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Business Process Innovation To Enhance Operational Efficiency (Case Study: Pt. Triton Global Maritim)

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ABSTRACT

This study investigates how PT Triton Global Maritim, an Offshore Support Vessel (OSV) company in Indonesia, addressed rising additional costs caused by inefficiencies in its document handling processes within the Procurement and Logistics (PNL) division. To resolve this, the company initiated the development of Resource Planning (ERP) system. The research applied Design Thinking to identify user problems and Agile Scrum to implement ERP features iteratively. A combination of Design Thinking and Agile Scrum methodologies was applied: Design Thinking was used to identify user problems through focus group discussions with the PNL user and interviews with the director, while Agile Scrum guided the iterative development and testing of the ERP prototype. The results indicate that the newly developed ERP system updates significantly improve process performance, reducing document lead time by 307% to 800% compared to the previous system. These findings confirm that combining Design Thinking and Agile Scrum provides an effective framework creating an internal ERP solution to optimize organizational efficiency and decision-making within the company.

INTRODUCTION

Offshore work is essential, especially in a maritime country like Indonesia. Offshore work is a job in a sea area. Usually, it is work that is related to installations in the middle of the sea; these kinds of works are varied, such as oil rigs, gas rigs, wind farms, pipe installations, and commercial ships. According to the Ministry of Energy and Mineral Resources, regarding oil and statistics in 2020, it is stated that Indonesia invests around 10.47 billion dollars in total for upstream oil and gas activities, which include exploration, development, production, and administration (Ministry of Energy and Mineral Resources, 2024). In the global market, according to Wintermar Public expose, the price of a barrel in 2024 is around 80 dollars/barrel, with

Indonesian gas and oil production around 750 million barrels per day for oil and 2000 million barrels per day for gas (PT Wintermar Offshore Marine Tbk., 2024). In 2030, there is an estimated gas and oil production of around 1,000 million barrels per day for oil and 3,200 million barrels per day for gas *(PT Wintermar Offshore Marine Tbk., 2024)*. International Mining and Resource Conference (IMARC) data shows that OSV market worldwide are valued to grow at around 61.3 billion USD in 2030 (IMARC Group, 2025). Meanwhile according to Ken research, the Indonesian offshore market valuation in 2023 is around 4,720 million USD, and it is estimated to grow to around 5,528 million USD in 2028 (Ken Research, 2023). This data shows that there are opportunities in the offshore market that can be prepared by 2030.

PT Triton, who is one of the shipping companies that work in the OSV field wants to seize more opportunity from that market cycle advantage, but currently they are having some critical challenges that they need to address. An internal investigation under the order of the director are conducted, and the result shows that there are inefficiencies issues due to the slow process and human error process that cause additional unwanted cost to stack and go above the prediction cost, creating a potential loss weighting down the company.

Due to this case, the director ordered the creation of an enterprise resource planning website to increase efficiency and integrate the departments to ease the business process, but the director would need to know what the user really needs in the business process to create an effective ERP website. Currently, the most crucial departments for the companies' OSV process are in the Purchase and Logistics. The PNL is considered crucial due to its role in the flow of most money that controls the cash outflow from the Purchase and Logistics department, spotting an efficiency opportunity to reduce expenses. The researcher's goals are to help the company digitalization by creating an ERP website that fulfills the user needs while fulfilling the requirements to increase the company efficiency in the process.

LITERATURE REVIEW

Design thinking is a human-centered, iterative approach to problem-solving and innovation that prioritizes understanding the needs and experiences of users in order to generate creative, innovative, and effective solutions. The methodology itself is well known in certain industries for its methods to foster innovation and tackle complex challenges. Design thinking is formed from 5 stages, which are the empathy, define, ideate, prototype, and test stages. Empathy is the process to understand people needs and desires regarding to their problems (Brown, 2009). Define is the process where the problems are going to be narrowed in making sure to find the process at an effective solution (Plattner et al., 2010). Ideate stage is to generate and explore various ideas and potential solutions towards the concentrated problem (Brown, 2009). Prototype phase is a phase to test something that can be quick, rough, and disposable (Plattner al., 2010). Testing is a stage to make sure how users interact with the solutions and to check whether the solutions that are implemented are an efficient solution towards the problems that have been focused on and identified (Brown, T., 2009). These stages are designed to help understand the user's situation, making sure that the solutions that are developed are not only creative but also fulfill the user's needs and even tackle the problems. Results from the Desing thinking will be in the form design prototype that are created in Figma, that are ready to be presented to the PNL users and directors for approval before moved into development using Agile Scrum approach.

Agile methodologies have become the central development method for modern software due to their flexible approach to managing complex projects. Most traditional project management relies on its linear and sequential process that has a fixed scope and timelines that make changes in the middle of the process difficult once the execution has begun, which is a downside for the traditional method. In terms of Agile methodologies, it promotes an iterative and adaptive approach to the development that makes teams adapt quickly to changes,

continuously improve the product, and better meet the needs of the user. Agile further reinforces products by prioritizing interactions and individuals over processes and tools and flexibility to change over following a plan (Beck et al., 2001). This research uses Scrum for the agile framework, as it emphasizes collaboration, transparency, and rapid delivery for the ERP website.

The main essence of Scrum lies in its iterative process that can be broken down into short development cycles known as sprints. Sprints typically last between two and four weeks; during those weeks, teams work together to deliver an incremental feature of the product. This increment feature is a functional version of the product that, if it is combined, could potentially be released to the users, making sure that the development process is aligned with the goal of delivering value (Schwaber & Sutherland, 2017). The iterative nature of scrum allows teams to get fast feedback and responses regarding the change of requirements, making it flexible for dynamic situations where user needs evolve rapidly. Scrum consists of 2 key elements, which are product backlog and sprints.

Product Backlog serves as a foundation in the development process, which is a dynamic prioritized list of features, updates, bug fixes, and other work items that are necessary to deliver a successful product. Unlike traditional project plans, which are static, the product backlog is continuously updated based on user feedback in changing the requirements. Once product backlog is created, a sprint process is performed. Sprint consists of 4 main parts, which are the sprint planning, sprint execution, sprint review, and sprint retrospective. sprint starts with a sprint planning, which is a collaborative process where they select items from the product backlog to work on during the sprint. After the Sprint Planning is utilized, the team will go into the real actual work of building the product, which is in the Sprint Execution phase. Sprint Execution is the phase in a sprint where the team works collaboratively to complete the tasks that have been provided in the sprint planning. After the execution, comes with the sprint review, which is a part where the teams present the completed work to the stakeholders (users and director). Last, Sprint Retrospective phase is conducted, where the team holds a review meeting where they check the sprint process to check what went well and the problems.

The combination of design thinking and agile methodologies creates a comprehensive framework for developing the ERP that fulfills the user's needs. Design thinking makes sure that the development process begins with a strong understanding of the user needs and their problems, while agile methodologies make sure that the development process follows the user needs for integrating the data requirements. Following this integrated framework helps PT Triton Global Maritim to develop an ERP website that meets the needs of the internal team and stakeholders in terms of process efficiency, preventing human error, and providing real-time data.

METHODS

In order to get an understanding insight on what to update for the business process and determine the user requirements for the ERP, a qualitative research approach has been chosen. The qualitative research approach is chosen due to its in-depth approach and wider opinions and transparency that can be used to emphasize and deeply analyze what the user feels through the research process (Turner et al., 2021). The research tries to show what the current company situation is and empathizes with its employees' problems and challenges on how to improve the activities process in PNL division so that the business process can be efficient. This research uses a qualitative approach, as the data that are collected are open-ended questions that are taken using data collection method through director in depth interviews, Focus Group Discussions (FGD) of what the PNL division members think about the issues that they might face in their work activities, and web analytics to estimate the lead time in order to verified the results are deemed to be effective or not.

In-depth interview methods are important and chosen for this research because they dig deep enough to gain information about how the person thinks and understands their process for making ERP decisions alongside the company's business strategy. The interview is conducted with the director, who is observing and providing critical decisions in the company. The interview also helps with how the director perceives his own employee and how to anticipate the risks in certain unwanted cases that occur.

Focus Group Discussion (FGD) processes are being used for data collection to collect PNL user insights. FGD methods are used for the PNL team's representative to gather and explore insights related to their work activity problems and their proposed solution that can be discussed together. Focus group discussions are deemed effective in understanding complex and tangled issues, which are suitable for accommodating user problems (Morgan, 1997). Other than that, focus group discussions encourage PNL users to discuss problems that might interconnect to another problem if it is dug enough, showing that there might be root problems that are causing several problems in the activity. During the FGD there are 4 users that conduct the discussions.

Web analytics are being used as a data collection tool in order to get the lead time process that can be compared as a benchmark for a better work effectiveness process. Web analytics from this research are taken from a feature that will be created to measure the duration of creating each document in the PNL from one document to another document in the process. The lead time durations are going to be taken based on a simulated situation that is close to the real task, where several chosen PNL users are going to take several simulation roles and be required to handle the document request that the internal company from the PNL activity flow needs to do. The result will then be compared to know its efficiency based on its average time assessment per document. The data collected from data collection are used as data insights from various methods can help map PT Triton Global Maritim main challenges, helping the company to create a user-centered and responsive solution. The data from the data collection are then processed using analysis methods for design thinking, which are later used for developing the interactive ERP product that aligns with what the stakeholder wants and that can help increase user effectivity.

Data that are collected from the data collection method will then be processed using a data analysis method for design thinking and agile scrum usage. Data that are taken from the interview and FGD are going to be transcribed from voices that are recorded into text. Once it is on the text form, jumbled text data discussions from the FGD are going to be put into the problem statement of the workshop to determine the who, what, where/when, and why to determine the problems for empathy and define the phase in design thinking. Solutions that are mentioned in the FGD are going to be put into the brainstorming phase as a recommended solution, while if they're not mentioned, problems are going to be conveyed to the QIS teams to be discussed for proper solutions. The validations of the problems and solutions are going to be presented during the Design Thinking testing phase, making sure that the director and the PNL user approve the solution regarding the problems that are mentioned. This will serve as the foundation for developing features that address problems within the Agile Scrum methodology.

In order to validate that the ERP truly increases user effectiveness, a lead time comparison is conducted as a KPI. The current lead time data are taken from the FGD testimony statements, while the ERP are taken from testing in making the documents in order to make sure that the efficiency is proven. Analysis for the lead time will be conducted by comparing the duration of creating the documents of one document to another.

RESULTS

In order to create a Robust ERP solution for PT Triton Global Maritim that can tackle the user and the director problems to increase their operational efficiency, a structured result process is conducted, starting from understanding the foundation for ERP as the main decision, the result from using the integration of design thinking and agile scrum, updating PNL business process and measuring the lead time.

Foundations for ERP as the Main Decision

Enterprise Resource Planning (ERP) was expected by the board of directors as one of its actions to solve problems that cause inefficiency in the company. The director himself has conducted a comparison of options and reasoning beforehand before deciding on ERP as its main decision. Based on the interviews that were conducted, the director mentioned that PT. Triton Global Maritim currently, communication with the vessel is done using radio, phone, email, and internet, but data recording is still handled using Microsoft Office applications, which are not integrated with other vessel data, and the data is difficult to standardize with the back-office standards. Another problem that the director saw is that it is difficult for users to record data that are considered many, and that also affects how slow the data is sent from the vessel to the ship. Another problem based on the director interview is that whenever old data is needed, it is difficult to find the old archives of the data due to the probability that the archive of the data is missing either in the office or in the vessel. Due to these reasons, the director mentioned that easiness, speed, time, and integration become important for companies to process data, perform analysis, and create reports until they make decisions that are effective and efficient, which goes with PT Triton's company vision that commits to giving clients additional value that is reliable, efficient, and flexible.

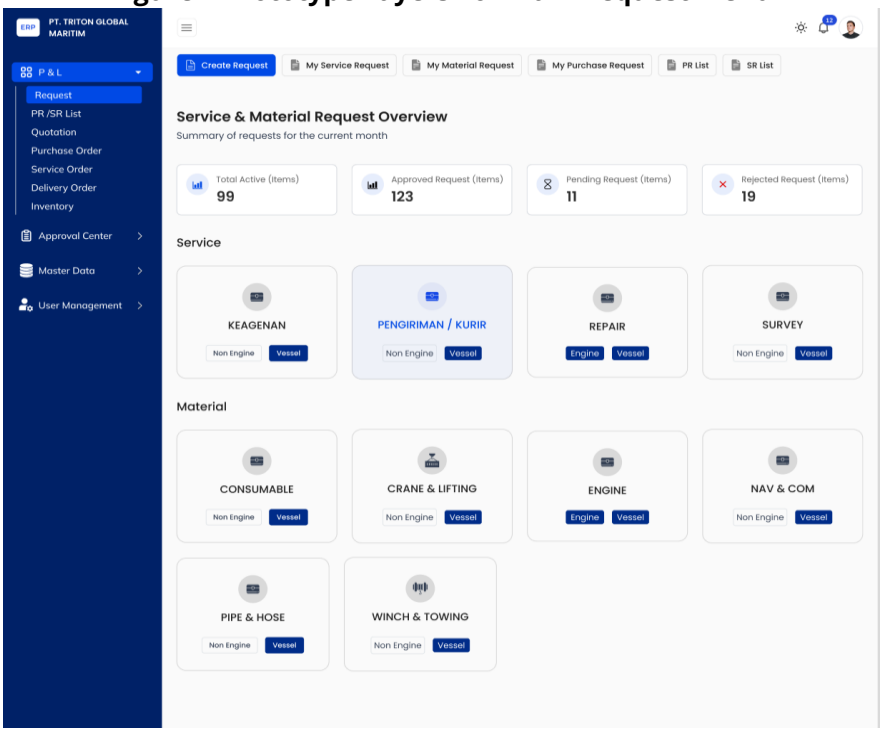
Another supporting statement from the director on why ERP was decided as a solution is because of how fast the development of technology had become in the world. This reason becomes the reason why the company must adapt and align the current business process with current technologies that can help users simplify and accelerate in taking decisions with a high, effective, and efficient accuracy. Besides the internal ERP solutions themselves, there are other alternate solutions, such as, for example, paying vendors or using a provided ERP that exists online on the internet. Based on the interview with the BOD, the reason why the director decided to create decisions by creating an internal ERP compared to using other alternative options is because an internal ERP itself can be adapted based on PT Triton's business process, which can be more flexible and customizable compared to using a standard ERP that is available in the online market. Besides that, PT Triton's industry and business process are considered unique and not popular in the market, which strengthens the reason for adjusting needs and features of the business process, which are needed and can be done well from the internal of the company.

Design Thinking Phase

Once the reasoning for ERP as medium of tools is solidified, the next step is to go through the Design thinking phase to determine and understand the problems the challenge of each stakeholder in PT Triton Global Maritim, especially the user who will interact directly with the ERP, which is the PNL team. The Emphasize, define, and ideate are combined during the FGD, while the prototype is done with the quality improvement system (QIS) team project, and the testing is done by presenting the result to the PNL user and director. During the FGD, there were 6 main problems out 14 problems that were mentioned during the interview. From the discussions of problems, the PNL determine the problems into a narrower version that summarizes all the problems for the define phase. The problems are summarized into "How might we How might we create an ERP feature to increase PNL effectivity, efficiency, and accuracy?". From the define phase, a few alternative solutions that are brainstormed by the user

are mentioned that are feasible for implementation in the Agile Scrum process. Based on the problems that the PNL users mentioned, design prototype is created using a Figma website, that the examples can be seen in figure 1. The mockup of the design is going to be presented to the user and director for approval to get into the next phase, which is ERP development using Agile Scrum.

Figure 1 Prototype Layers For Main Request Menu



Agile Scrum Phase

Once the testing phase that consists of presentations to each of the representative stakeholders that consist of PNL teams and directors is implemented and approved by both of them, then the next phase is to perform the implementation of developing the previous prototype into a realization that has been presented to the stakeholders. The process will be given on how the Agile scrum process works that consist of product backlog and sprint iterations in order to develop ERP that are continued from a design thinking prototype into a workable interaction prototype.

The first step in Agile Scrum is to create the product backlog before implementing the sprint. This product backlog currently addresses the features that want to be created as a solution for the PNL user division in PT Triton Global Maritim based on the Design Thinking. These features are planned and discussed with the researcher's QIS teams related to what the feature requirement needs to be and in which part of the menus, along with its description. The features are shown in table 1.

Table 1 Product Backlog

Feature Requirement	Feature Location	Description
Lead Time Dashboard	Dashboard Menu	Dashboard that shows analytical statistics that shows the average time of user finishing the work in certain process.
E-commerce like menu	Material Request Menu in Requisitions	Item request menu that looks like a commerce shop to make user easier in finding the items.

Feature Requirement	Feature Location	Description
Upload function	Several Documents Request Locations	Place where user can upload documents to the ERP as a support document to a certain document.
Paper template Automation	Several Document List menu	Button that provides the preview of the processed documents that are formed automatically when user finished that certain document process.
Price Comparison	Quotation	Feature that creates table comparison so that user can easily see the difference.
Vendor Online Form	Quotation	Feature that provides online form in a form of URL link that can be sent to vendor for simplicity and standardization .
Inventory Menu	Inventory	Menu to track all inventories amounts and transitions.

After product backlog, a sprint iteration is conducted. Sprint iterations are conducted using the 4 phases, which consist of sprint planning, sprint execution, sprint review, and sprint revise.

First, the sprint planning consists of determining which actions or features are required to be done first. Besides the features that need to be implemented, the skeleton foundation of the ERP itself needs to be done first from the Figma design into the ERP web prototype. The implementation timeline of the sprint planning is shown below.

Figure 2 Sprint Planning

No	Actions / Features	2025			
		Week 1	Week 2	Week 3	Week 4
1	Getting data collection from Design thinking				
2	Preparing Database requirements				
3	Creating ERP Foundations Based on PNL business process				
4	E-commerce like menu				
5	Upload function				
6	Paper template automation				
7	Price comparison				
8	Vendor online form				
9	Inventory Menu				
10	Lead Time Dashboard				
11	Sprint Review				
12	Lead Time Optimization				
13	Approval process				
14	External Transfer process				

Once planning for the sprint has been done, then the execution of the sprint is implemented. The execution of a sprint for the feature itself lasts around 2 to 4 weeks. After execution, sprint review is being implemented. The sprint review result shows that The feedback there is one example of the critical feedback that the initial lead time feature is considered buggy and requires optimization, which the lead time dashboard function will be optimized in week 4. Overall, the other feedback is more into additional minor adjustments or naming suggestions that are required to be specified.

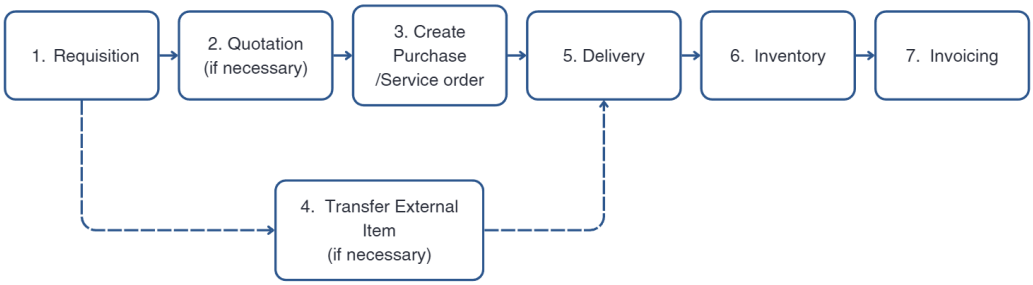
Insights that are taken through the review sprint process will be taken into the retrospective process, where the internal QIS teams discuss what the insights are that can be considered for future sprint processes, ensuring a better understanding to create a faster and more optimized feature for future sprints. Once sprint review is done by getting the approval of its stakeholders, the project can go into the next module and go through the same iteration process again, starting from design thinking and followed by agile scrum methodology. This

iterative process of Agile Scrum is used to develop the ERP from ideas into a usable product that can be used to help user needs.

Updated Business Process

According to the FGD with PNL users and feedback from presenting during Agile Scrum process, it is stated by the stakeholders that the users feel like each phase of the activities is required to have some sort of verification of documents before shifting the documents into the next phase by creating another document. The user mentioned during discussions that verification for an approval in each step of the business process is necessary. It is also mentioned that the quotation phase can be considered as optional if the item has been compared or does not have a comparison. The updated business process is shown in figure 3.

Figure 3 Updated Business Process



Lead Time Result

After creating and implementing the Lead Time Dashboard as a feature, a web analytics is conducted by measuring the duration of creating the document, for which each of the chosen PNL users will be assigned to several roles in simulating the process of the PNL from MR request in requisition until PO approval is approved. Data that are taken from the web analytics are going to be compared by the current lead time that is taken from FGD. The comparison of the lead time of shows that the current lead time from requisition to the start of delivery phase is on 8 hours per document, while using the ERP based on the analytics, the lead time for the same document process is 1 to 2.6 hours per document which the number is determined based on the necessity during the quotation process. When the numbers are compared, it shows that there is an time efficiency when using the ERP around 307% to 800% in comparison with doing it with the current process.

DISCUSSION

Overall, The process of implementation starting from finding problems related to the business process through design thinking until the development of an ERP solution with its features through Agile Scrum methodology is implemented with the justification of the director's decisions has been executed and shows that it can provide solutions that produce more effective, efficient, and integrated business processes. This solution is not only aligned with all of the stakeholder problems, but it is also aligned with the company's vision and mission that are reliable, flexible, and efficient, which suits their long-term goals (Davenport & Short, 1990).

Now, ERP for the PNL module can help in creating efficient decisions from the dashboard, a user-friendly menu for crews in requesting items, an effective work process through automation and price comparison in quotation, and better data accuracy through document automation templates and integrated inventory menus that are available. These solutions ensure that it can adapt and improve with the company, helping companies with their future growth and changes in the business environment (Hammer & Champy, 1994).

CONCLUSION

The research tackles PT Triton Global Maritim business problems using a structured approach starting from ERP justification, Design Thinking methodology to determine and understand the user and director problems, Agile Scrum methodology to implement the featured requirement as a solution, update the business process, and test the method efficiency by performing a lead time analysis comparison. Moreover, in the long run, the ERP website's main goal is not just to be used as a tool for solving the current problems that the company has, but instead it can be used for PT Triton Global Maritim as an edge in their OSV market compared to their competitors. This iteration process of solving PT Triton Global maritime issues slowly helps the company in building better foundations, which later can be capitalized for gaining its momentum in preparing for gaining a larger market size when the macro conditions for OSV are at their peak.

LIMITATION

1. Integrating solutions with other divisions
   there are several problems are not listed as a problem due to the problems are supposed to actually exist in the other division, but the problem also effect the PNL module, for example the problems regarding to invoicing that might need to be discussed with the finance accounting and tax teams as well inside the finance module in order to tackle the problems that both of the divisions have. Due to limitation data constraints, this kind of problem are preferred to be prioritized in other ERP module categories instead of putting it in the PNL module. In the long run, a follow-up FGD might be required to discuss this problem further to solve these interconnected division problems and be improved by providing ERP features in the next module that can solve this kind of problems.
2. Putting art of state feature methods to support solving problems
   Due to time limitations and human resource limitations, solutions that are provided might not be the current art of state solutions, such as for example, integrating data with AI to perform more efficient data analytics or improvement. In the long run, improvement of adding such new feature methods to the current development might be useful to have an additional competitive edge compared to other similar business sectors.
3. Training and guidance related to the new ERP system
   Once the ERP system is able to be deployed and usable to all the employees of PT Triton Global Maritim, providing a training and guidance is a must to all of the employees in order that they can successfully adapt into the new system. Helping guidance such as socialization, training sessions, user guidance on how to use the system, and ready to help QIS teams are required in order to tackle any difficulties in adapting to the new business process that might rise during their work later.
4. Investigate a way to decrease lead time on Deliveries activities
   The process in delivery time in PNL module is considered as something that can't be changed due to dependency with another vendor that limits certain quantity that can be delivered to the ship. In the future, a feature in the ERP such as delivery planning, or a better delivery approach can be advised in order to solve these kinds of issue to increase its time efficiency in sending items from either the vendor to the dock, or from the dock into the ships.
5. Impact on the vendor can be negative
   Since this is a new system, some vendor might have difficulties in filling the online quotation forms, since it might be new to them. To solve this problem, a recommendation of providing tutorials to fill the forms are needed to give a guidance to the partner vendor so that they can follow on how to fill the new online quotation form properly.

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