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Improving Service Excellence in the Procurement Process of Products Through the HaloProc Chatbot: A Project at XYZ

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Abstract: The procurement department plays a very important role in XYZ's operational continuity. The procurement team faces several challenges, such as complex and lengthy processes, limited communication, time, and resources, the length of time it takes for service users to take care of procurement documents, and understated budget absorption. This research aims to find the cause of these problems and provide solutions. This study uses qualitative methods by using a root cause analysis or cause-and-effect analysis worked by the procurement team. The results of the cause-and-effect analysis were combined with the Five Quality and Risk Matrix method. The result was the finding that the quality factor of procurement preparation was the most important root cause with a Risk Level of 15 or 41.67% of all root problems, mainly due to the lack of proper means of communication between the service user and the procurement team. Several solutions were proposed, and the one agreed upon was to create a booking system using a ChatBot called HaloProc. The implementation of HaloProc most likely will help improve service excellence in the procurement process of XYZ.

Keywords: procurement, cause-and-effect analysis, risk matrix, robotic chat

INTRODUCTION

Procurement is an important process in supply chain management in increasing efficiency and effectiveness, thus increasing competitiveness (Jahani et al., 2021). An effective and efficient procurement process is the key to the company's operational success in facing competition, particularly in the disruption era. However, some challenges hinder efforts in providing excellent service to the users or the stakeholders. The limitations of manual communication, slow responses, and real-time information are the main issues to be overcome. The procurement process involves many stages and documents that often face barriers. Those obstacles include delays in delivering information about document policy and requirements, high procurement workload due to manual work repetition, lack of automatic and accurate document tracing, and accessible and responsive information services needed by users. In the era of the internet and Industry 4.0, the procurement management process has begun to shift from manual activities to digital-based activities, commonly referred to as e-

procurement (Jahani et al., 2021)(Ageshin, 2001). E-procurement is important to reduce purchase prices and improve the efficiency of the procurement process (Waithaka, 2021).

XYZ, a state-owned enterprise that was established on December 10, 1957, commits to providing energy and developing new and renewable energy to support the creation of national energy independence. XYZ also marks a new milestone in the company's business journey after the real contribution to providing energy that has moved the joints of the lives of Indonesians and various regions abroad. Procurement in XYZ is one of the most important business activities for the smooth operations of the company and is facing some general issues, such as process complexity, repetitive communication, and lack of time and resources. Two procurement divisions service different users, as shown in Table 1.

Table 1. Procurement divisions in XYZ and their users

Procurement – I	Procurement - II
Business Support Directorate	Human Resource Directorate
Finance Directorate	Logistics & Infrastructure Directorate
Corporate Secretary	Strategy, Portfolio, and Development Directorate
HSSE	Audit Executive
Integrated Enterprises Data & Command Center	Legal Counsel
Procurement Governance & Support	Category Management Upstream
Category Management Corporate	Category Management Downstream

Source: Research Data

The users commonly face issues in the sourcing process. They have difficulty obtaining updated information regarding the provisions of Procurement of Goods / Services (PGS), especially the process and type of procurement method and project status. They take a longer time, at an average of one to two months, to complete the Supporting Document for Selecting Implementation (SDSI) needed to accomplish the goods and services procurement process. Table 2 shows the documents listed in the SDSI.

Table 2. List of Documents Required by XYZ Procurement

Mandatory	Supplementary
Terms of Reference	Principal Permit
Owner Estimate	Worksheet for Self-Assessment as per Procedure
Purchase Requisition	Justification
Bill of Quantity	Checklist Review Documents to Source Contractors, Experts, or Consultants
Integrity Pact	Other Documents
Risk Assessment HSSE	
Risk Assessment Fine & Warranty	
TKDN Qualification	
Technical & Commercial Evaluation Criteria	

Source: Research Data

Procurement in XYZ also faces another issue regarding budget uses. The absorption of the procurement budget is not optimal because the fulfilment of the project is not according to plan, causing the project budget to be carried over to the next year. For example, the 2021 budget of IDR 64.4 billion is carried over to 2022. Thus, the Procurement team needs to find solutions to address and solve those issues. In facing the challenges of an increasingly complex procurement process, companies need digital innovations that can increase operational efficiency and effectiveness. One of the proposed solutions is the application of a WhatsApp-based chatbot, namely Haloproc, as a communication and information management tool between users and the procurement team.

METHOD

This research uses the qualitative method by using the root cause analysis or the cause-and-effect analysis that is combined with the Five Qualities (Panca Mutu) and the Risk Matrix. The cause-and-effect analysis, commonly known as the fishbone diagram, is a tool for identifying problems and grouping them (Ilie & Ciocoiu, 2010). This is commonly called the Ishikawa diagram, after the name of its inventor, the other name for root cause analysis (Holifahtus Sakdiyah et al., 2022). The fishbone diagram is used to search for the root cause of the dominant cause by evaluating the five "M" consisting of man, machine, method, material, and environment or mother nature.

The Five Qualities, which is the philosophy of Operations in XYZ, comprise Quality, Cost, Delivery, Safety, and Morale. The Five Qualities are the development of the operation and supply chain framework consisting of quality, cost, and delivery, coupled with safety and employee morale improvement (Sipos & Pató, 2022). The Risk Matrix is used to assess risk factors and set priorities for handling potential risks (Duan et al., 2016). The Risk Matrix in this study is combined with other risk evaluation methods, such as Failure Mode Effect Analysis (FMEA) and Risk Map (Guo et al., 2022). This integrated method results in the risk level, which is obtained from the probability and severity of the risk of each quality (Bognár & Hegedűs, 2022; Colletaz et al., 2013). FMEA is used to identify and prevent problems in systems, products, and processes before they arise (Sharma & Srivastava, 2018).

RESULTS AND DISCUSSION

The Risk Matrix will measure the probability and severity of the risk of each quality (Duan et al., 2016) . Table 3 shows the Risk Level Result and percentage of the level. The highest risk level is at the Quality Aspect, which needs to be analysed further to get the right solution. Nevertheless, the rest of the quality aspects, i.e., C, D, S, and M, will be on the next exploration.

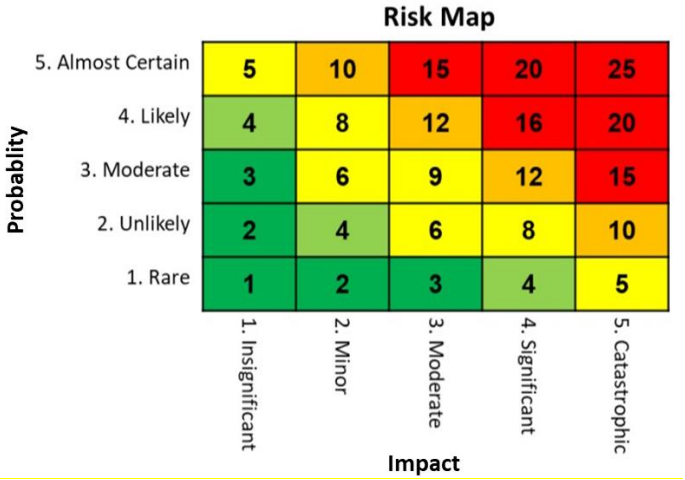
Table 3. Risk Matrix Calculation

The Five Quality	Impact not corrected viewed from QCDSM aspects	RISK MATRIX			
		Probability	Severity	Risk Level	
Quality	1. Understanding of the provisions for the procurement of limited goods/services, 2. User difficulties in obtaining updated information on a procurement project 3. Uncompliance PGS process	3	5	15	41.67%
Cost	The project budget is not optimally absorbed	3	3	9	25%
Delivery	Many requests related to procurement information on the procurement of goods/services and monitoring project requests are not handled quickly	3	3	9	25%
Safety	Security of information/data	2	1	2	5.56%

The Five Quality	Impact not corrected viewed from QCDSM aspects	RISK MATRIX			
		Probability	Severity	Risk Level	
Morale	The user is not confident and worries about being found in the audit	1	1	1	2.78%

Source: Research Data

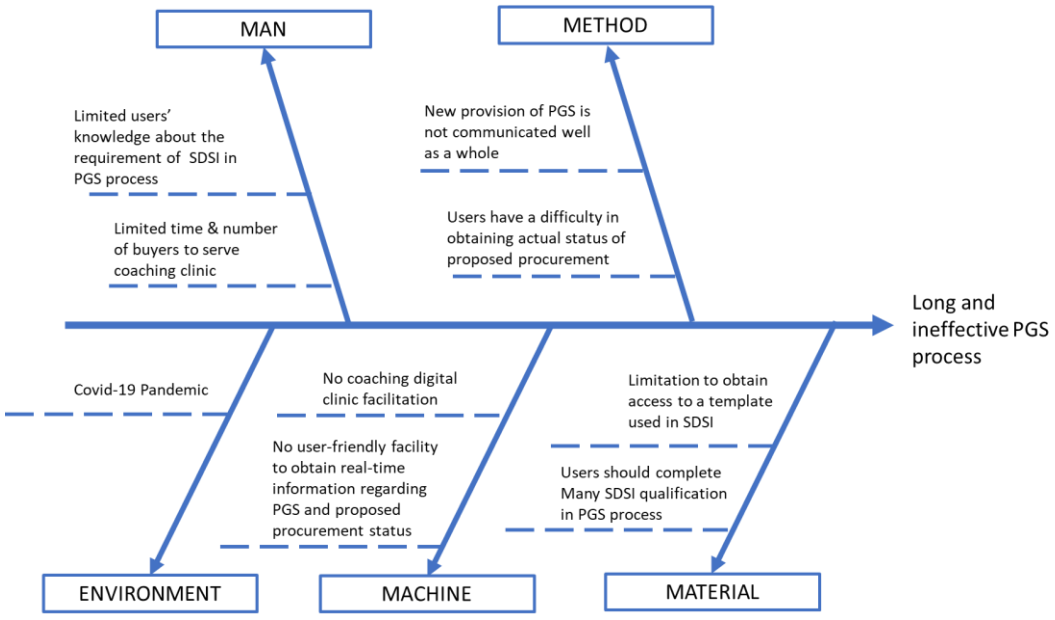
The score in the risk level column is determined by the Risk Map, as shown in Figure 1. Risk Map is a new tool that measures the number and the magnitude of losses and summarizes information about a risk model's performance (Bognár & Hegedűs, 2022; Colletaz et al., 2013).



Source: (Colletaz et al., 2013) – Redo by Researcher

Figure 1. Risk Matrix uses the Risk Map's score to determine the magnitude of loss

The ineffective procurement process due to the Quality Aspect is then analyzed by using the cause-and-effect diagram or fishbone diagram as presented in Figure 2.



Source: Research Data

Figure 2. Fishbone diagram to determine root causes.

From the fishbone, continue to analyze the most appropriate causes by completing Table 4 as follows. Brainstorming among the procurement team results in a determination of the main issues, proposed solutions, and financial analysis before selecting the right and highest-priority solution.

Table 4. Route cause analysis from the fishbone diagram

Analysis	Cause Factors	Operational Impact	Compliance Impact	Score	Rank	
Man	1. Limited users' knowledge about the requirement of SDSI in PGS process 2. Limited time & number of buyers to serve coaching clinic	2	2	4	III	18.2%
Method	1. The new provision of PGS is not communicated well as a whole 2. Users have difficulty in obtaining the actual status of the proposed procurement	2	3	6	II	27.3%
Machine	1. No coaching digital clinic facilitation 2. No user-friendly facility to obtain real-time information regarding PGS and proposed procurement status	3	3	9	I	40.9%
Material	1. Limitation to obtain access to a template used in SDSI 2. Users should complete Many SDSI qualifications in PGS process	2	1	2	IV	9.1%
Environment	Covid-19 Pandemic	1	1	1	V	4.5%

Source: Research Data

The three causes from the table are Machine, Method, and Man. The team determined the root cause is the lack of information about PGS requirements and project request updates. Three alternative solutions selected are to make a robotic chat, to prepare more customer service staff, or to conduct regular user workshops. Developing robotic chat as the first option is to provide information automatically and costs around IDR 6.2 million to purchase the gadgets and internet quota. Robotics is one of the latest developments in industry 4.0 (Jahani et al., 2021). The implementation will take around two months. This new tool is expected to be user-friendly and to provide real-time information accurately. The second option, to provide more customer service staff, will cost a lot, around IDR 60 million per year. The team requires approval from the HR director since they have to appoint a manpower subcontractor, and it will take approximately six months before it runs. The last option is to conduct regular workshops for the users. The costs are extremely high, around IDR 200 million per year, only for a limited number of participants. The procurement team agreed to select option one, i.e., develop a robotic chat or called a chatbot.

The budgeting method chosen is carried out in a self-managed manner by Procurement. The design and implementation are carried out independently. The cost needs to realise IDR 6,200,000, only for the gadget and internet quota. The chatbot being developed at XYZ is named HaloProc as an effort to improve excellent service from

Procurement to the users related to the procurement process of goods and services. HaloProc's design is to meet aspirations raised by users related to the procurement of goods and services, monitoring information on project status updates, and access to other applications that have been running in Procurement. The devices provided are one gadget and one provider card through synchronization between the Google spreadsheet application and WhatsApp auto, which works independently by the team. The data information system is carried out in a limited and general manner but is not confidential.

The project was carried out for 16 months, from April 2022 to August 2023. Chatbot's determination is based on ease of use, speed of response, ability to integrate with existing systems, development cost, and popularity of social media platforms. The team studied and analyzed four platforms, which are presented in Table 5. Based on four aspects of consideration, the Team selected WhatsApp as the provider for the chatbot. The Team concludes that the WhatsApp Chatbot has some benefits, such as wider reach and broader popularity, high accessibility, user-friendliness and ease of integration with other systems, and more cost-efficient.

Table 5. Comparison of most-used social media and cost of chatbot development

Aspects	WhatsApp Chatbot	Facebook Messenger	Telegram	Website Chatbot
Licence Fee	Free	Free	Free	$20-$200/month
Development cost	$50-$500	$500-$5.000	$500-$500	$1.000-$10.000/month
Platform popularity	High	Medium	Low - Medium	Depend on website
Economic Value	High	Low - Medium	Medium	Medium

Source: Research Data

HaloProc has nine user-friendly features i.e., 1) Complete SDSI information; 2) Procurement information; 3) Amendment information; 4) PPHK information; 5) Tracking status; 6) Coaching clinic; 7) Procurement Plan List; 8) Padi UMKM, and 9) Predict 2.0. After HaloProc implementation, the team evaluates the Five Qualities and takes proper steps to improve the chatbot. In terms of Quality, users are satisfied with obtaining clear information about PGS and procurement status (rank 4.9 out of 5 Likert scale). Chatbot is considered to comply with PGS requirements. The second factor, Cost, shows the tool can minimize the opportunity loss due to procurement budget absorption. Delivery, as the third aspect, gives the users real-time information related to procurement provisions and the status of the proposed procurement request with a response time of less than five seconds. The fulfilment of SDSI is faster and meets the requirement of less than two weeks. Lastly, the morale factor. Users are more confident with the procurement provisions and have positive trends toward accessibility, fast response, transparency, and compliance.

CONCLUSION

Procurement management is essential to understand the needs of its users. Barriers to communication with users pose significant potential risks (Uhl et al., 2017). The HaloProc chatbot in the procurement process is not only an additional communication tool but also an innovative strategy to support operational efficiency, improve service quality, and accelerate the company's digital transformation. With this solution, the company can ensure that

procurement management is more effective, transparent, and responsive to the needs of the users.

The application of WhatsApp chatbot "HaloProc" in the procurement process has been proven to be able to increase the efficiency, accuracy, and satisfaction of users. With its ability to automate routine tasks, provide information, and improve collaboration between teams, the HaloProc chatbot has become an indispensable link in the procurement process. Along with the development of artificial intelligence (AI) technology, we can expect that the HaloProc chatbot will become more sophisticated and capable of performing more complex tasks.

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