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Analysis of Helpdesk System Development in A Manufacturing Company using Design Thinking Approach

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ABSTRACT

The IT department is vital in manufacturing companies, including PT XYZ, where operations involve transforming raw materials into finished goods. With the complexity of these activities, IT support is essential for managing software and hardware that aligns with business processes. PT XYZ implemented a helpdesk system to streamline IT services but encountered communication issues in the ticketing feature, affecting system efficiency and effectiveness. This research aimed to improve communication between users and administrators to enhance efficiency in monitoring and maintaining IT infrastructure. The study used a design thinking approach, chosen for its collaborative, flexible, and adaptive nature. The process began with the empathize stage, using usability scales and in-depth interviews with users to identify pain points and gather insights. Define, ideate, and prototype stages involved brainstorming and designing solutions in collaboration with the IT team. Finally, the testing stage evaluated user feedback on the improved system. The redevelopment of the helpdesk system yielded significant results, including a 12.27-point increase in usability scale scores. Enhanced features addressed user needs effectively, and all components of the upgraded system were well-received during testing. The improvements led to more structured and systematic communication, making the helpdesk system at PT XYZ more effective and efficient.

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1. INTRODUCTION

The rapid development of Information Technology and Information Systems affects various business sectors. To support their business operations, many companies utilize information technology to be more optimal. [1], including manufacturing companies. A manufacturing company is a company whose business activity is to convert raw materials into finished goods. [2]. In fulfilling the production process, manufacturing companies are supported by the establishment of an IT (Information Technology) department to support the running of all company activities starting from planning, marketing, production, warehousing, to meeting customer needs. [3]. In the era of increasingly massive IT development, the need for information systems is a priority, all data processing activities are accommodated in an information system container to facilitate the exchange of data and information on internal and external companies. [4]. The implementation of information technology in a company aims to provide business direction in meeting business needs

in order to make the right decisions. [5]. Information technology has a big and positive impact on the internal and external activities of the company, these activities help in the acceleration and accuracy of information. [6].

PT XYZ is a manufacturing company domiciled in Bekasi, West Java, Indonesia. As one of the large manufacturers of motor vehicle spare parts, PT XYZ has an IT department to support information technology needs in its business activities. The six-person IT department consists of IT Support, Software Development, IT Business Analyst, and a manager who oversees the line. To facilitate data processing, monitoring, and tracing user requests for software and hardware, the IT department provides a helpdesk platform [7]. Helpdesk serves as a communication medium for hardware and software maintenance between users and the IT team as administrators [8]. The Helpdesk is also intended for the IT team to control work requests related to IT services from other departments [9]. PT XYZ helpdesk has been running for approximately one year, but in its use there are still ineffectiveness found, so development is needed in terms of features, appearance, and policies that support the running of the helpdesk system. The menu display on the helpdesk system is considered too complex so that it confuses users when using it. Users also consider that the operation of the helpdesk system has not been effective due to communication and response constraints by administrators, which they consider inefficient because they consider IT services to be the same with or without a helpdesk system. The current process is that users will make requests or open tickets through the helpdesk system, then the IT administrator receives and delegates tasks on the request to the relevant PIC (Person In Contact), whether it is intended for IT Support or software development, and whether to repair, purchase, or develop the system.

Based on the above problems, it is necessary to re-analyze the existing helpdesk system. This system needs to be developed to make it easier for users to communicate with the IT department when there is a problem with their device or for maintenance purposes. The needs analysis for the development of the helpdesk system was carried out with a design thinking approach [10]. Design thinking is a method that looks from a human perspective by considering the feasibility of the technology owned and the feasibility of the company's business operations. The advantage of this method is to empathize with users and understand and uncover their problems and needs [11]. Design thinking is a process used in organizations, which aims to solve problems and drive innovation [12]. With its creative and intuitive nature, design thinking can be distinguished from other purely analytical processes. Benefits for product or service innovation are promised through design thinking with a strong focus on user needs. Other benefits include better decision-making by reducing cognitive biases, increasing learning effects, and changing organizational culture towards innovation [13]. Design thinking has five stages in its process, namely the empathize, define, ideate, prototype, and test stages [14]. The empathize stage is the most critical element [15], where the process of understanding needs from the user side by means of intensive interviews [16]. From the results of these interviews, it is possible to define the core problems felt by users based on the results of the analysis and synthesis obtained previously [17]. The ideate stage is the expansion stage of the problem formulation that produces several design alternatives [18]. To validate the design alternatives, a prototype was made. [19]. The testing stage is an opportunity to gather feedback, filter out criticisms and suggestions, and continue to recognize user needs. After testing, the design thinking stage will return to the beginning and allow several iterations to reach perfection in the development of the helpdesk system [20].

Design thinking was chosen in this study because of its user-centered approach [21], where users are the main actors in a software [22]. Compared to other software development methods such as agile development, which focuses on the iteration of software development itself [23] or the waterfall method, which is more suitable for creating new software [24], design thinking approach is superior and suitable for use in this study. In a manufacturing company, there are many different users, ranging from machine operators to production managers [25]. Design thinking helps ensure that the software developed actually meets the specific needs of these users, thereby increasing productivity and efficiency [26]. Design thinking also prioritizes flexibility and adaptability, as the manufacturing industry often undergoes changes, both in terms of technology, processes, and

regulations [27]. Design thinking provides flexibility in development so that solutions can be easily adapted as they change [28].

2. RESEARCH METHOD

This research uses the design thinking method by going through several stages which are illustrated in the following flowchart.

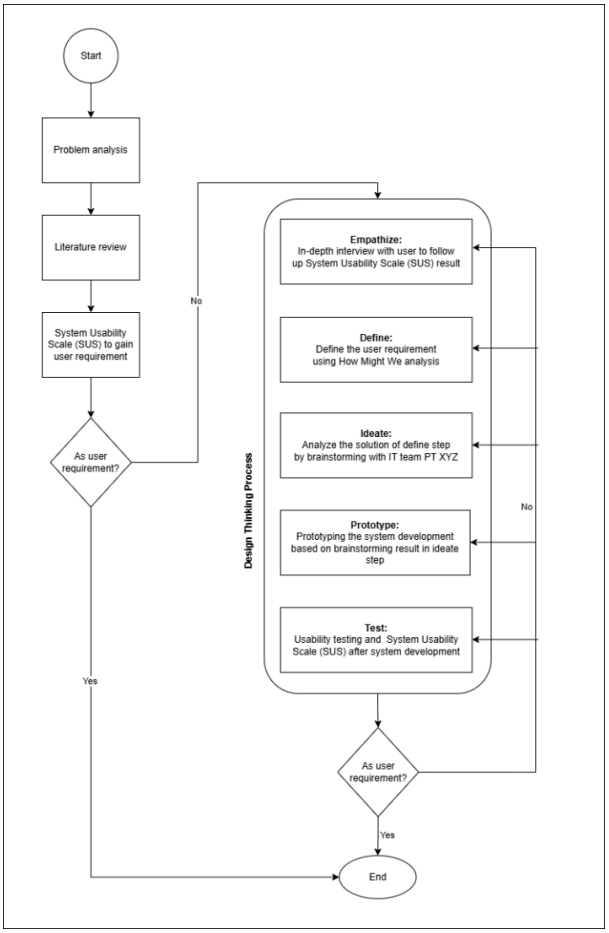

Figure 1. Research Flowchart

2.1. Empathize

The first stage begins with empathize, which is conducting in-depth interviews with client users of the helpdesk system to follow up on the results of the System Usability Scale (SUS) that they previously filled out. In-depth-interview aims to understand the description of the user's impression when using the system, so that the user's expectations and needs for the next system update are obtained. This empathize stage will be carried out by researchers on users from each department of PT XYZ.

2.2. Define

The define stage determines the problem with a focus on specific users based on their needs obtained from the empathize stage. At this stage will define the perceived problem with the How Might We (HMW) Question analysis. The results of the problem analysis are used as a reference for making solutions for development. The define stage was carried out by researchers and discussed with the IT Business Analyst team from PT XYZ.

2.3. Ideate

The ideate process begins with brainstorming ideas for solutions to problems that have been formulated in the define stage. The results of brainstorming ideation will be selected as the easiest

and closest to user needs to be executed into a prototype. The ideate stage will be carried out by researchers and discussed with the IT Business Analyst team from PT XYZ.

2.4. Protoype

The prototype stage is used to test whether the solution idea can be implemented properly. This stage includes the development of helpdesk systems technically and non-technically. The prototype stage will be carried out by the IT Programmer and IT Support team from PT XYZ.

2.5. Testing

System testing will be carried out using the System Usability Testing (SUS) method again, aiming to get feedback from users after development and can display comparative results between before and after development. Testing of helpdesk system users by distributing questionnaires to interviewees at the empathize stage. Testing on features that have been developed is also carried out together with users using the Usability Testing method. The results of SUS at the testing stage are the basis for assessing the success of the helpdesk system development at PT XYZ. The testing stage will be carried out by researchers, then discussed with the IT Manager of PT XYZ.

3. RESULTS AND DISCUSSION

This research involved 21 respondents who were users of the helpdesk system to be asked for their perspectives by filling out the System Usability Scale (SUS) questionnaire.

Table 1. Respondents of System Usability Scale (SUS)

No	Name	Position
1.	Marsella	General Manager System & IT
2.	Sasmitoh Rahmad Riady	Manager IT
3.	Moh Khamim	Asst. Supervisor IT
4.	Shelden Thimotius	Staff IT Development
5.	Fazri Muharam Anwar	Staff IT BA & QA
6.	Rahmat Hidayat	Staff IT Infrastructure
7.	Firdaus Nur Hariyanto	Staff IT Infrastructure
8.	Deki Suwanda	Asst. Manager PPIC
9.	Asep Sunarya	Asst. Supervisor PPIC
10.	Irmi Nengsih	Staff MPC PPIC
11.	Cynthia Belinda	Supervisor System
12.	Kevin	Staff System
13.	Shakila Esa Falah	Staff System
14.	Andi Akbar Yamaichi	Staff QMR
15.	Listiyani Rahayu	Staff QMR
16.	Uli Cahyati	Staff QMR
17.	Septiani	Staff Produksi
18.	Bintang Hidayati	Staff Engineering
19.	Chen	Staff Finance
20.	Ratna Aryanti	Staff HRD
21.	Ineke Wulandari	Staff Purchasing

The following are the scores from the SUS questionnaire.

Table 2. Result of SUS Questionnaire

R	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Total	Total*2.5
R1	4	2	3	2	1	1	1	1	1	1	17	42,5
R2	4	3	4	2	3	3	3	3	3	1	29	72,5
R3	3	4	3	4	3	2	3	4	3	1	30	75
R4	4	3	4	0	4	3	3	3	3	1	28	70
R5	3	3	3	3	4	3	3	3	3	3	31	77,5
R6	3	3	3	4	3	2	2	3	3	1	27	67,5
R7	4	2	2	1	2	2	1	4	1	1	20	50
R8	4	2	2	1	2	1	3	4	1	1	21	52,5
R9	4	2	3	1	2	2	1	3	3	0	21	52,5
R10	3	2	2	3	2	2	1	1	2	2	20	50
R11	3	4	3	4	4	4	3	3	3	3	34	85
R12	4	1	3	3	3	3	4	4	4	0	29	72,5
R13	4	4	4	4	4	4	4	4	4	2	38	95
R14	3	2	3	0	3	2	2	3	3	1	22	55
R15	2	2	3	1	3	2	1	1	2	0	17	42,5

R	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Total	Total*2.5
R16	3	3	3	2	3	1	3	2	2	1	23	57,5
R17	4	3	3	2	4	3	3	4	2	2	30	75
R18	3	3	3	0	4	1	2	2	2	1	21	52,5
R19	3	2	2	1	3	2	3	3	2	1	22	55
R20	2	2	3	1	2	2	1	2	1	3	19	47,5
R21	3	3	3	0	3	2	2	4	0	0	20	50
Average Score											**519**	**61,79**

The SUS assessment score of the PT XYZ helpdesk system involving 21 respondents is 61.79. Based on the SUS percentile rank score determined by SUS, the score has a grade D (Poor) which means it is still below the SUS normal limit value of 68. Below are the percentile rank scores of SUS [29].

Table 3. Score Percentile Rank

SUS Score	Grade	Ajdective Rating
>=80,3	A	Excellent
>= 74 dan <80,3	B	Good
>= 68 dan <74	C	Okay
>= 51 dan <68	D	Poor
<51	E	Awful

Based on the acceptability range provisions, the score of 61.79 obtained from the PT XYZ helpdesk system assessment falls into the Marginal Low category with Grade D [30].

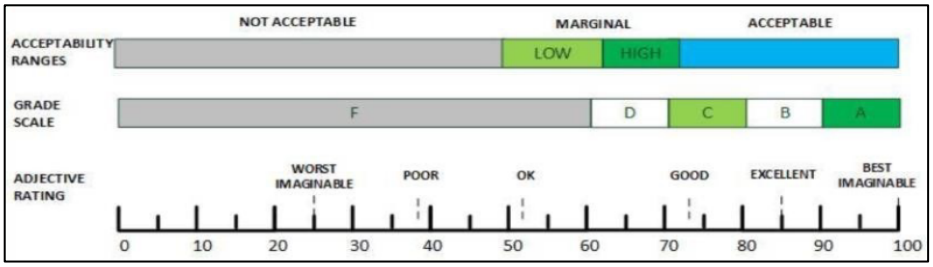

Figure 2. Acceptability Range

3.1. Empathize

After knowing the results of the usability assessment of the helpdesk system, then an in-depth interview was conducted with the users. In-depth interviews with the IT team as administrators and product owners to explore perspectives as helpdesk service providers in assessing the suitability of the current system with expectations of their needs. In-depth interviews were also conducted with 5 users who had the lowest scores to follow up on their questionnaire responses.

Table 4. Users of In-depth Interview

No.	Name	Position	Remarks
1.	Moh Khamim	Asst. Supervisor IT	*Product Owner*
2.	Rahmat Hidayat	Staff IT Infrastructure	*Administrator*
3.	Firdaus Nur Hariyanto	Staff IT Infrastructure	*Administrator*
4.	Deki Suwanda	Asst. Manager PPIC	*Client*
5.	Asep Sunarya	Asst. Supervisor PPIC	*Client*
6.	Andi Akbar Yamaichi	Staff QMR	*Client*
7.	Listiyani Rahayu	Staff QMR	*Client*
8.	Septiani	Staff Porduksi	*Client*

The following is a list of questions that were asked to the users during the in-depth interview.

Table 5. Questions List of In-depth Interview

No.	Questions	Addressed To
1.	Has the helpdesk system covered all needs?	*Product Owner*
2.	Are there any obstacles from users? Please tell us at length!	*Product Owner*
3.	What are the features that are frequently used by users?	*Product Owner*
4.	What is your role in the existing system?	*Administrator/Client*
5.	How do you feel about the existing system? Please tell us at length!	*Administrator/Client*
6.	Is the system easy to use? What obstacles are often encountered?	*Administrator/Client*
7.	Does it cover everything needed?	*Administrator/Client*

No.	Questions	Addressed To
8.	What features/functions are working well?	*Administrator/Client*
9.	What are the most used features/functions?	*Administrator/Client*
10.	What features/functions are difficult to use?	*Administrator/Client*
11.	What do you think needs to be improved in the existing system?	*Administrator/Client*
12.	"10. I need to familiarize myself first before using this system". Answer Agree to this point, why?	Asep Sunarya/ Deki Suwanda
13.	Four questions answered Doubtful, can you tell us about your experience using this system?	Septiani
14.	"6. I feel that there are many inconsistencies in the system". Answering in the affirmative to this question, please describe the inconsistencies in the system, and what are your expectations?	Listiyani Rahayu

The following is a summary of the problems and needs for each of the interviewed users.

1. Product Owner – Moh Khamim

As product owner, Khamim is in charge of ensuring that the helpdesk system runs optimally and in accordance with the original purpose, which is to facilitate the work process. He found that users still had difficulty using the system, despite the training provided. This causes the system to run less effectively, especially in terms of submitting tickets from client users. As a product owner, Khamim feels it is important to continue to listen to feedback and constraints from users, both clients and administrators, so that the system can be improved. The end goal is to make the system more effective, efficient, and support the overall operational needs of the company.

2. Administrator – Rahmat Hidayat

Rahmat feels that the system display is not user-friendly because many menus are not relevant to his work. In addition, the absence of work duration definitions for each ticket urgency category (High, Medium, Low) made it difficult for him to prioritize work. He needs a simpler system interface and clear duration definitions for the High, Medium, and Low categories.

3. Administrator – Firdaus Nur Hariyanto

Daus complained that many features were not relevant to his work, making navigation difficult. Another obstacle is that tickets from clients often do not have clear descriptions, and many requests are given inappropriate urgency statuses. Firdaus requires simplification of system features as well as guidance for clients in providing the right ticket description and urgency status (High, Medium, Low).

4. Client – Deki Suwanda

Deki feels that he does not know if his subordinates make requests to IT because the system does not have an approval structure. He also sees that there is no SOP (Standard Operational Procedure) or WI (Work Instruction) to support the legality of the system. Deki needs an approval structure feature to monitor subordinate requests as well as SOP and WI documents as official guidelines for using the system.

5. Client – Asep Sunarya

Asep complained about the IT administrator's slow response and the lack of work estimate information after the ticket was submitted. In addition, he often misses replies because there are no desktop notifications. Asep needs to improve the IT administrator's response, the ticket estimation feature, and desktop notifications so that he does not miss replies from the system.

6. Client – Andi Akbar Yamaichi

As a system user, Akbar felt that filling in the request description repeatedly each time made the ticket less efficient. He needs a feature to save recurring request templates so that he doesn't have to fill in the same description over and over again.

7. Client – Listiyani Rahayu

Listi feels that the IT administrator's response is slow and the urgency status of High, Medium, and Low is unclear because the duration of the work is not defined. She needs an increase in the IT administrator's response speed as well as a definition of the duration of work for each urgency category (High, Medium, Low) to make the system more effective.

8. Client – Septiani

Septi complained that the IT administrator's slow response hampered her work. She was also confused because there was no information on the status of work after the ticket was submitted, while the urgency status (High, Medium, Low) did not provide a clear picture of the duration of

work. Septiani needs an increase in response speed, a feature to monitor the status of ticket processing in real-time, and a definition of duration for each urgency category.

3.2. Define

The define stage was conducted on November 10, 2024, the result of this stage is the formulation of HMW (How Might We) to define user needs.

Table 6. HMW (How Might We) Formulation

No.	HMW Formulation	User Needs
1.	How might we improve understanding of helpdesk system workflows?	As a product owner, I have seen many users still confused in using the helpdesk system.
2.	How might we increase awareness of the importance of helpdesk systems?	As a client, I do not see what standards require us to make requests through the helpdesk system, because we only get instructions from the IT team that if we do not go through the helpdesk system, it will not be processed.
3.	How might we know the stages of a ticket process in a helpdesk system?	As a client, I don't know where my ticket has reached, whether it has been processed or not.
4.	How might we streamline the waiting time for ticket responses?	As a client, I did not receive any information on whether the ticket had been received or not.
5.	How might we identify requests on a ticket more specifically?	As an administrator, I am sometimes confused when reading tickets from clients, what they are asking for, because it is not specifically explained.
6.	How might we know the urgency level of a ticket?	1. As a client, I don't know what the urgency level of High, Medium, Low means, there is no explanation of the duration of the work, so I filled in "High" so that it would be handled quickly. 2. As an administrator, I was at a loss to filter the incoming tickets because the majority of them were given an urgency status of "High".
7.	How might we make tickets that are repetitive not do manual entry?	As a client of the QMR department who often requests quota prints, I have to enter the same request data in the helpdesk system, why not make it automatic, because data entry with repeated information in my opinion is wasting time.
8.	How might we effectively monitor a ticket submitted by a subordinate?	As a client who oversees PPIC members, I do not know what my subordinates are asking the IT department, because this helpdesk system is direct, client users can enter any request and go directly to IT without going through leadership approval first.

3.3. Ideate

The ideation stage was conducted with the IT Manager on November 17, 2024 using brainstorming techniques, the ideas were outlined in the following brain-wall.

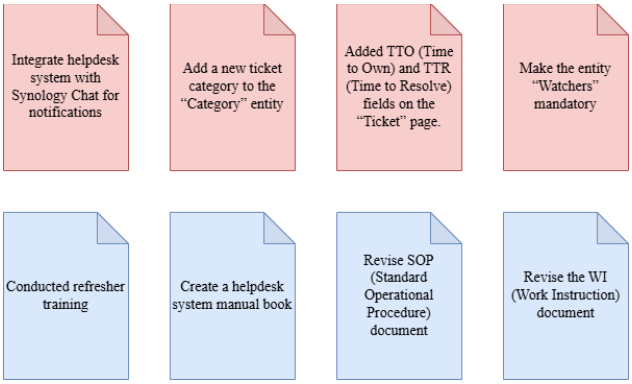

Figure 3. Brain-wall

3.4. Protoype

The prototype stage was carried out from the second week to the fifth week of November 2024, where this process involved the IT Manager, IT Business Analyst, IT Software Development, and Administrator of the helpdesk system. By doing the division of tasks by each role, and the following results. Below is the existing workflow of the helpdesk system that runs at PT XYZ.

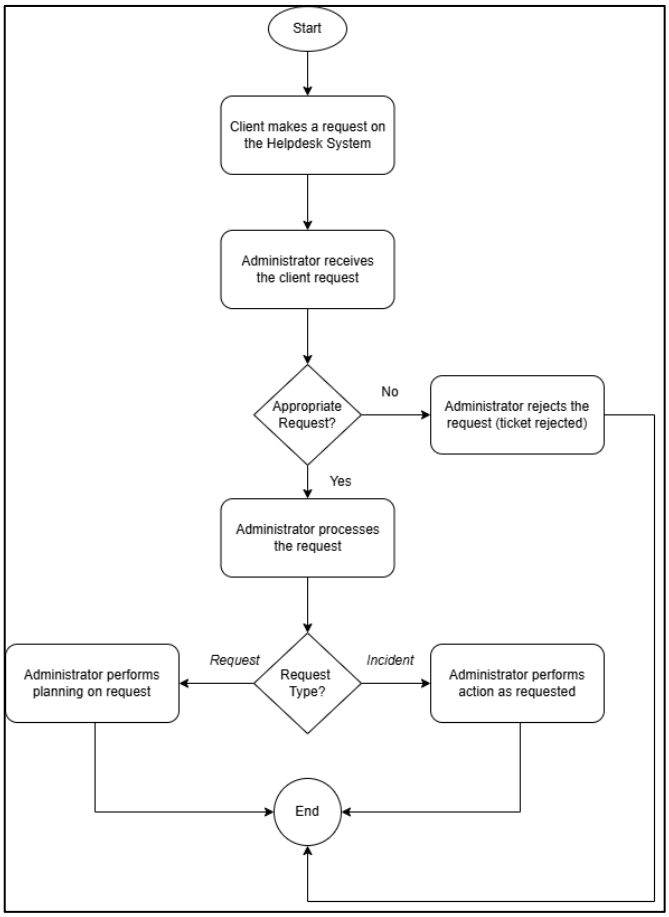

Figure 4 Flow Process Helpdesk System

The flow process of the PT XYZ helpdesk system as depicted in Figure 4 explains the work of the helpdesk system which starts with the client making a request (open ticket) for a particular job, such as trouble on a device, request for procurement of goods, fixing bugs or modifying applications, or procuring applications. Requests are made by submitting on the helpdesk ticket by filling in all the required detail fields. Then the administrator will receive and distribute the next process to the relevant team. After the request has been fulfilled, the administrator closes the ticket.

In this prototype stage, the conditions before and after the development of the helpdesk system will be explained based on the results of the ideation that has been decided by the team.

1. Integrate helpdesk system with Synology Chat for notifications
   a. Before the development

      The helpdesk system live chat feature does not have a notification when there is a reply, so users need to open the helpdesk system first to check.

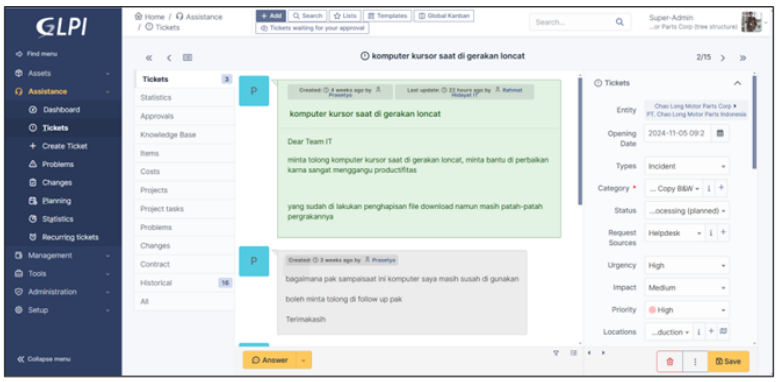

Figure 5. Live Chat Default Helpdesk System

b. After the development

The helpdesk system is integrated with Synology Chat for additional live chat features and desktop notifications, so that client user communication with administrators runs more effectively.

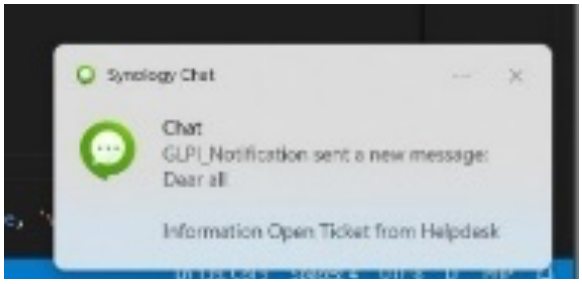

Figure 6. Desktop Notification Feature

2. Menambahkan kategori tiket baru pada entitas "Category"

a. Before the development

On the “create a ticket” page, users are not yet able to make automatic requests that are repetitive in nature.

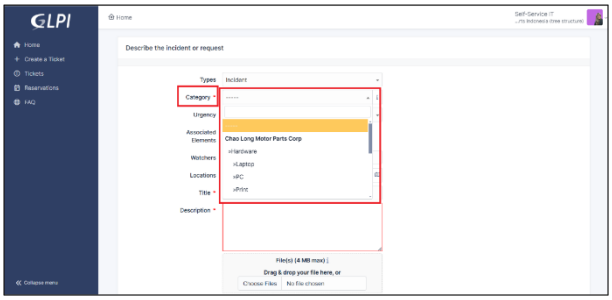

Figure 7. Entity “Category” Before Added

b. After the development

Added categories for requests for BW (Black and White) Printer Quota 50, 100, 200, 500; Color Printer Quota 50, 100; BW (Black and White) Photocopy Quota 50, 100, 200, 500; Color Photocopy Quota 50, 100.

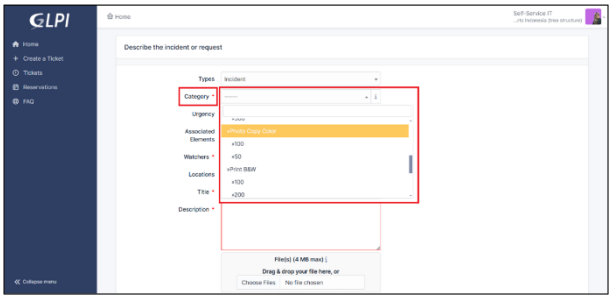

Figure 8. Entity “Category” After Added

3. Menambahkan keterangan TTO (Time to Own) dan TTR (Time to Resolve) pada halaman detail “Ticket”

a. Before the development

There is no TTO (Time to Own) and TTR (Time to Resolve) on administrator access so that client users cannot monitor the process of their tickets.

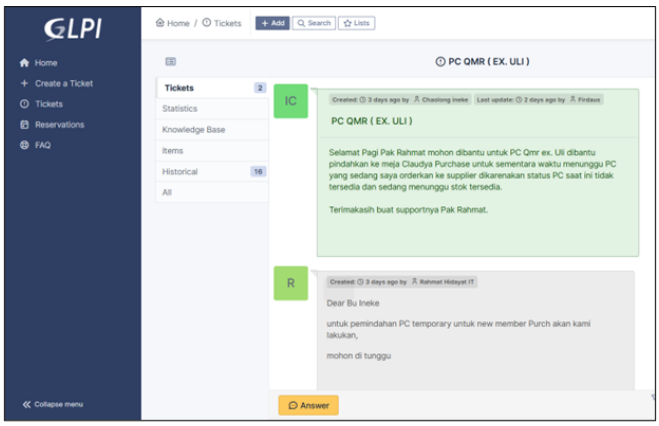

Figure 9. TTO & TTR Before Listed

b. After the development

Added TTO (Time to Own) and TTR (Time to Resolve) features that are filled in by the administrator when receiving tickets, so that client users can monitor the progress of the tickets they submit.

Figure 10. TTO & TTR After Listed

4. Memberikan mandatory (wajib diisi) pada entitas "Watchers"

a. Before the development

The Wathcers column is not mandatory, so client users often skip it, causing unit leaders to be unaware when a subordinate submits a ticket.

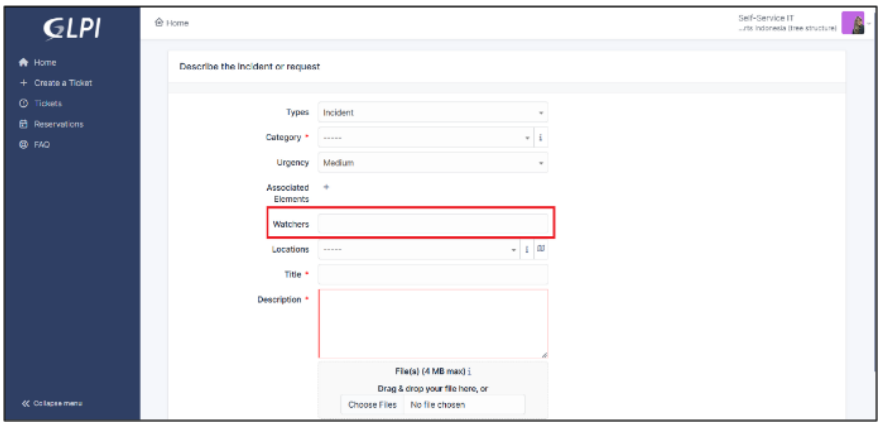

Figure 11. Entity “Watchers” Before Mandatory

b. After the development

The Watchers field is mandatory (*) to be filled in by every client user who submits a ticket.

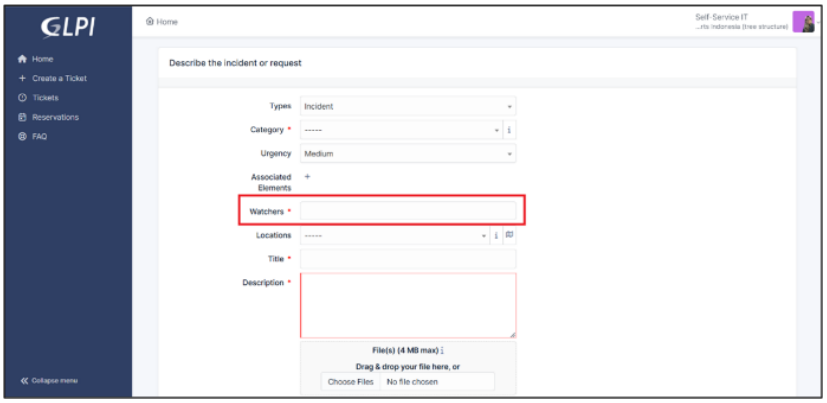

Figure 12. Entity "Watchers" After Mandatory

5. Mengadakan refreshment training

a. Before the development

Training is conducted once by the IT team in general to all client users, there is no refreshment training schedule.

b. After the development

A refresher training schedule for all client users of the helpdesk system was created every three months starting in January 2025. This schedule has been included in the 2025 annual work plan that was presented at the 2024 Management Review on November 30, 2025 by the IT Manager.

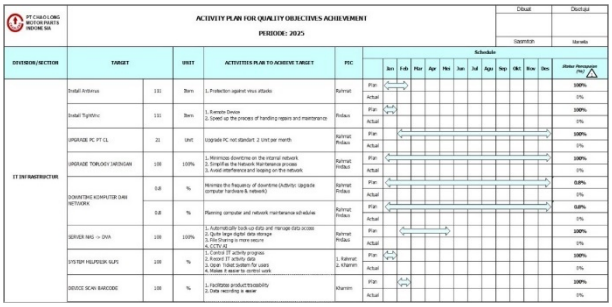

Figure 13. Helpdesk System Refreshment Training Schedule

6. Membuat manual book sistem helpdesk

a. Before the development

There is no Manual Book media for explaining the features of the helpdesk system, so some users do not know the functions and operations.

b. After the development

A Manual Book document was created to explain the features of the helpdesk system and how to operate it. The document is socialized through the helpdesk system FAQ feature.

Figure 14. Manual Book Uploaded on Helpdesk System

7. Merevisi dokumen SOP (Standard Operational Procedure)
   a. Before the development

   Procedure document QP-CL-IT-01-02 on Hardware & Software Maintenance and Repair Procedures did not include a reference to Work Instruction (WI) document number WI-IT-15-01 on Open Ticket Helpdesk GLPI System in hardware and software monitoring activities in the flowchart on page 3.

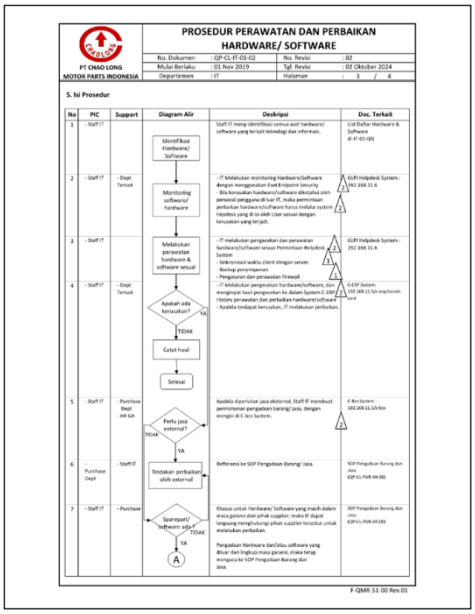

Figure 15. Procedure Document Before Revised

   b. After the development

   Adding reference to Work Instruction (WI) document number WI-IT-15-01 on Open Ticket Helpdesk GLPI System in hardware and software monitoring activities in the flowchart page 3 in the revision of Procedure document QP-CL-IT-01-03 on Maintenance and Repair Procedures for Hardware & Software.

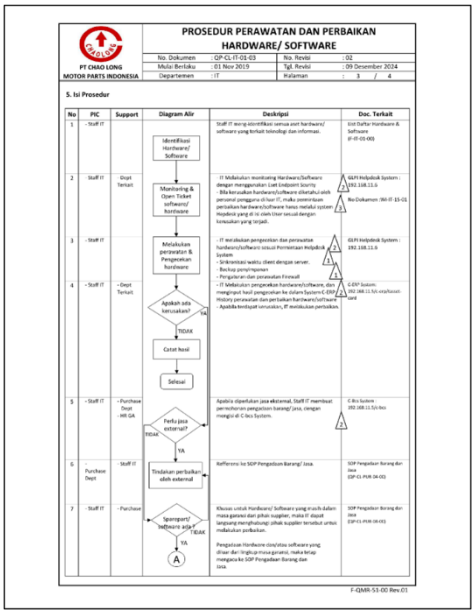

Figure 16. Procedure Document After Revised

8. Merevisi dokumen WI (Work Instruction)
   a. Before the development
      Work Instruction (WI) number WI-IT-15-01 on Open Ticket Helpdesk GLPI System only explains the flow of ticket creation operations.

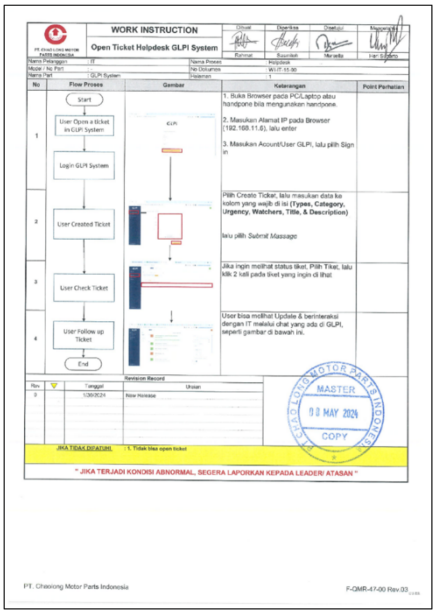

Figure 17. Work Instruction Document Before Revised

   b. After the development
      Revise the Work Instruction (WI) WI-IT-15-01 document on Open Ticket Helpdesk GLPI System by adding an explanation of each menu detail and function of the "Ticket" page; adding information on TTO (Time to Order) and TTR (Time to Release); and adding the definition of urgency High (1 Hour), Medium (1 Day), and Low (3 Days).

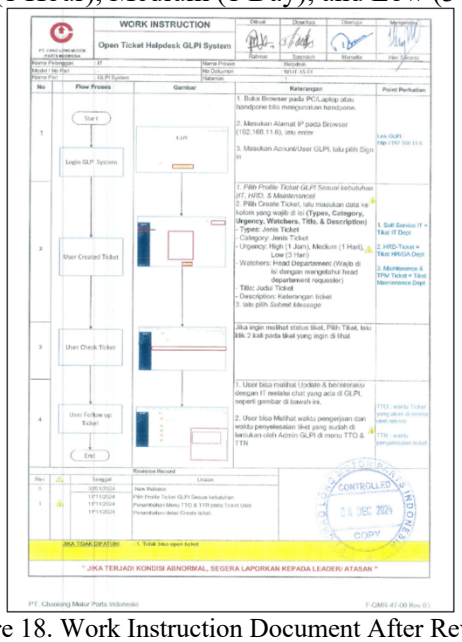

Figure 18. Work Instruction Document After Revised

3.5. Testing

In the testing stage, two testing methods are carried out, namely usabilily testing to determine the extent to which users easily use the helpdesk system after development, as well as System Usability Scale (SUS) testing to measure the usability score of the helpdesk system and then compare between before and after improvements.

1. Usability Testing

At the usability testing stage, users are asked to test scenarios on the features of the helpdesk system.

Table 7. Usability Testing

No.	Scenario	Status	Remarks
1.	Client users can use the urgency status fields High, Medium, Low	Success	Users understand the urgency status of High, Medium, Low because it has been outlined in the Work Instruction (WI) document.
2.	Client users can use the Live Chat feature integrated with Synology Chat	Success	Client users can use the Synology Chat feature as a notification when getting a chat reply from an administrator user.
3.	Client users can fill in the "Watchers" field to forward requests to work leaders.	Success	Client users understand the usefulness of the "Watchers" feature and are required to fill it in when making ticket requests.
4.	Client users can create requests with a new category, namely print and photocopy quotas.	Success	Client users can create repetitive requests by simply adding categories.
5.	Administrator users can fill in TTO (Time to Own) and TTR (Time to Resolve) when getting a new ticket.	Success	Administrator users understand the TTO and TTR functions and are required to fill them in when receiving a request ticket from a client.

2. System Usability Scale (SUS)

The testing stage was carried out by redistributing the SUS (System Usability Scale) questionnaire to users who were the sources of in-depth interviews at the empathize stage. Testing was carried out on December 11, 2024 against 8 respondents via Google Form. From the SUS questionnaire distributed, the average result was 74.06 with the following details.

Table 8. SUS Questionnaire Results

R	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Total	Total*2.5
R1	4	3	3	3	4	3	4	4	4	3	35	87.5
R2	4	4	3	3	3	3	3	4	3	3	33	82.5
R3	3	3	3	3	2	3	3	3	1	3	27	67.5
R4	3	3	1	4	3	2	3	3	3	3	28	70
R5	3	3	3	2	3	3	3	3	3	1	27	67.5
R6	4	3	3	1	3	1	2	3	3	1	24	60
R7	3	3	3	1	3	3	2	3	3	1	25	62.5
R8	4	4	4	4	4	4	4	4	4	2	38	95
Average Score												**74.06**

The average score of 74.06 means that there is an increase in score compared to before the development of the helpdesk system by 12.27 points. This score can be concluded to have an acceptibility level with a Good grade and Acceptable status.

4. CONCLUSION

From the entire design thinking process carried out in the development of the PT XYZ helpdesk system, starting from the empathize stage which collects constraints and user needs through the usability scale and in-depth interviews, followed by the define stage which defines user needs from the results of empathize, the ideation process carried out by brainstorming together with helpdesk system stakeholders both in technical and non-technical terms, which is the basis for prototyping, and testing which again involves the resource persons to test its success, it can be concluded as follows.

1. The needs of helpdesk system development have been collected by conducting usability scale analysis and in-depth interview approach with users including Product Owner, Administrator, and Client. Generated user needs from technical and non-technical aspects to be realized in system development. The technical aspects include changes and additions to the helpdesk

system features. While non-technically produced supporting needs for the management of the helpdesk system such as documentation and regulations that are enforced.

2. The design thinking approach was declared successful in developing a helpdesk system at PT XYZ. The success is evidenced by the SUS score which increased by 12.27 from the previous 61.79 to 74.06. All features that become development points have been tested and the results of all scenarios can be run properly by users.

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