	Update the status of goods received when the vendor sends the finished product to Giyomi.	It can be easier for me to report to the owner about the progress of goods receipt so that at glance it could save time to

ID	Motivation Categories	User Needs ID	As ..	I want to..	So that…
					know how many products which have been received and will be received.
		VD2	Employee	Manage the information about new vendor.	I could save time in choosing vendor because I don't need to enter the description about the vendor first.
		RO2	Owner	Have all the functions that the Employee has.	I don’t have to wait for the Employee if any urgent activities need to be done immediately, it could save time in production.
		RO3	Owner	Know which Employee who did something in the application and when they did it	I know when and who made what, so if something wrong happens with the data, I can directly ask the responsible

ID	Motivation Categories	User Needs ID	As ..	I want to..	So that…
					person without getting confused of whom to blame.
PP-02	Reduce error rate	SP5	Owner	Make an approval for each new SPK which has been made by the Employee	I want to recheck everything before new SPK is sent to the vendor so we can avoid mis-production.
		PG2	Employee	Suspend running SPK from certain vendors so that I can insert a new urgent SPK to the vendor.	The production for urgent products can be completed on time.
		VD1	Owner	Get information about the good or bad performance of a vendor.	I can consider the possibility of continued collaboration, and the possibility for cutting vendors who have performance which is below expectations at the end of each month.

ID	Motivation Categories	User Needs ID	As ..	I want to..	So that…
PP-03	Structured documents	SP7	Owner	See the history of completed SPK in the application.	I can use it as consideration to hold a vendor which has low work efficiency in completing certain SPK in a certain period.
		SP8	Owner	filter all SPK based on vendor, month or status (ongoing, completed)	I can make quick analysis or decision of things related to vendor efficiency.
		SP10	Employee	Input the detail of accessories for each product in making new SPK.	We can share information about detail of a product in SPK (collar material, type of zipper, color of studs, etc.), so that the flow of information can be done quickly if there is a Employee turnover.
		SP12	Employee	Upload picture of the product design in the new SPK that I made.	The mockup design pictures stick to the SPK to avoid lose.

ID	Motivation Categories	User Needs ID	As ..	I want to..	So that…
PP-04	Faster Communication	VD3	Employee	Get information about the vendor in the application as information sharing center.	I do not need to ask the owner to find out the contact from the vendor whenever I want to call them to ask for update.
		RO1	Owner	Monitor the update of ongoing SPK from the application because the update is done by the Employee.	I know in advance the possibility of ongoing SPK being overdue without asking the progress to the warehouse Employee, production Employee, or accounting Employee, so that I can instruct my Employee to intensely follow up the vendor to avoid delay in production
PP-05	Avoid Confusions	SP11	Employee	Write the detail of accessories for each	I will not be confused of the given option of accessories when I make new SPK, because most of the case the detail for

ID	Motivation Categories	User Needs ID	As ..	I want to..	So that…
				product in the new SPK in a text field	each product is very different although the products are similar.
		PG8	Employee	Close the status of an ongoing SPK if goods have been received.	The owner and I will not be confused to distinguish between the completed SPK and those which have not.
PP-06	Avoid Forgetting	PG1	Employee	Add notes obtained from the results of vendor progress update of a running SPK	I can directly insert vendor evaluation notes from each update to avoid forgetting, so that further updates can be made effectively with question from the evaluation that has been made. In addition, the owner can simultaneously control the obstacles of the progress through the application to be able to shortly

ID	Motivation Categories	User Needs ID	As ..	I want to..	So that…
					analyses things in production lane.
		PG4	Owner	Know how many times (batches) the delivery of finished products to Giyomi.id is done by the vendor.	I know how many products have been entered in each batch to be able to predict the trend of the on time finished good delivery.
		PG6	Employee	Directly write the results of quality check into the application when the warehouse Employee has performed QC when the item arrives	I can avoid forgetting to record anything and how many reject items are returned or not to the vendor.
		VD4	Owner	Assess vendors with badges after the vendor has successfully completed the SPK	I can directly conduct an immediate evaluation to the vendor who has just completed the SPK before forgetting.

Appendix E. Pain Points and Design Opportunity

Table E.1. Pain Points and Design Opportunity

Need Finding	Context	Pain Points	Design Opportunity	Code
Do efficient work and save time in production process	SPK is manually made in excel	Users have to manually enter certain values multiple time. For example: document creation date, order date.	Creating page where users can write new SPK which simultaneously generate default date.	DO1-1
		Users have to manually input some values, even for long values for repeated order. For example: vendor name.	Adding dropdown list for vendor option in every form.	DO1-2
		The owner too often follows up the vendor because he just predicts the schedule for following up.	Giving auto generated deadline date for each stage of production so that the users can effectively follow up the vendor.	DO1-3
Reduce error rate	SPK is sent to the vendor using WhatsApp without proofreading. All the incorrect input will be stated in WhatsApp chatroom.	An input error occurred in the SPK that was just sent to the vendor because there was no proofread beforehand.	Creating validation option for the Employee before they send the SPK to the vendor. The owner can proofread the SPK, and when there is no correction the owner can directly send it to the vendor.	DO2-1

Need Finding	Context	Pain Points	Design Opportunity	Code
Structured documents	All SPK which have been made in excel will be printed out and glued in accounting book.	Users could not practically check the ongoing or completed SPK because they have to search them in the accounting book.	Creating a page which contains list of all SPK, so that the user can filter the data that he wants to see based on the status of completeness	DO3-1
		Users have difficulty distinguishing which SPK has been completed and which one is still in process.	Marking closed SPK and ongoing SPK differently	DO3-2
		Users have difficulty in ordering SPK from the same vendor because the SPK are glued to the book.	Adding vendor filter to the SPK list so users can find information about every vendor regarding the SPK	DO3-3
	SPK is manually made in excel	Users don't record the detail accessories as customized request in the excel because they're too complex.	Adding text field too record the detail accessories while creating new SPK.	DO3-4
	User sends the mockup picture separately through WhatsApp	The owner having difficulties in finding the right mockup picture of every SPK.	Adding function to upload pictures while making new SPK and adding the dislay of those pictures inside the SPK.	DO3-5

Need Finding	Context	Pain Points	Design Opportunity	Code
	Finance Employee record the good receipt in the accounting book.	Users having difficulties in finding the good receipt note when users want to record good receipt for the following batch.	Adding good receipt notes inside the SPK progress.	DO3-6
Faster Comm-unication	New SPK which has been made was sent separately to vendor, warehouse and accounting Employee.	Too much SPK handling happened because the file is not accessible for everyone related. Employees must ask to the owner to send them the SPK.	Giving Employee role to be able to also access the SPK	DO4-1
		The owner needs much time to deliver the follow up progress to the Employee if he is out of town because the owner handles all things about vendor by himself	Storing all information about SPK progress to the system and make it available for everyone related.	DO4-2
		The owner needs much time to deliver the vendor information to the Employee when they need to contact the vendor.	Adding new function to create vendor information and store it in the system and make it available for everyone.	DO4-3

Need Finding	Context	Pain Points	Design Opportunity	Code
Avoid Confusion	The owner of Giyomi performs the vendor progress follow up by himself	The owner feels overwhelmed to follow up the progress of vendor because he also manages other things than vendor.	Giving role to the Employee to perform progress follow up	DO5-1
		The owner does not have a record of each follow-up to the vendor so sometimes if there is more than one vendor there will be confusion.	Adding notes option in the progress stage to record everything regarding the progress.	DO5-2
	SPK is manually made in excel	Too many distraction in the excel software, the tool bar provides to many useless function.	Displaying necessary functionality in every page for example sort and filter function.	DO5-3
	All SPK which have been made in excel will be printed out and glued in accounting book	Having difficulties to read some dates written in the accounting book, because sometimes it is thought to be either the date of creating the SPK, payment or closing the SPK.	Adding placeholder for each date shown in the apps to avoid confusion	DO5-4

Need Finding	Context	Pain Points	Design Opportunity	Code
Avoid Forgetful-ness	When the Giyomi owner wants to draft the SPK, he will save excel file into the desktop.	The owner has difficulty in finding SPK files that have been saved as drafts in excel, especially if there is a fairly long lag between storing the draft with the time to rework it.	Adding draft function to store SPK.	DO6-1
	Completed SPK will be marked "Closed" in the top of the document.	The users are confused of the SPK completion time because the SPK is closed by finance Employee after payment is made to the vendor, not after the goods are delivered. Users have a hard time to identify completed and ongoing SPK since they often forgot to mark the closed SPK	Adding closing confirmation right after all the products have been received from the vendor.	DO6-2
		The owners forget about the vendor evaluation from each SPK they have completed	Adding evaluation page right after user close the status of SPK	DO6-3

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Appendix F. Storyboard

PERSONA:
- Production Staff
- Giyomi Owner

SCENARIO:
Sharing progress update

production staff will be reminded to follow up the vendor if there is an update

production staff can write note about the SPK progress update she got from the vendor.

the Owner who is out of town can check the progress as well as the update through the app.

Figure F-1. Sharing Progress Storyboard

PERSONA:
- Production Staff
- Giyomi Owner

SCENARIO:
Weekly Meeting for SPK allocation

There is a list of vendor along with their score based on their work on completing the previous SPK

staff and the owner can analyse each vendors' working history in the apps

It makes it easier to decide which vendor having good performance to be allocated with new work order

Figure F-2. Vendor Scoring Storyboard

Appendix G. Design 1st Iteration

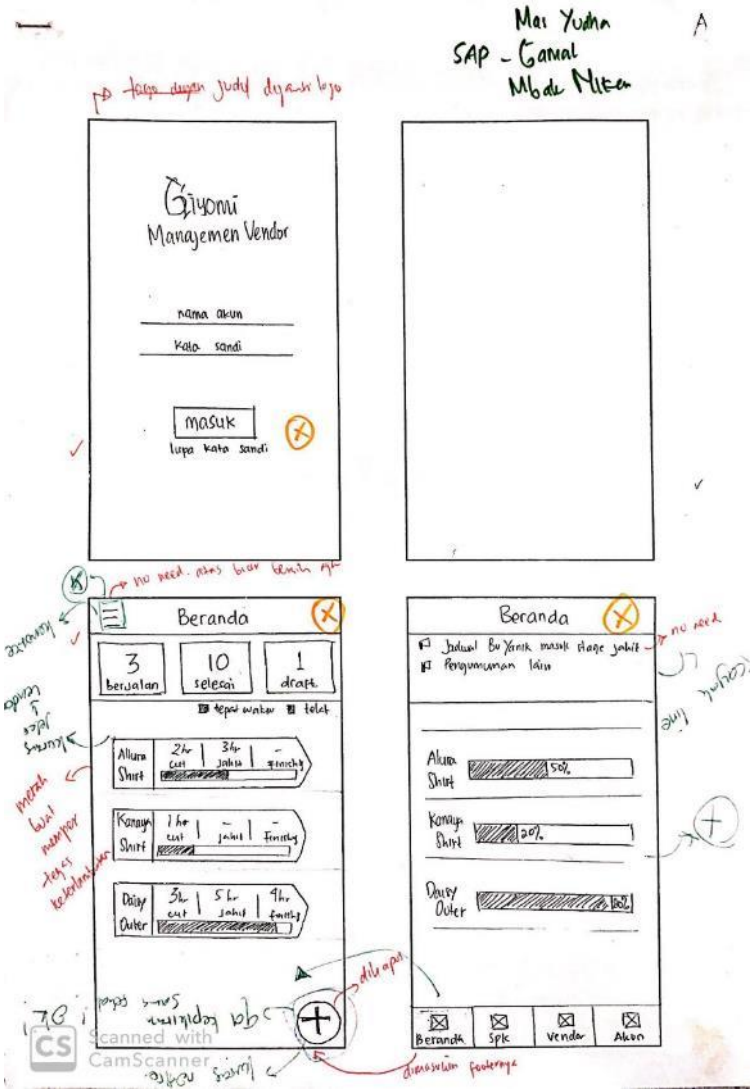
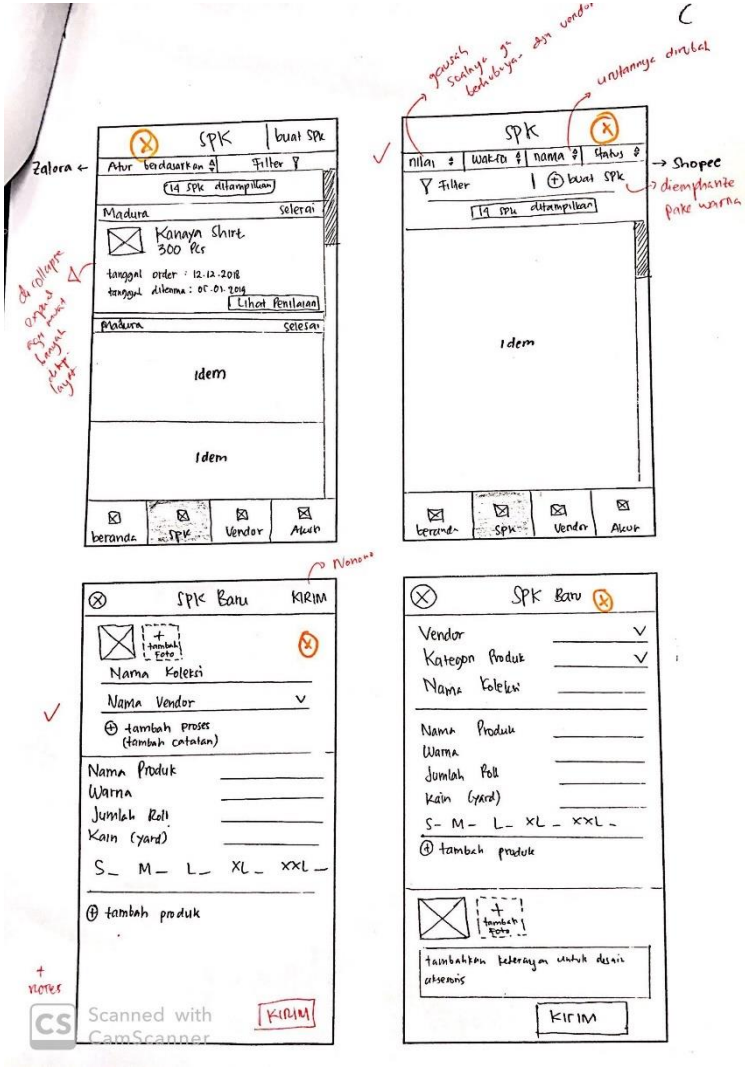
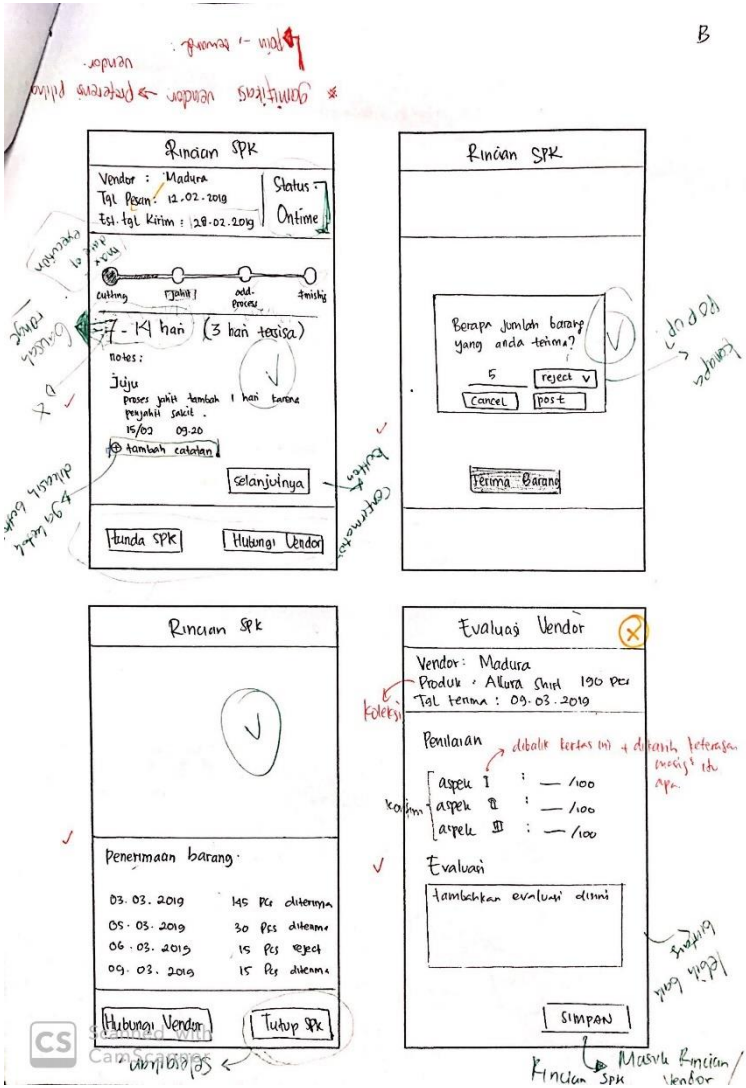
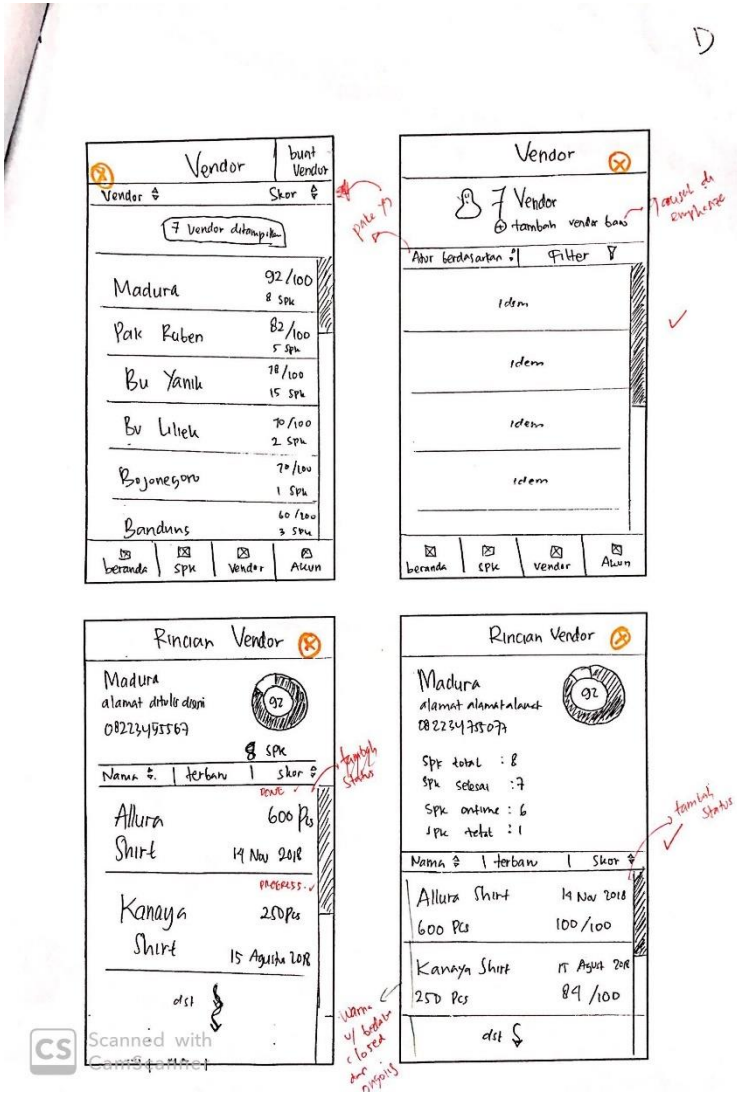


Figure G-1. First Iteration Design


SPK
buat SPK
Zalora
Atur berdasarkan
Filter
19 SPK ditampilkan
Madura
selesai
Kanaya Shirt
300 Pcs
tanggal order : 12.12.2018
tanggal dikirim : 05.01.2019
Lihat Penilaian
Idem
beranda
SPK
Vendor
Akun
nilai
waktu
nama
status
Shopee
buat SPK
SPK Baru
KIRIM
Nama Koleksi
Nama Vendor
tambah proses
(tambah catatan)
Nama Produk
Warna
Jumlah Roll
Kain (yard)
S M L XL XXL
tambah produk
Kategori Produk
tambahkan keterangan untuk desain aksesoris
Scanned with CamScanner


B
Rincian SPK
Vendor : Madura
Tgl Pesan: 12.02.2019
Est. tgl Kirim : 28.02.2019
Status : Ontime
cutting
jahit
add-process
finishing
7 - 14 hari (3 hari tersisa)
notes :
Juju
proses jahit tambah 1 hari karena penjahit sakit.
15/03 09.20
tambah catatan
selanjutnya
Hubungi Vendor
Rincian SPK
Berapa jumlah barang yang anda terima?
5
reject
cancel
post
Terima Barang
Rincian SPK
Penerimaan barang
03.03.2019 145 Pcs diterima
05.03.2019 30 Pcs diterima
06.03.2019 15 Pcs reject
09.03.2019 15 Pcs diterima
Hubungi Vendor
Tutup SPK
Evaluasi Vendor
Vendor: Madura
Produk : Allura Shirt 190 Pcs
Tgl terima : 09.03.2019
Penilaian
aspek I : — /100
aspek II : — /100
aspek III : — /100
Evaluasi
tambahkan evaluasi disini
SIMPAN


Vendor
buat Vendor
Vendor
Skor
7 Vendor ditampilkan
Madura 92/100 8 SPK
Pak Raben 82/100 5 SPK
Bu Yanik 78/100 15 SPK
Bu Lilek 70/100 2 SPK
Bojonegoro 70/100 1 SPK
Bandung 60/100 3 SPK
beranda
SPK
Vendor
Akun
Vendor
7 Vendor
tambah vendor baru
Akor berdasarkan
Filter
idem
idem
idem
idem
beranda
SPK
vendor
Akun
Rincian Vendor
Madura
alamat ditulis disini
082234955567
92
8 SPK
Nama
terbaru
skor
Allura Shirt
600 Pcs
14 Nov 2018
Kanaya Shirt
250 Pcs
15 Agustus 2018
dst
Rincian Vendor
Madura
alamat alamatalamat
082234755077
92
Spk total : 8
Spk selesai : 7
Spk ontime : 6
Spk telat : 1
Nama
terbaru
skor
Allura Shirt
600 Pcs
14 Nov 2018
100/100
Kanaya Shirt
250 Pcs
17 Agust 2018
89/100
dst

Appendix H. Users Feedback

First Iteration

User : Yudha Prasetya
Position : Owner of Giyomi

Page Code	Page Name	Feedback
S1F1-1	Halaman Login	• Sudah cukup jelas, namun untuk penamaannya harusnya memakai logo Giyomi saja untuk brand pride.
S1F1-2	Beranda	• Lebih cocok dengan prototipe pertama sebab grafik lebih jelas dan informatif. • User tidak notice dengan adanya tombol (+) pada sisi bawah halaman, ketika di tunjukkan pun user tidak berhasil mengidentifikasi fungsi dari tombol tersebut. Fungsi sebenarnya dari tombol adalah membuat SPK baru. • Meskipun user tertarik dengan prototipe pertama, rupanya user juga tidak notice dengan adanya icon sidebar pada header sebelah kiri. User lebih tertarik dengan adanya footer pada prototipe kedua. • User menilai adanya fitur pengumuman pada prototipe kedua membuat tampilan menjadi terlalu ramai dan mengalahkan keberadaan progress bar yang seharusnya menjadi fokus utama.

S1F1-3	Rincian SPK	• User berhasil mengidentifikasi bar progress sebagai hal yang menjadi fokus utama pada halaman tersebut.
S1F1-4	Penerimaan Barang	• Sudah cukup jelas
S1F1-5	Tutup SPK	• Sudah cukup jelas
S1F1-6	Evaluasi Vendor	• Prototipe sesuai dengan ekspektasi user. • User memberikan masukan terhadap aspek yang dievaluasi dengan memperjelasnya kedalam 3 aspek yaitu : ketepatan waktu, kualitas produk dan kesesuaian dengan target potong
S1F1-7	List SPK	• Pada kedua opsi prototipe, user tidak memperhatikan adanya tombol “buat SPK baru” padahal seharusnya fungsi ini yang menjadi fokus utama dihalaman ini. • Setelah diberi tahu barulah user mengatakan bahwa pemberian warna yang berbeda pada tombol “buat SPK baru” akan dapat menarik perhatian user, selain itu peletakannya juga kurang sesuai. • Pada prototipe pertama tombol “buat SPK baru” terdapat pada header sisi kanan. Selain kurang menjadi fokusan utama, user menilai bahwa peletakan tombol tersebut di header akan mengganggu estetika.

		• Di kedua prototipe, user mengeluhkan banyaknya informasi yang terkandung didalam satu bubble SPK. Hal ini menyebabkan user hanya dapat melihat kurang lebih 3 spk dalam satu layar tanpa scroll. • User berekspektasi bahwa seharusnya list SPK hanya menampilkan nama vendor, nama produk dan jumlah produk per SPK nya. Jika ingin melihat selengkapnya maka user memiliki opsi collapse dan expand SPK tersebut. • User juga mengeluhkan filter dan sort pada prototipe pertama yang terkesan terlalu ribet. User lebih senang ketika menjelaskan apa ekspektasinya ketika menekan opsi filter dan sort dari prototipe kedua.
S1F1-8	SPK Baru	• Hal pertama yang di notice oleh user adalah picture. • User lebih memilih adanya tambahan proses yang bisa di trace pada aplikasi (sablon, border, dkk) • User pada awalnya salah menangkap maksud dari field nama produk, warna dll. User berekspektasi bahwa field tersebut nantinya akan diisi dengan informasi aksesoris seperti kancing, benang dll. • User lebih condong ke prototipe pertama, namun user sangat mengharapkan adanya kolom untuk mengisikan deskripsi dari detail aksesoris produk.
S1F1-9	List Vendor	• User tepat mengidentifikasi bahwa halaman vendor akan menampilkan review dari semua vendor, bukan sort SPK berdasarkan vendor. • User berhasil mengidentifikasi fungsi sort.

		• User merasa terganggu dengan peletakan tombol “buat vendor baru” pada header sebelah kanan - prototipe 1. Lebih condong ke peletakan dari prototipe 2. • Urgensi fungsi buat vendor baru rendah, tidak perlu di emphasize. • User berhasil mengidentifikasi bahwa klik pada list vendor akan mengarah ke halaman rincian vendor.
S1F1-10	Rincian Vendor	• User berekspektasi bahwa ada status SPK (done, progress) yang ditampilkan dari masing masing list SPK dari vendor tersebut. • User merasa informasi yang ditampilkan di prototipe 2 lebih jelas dan informatif.
S1F1-11	Tambah Vendor	• Sudah cukup jelas.

User : Gamal Akbar
Position : System Enterprise Assistant – SAP

Kode Page	Nama Page	Feedback
S2F1-1	Halaman Login	• User berhasil mengidentifikasi bahwa yang akan menggunakan aplikasi lebih dari orang yang memiliki role berbeda beda. • Perintah lupa kata sandi tidak perlu ditampilkan karena merupakan aplikasi internal sehingga kata sandi diatur oleh admin. • Super user yang akan membuat akun untuk Employee. • User berhasil mengidentifikasi halaman berikut nya setelah memilih call to action “Masuk” yaitu home yang mengandung grafik.
S2F1-2	Beranda	• User berekspektasi halaman tersebut akan berisi 10 SPK teratas yang sedang di kerjakan, vendor yang berkaitan dengan giyomi berapa, ada notifikasi SPK yang paling dekat deadlinenya. • User lebih condong ke prototipe pertama karena grafik lebih informatif. • User salah mengidentifikasi nama koleksi SPK sebagai nama Vendor. • User notice bahwa tidak ada informasi nama vendor di halaman beranda. • User beranggapan pengelompokan SPK berdasarkan vendor akan lebih mudah dipahami → vendor salah mengerti sebab satu vendor hanya mengurus satu SPK saja.

		• User tidak paham dengan grafik kotak pada halaman ini • Gauge progress SPK ambigu. • User tidak notice tombol (+) pada halaman, ketika ditunjukkan pun user tidak berhasil mengidentifikasi kegunaan dari tombol tersebut. • User notice icon “sidebar” dengan beranggapan bahwa ada menu lain yang dapat di akses oleh user. • User beranggapan bahwa footer di prototipe kedua akan lebih baik jika dimasukkan kedalam prototipe pertama. • Grafik pada prototipe kedua tidak informatif. • Notifikasi di prototipe kedua dinilai tidak terlalu penting, terlebih lagi user tidak memiliki opsi untuk menghapus atau minimize notifikasi. • User beranggapan bahwa dihalaman beranda tidak ada opsi yang bisa di pilih, sehingga user cenderung akan masuk ke tab SPK pada footer.
S2F1-3	Rincian SPK	• User berhasil mengidentifikasi bar progress sebagai hal yang menjadi fokus utama pada halaman tersebut. • User bingung dengan informasi mengenai durasi hari dan sisa hari pengerjaan • Daripada memberikan informasi sisa hari, lebih baik memberikan tanggal jatuh tempo di setiap stage nya. • User menyarankan bentuk dari progress bar menjadi vertical. • Tambah catatan kurang pop up, seharusnya di buat bentuk button.

		• User tidak notice dengan adanya status ontime, pun ketika ditunjukkan user kurang paham dengan maksud dari status tersebut. Setelah dijelaskan, user memberikan masukan untuk menggunakan warna saja untuk mengidentifikasi keterlambatan SPK (merah : telat, kuning: berpotensi telat, hijau: ontime) • User notice jika sampai di stage finishing maka tombol selanjutnya harus berganti dengan tombol lain.
S2F1-4	Penerimaan Barang	• User menanyakan kenapa proses penerimaan barang harus dalam bentuk pop up? Karena aplikasi mobile jarang yang memakai pop up. • User rancu dengan istilah finishing. • User merasa tombol hubungi vendor harus tetap ada dihalaman ini untuk memudahkan mengontak vendor.
S2F1-5	Tutup SPK	• User tidak dapat notice pilihan tutup SPK, user malah berekspektasi bahwa step selanjutnya adalah “back”. • Ketika ditunjukkan tombol tutup SPK, user berekspektasi bahwa tombol tersebut akan mengarah ke home. • Setelah ditunjukkan halaman selanjutnya yaitu evaluasi vendor, user barulah memberi masukan bahwa seharusnya nama call to action nya bukan tutup SPK, tapi selesaikan SPK.
S2F1-6	Evaluasi Vendor	• Hal pertama yang dinotice oleh user adalah aspek penilaian yang merupakan fokus utama dalam halaman ini. • User kurang paham dengan perhitungan akhir dari aspek aspek yang dinilai.

		• Setelah di jelaskan bahwa penilaian akan di rata rata untuk dibandingkan dengan vendor lain, user menanyakan kenapa harus dibedakan kedalam 3 aspek. Karena pada akhirnya vendor yang memiliki nilai rata rata di ketiga aspek akan kalah dengan vendor yang memiliki satu aspek dengan nilai dibawah rata rata. • User berekspektasi bahwa setelah menyimpan evaluasi vendor maka aplikasi akan mengarah ke halaman home, riwayat SPK yang dikerjakan tersebut atau semua riwayat SPK vendor tersebut.
S2F1-7	List SPK	• User tidak notice dengan tombol “buat SPK” • User menilai bahwa filter dan sort ribet.
S2F1-8	SPK Baru	• User tidak mengerti maksud dari fitur tambah proses pada halaman pembuatan SPK baru. • Setelah user dijelaskan, user memberikan masukan bahwa opsi tambah catatan yang berada di bawahnya langsung saja disajikan dalam bentuk field text untuk menghindari kerancuan.
S2F1-9	List Vendor	• User condong ke prototipe 2 namun dengan fungsi sort seperti prototipe 1.
S2F1-10	Rincian Vendor	• Vendor lebih condong ke prototipe ke 2, namun concern karena data yang ditampilkan di satu layer pada list penilaian menjadi sedikit.
S2F1-11	Tambah Vendor	• Sudah cukup jelas

User : Fauzan Pinantyo
Position : System Enterprise Assistant – Odoo

Kode Page	Nama Page	Feedback
S3F1-1	Halaman Login	• User beranggapan bahwa yang akan menjadi user dari aplikasi adalah vendor dengan satu role. • User berhasil mengidentifikasi bahwa halaman setelah nya adalah halaman berisi dashboard tentang status dari produk yang sedang dikerjakan.
S3F1-2	Beranda	• User lebih condong ke prototipe pertama karena dinilai banyak bentuk bentuk dan informasi yang disampaikan. • Hal pertama yang di notice oleh user adalah grafik kotak akumulasi jumlah SPK baru grafik progress. • User pada awalnya salah mengidentifikasi nama produk sebagai nama vendor. • User merasa progress bar kurang menunjukkan bahwa produk tersebut telat atau ontime. • User tidak notice button (+), tetapi ketika ditunjukkan barulah user mengira bahwa tombol tersebut untuk membuat spk baru. Namun user mempertanyakan kenapa harus diletakkan di halaman tersebut. • User tidak notice bahwa progress bar dapat di ketuk untuk membuka detail, selain karena tampilannya seperti tidak bisa di klik, progress bar juga kurang menarik.

S3F1-3	Rincian SPK	• User berekspektasi bahwa ketika progress bar di klik di setiap stagenya maka akan muncul pop up balon yang menyampaikan detail dari stage tersebut, termasuk deadline dan catatan pengerjaan. • User dapat menangkap maksud dari 3 hari tersisa, namun untuk rentang waktu, user salah menangkap informasi tersebut sebagai durasi total SPK, bukan durasi per stage nya. • User memberi masukan bahwa detail SPK tidak dapat diakses dari halaman ini. • User berhasil mengidentifikasi fungsi dari tombol “selanjutnya” yaitu untuk pindah step ke stage selanjutnya. (cut, jahit, finishing) • User menyarankan untuk memperjelas tombol selanjutnya menjadi “stage selanjutnya”
S3F1-4	Penerimaan Barang	• User berhasil mengidentifikasi maksud dari halaman tersebut. • User awalnya bingung dengan istilah post. • User tidak yakin halaman selanjutnya setelah penerimaan barang, apakah masuk kembali ke detail SPK atau ke list semua SPK.
S3F1-5	Tutup SPK	• Sudah cukup. • User tidak berhasil mengidentifikasi halaman selanjutnya, user berekspektasi bahwa setelah menutup SPK maka akan mengarah ke halaman list SPK.

S3F1-6	Evaluasi Vendor	• User tertarik pada aspek aspek yang dinilai, dengan pertimbangan tidak terlalu banyak aspek yang dinilai. • User beranggapan bahwa field evaluasi tidak harus diisi (optional) • User berekspektasi bahwa halaman selanjutnya akan menampilkan riwayat dari SPK yang telah diselesaikan.
S3F1-7	List SPK	• Hal yang menarik pertama kali untuk user adalah list nya sendiri. • Hal kedua adalah tombol lihat penilaian, namun user masih belum memiliki gambaran maksud dari fungsi tersebut. • User tertarik untuk mengeklik tombol lihat penilaian daripada klik pada bubble SPK untuk melihat detail SPK. Karena button lebih menarik daripada bubble. • User notice tombol “buat SPK”.
S3F1-8	SPK Baru	• User lebih memilih prototipe pertama sebab sebagai spesialis odoo, call to action biasanya menempel di header sisi kanan. • User salah mengidentifikasi bahwa input di size diisi dengan centang, padahal seharusnya diinputkan jumlah dari size tersebut. • User menilai bahwa inputan jumlah roll tidak perlu jika sudah ada inputan kain (yard) nya.
S3F1-9	List Vendor	• Ekspektasi user sesuai dengan isi dari halaman ini. • User lebih memilih prototipe pertama karena prototipe kedua terlalu ramai.

S3F1-10	Rincian Vendor	• User lebih memilih prototipe kedua. • User beranggapan bahwa tombol terbaru tidak dapat diklik. • User berekspektasi bahwa grafik nilai keseluruhan bisa di klik, karena tidak memiliki keterangan lebih lanjut.
S3F1-11	Tambah Vendor	• Sudah cukup.

Second Iteration

User : Hipzul Ahmad Jabbar
Position : System Enterprise Assistant – SAP

Tabel H-1. 1st User Feedback and Action – 2nd Iteration

Kode Page	Nama Page	Feedback	Action
S1F2-1	Halaman Login	• User berekspektasi terdapat role dalam aplikasi ini yang usernya sendiri merupakan bagian dari Giyomi. Akun akun di atur oleh super user. • User berhasil mengidentifikasi halaman selanjutnya yaitu home page yang menampilkan menu menu berdasarkan role dia.	• Sesuai dengan design awal • Flow setelah halaman login adalah beranda, sesuai dengan design awal.
S1F2-2	Beranda	• Yang dilihat pertama kali di halaman ini adalah warna merah pada progress bar dan user dapat mengidentifikasi itu sebagai indikasi SPK tersebut telat.	• Pendefinisian warna progress bar sudah tepat. • Penamaan vendor akan disesuaikan dengan masukan user yaitu dengan mengubah

		• User beranggapan bahwa penamaan vendor sudah sesuai namun komposisi ukuran font berbalapan dengan font nama produk • User berhasil mengidentifikasi bahwa grafik kotak bisa di klik namun masih ragu apakah progress bar bisa di klik • User memberi masukan bahwa di halaman beranda terdapat filter atau sort untuk menampilkan SPK yang sebentar lagi selesai.	komposisi ukuran font menjadi lebih kecil daripada nama SPK karena semua user menemukan permasalahan yang sama dalam membedakan nama SPK dan nama vendor.
S1F2-3	Rincian SPK	• Penulisan tanggal diatas stage disalah artikan sebagai jam. Daripada penulisan 05.02 lebih baik 05/02. • Hal pertama yang di notice adalah progress bar. • User kesulitan mengidentifikasi slidedown untuk menampilkan detail SPK. Setelah di jelaskan user merasa informasi detail SPK terlalu banyak untuk ditampilkan di satu page rincian SPK. User memberikan masukan	• Penulisan tanggal akan diseragamkan seperti masukan user dengan format dd/mm atau dd/mm/yyyy untuk mencegah salah informasi dan menjaga konsistensi design. • Sudah sesuai dengan desain awal. • Karena semua user mengalami hal yang sama yaitu terlalu panjangnya informasi yang ditampilkan dalam satu halaman,

		untuk menampilkan detail SPK di satu page lain dengan adanya tombol lihat detail. • User tidak berhasil mengidentifikasi bahwa catatan itu adalah untuk catatan per stage. User memberi masukan untuk memberikan tanda panah untuk swipe kanan kiri di catatannya atau memberikan bentuk clickable untuk stage di progress bar nya. • User salah mengidentifikasi tombol "step selanjutnya" sebagai tombol untuk menyudahi satu step, user mengira bahwa tombol selanjutnya digunakan untuk menyudahi proses produksi secara keseluruhan karena terletak di bawah dan menempel.	maka design page rincian SPK akan di buat tab tab dengan pembagian informasi sebagai berikut: 1. tab detail SPK 2. tab progress SPK 3. tab penerimaan barang 4. tab evaluasi vendor. • Semua user mengalami permasalahan yang sama dengan mengartikan bahwa catatan yang tersedia adalah catatan untuk keseluruhan progress. Perbaikan yang dilakukan adalah dengan mengganti tulisan stage menjadi button sehingga user dapat beralih dari satu stage ke stage lain melalui button tersebut dan catatan akan berubah ubah setiap beralih stage. • Semua user mengalami permasalahan yang sama dengan

			mengartikan bahwa tombol selanjutnya adalah untuk beralih ke proses penerimaan barang, bukan beralih step. Perbaikan yang dilakukan adalah dengan memindahkan posisi tombol dari yang semua menempel di footer menjadi berada dibawah catatan setiap step. Pemberian warna yang mencolok juga dinilai dapat menarik perhatian user untuk klik tombol tersebut.
S1F2-4	Penerimaan Barang	• User bingung dengan istilah reject dan accept. Karena reject berarti Giyomi menerima barang dengan kondisi buruk, berbeda dengan penjelasan peneliti yang beranggapan bahwa reject berarti barang yang dikembalikan ke vendor. • User menyarankan untuk menambah tombol pada page ini yaitu tombol	• Perbaikan yang dilakukan: menstandarkan istilah dalam penerimaan barang kedalam tiga bentuk berikut: 1. Reject: barang diterima di gudang Giyomi dalam keadaan ada cacat. 2. Return: Barang dikembalikan kepada vendor untuk diperbaiki

		"terima barang" dan tombol "kembalikan barang".	3. Accept: barang di terima di gudang Giyomi dalam keadaaan normal. • Ditemukan kesalahan flow dalam prototipe sebelumnya karena sebenarnya terdapat dua case pada saat penerimaan barang yaitu: 1. Case terima: accept dan reject. 2. Case kembalikan: return Perbaikan yang dilakukan dari prototipe ini adalah dengan memberikan 2 tombol berbeda sesuai dengan case tersebut diatas.
S1F2-5	Tutup SPK	• User menyadari bahwa page ini mengandung terlalu banyak informasi sehingga user menyarankan untuk menambahkan tab seperti share ITS, atau collapse expand per kategori (detail SPK, progress SPK,	• Karena semua user mengalami hal yang sama yaitu terlalu panjangnya informasi yang ditampilkan dalam satu halaman, maka design page rincian SPK akan di buat tab tab dengan

		penerimaan barang, evaluasi vendor) seperti pada list friends di line	pembagian informasi sebagai berikut: 1. tab detail SPK 2. tab progress SPK 3. tab penerimaan barang 4. tab evaluasi vendor.
S1F2-6	Evaluasi Vendor	• Sudah sesuai	• Sesuai dengan design awal
S1F2-7	List SPK	• User merasa diperlukan adanya fungsi search	• Tidak perlu karena fungsi tersebut sudah digantikan dengan fungsi sort dan filter.
S1F2-8	SPK Baru	• Diberikan jenis produk yang akan menentukan field produk. Contoh: jenis produk atasan, sehingga ukurannya S, M, L, XL, XXL. Untuk produk bawahan ukurannya menjadi S, M, L, 4L. Untuk ukuran tas field hanya berisi jumlah tas yang diinginkan.	• Perbaikan dilakukan sesuai dengan masukan user.
S1F2-9	List Vendor	• User dapat menangkap bahwa kinerja vendor tersebut bagus tetapi masih	• Sesuai dengan desain awal.

		mempertimbangkan jumlah SPK yang diselesaikan. • User tidak notice adanya tombol "tambah vendor baru", user memberi masukan untuk sedikit emphasize keberadaannya meskipun tidak jadi fokus utama sebab tidak terlihat.	• Perbaikan yang dilakukan adalah dengan mengganti tampilan call to action tambah vendor kedalam icon dengan lebih memperjelas komposisi ukuran.
S1F2-10	Rincian Vendor	• User notice adanya ketidak konsistensian penulisan variable. Seharusnya nama koleksi bukan nama produk. • User tidak notice bahwa "terbaru" merupakan fungsi sort. • User merasa keberadaan rincian SPK mengganggu dan informasi yang tertuliskan rancu. Seharusnya informasi ttg total SPK menjadi fokus utama, kemudian informasi ttg status. • User menilai penilaian vendor dari perspektif kuantitatif. Dimana semakin banyak SPK yang diselesaikan lebih baik kinerjanya.	• Perbaikan yang dilakukan sesuai dengan masukan user. • Perbaikan yang dilakukan adalah dengan merubah tampilan call to action tersebut kedalam bentuk tombol yang sedikit lebih mencolok. • Perbaikan yang dilakukan adalah dengan merubah komposisi ukuran text. • Tidak sesuai dengan design awal karena penilaian vendor dilakukan berdasarkan kualitas dari pengerjaan sesuai aspek

			penilaian pada form evaluasi vendor
S1F2-11	Tambah Vendor	• User tidak perlu memberikan role kepada vendor didalam aplikasi • User notice bahwa informasi yang dimasukkan dihalaman ini tidak terdisplay di rincian vendor. User memberi masukan untuk memasukkan semua informasi	• Sesuai dengan desain awal • Perbaikan yang dilakukan sesuai dengan masukan user.
S1F2-12	Tab Akun	• Tidak perlu adanya foto Giyomi, kecuali foto profil orang yang nantinya berfungsi untuk mempercepat user dalam mengidentifikasi akun ketika terdapat nama yang mirip. • Opsi Employee di perjelas lagi menjadi akun Employee.	• Perbaikan yang dilakukan sesuai dengan masukan user. • Perbaikan yang dilakukan sesuai dengan masukan user.
S1F2-13	Tambah Employee	• User id auto generate seharusnya • Ditambah field untuk upload foto.	• Tidak sesuai dengan design awal. • Perbaikan yang dilakukan sesuai dengan masukan user.

User : Muhammad Farchan Ramadhan
Position : System Enterprise Assistant – Odoo

Tabel H-2. 2nd User Feedback and Action – 2nd Iteration

Kode Page	Nama Page	Feedback	Action
S2F2-1	Halaman Login	• User beranggapan bahwa Employee giyomi yang akan menjadi user	• Sesuai dengan desain awal
S2F2-2	Beranda	• User berekspektasi halaman ini akan berisi menu menu sesuai privilege. • Pemilik giyomi sebagai super user memiliki semua fungsionalitas • Hal pertama yang dilihat oleh farchan adalah Bu Yanik, dimana ini mengindikasikan bahwa pemberian nama vendor sudah cukup jelas. • User berhasil mengidentifikasi nama produk / nama koleksi/ nama SPK. • User beranggapan bahwa tampilan terlalu ramai dengan ukuran font yang sama besar, seharusnya yang di emphasize itu	• Sesuai dengan desain awal • Sesuai dengan desain awal • Sesuai dengan desain awal • Sesuai dengan desain awal • Perbaikan dilakukan sesuai masukan user. • Sesuai dengan desain awal

		nama produk, kemudian nama vendor ditulis kecil dibawahnya karena biasanya user ingin tau terlebih dulu produk mana yang harusnya segera selesai, bukan vendor mana yang telat. • User berhasil mengidentifikasi bahwa grafik kotak dan progress bar bisa di klik	
S2F2-3	Rincian SPK	• Penulisan tanggal diatas stage disalah artikan sebagai jam. Daripada penulisan 05.02 lebih baik 05/02. • Hal pertama yang di notice adalah progress bar. • User merasa adanya slide down untuk melihat detail SPK itu terlalu panjang, lebih baik di tempatkan di page lain. • User tidak berhasil mengidentifikasi bahwa catatan itu adalah untuk catatan per stage. • User salah mengidentifikasi tombol selanjutnya sebagai tombol untuk menyudahi satu step, user mengira bahwa tombol selanjutnya digunakan untuk	• Perbaikan dilakukan sesuai masukan dari user. • Sesuai dengan design awal. • Karena semua user mengalami hal yang sama yaitu terlalu panjangnya informasi yang ditampilkan dalam satu halaman, maka design page rincian SPK akan di buat tab tab dengan pembagian informasi sebagai berikut: 1. tab detail SPK 2. tab progress SPK 3. tab penerimaan barang

		menyudahi proses produksi secara keseluruhan. • User memberi masukan untuk menambahkan kata “step” pada setiap stage sehingga tombol “step selanjutnya” tidak di salah artikan. • User juga memberi masukan untuk memberikan warna abu abu di step yang belum di mulai, dan meletakkan progress bar beserta catatannya menempel di atas sebagai header sehingga peletakan “step selanjutnya” tidak menjadi rancu.	4. tab evaluasi vendor • Perbaikan dilakukan dengan mendesign dengan axure untuk memberikan gambaran yang lebih jelas kepada user dibandingkan menggunakan paper. • Perbaikan dilakukan sesuai masukan user. • Tidak sesuai dengan desain awal • Perbaikan dilakukan sesuai masukan user.
S2F2-4	Penerimaan Barang	• User menyarankan untuk membedakan istilah reject, return dan accept. • User menyarankan untuk menggabungkan inputan reject + accept dan menjadikan return kedalam opsi yang berbeda.	• Perbaikan yang dilakukan: menstandarkan istilah dalam penerimaan barang kedalam tiga bentuk berikut: 4. Reject: barang diterima di gudang Giyomi dalam keadaan ada cacat.

			5. Return: Barang dikembalikan kepada vendor untuk diperbaiki 6. Accept: barang di terima di gudang Giyomi dalam keadaaan normal. • Ditemukan kesalahan flow dalam prototipe sebelumnya karena sebenarnya terdapat dua case pada saat penerimaan barang yaitu: 1. Case terima: accept dan reject. 2. Case kembalikan: return Perbaikan yang dilakukan dari prototipe ini adalah dengan memberikan 2 tombol berbeda sesuai dengan case tersebut diatas.
S2F2-5	Tutup SPK	• Dihalaman ini user notice bahwa opsi tombol di bagian bawah selalu berubah ubah.	• Benar

		• Dihalaman ini user notice bahwa terlalu banyak informasi yang harus di tampilkan didalam satu page meliputi detail SPK, progress SPK, penerimaan barang dan evaluasi vendor. • User menyarankan untuk memberikan tab dihalaman ini. Terdapat 4 tab yaitu rincian SPK, progress bar, penerimaan barang dan evaluasi barang yang di pisah kedalam page baru. Tab akan berwarna abu abu jika memang belum sampai ke proses tersebut.	• Karena semua user mengalami hal yang sama yaitu terlalu panjangnya informasi yang ditampilkan dalam satu halaman, maka design page rincian SPK akan di buat tab tab dengan pembagian informasi sebagai berikut: 5. tab detail SPK 6. tab progress SPK 7. tab penerimaan barang 8. tab evaluasi vendor • Seperti pada poin sebelumnya.
S2F2-6	Evaluasi Vendor	• Dihalaman ini user notice bahwa tidak ada tombol back sama sekali. User memberi masukan bahwa di setiap halaman yang tidak memiliki footer harus diberi icon back sebagai penanda kepada user bahwa halaman tersebut dapat di back.	• Dilakukan perbaikan sesuai masukan user.

S2F2-7	List SPK	• User memberi masukan untuk mendesain filter dan sort kedalam satu bentuk desain.	• Tidak sesuai dengan design awal.
S2F2-8	SPK Baru	• Diberikan jenis produk yang akan menentukan field produk. Contoh: jenis produk atasan, sehingga ukurannya S, M, L, XL, XXL. Untuk produk bawahan ukurannya menjadi S, M, L, 4L. Untuk ukuran tas field hanya berisi jumlah tas yang diinginkan.	• Perbaikan dilakukan sesuai dengan masukan user.
S2F2-9	List Vendor	• User memberi saran untuk memperbesar tombol “buat SPK baru” disisi kanan dari total vendor dengan memberikan icon tambah kontak hp.	• Perbaikan di lakukan sesuai masukan user.
S2F2-10	Rincian Vendor	• User merasa keberadaan rincian SPK mengganggu. • User menilai penilaian vendor lebih dari perspektif kualitatif. Dimana semakin banyak SPK yang diselesaikan secara ontime daripada yang telat maka lebih baik kinerjanya.	• Perbaikan dilakukan dengan memperbaiki komposisi ukuran font. • Sesuai dengan design awal

S2F2-11	Tambah Vendor	• Sudah cukup	• Button untuk tambah vendor menggunakan icon +
S2F2-12	Tab Akun	• Tombol keluar terlalu besar. • Notifikasi dan validasi SPK seharusnya dijadikan satu saja.	• Memperbaiki komposisi tombol keluar. • Tidak sesuai dengan desain awal
S2F2-13	Tambah Employee	• Opsi untuk menghapus akun belum ada, padahal ada kemungkinan Employee keluar dari Giyomi. Opsi ini bisa ditampilkan di Tampilan rincian Employee	• Perbaikan dilakukan sesuai dengan masukan user.

User : Niken Wibawani
Position : Accounting Employee - Giyomi

Tabel H-3. 3rd User Feedback and Action – 2nd Iteration

Kode Page	Nama Page	Feedback	Action
S3F2-1	Halaman Login	-	-
S3F2-2	Beranda	• User langsung dapat menangkap maksud dari grafik yang ditampilkan. • User berhasil mengidentifikasi nama produk / nama koleksi/ nama SPK. • User berhasil mengidentifikasi bahwa grafik kotak dan progress bar bisa di klik	• Sesuai dengan desain awal • Sesuai dengan desain awal • Sesuai dengan desain awal
S3F2-3	Rincian SPK	• User salah mengidentifikasi tombol selanjutnya sebagai tombol untuk menyudahi satu step, user mengira bahwa tombol selanjutnya digunakan untuk menyudahi proses produksi secara keseluruhan.	• Perbaikan dilakukan dengan mendesign dengan axure untuk memberikan gambaran yang lebih jelas kepada user dibandingkan menggunakan paper.

S3F2-4	Penerimaan Barang	• -	-
S3F2-5	Tutup SPK	• Dihalaman ini user notice bahwa terlalu banyak informasi yang harus di tampilkan didalam satu page meliputi detail SPK, progress SPK, penerimaan barang dan evaluasi vendor.	Karena semua user mengalami hal yang sama yaitu terlalu panjangnya informasi yang ditampilkan dalam satu halaman, maka design page rincian SPK akan di buat tab tab dengan pembagian informasi sebagai berikut: 1. tab detail SPK 2. tab progress SPK 3. tab penerimaan barang 4. tab evaluasi vendor.
S3F2-6	Evaluasi Vendor	-	-
S3F2-7	List SPK	• User sangat puas dengan penempatan tombol buat SPK baru yang sangat menonjol.	• Sesuai dengan desain awal

S3F2-8	SPK Baru	-	-
S3F2-9	List Vendor	-	-
S3F2-10	Rincian Vendor	• User merasa keberadaan rincian SPK mengganggu.	• Perbaikan dilakukan dengan memperbaiki komposisi ukuran font.
S3F2-11	Tambah Vendor	• Sudah cukup	• Button untuk tambah vendor menggunakan icon +
S3F2-12	Tab Akun	• User sedikit bingung dengan tampilannya	• Memperbaiki komposisi halaman
S3F2-13	Tambah Employee	• Opsi untuk menghapus akun belum ada, padahal ada kemungkinan Employee keluar dari Giyomi. Opsi ini bisa ditampilkan di Tampilan rincian Employee	• Perbaikan dilakukan sesuai dengan masukan user.

Third Iteration

Respondent Name: Imam Teguh

Date of Validation: June, 28th 2019

No	Success Rate	Time Spent	Note
TC1	1	53	User menyebutkan jumlah SPK didalam list dengan menghitung. User mengakses dari beranda langsung, bukan dari fitur filter yang ada di halaman SPK.
TC2	1	25	User sempat ragu bahwa detail assesors berada di tab detail SPK.
TC3	1	90	Lancar.
TC4	1	250	User sempat kesulitan dalam memasukkan accepted dan return. Diira satu produk accept/return nya setelah memasukkan. Bingung istilah accepted, reject & return.
TC5	1	40	Lancar.
TC6	1	27	Lancar
TC7	1	14	Lancar
TC8	1	80	Lupa simpan vendor dengan nilai tertinggi sehingga harus kembali ke tab vendor. Sempat bingung cara menyimpan rekomendasi draft.
TC9	1	150	Kesulitan mencari SPK yang telah dibuat, user membuka halaman list SPK.
TC10	0	240	User tidak berhasil menemukan lokasinya. User membuka list SPK dan tab vendor Pak Noval
TC11	1	52	User membuka tab vendor berharap bisa mengakses dari tab Pak Ruben.
T12	1	20	User sempat bingung lokasi pembuatan akun karena nama tab tidak representatif

(Imam Teguh)

Respondent Name: Andira Gita N.

Date of Validation: 28 06 2018

No	Success Rate	Time Spent	Note
TC1	1	30	akses dari beranda.
TC2	1	23	lancar.
TC3	1	80	membatalkan SPK diarahkan, padahal gabisa dibatalkan. selain itu lancar. tombol selesaikan sulit missed.
TC4	1	122.	lancar, kurang notice ada "Keterangan" karena terlalu fokus menyelesaikan tugas
TC5	1	28	lancar.
TC6	1	31	lancar.
TC7	1	8	lancar
TC8	1	200	mengalami kesulitan dalam mengisikan vendor dengan nilai tertinggi. bingung cara menyimpan didraft. ulang.
TC9	1	75	sedikit bingung letak tab draft. selebihnya lancar.
TC10	1	97	user masuk list spk., beranda, vendor, akun sempat bingung saat di list spk dan beranda.
TC11	1	14	langsung masuk ke list SPK dan langsung filter list nya. lancar.
T12	1	31	sedikit ragu dengan istilah peraturan sehans nya pengaturan.

Andira

Respondent Name: FIA AFINA YUSVIANA

Date of Validation: 28 – 06 – 2019

No	Success Rate	Time Spent	Note
TC1	1	35	User mengakses filter . Lancar
TC2	1	16	Lancar.
TC3	1	113.	User masuk tab penerimaan barang , kemudian tab evaluasi
TC4	1	134.	User rancu dengan istilah return .. Awalnya diira return itu sama dengan "terima cacat" dirasih warna button . merah , kuning , biru
TC5	1	28	Lancar
TC6	1	30	Lancar
TC7	1	6	Lancar
TC8	0	153	Sedikit kesulitan mencari tombol [Spk baru] User bingung cara menyimpan di draft . cuang karena request for validation
TC9	1	63	langsung menemukan [draft] box di beranda
TC10	1	115	user membuka list SPK , draft SPK , dan bolak - balik . User berfikir u/ bersanti akun dulu makanya bisa ketemu.
TC11	1	16.	akses tab vendor dan melihat info diberikan Sukses.
T12	1	30	Lancar.

Fia Afina Yusviana

Respondent Name: Evia Nanda
Date of Validation: 28/6/2019

No	Success Rate	Time Spent	Note
TC1	1	34.	Mengakses beranda
TC2	1	57	Bingung mencari detail aksesoris. Klik klik di bagian catatan.
TC3	1	158	Langsung klik step fungsi setelah step jahit. Sudah klik "selesaikan jahit"
TC4	1	272	Return → Reject (kesulitan menemukan return) Lama monotice tombolnya barang
TC5	1	35	Lancar.
TC6	1	34.	Nyasar ke tab akun dulu sesaat.
TC7	1	98	Lancar
TC8	1	100	Ulang lagi karena salah memilih request validasi
TC9	1	97	User membuka tab spk. Bingung dimana letak draft.
TC10	1	256	User membuka tab list SPK. Kemudian kotak draft. balik lagi ke list spk.
TC11	1	24	User tersesat di fitur sort (nama) diklik urut kan berdasar nama vendor.
TC12	1	29	Lancar

Evia N.

Fourth Iteration

4th Iteration

Respondent Name: Gamal Akbar
Date of Validation: 29/6/2019

No	Success Rate	Time Spent	Note
TC1	1	28	Masuk dari beranda. - Filter. Lancar
TC2	1	26.	Akses dari dashboard → detail produk lancar.
TC3	1	64.	Tanggal berhasil diidentifikasi dengan cepat, Selesaikan sakit Clear.
TC4	1	107	Lancar
TC5	1	31	Lancar. Tombol tutup cepat diidentifikasi
TC6	1	29	Sesuai flow.
TC7	1	6	Lancar
TC8	1	33.	User input spk tertinggi. Simpan draft ok
TC9	1	63.	Akses dari dashboard.. Missed perintah.
TC10	1	34.	Akses dari dashboard
TC11	1	15	Sesuai flow. dari footer
T12	1	17	Sesuai flow. Ragu dgn istilah Pengantar

Gamal Akbar

2nd Ideration

Odoo

Respondent Name: Fauzan Pinantyo
Date of Validation: 29/6/2019

No	Success Rate	Time Spent	Note
TC1	1	23	Buka dari beranda. Filter
TC2	1	17	Buka dari beranda → lancar
TC3	1	67	tanggal sudah jelas. - Lancar saja
TC4	1	100	Lancar. Istilah tombolkan sedikit rancu.
TC5	1	38	Lancar.
TC6	1	18	Lancar
TC7	1	5	Lancar
TC8	1	60	Langsung notice tombol (+). Notice tombol simpan draft
TC9	1	85	Akses dari beranda.
TC10	1	23	Langsung akses dr beranda.
TC11	1	50	Masuk ke tab diberanda.
T12	1	32	Pasu dengan istilah pengaturan akun Staff

Fauzan

Heration

Giyomi

Respondent Name: Juariya
Date of Validation: 29/6/2019

No	Success Rate	Time Spent	Note
TC1	1	42	Lancar.
TC2	1	30	Langsung membuka dari dashboard. User lama berada di Progress SPK. Masuk Detail Produk tapi masuk progress spk lagi
TC3	1	140	Penyebutan tgl nya lancar.
TC4	1	200	Sedikit bingung dengan retur v istilah nya: kembalikan sedangkan di giyami lebih familiar dengan istilah retur
TC5	1	32.	langsung lancar.
TC6	1	25	Langsung masuk tab dan menemukan icon.
TC7	1	5	Lancar
TC8	1	42	Lancar langsung masuk tab SPK
TC9	1	100	Sort name. Kemudian masuk ke filter draft. Langsung bisa notice ⊕ tambah produk
TC10	1	35	Akses dari beranda, Sempat hover bagian badan list.
TC11	1	18.	tab spk, pak Ruben ✓
T12	1	25	Langsung masuk staff akun. Lancar.

Juariya

Respondent Name: Yudha Prasetyo
Date of Validation: 2/7/2019

No	Success Rate	Time Spent	Note
TC1	1	45	Lancar . Ganti filter
TC2	1	49	Lancar
TC3	1	28.	Lancar.
TC4	1	125	Sangat lancar dalam memasukkan jumlah dana yg diterima
TC5	1	29	Lancar
TC6	1	24	Lancar
TC7	1	8	Lancar
TC8	1	35	Lancar.
TC9	1	78	Akses dari beranda. Bisa tambah produk. Lancar
TC10	1	64	User bingung bagaimana cara validasi
TC11	1	12.	Langsung mengarah ke list sku dari filter.
T12	1	26	Langsung masuk akun. lancar

Appendix I. Design Opportunities

First Iteration

From lo-fi 1 to lo-fi 2

Table I.1. Design Opportunity Iteration 1

Code	Page Name	Problems	Design Opportunities
FD1-1	Log in page	Users found it less brand pride to have this application without adding their logo in the initial page.	Adding the logo of the company in the login page
FD1-2	Home page	The first option gives informative dashboard, whereas second option provides a quick way to move to other pages in the form of footer. All other features beside those which are mentioned were not noticeable for the users.	Combining the dashboard and the footer in the home page.
FD1-3	SPK list pages	Users found that there were too much content in one list entry. So, they could not really see many entries in one single page.	Adding collapse and expand function for each entries in the list. Emphasizing the create new SPK button by changing the size and adding (+) icon.

Code	Page Name	Problems	Design Opportunities
		User also found that the main function in this page, which is option to create new SPK, was not yet emphasized. Users found it hard to operate sort function in the first design option.	Using the second option of sort function by deleting “nilai” as this function is not related to the page.
FD1-4	SPK progress pages	Users found many ambiguities in term of date statement, especially deadline. Users missed the function of [selanjutnya] button as the call to action. They did not expect that button [selanjutnya] means to move one step forward Users didn’t notice the existence of clickable text [+tambahcatatan]. All users did not think that the status information is necessary. Users felt annoyed with the position of button [selanjutnya]	Change the deadline composition by detailing the date above each stage in the progress bar. Changing [selanjutnya] to [step selanjutnya] Changing the [+tambahcatatan] clickable text into button Deleting the status information Stick the [selanjutnya] button to the bottom of the page.

Code	Page Name	Problems	Design Opportunities
FD1-5	Create new SPK pages	First design option gave a clear flow of text field, but user felt irritated with the position of the send button. Users liked the option to write down detail accessories in text box. Users didn't notice the (x) option in the header.	Using the first design but replacing the send button to the bottom of the page. Adding text box for detail accessories filling. Deleting (x) button and replacing it with cancel button in the buttom page instead.
FD1-6	Goods Receipt	The use of unconsistent language.	Changing "post" button into "simpan"
FD1-7	Vendor pages	Users felt annoyed with the location of create new vendor option on the first design. Users could hardly understand the filter and sort function in the second page.	Using the second design option but changing the sort and filter function into a quick action as what the first design option had
FD1-8	Vendor details pages	Users were having difficulty in finding the progress status of the SPK entries	Using second design option by adding status in each entries to

Code	Page Name	Problems	Design Opportunities
		Users tend to like the second design because it gives more information about SPK score	better present the SPK information.
FD1-9	Vendor evaluation page	Users requested the aspects they want to grade Users were confused with the naming of SPK, was it identified with the Product Name or Collection Name	Adding 3 aspects to the evaluation page. standardize SPK naming taken from the collection name.
FD1-10	-	Requested New Page	Details of completed SPK, Account Page, create new vendor, Managing Employee account

Second Iteration

From lo-fi 2 to hi-fi 1

Table I.2. Design Opportunity Iteration 2

No	Page Name	Problems	Design Opportunities
FD2-1	Log in page	Flow	Home page
FD2-2	Home pages	The user assumed that vendor naming was appropriate, but the font size composition was too bias with the SPK name	Changing the composition of the font size to be smaller than the SPK name because SPK name should be emphasized than other features.
FD2-3	SPK list pages	Users found it unnecessary to give option to sort based on the status, it would be better to put those option as filter	Deleting status sorter.
FD2-4	SPK progress pages	User still could not recognize the way to navigate from one step to another.	Changing [step selanjutnya] to [selesaikan step x] and pull it out from the bottom panel.
FD2-5	Create new SPK pages	There appeared ambiguity from the meaning of the button send on this page.	Changing button send to button [request validasi]

No	Page Name	Problems	Design Opportunities
		Users found it unnecessary to write Jumlah Roll and Kain because both hacing similar meaning Users were confused by the different between Nama Koleksi and Nama Produk Users were confused with the size field since shirt and pants have different sizing.	Deleting jumlah roll. Adding "Detail Produk" placeholder between the upper part and lower part of the page. Adding an option to choose product category which could affect the sizing option.
FD2-6	Goods Receipt	There is no specific product name and size	Adding name and size to the option
FD2-7	Vendor list	Users were frustrated with the composition of "create new vendor" button	Adding icon for creating new vendor instead
FD2-8	Vendor details	-	-
FD2-9	Vendor evaluation	-	-

No	Page Name	Problems	Design Opportunities
FD2-10	Details of completed SPK	The users feel overwhelmed to scroll down the page because there was too many information in one page.	Changing the presentation into tab view.
FD2-11	Account Page	Users don't need notification option in the application because users perform progress update everyday	Deleting the notification button.
FD2-12	Create new vendor	User confused on how to cancel the task if they don't want to to create new vendor.	Adding cancel button to provide cancel option to the users.
FD2-13	Create new Employee account	-	-
FD2-14	Employee list	Users feel irritated with the button for creating new Employee account.	Standardized all button for creating new account.

Third Iteration

From hi-fi 1 to hi-fi 2

Table I.3. Design Opportunity Iteration 3

No	Page Name	Problems	Design Opportunities
FD3-1	Log in page	-	-
FD3-2	Home pages	-	-
FD3-3	SPK list pages	The user had difficulty finding the filter button on this page.	It's possible that the filter button is too small in composition so resize is needed.
FD3-4	SPK progress pages	-	-
FD3-5	Create new SPK pages	-	-
FD3-6	Goods Receipt	Users confused with the flow	Changing the flow Deleting “Keterangan”

		From test case 4, user didn't notice "Keterangan"	
FD3-7	Vendor list	The user had difficulty finding the filter button on this page.	It's possible that the filter button is too small in composition so resize is needed.
FD3-8	Vendor details pages	Users need the overview of the product	Shows the picture of the product in the repeated list.
FD3-9	Vendor evaluation page	-	-
FD3-10	Details of completed SPK	-	-
FD3-11	Account Page	Ref to number 6	Ref to number 6
FD3-12	Create new vendor	-	-
FD3-13	Create new Employee account	-	-

FD3-14	Employee list	-	-
FD3-15	Draft	Users found it hard to find the location of draft from homepage. User tried to find it in the SPK list.	Adding the draft SPK to SPK list with the help of filter option
FD3-16	SPK Validation	Users could not find the location of validation request. User tried to find it in the SPK list.	Deleting the option from the account page and relocate it to the homepage and SPK list with the help of filter option.

Fourth Iteration

Table I.4. Design Opportunity Iteration 4

No	Page Name	Problems	Design Opportunities
FD4-1	Log in page	-	-
FD4-2	Home pages	-	-
FD4-3	SPK list pages	-	-
FD4-4	SPK progress pages	User experienced doubt to click the stage button.	Adding right and left button to ensure the users that the page is dynamic
FD4-5	Create new SPK pages	-	-
FD4-6	Goods Receipt	-	-
FD4-7	Vendor pages	-	-

FD4-8	Vendor details pages	-	-
FD4-9	Vendor evaluation page	The score on all three aspects of the assessment should not be inputted by the users but generated automatically based on the performance results from the SPK progress which have been carried out.	Looking at SCOR standards to find way to assess performance in term of timeliness and quality.
FD4-10	Details of completed SPK	Vendor experienced doubt in clicking "Detail SPK" to find the detail accessories	Changing "Detail SPK" to "Detail Produk"
FD4-11	Account Page	-	-
FD4-12	Create new vendor	-	-
FD4-13	Create new Employee account	-	-
FD4-14	Employee list	-	-

Appendix J. Testing Protocol

Table J.1. Testing Protocol

Domain	Description
Author	Erica Maulidina Bening
Contact Detail	maulidina.erica@gmail.com
Product under test	Vendor Management Giyomi Prototype
Test Objective	Testing effectivity of the constructed design and efficiency of the test case which have been made.
Participant	1. 10 participants who have experience in production or warehousing scope. 2. All participants have ever used software related to production or warehousing.
Equipment	Laptop All sessions are audio recorded Notes. Testing form
Respon-sibilities	Erica Maulidina Bening (moderator, client contact, recruitment)
Test Procedure	Terima kasih telah berpartisipasi dalam uji coba prototype mobile ini. **Tujuan dari kegiatan ini adalah untuk mengevaluasi tampilan dari prototipe Manajemen Vendor Giyomi.** Proses produksi dari Giyomi dikerjakan oleh vendor, sehingga prototipe ini akan

Domain	Description
	membantu Giyomi dalam memantau proses produksi di vendor tersebut. Dimulai dari pengiriman SPK (Surat perintah kerja) kepada vendor, kemudian vendor akan melakukan produksi sesuai dengan detail permintaan yang tersampaikan di SPK tersebut. Terdapat 3 stage dalam progress SPK yaitu cutting, jahit dan finishing stage. Jika produk sudah jadi, vendor akan mengirimkan barang ke gudang Giyomi untuk dilakukan QC. Anda akan diberikan 12 test case yang berisi beberapa poin aktifitas yang harus anda lakukan didalam prototipe ini secara urut. Anda tidak diperbolehkan menanyakan cara menyelesaikan aktifitas tersebut kepada moderator karena tugas moderator adalah merekam suara anda dan mencatat semua kesulitan yang anda alami selama menjalankan test case tersebut. Jika anda merasa bingung dan merasa tidak sanggup menyelesaikan case, anda diperbolehkan untuk berhenti mengerjakan dan poin test case tersebut akan dinilai gagal. Selain itu, moderator akan mencatat waktu yang anda butuhkan untuk menyelesaikan setiap case nya, sehingga semakin cepat waktu penyelesaian maka semakin baik. Diakhir sesi, moderator akan meminta evaluasi kepada anda mengenai sesi yang telah berlalu dan mengenai prototipe yang telah anda coba. Hasil dari testing ini akan digunakan sebagai masukan untuk perbaikan selanjutnya dari design dan fungsi prototype. Sebelum kami memulai instruksi pengerjaan tugas, **moderator akan meminta Anda untuk membaca test case. Anda dapat mengajukan pertanyaan jika terdapat case yang kurang jelas.**

Appendix K. Heuristic Evaluation Sheet

Heuristic Principle

Tabel K-1. Heuristic Principles

Prinsip Heuristic Evaluation (HE)	Deskripsi
H1 - *Visibility of System Status*	The system should always keep users informed about what is going on, through appropriate feedback within reasonable time.
H2 - *Match Between System and the Real World*	The system should speak the users' language, with words, phrases and concepts familiar to the user, rather than system-oriented terms.
H3 - *User Control and Freedom*	Users often choose system functions by mistake and will need a clearly marked "emergency exit" to leave the unwanted state without having to go through an extended dialogue. Support undo and redo.
H4 - Consistency and Standards	Users should not have to wonder whether different words, situations, or actions mean the same thing.
H5 - *Error Prevention*	Even better than good error messages is a careful design which prevents a problem from occurring in the first place.
H6 - *Recognition Rather Than Recall*	Minimize the user's memory load by making objects, actions, and options visible. The user should not have to remember information from one part of the dialogue to another. Instructions for use of the system should be visible or easily retrievable whenever appropriate.

H7 - *Flexibility and Efficiency of Use*	Accelerators — unseen by the novice user — may often speed up the interaction for the expert user such that the system can cater to both inexperienced and experienced users.
H8 - *Aesthetic and Minimalist Design*	Dialogues should not contain information which is irrelevant or rarely needed. Every extra unit of information in a dialogue competes with the relevant units of information and diminishes their relative visibility.
H9 - *Helps User Recognize, Diagnose, and Recovers User*	Error messages should be expressed in plain language (no codes), precisely indicate the problem, and constructively suggest a solution.
H10 - *Help and Documentation*	Even though it is better if the system can be used without documentation, it may be necessary to provide help and documentation.

Severity Rating

Tabel K-2. Severity Ratings

SR	Deskripsi
0	***Don't Agree*** : I don't agree that this is a usability problem at all.
1	***Cosmetic Problem*** : Need not be fixed unless extra time is available on project
2	***Minor usability problem*** : Fixing this should be given low priority.
3	***Major usability problem*** : Important to fix, so should be given high priority.
4	***Usability Catasthrope*** : Imperative to fix this before product can be released.

Heuristic Evaluation Sheet

Tabel K-3. Heuristic Evaluation Results 1st Iteration

ID	Problems	SR	Evaluator			HE
			1	2	3	
FH1-1	Penggunaan bahasa konsisten apabila menggunakan bahasa Indonesia, maka seluruhnya menggunakan bahasa tersebut. misalnya pada tombol back, edit profile, draft.	1	Yes	-	Yes	H4
FH1-2	Memberikan intro slider sebelum login untuk memberitahu user baru mengenai kegunaan dan tujuan aplikasi	1	Yes	-	Yes	H10
FH1-3	Terdapat beberapa control yang tidak berjalan atau merujuk ke informasi atau tampilan manapun (fungsi dropdown di navigasi SPK,	4	Yes	Yes	Yes	H8

ID	Problems	SR	Evaluator			HE
			1	2	3	
	edit profil di akun, hubungi vendor, tunda SPK)					
FH1-4	Halaman beranda, tombol pada Ameera Sweater Pak Noval tidak memiliki keterangan yang jelas (bahkan saya tidak menyadari bahwa itu bisa dipencet), tambahkan tulisan kecil seperti (lihat detail ->) dibawah tulisan Ameera Sweater Pak Noval agar orang dapat mengerti bahwa tombol dapat dipencet	3	Yes	-	Yes	H8
FH1-5	Field kain (yard) pada SPK Baru ubah ke kain (meter) dan istilah telat bisa diubah ke terlambat.	1	Yes	-	Yes	H2

ID	Problems	SR	Evaluator			HE
			1	2	3	
	Memakai istilah yang awam bagi pengguna					
FH1-6	Setelah melakukan request validasi atau kirim ke vendor, notifikasi ya tidak nya ditambahin summary pemesanannya apa aja	2	Yes	-	Yes	H6
FH1-7	Detail tidak bisa di-klik ketika masuk menu spk lewat 4 kotak dari atas beranda.	2	-	Yes	-	H4
FH1-8	Opsi Ya dan Batal tidak memiliki warna atau ciri yg berbeda, pengguna yang bisa saja salah pencet	2	-	Yes	-	H5
FH1-9	Tidak ada opsi untuk mengedit info vendor yg sudah ada, misal no telponnya ganti. Tapi kalo	2	-	Yes	-	H3

ID	Problems	SR	Evaluator			HE
			1	2	3	
	bukan kebutuhannya, ya gakpapa					
FH1-10	Tidak ada opsi untuk menghapus staf	2	-	Yes	-	H3
FH1-11	Perlu ditambahkan skenario memasukkan email dan password, seperti alert atau caution apabila lupa mengisi untuk memastikan skenario prototype sesuai dengan skenario aplikasi yang sesungguhnya	2	-	-	Yes	H4
FH1-12	Pada menu Buat SPK Baru apabila ingin menyimpan dan selesai menekan tombol Simpan Draft, seharusnya masuk ke navigasi SPK dan masuk ke filter draf	4	-	-	Yes	H8

ID	Problems	SR	Evaluator			HE
			1	2	3	
FH1-13	Perbedaan warna antara status draf, berjalan, selesai, dan validasi. Agar memudahkan pengguna dalam memahami saat sekilas melihat	2	-	-	Yes	H8

Tabel K-4. Heuristic Evaluation Results 2nd Iteration

ID	Problems	SR	Evaluator			HE
			1	2	3	
FH2-1	filter SPK tidak ada select all & clear filter	1	Yes	-	-	H3
FH2-2	Tidak ada halaman help/dokumentasi atau tutorial utk pake app nya	2	Yes	-	-	H10
FH2-3	Fitur sort tidak ada keterangan sedang mengurutkan ASC atau DESC	1	-	Yes	-	H1
FH2-4	Tombol aksi "edit draft"terlihat sama dengan tampilan status	1	-	Yes	Yes	H8
FH2-5	Ketika menerima/kembalikan barang, sebaiknya ada	2	-	-	Yes	H5

ID	Problems	SR	Evaluator			HE
			1	2	3	
	summary jumlah yang diterima/kembalikan lalu pertanyaan apakah benar - benar ingin menerima/kembalikan, karena bisa saja salah tulis dan ingin menggantinya					
FH2-6	Ketika penerimaan barang itu jika jumlah barangnya tidak ada menggunakan "0" atau "-", sebaiknya dibuat konsisten	1	-	-	Yes	H4

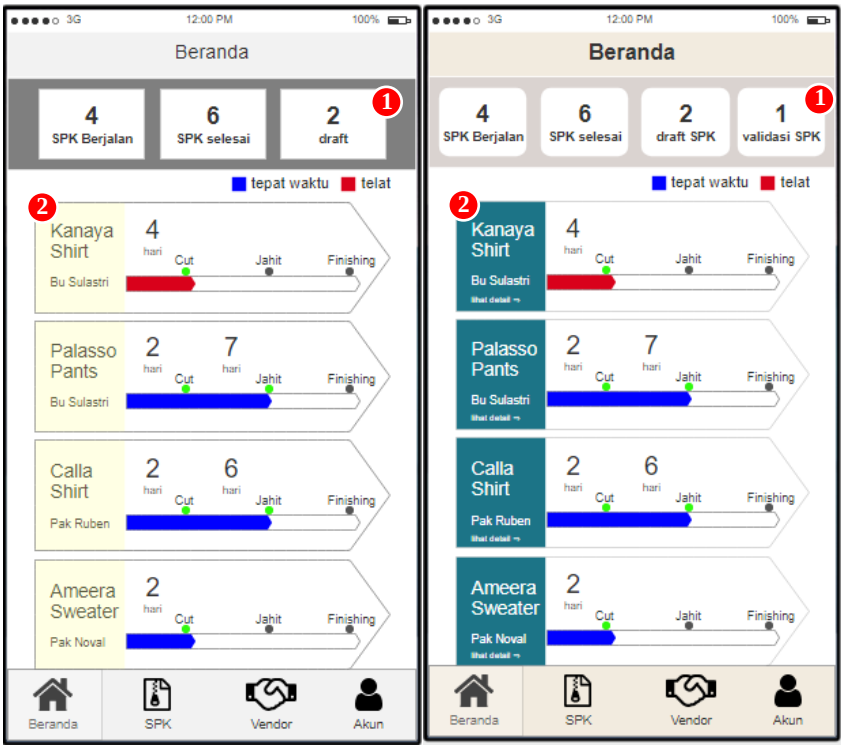
Notes:

SR: Severity Ratings.

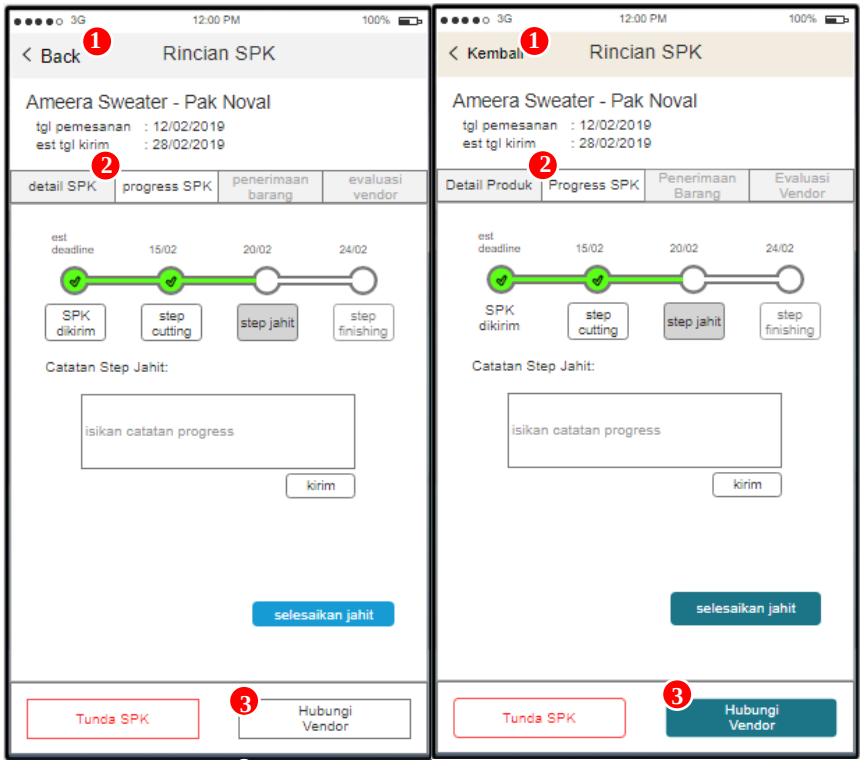
HE Principe: Heuristic Evaluation Principal.

Yes: The evaluator found it.

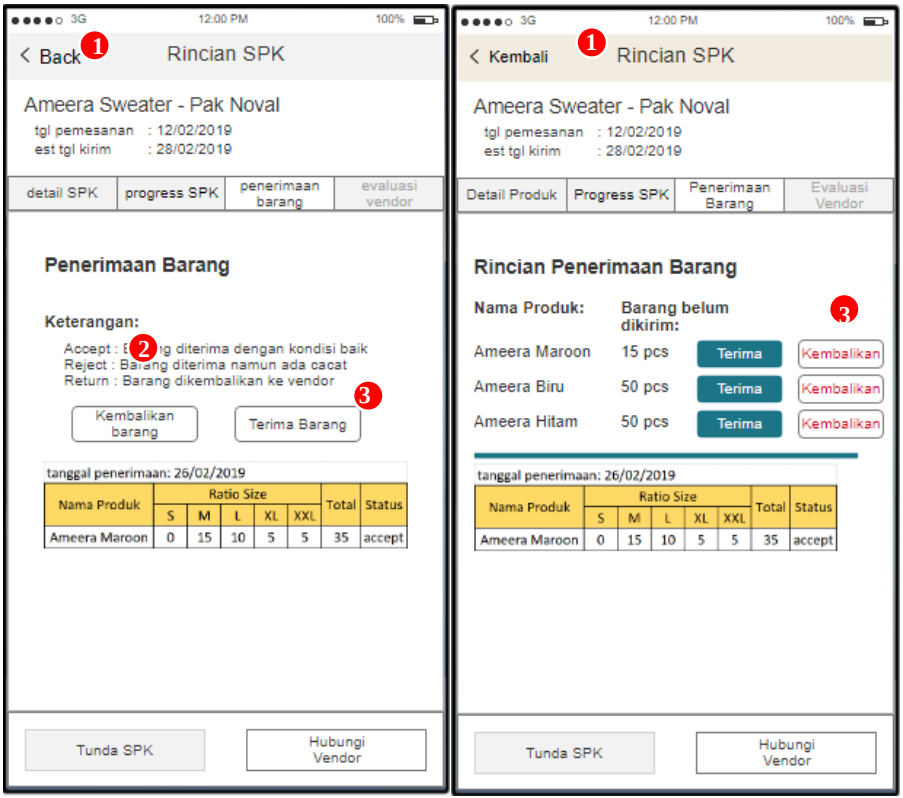
Appendix L. Design Comparison (Last Iterations)



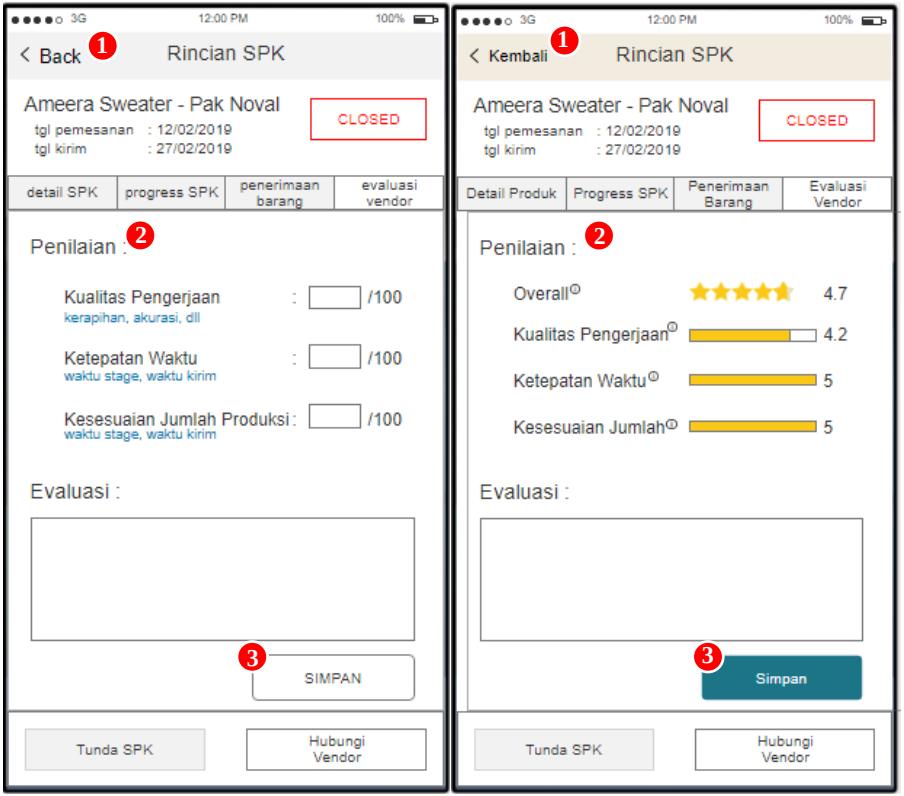
Number	User Feedback
1	FD3-16
2	FH1-4



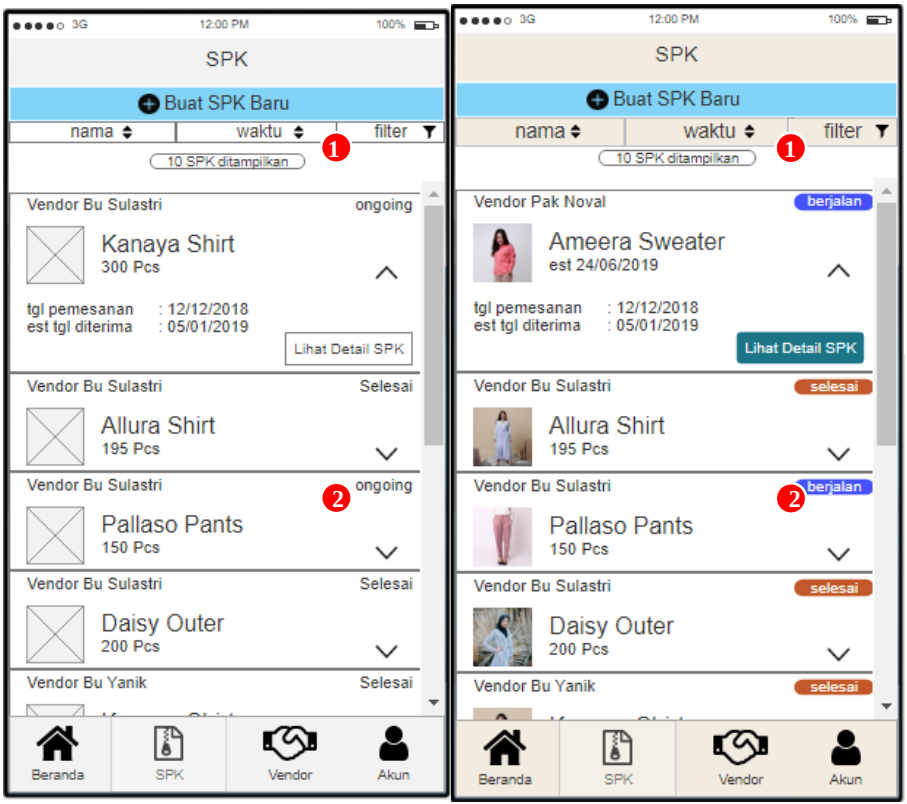
Number	User Feedback
1	FH1-1
2	FD4-10
3	FH1-1



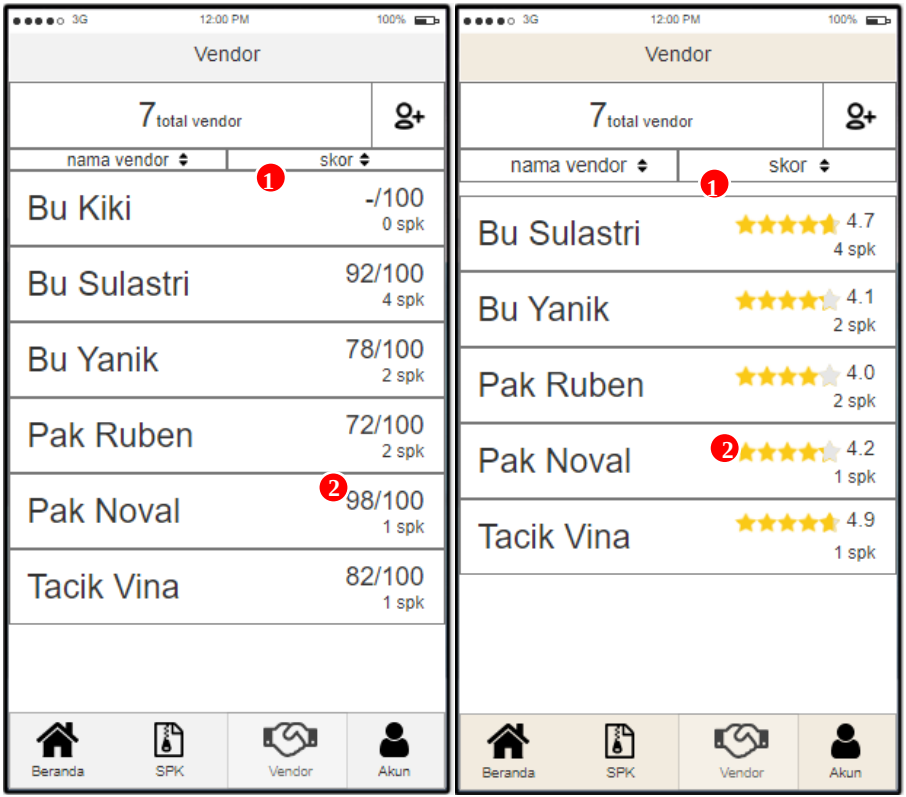
Number	User Feedback
1	FH1-1
2	FD3-6
3	FD3-6



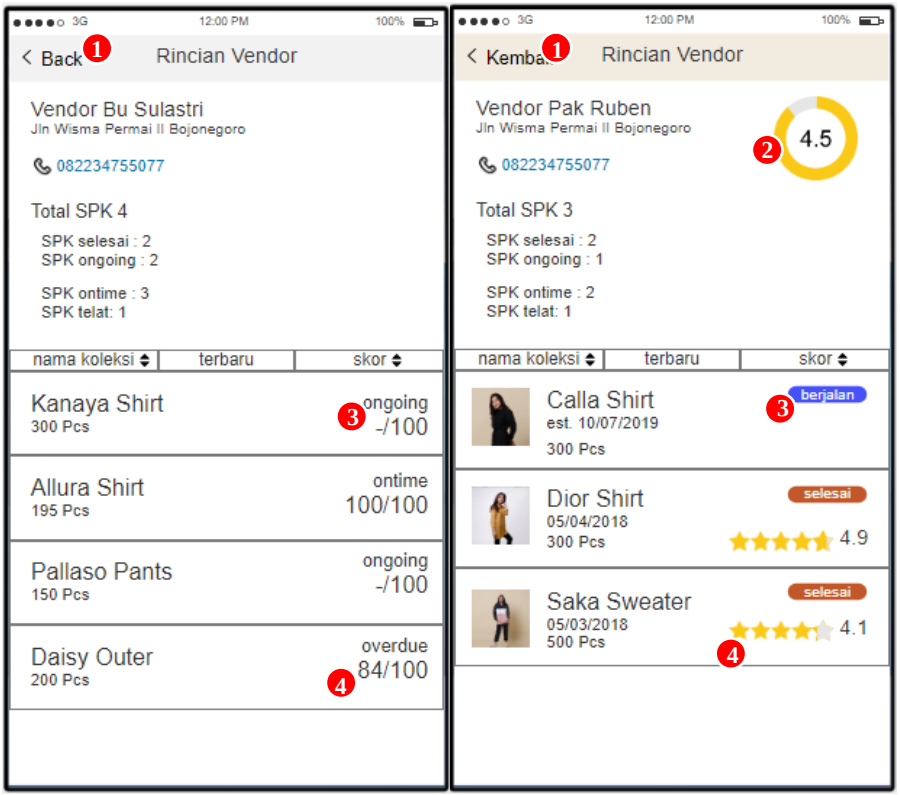
Number	User Feedback
1	FH1-1
2	FD4-9
3	FH1-1



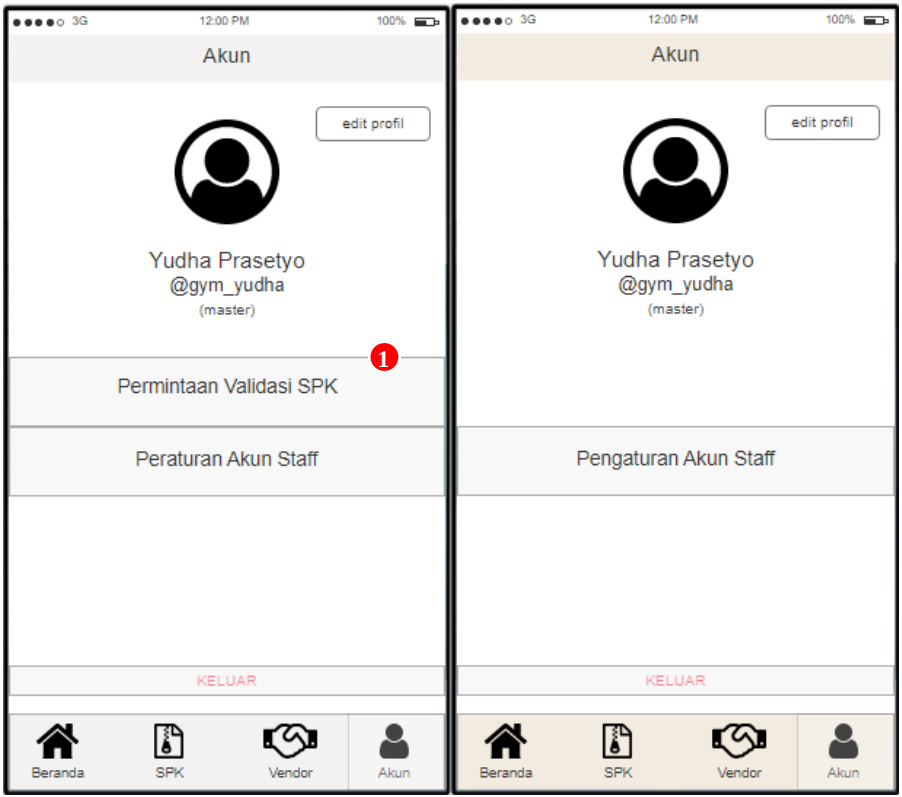
Number	User Feedback
1	FD3-3
2	FH1-13



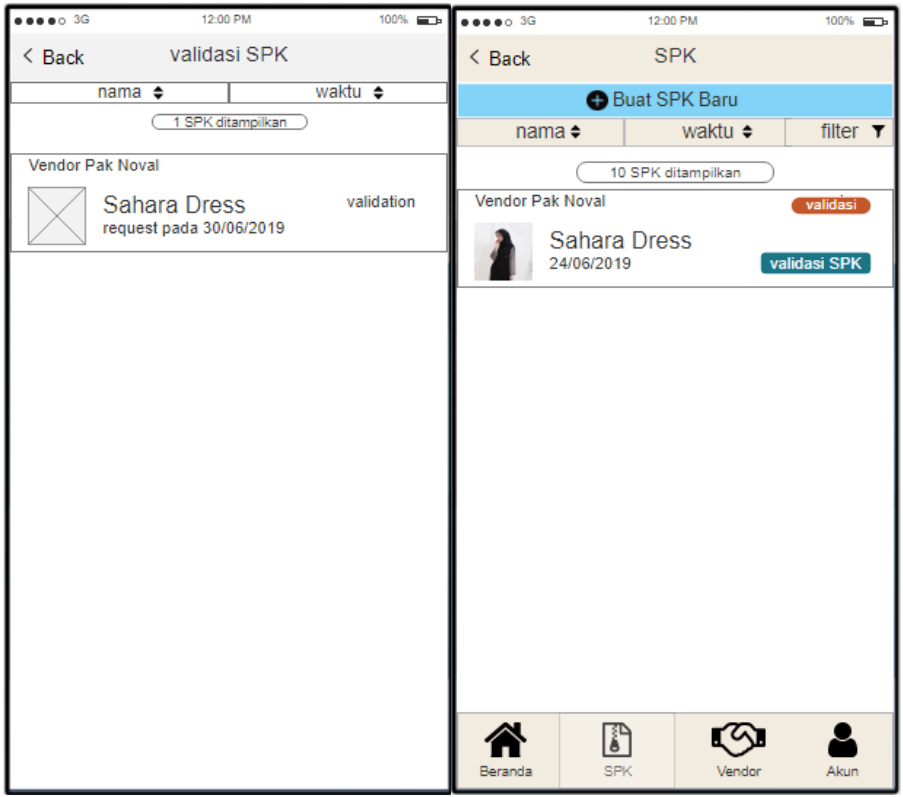
Number	User Feedback
1	FD3-3
2	FD4-9



Number	User Feedback
1	FH1-1
2	FD4-9
3	FH1-13
4	FD4-9



Number	User Feedback
1	FD3-16



Number	User Feedback
1	FD3-16

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Appendix M. Validation Sheet

Lembar Validasi

Judul Penelitian	:	Designing Prototype of Vendor Management System Using Iterative Prototyping and Moderated Usability Test Methods. (Case Study: Giyomi.id)
Peneliti	:	Erica Maulidina Bening
Pembimbing I	:	Mahendrawathi ER, ST, M.Sc, Ph.D
Pembimbing II	:	Rully Agus Hendrawan, S.Kom, M.Eng

Telah dilakukan penggalian data melalui wawancara dan observasi langsung terhadap informan penelitian sebagai berikut:

Narasumber	: Yudha Prasetyo
Jabatan	: Pemilik Usaha
Hasil Penelitian	: terlampir

Berikan checklist pada kolom dibawah ini:

Komponen Validasi	Sesuai dengan fakta dilapangan	
	Ya	Tidak
Pernyataan narasumber yang digunakan dalam menentukan user needs dan user stories dalam penelitian.	✓	
Feedback narasumber atas prototype yang diujikan pada iterasi pertama dan keempat.	✓	
Pernyataan narasumber terkait aspek penilaian kinerja vendor	✓	

Surabaya, 8 Juli 2019

CV JAVA FASHION INDONESIA

Yudha Prasetyo

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Appendix N. Project Link

The online published project can be accessed through the following link:

https://pwa7yd.axshare.com

The axure project can be downloaded in the following link:

http://bit.ly/axure_05211540000094

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BIODATA

Born in Trenggalek July 20th, 1997, the author is a proud daughter of Rohadi and Sutarti, and a blessful sibling of 4, Bagas, Kafi, and Hilma. The author went to SMAN 1 Trenggalek to later obtained the bachelor's degree from Information Systems Department of Institut Teknologi Sepuluh Nopember, Surabaya. The author contributed actively both in the academic and non-academic fields during the lecture. The author was once the awardee of Bank Indonesia Scholarship for two periods from 2017 until 2019. The author is a responsible, reliable and team-oriented person who has several times received offers to be part of reputable events such as CommTECH Camp Insight 2017 and ISICO Bali 2017. The author is an open person and is very fond of internationalization. In 2018 the author had the opportunity to be an exchange student at Hochschule Darmstadt Germany for six months. The author also openly accepts suggestions and input, which can be contacted via email at maulidina.erica@gmail.com

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