

Design Architecture Cargo Acquisition for Traditional Shipping

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Keywords: Architecture, Design, Mobile Application, Pelra

Abstract: Pelra's business has been decreased due to lack of its cargoes. Currently, approximately 90% of the port time is waiting for cargoes. Most of cargoes comes from a regular customers and the amount of cargo is decreased, while Pelra has difficulties obtaining new customers due to a very tight competition. The policy of port development and tariff reduction have no significant impact on the business. Furthermore, the preliminary results of the research show that there is still demand for Pelra services, but there is an asymmetric information between Pelra and prospective (new) customers. The research aims to build a mobile application as an information pipeline between Pelra and its customers. The design of the system architecture is needed to be developed as an initial and crucial stage in the development of the mobile application. The mobile application provides definitive information about Pelra's services, especially on reliability issues, and becomes a tool to obtain statistical data on the cargoes and routes of Pelra.

1 INTRODUCTION

Pelayaran Rakyat or Pelra, according to Undang-Undang Pelayaran (Shipping Act) No. 17 of 2008 paragraph 1, is a people's business which is traditional and has its own characteristics by using sailboats, motorized sailboats, and/or simple motor boats in a certain size.

Currently, Pelra's business has been decreased along with decreasing of productivity. The number of fleets and companies were declined as well. The Pelra fleet in 1997 was recorded at 2,793 units, but by 2014 the number of Pelra's was decreased to 1,357 units. Pelra's empowerment policy using a dock development approach and special rates and the addition of equipment has not been effective to improve Pelra's productivity and business. Approximately 90% of the port time is idle time, and is still dominated by waiting for the cargoes (Subari, 2015), and vessels were going to be departed when shipping costs have been fulfilled by revenue from cargoes. This affects the sustainability of Pelra business. Thus, the main problem is the uncertainty of the cargoes.

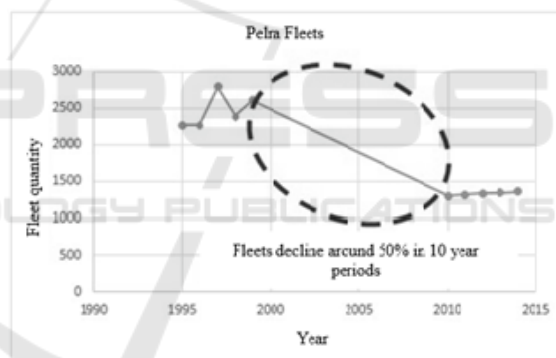


Figure 1: The number of Pelra's fleets tendency (source: Transport Statistics Book).

Pelra has two types of customers, i.e. regular customers and the non-regular customers, and where most of the Pelra's cargoes comes from regular customers. Meanwhile, Pelra has difficulty obtaining cargoes from new customers. Regular customers are dominated by ship owners, as ship owners are trader (case study of Pelra Kalimas), so Pelra's business sustainability depends on the owner's trading business.

Pelra's services are still needed, especially for transportation needs of eastern part of Indonesia and the remote islands that cannot be reached by large vessels. However, Pelra requires some improvements in management and operations. The customers need certainty in schedules, minimum risks in damage or loss of cargoes, improvements in

business processes, data consistencies, standard documents, and inadequate human resources. Thus, the information is very important for both parties.

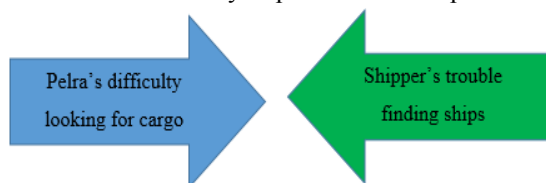


Figure 2: Asymmetric information between Pelra and customers.

2 RESEARCH METHOD

This application is a useful tool in daily operational activities, so the development requires several stages. The figure below shows the stages of this research.

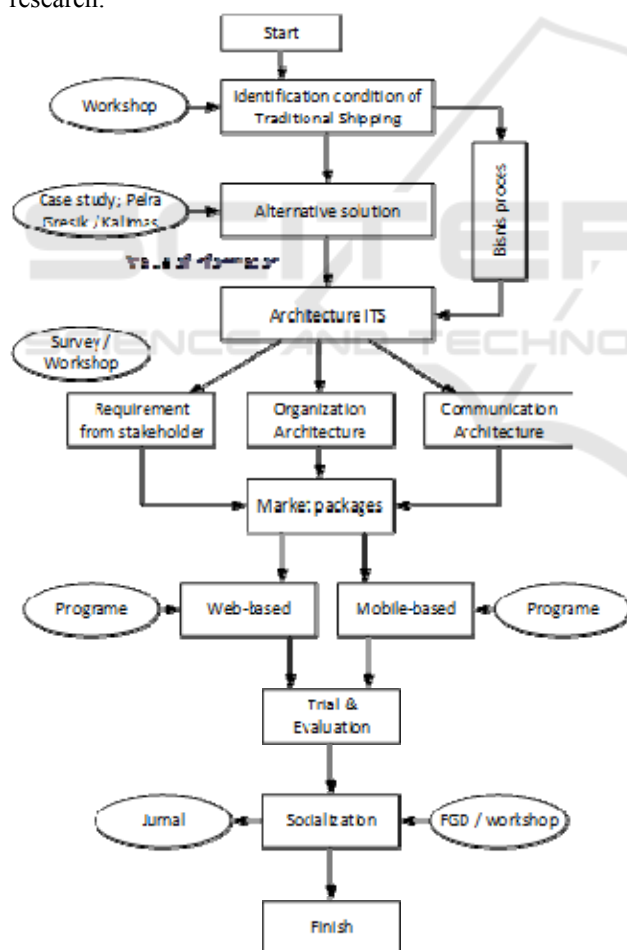


Figure 3: Research methods.

Identification of Pelra's current condition by conducting FGD activities involving ship owners, agents, ship crews, customers' representatives. FGD aims to give insight the main problems of Pelra from the perspective of shipowners, agents, crews, and customers, to know the real business processes that occur in Pelra, to know the user's need for the solution choices, to know the value of information, and to know Pelra stakeholders. Analysis and evaluation of FGD results resulted in system architecture design. This architecture design is the basis for the design of the application prototype/market package. Application/market package development based on mobile and web. Both of these technologies became an early choice because of the high technological flexibility.

The next step is testing and evaluation of application/market package by involving Pelra and its customers who have followed the initial FGD. Evaluation results form the basis for improvement in the next stage.

The last stage is the dissemination of the application to Pelra and Pelra customers in the second FGD. In addition, the FGD also increase the knowledge of knowledge of Pelra more broadly.

3 GENERAL OVERVIEW

3.1 Pelra's Fleet and Business

Pelayaran-Rakyat also known as Pelra is citizen's business which is traditional and have its own characteristics to carry out transport in water using sailing vessels including Pinisi, sailing boat, and/or simple motor boat with a certain size. Pelra rated more economical and can reach into the river and the small islands around the country if compared to shipping in general. Figure 4 is a type of Pelra's vessel in Kalimas Surabaya (Mubarok, 2013).

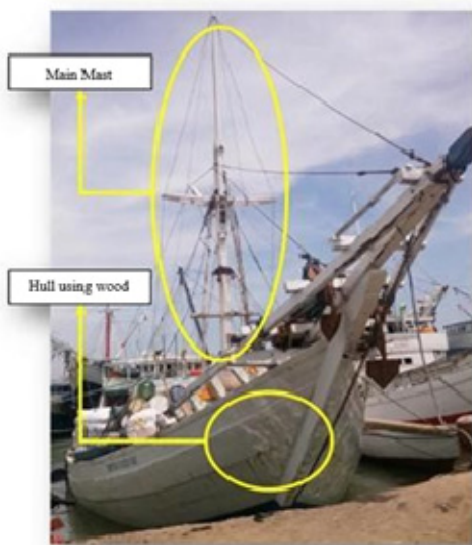


Figure 4: Type of Pelra’s cargoes in general

3.2 Service Activities in Pelra

Idle time in Pelra’s vessel is 91%. The average Pelra’s vessel in Kalimas wait for cargoes became the high docking time constraint.

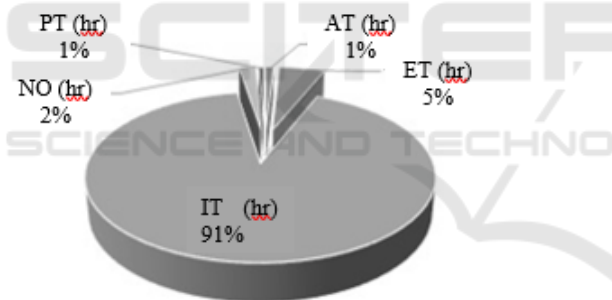


Figure 5: Proportion of Port Time in Port of Pelra Kalimas (Mubarok, 2016).

The efforts to increase competitiveness of Pelra by increasing the loading-unloading productivity proven ineffective, because it only had an impact on decreasing port time. In this case, a strategy to improve the capability to obtaining cargoes need to be developed, both from the side of the vessel which is seeking the vessel to meet the rules of bureau classification as well as increasing access to cargo owners.

3.3 Shipping Connectivity

In Pelra, especially vessels depart from or arrive to Port of Pelra Kalimas. Pelra’s vessels is included in tramp shipping, due to vessel’s routes and

schedule in accordance with the request of the cargo owners. The current route of the Pelra’s vessel tent to remain. However, the departure schedule of the vessel is still dependent on the cargoes means that the vessel set off when it had already been fully cargoes. It is differentiating services in Pelra’s vessels with conventional vessels.

In terms of connectivity, Pelra has more routes than other types of shipping. Leli (2016) stated that there are 227 port in Indonesia which is just trodden by Pelra. So, the role of Pelra is urgently needed in that region.

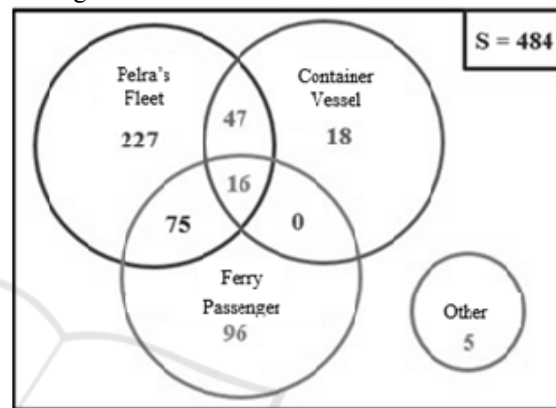


Figure 6: The number of port which is just trodden by Pelra’s vessels in Indonesia (Leli, 2016).

One of the connectivity’s indicator is accessibility. Accessibility is directly proportional to the amount of the cargo and inversely proportional to the distance. Areas with low accessibility tent to have a low GDP per capita.

3.4 Digital Island @SIDI

Small islands scattered in the territory of Indonesia have a lot of potential in natural resources, which is a major maritime tourist capital. Maratua Island is a typical example. The challenge of developing small island like this is very evident, poverty, high commodity prices, low level of connectivity with the economic centers, low levels of health and education as well as the limited availability of fresh water and electricity. Therefore, small island development is a challenge for the Government and the community and for science.

Sustainable Island Development Initiatives (SIDI) implemented by ITS joint partners with in and out of the country carrying out interdisciplinary research to answer the challenges of small islands and outermost.

From the perspective of Intelligent Transportation System (ITS), information

technology has great potential to be able to increase the capacity of transportation while stimulating economic activities and other sectors. Despite the known of high potential role of information technology, the small islands face the real digital disparity. Digital Island's Prototype for marine transportation have been developed in this research.

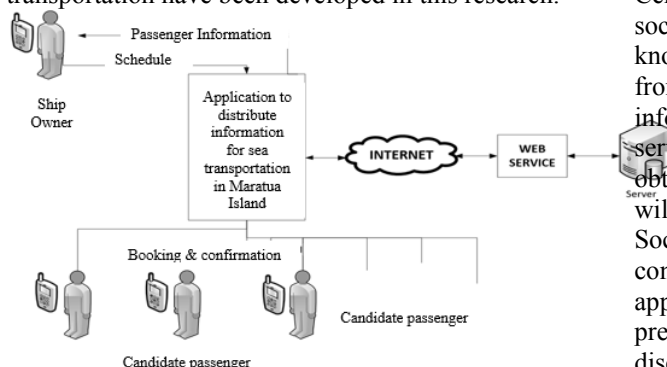


Figure 7: Digital Island (Nugroho, 2015).

4 RESEARCH PROGRESS

4.1 The Progress of the Implementations of the Research

Researchers made a visit to the port of Pelra in Kalimas and Gresik in order to survey the real conditions in the field and collect some information there regarding processes, documents, the characteristics of the cargoes, the characteristics of shipper, the characteristics of vessel's crew, the characteristics of truck's crew and labour, as well as the constraints often encountered in shipping activity through Pelra. The results of this survey are used in making the initial architecture of the application.



Figure 8: Activity in Port of Pelra Surabaya.

The next stage of the research activity is Focused Group Discussion (FGD) on August 8, 2017 in Naval

Architecture and shipbuilding Engineering Department. This FGD was attended by representative of DPD of Pelra East Java and Bali, DPC of Pelra Kalimas Surabaya, DPC of Pelra Gresik, PT Unilever Indonesia, PT Leschaco Logistik Indonesia, CV Avenir, Indonesia Research Center (LIPI) and ITS. The first FGD aim for socialization research activities on stakeholders, knowing the the condition and the business process from recent cargo acquisition in Pelra, dig up informations from Pelra's stakeholders regarding services of Pelra in the logistics activities, as well as obtain feedback and advice on the application that will be created as the result of this research. Socialization as the first material of discussion contain an early description of business process and application design that have been obtained from previous studies, so that FGD's participants can discuss and provide input and knowledge that have not been obtained from previous research. This FGD activity also acted as the initial survey activity against internal and external management of Pelra.



Figure 9: FGD of Pelra's realization in ITS

The result of this FGD analyzed again through internal discussion of the researchers to get the main Figure of the current condition of Pelra in cargo acquisition and making the business process diagram. The result is the analysis of the value of information for Pelra and its customers, completion of business process and system architecture, and initial design (forms application).

4.2 The Result of the Research

Based on the results of recommendation and analysis of realization of the first FGD then has compiled a new mock up in accordance with the revision of the business processes of the stakeholders involved.

The mock up as follows:



Figure 10. Home

In Figure 10 above in the displays home menu options is available for the reservation of the vessels, if clicked would henceforth be required field cargo origin and destination delivery.



Figure 11. Vessels, Figure 12. Detail of vessels

Based on Figure 11a, the vessels served the option available on selected routes, and if clicked on one of the vessels will appear detailing information regarding the vessels (Figure 11b). Next if it selected, then cargo owners prompted the cargo details along with the picture.

4.3 The Constraints and the Solutions

Pelra is the traditional non-profit company and has no standard business process, as well as human

resources unpreparedness, becoming one of the challenges for researchers. Discussion about the business process has been going on since the beginning of the researches on Pelra in 2009. Each company has a different business process and standardization, these become a challenge to do Pelra revitalization. The concern of the standard is regarding the determination of the cargo sizing. These conditions make it difficult for researchers developing the system architecture.

The solutions that can be implemented are standardizing the size of the cargo to be mutually agreed by all the representatives of Pelra, and forms of document with the information required by Pelra.

The researchers will also provide training on human resources of Pelra in information technology that can help the operational activity and daily work, as well as training in the use of the application.

5 CONCLUSION

Based on the results of the activities that have been implemented may be known that the application of the Pelra's cargo acquisition is helpful and necessary either for the company or the customers. Through this application, the company hopes to acquire new customers which previously did not exist, and acquiring certainty amount of cargoes, as well as can make Pelra as the accountable company and worth according to banking and insurance. As for customers of Pelra, this application expected can give definite information's about Pelra, especially on Pelra reliability. This application can also be a means of obtaining statistical data cargo and vessel routes of Pelra.

The other results that have been obtaining are the inputs regarding the completion of business process, system architecture design, and design and application forms. The core of the FGD results was as follows:

1. The condition of Pelra still wait for cargoes approximately 2 months, in fact there is no cargoes for return shipping,
2. The competition of Pelra with the other modes increasingly unhealthy, some rules should be enforced again,
3. Cargoes of Pelra tend to have low values,
4. The application benchmark which can be taken as an example, among others, the lazada express, cargo.co.id, gojek, traveloka
5. Some of the cargo owners still need the services of Pelra, especially for the delivery of goods to the deserted islands.

6. Complaints from the customers is about the packing of pallet wood which is expensive, the potential of damage and loss of the cargoes are high, the determination of the size of the vessels, the search for information about services, the uncertainty schedule, the culture and habits of the crew, and the lack of information regarding the service provided by Pelra.

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