



Implementation of E-Billing Digital Payment System on Port Service Memorandum at Lhokseumawe City Port (Case Study at PT Pelindo Lhokseumawe Branch Port)

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ABSTRACT

This study aims to analyze the implementation of the e-billing digital payment system on port service notes at the Port of Lhokseumawe City and identify obstacles and efforts in its implementation. This study uses a qualitative approach with data collection techniques through interviews, observations, and documentation. The research informants consisted of employees of PT Pelabuhan Indonesia (Pelindo) Lhokseumawe Branch, including Deputy Branch Manager for Operational Support, Deputy Branch Manager for Operations Support, Guide, Junior Officer for Operational Support, Junior Officer for Commercial and Customer Service, Loading and Unloading Administration, Billing Administration, and Social and Environmental Responsibility Staff (TJSL). Data analysis was carried out using the Miles and Huberman interactive model which includes data reduction, data presentation, and conclusion drawn. The results of the study show that the implementation of the e-billing system has been running well and is able to increase efficiency, transparency, and accuracy in the payment process for port services. This success is supported by the readiness of technological infrastructure, system maintenance, human resource competence, and coordination between work units. In addition, continuous socialization increases the understanding of service users. However, there are still obstacles such as network stability, server capacity, and operational data adjustments. These obstacles are overcome through infrastructure improvement, employee training, and strengthening coordination and socialization.

INTRODUCTION

The development of information technology and digitalization has encouraged various public service and service sectors to transform towards a more effective, transparent, and efficient system. This digital transformation is part of efforts to improve the quality of public services through the implementation of an electronic-based system (e-government) that is able to minimize manual practices that have the potential to cause errors and delays. The use of information technology not only functions as an operational tool, but also as a strategic instrument in increasing accountability and transparency of services.

The port sector as one of the main pillars of national logistics and trade activities is required to provide fast, accurate, and integrated services, including in the management of port administration and payment services. According to Mankiw (2021), the smooth distribution of goods is one of the important factors in maintaining economic stability and market efficiency. Lhokseumawe Port as one of the strategic ports in the Aceh region has an important role in supporting loading and unloading activities, ship services, and the flow of distribution of goods and services, but the management of port service memoranda that is still carried out conventionally or semi-digitally has the potential to cause delays in the payment process, recording errors, low transparency, and less than optimal supervision of the revenue flow of port services. This is in line with the opinion of Laudon and Laudon (2020) who stated that manual systems tend to have a higher risk of data errors than digital-based systems.

Various regulations have been set by the government to support the implementation of better port services, such as Law Number 17 of 2008 concerning Shipping, Government Regulation Number 61 of 2009 concerning Ports, and Presidential Regulation Number 95 of 2018 concerning Electronic-Based Government System (SPBE) which encourages agencies to integrate services electronically. In the port sector, service digitization is realized through systems such as Inaportnet, while in the aspect of service payment, PT Pelabuhan Indonesia (Pelindo) Lhokseumawe Branch implements an e-billing system to replace the manual billing and payment process. Based on the results of initial observations, there are still obstacles in coordination between agencies involved in port operations, which has an impact on the lack of optimal service to service users, so that the system that runs is not fully able to meet the demands of excellent public services in the current digital era.

Based on this description, this article aims to analyze the implementation of the e-billing digital payment system on port service memorandum at the Port of Lhokseumawe City and identify obstacles and efforts in its implementation. This research focuses on the implementation, obstacles, and efforts in the implementation of the e-billing system in port service memorandums at PT Pelabuhan Indonesia (Pelindo) Lhokseumawe Branch. Theoretically, this research is expected to enrich the treasure of Public Administration science, and practically it is expected to be an evaluation material for Pelindo in improving the quality of port services.

LITERATURE REVIEW

Good Governance

Good Governance is a governance concept that emphasizes the importance of the implementation of government and public services that are carried out effectively, efficiently, transparently, accountably, and oriented towards the interests of the community. According to Mardiasmo (2018), Good Governance is a public sector organizational management system that is implemented based on the principles of transparency, accountability, participation, rule of law, effectiveness, and efficiency in order to achieve optimal organizational goals. The United Nations Development Programme (UNDP, 1997) defines Good Governance as the exercise of political, economic, and administrative authority in managing state affairs characterized by transparency, accountability, effectiveness, efficiency, responsiveness, and community participation. One form of implementation of Good Governance is the implementation of an e-billing digital payment system on port service memoranda which aims to increase transaction transparency, speed up the administrative process, reduce recording errors, and increase the effectiveness and efficiency of services to port service users.

Policy Implementation Factors According to George C. Edward III

According to George C. Edward III (1980), the success of policy implementation is influenced by four main factors, namely: (1) Communication, which is the process of delivering policy information to implementers and target groups clearly and consistently; (2) Resources, namely the availability of human resources, budgets, facilities, information, and authority needed in the implementation of policies; (3) Disposition, namely the attitude, commitment, and willingness of the implementer in carrying out the policy that has been determined; and (4) Bureaucratic Structure, namely work mechanisms, division of tasks, coordination, and operational procedures in the organization. These four factors were used as an analytical framework in this study to see the implementation, obstacles, and efforts in the implementation of the e-billing digital payment system on port service notes at the Port of Lhokseumawe City.

E-Billing Digital Payment System

Digital payments are a method of financial transactions that are carried out electronically by utilizing information technology and internet networks without using cash directly. One form of digital payment implementation in the service sector is the e-billing system, which is an electronic-based billing and payment system that allows service users to make payments online through an integrated platform (Indrajit, 2016). The e-billing system replaces conventional billing methods that were previously done manually, such as the use of physical documents or direct payments at the counter, so that the billing and payment process becomes faster, practical, and can be done anytime and anywhere. In the context of port services, the implementation of e-billing supports the creation of more effective and efficient services and is in line with the principles of Good

Governance, especially transparency, accountability, effectiveness, and efficiency in the implementation of public services.

METHODOLOGY

This study uses a qualitative approach to understand the natural and in-depth conditions of the implementation of the e-billing digital payment system in port service notes (Sugiyono, 2018). The research was carried out at PT Pelabuhan Indonesia (Pelindo) Lhokseumawe Branch, which is located at Jl. Pelabuhan Umum, Tambon Baroh, Dewantara District, North Aceh Regency, Aceh, in 2026, including the preparation stage, data collection, data analysis, and preparation of research reports.

The data source consists of primary data obtained through interviews and observations of research informants, namely Deputy Branch Manager Operational Support, Deputy Branch Manager Operations Support, Scout (Ship Guidance Officer), Junior Operational Support Officer, Junior Officer Commercial and Customer Service, Loading and Unloading Administration, Billing Administration, and Social and Environmental Responsibility Staff (TJSL), and secondary data in the form of laws and regulations, official documents, as well as reports of related agencies. Data collection techniques were carried out through non-participant observation, semi-structured interviews, and documentation. Data analysis uses Miles and Huberman's interactive model which includes data reduction, data presentation, and conclusion drawn.

RESULT AND DISCUSSION

Implementation of the E-Billing Digital Payment System on Port Service Memorandum at the Port of Lhokseumawe City

PT Pelabuhan Indonesia (Pelindo) Lhokseumawe Branch has implemented an e-billing digital payment system as a replacement for the billing and payment process for port service notes that were previously done manually. The implementation of this system has generally run well and supports the effectiveness of port service services to service users.

"... To ensure that the implementation of the e-billing system runs well, the port must ensure the readiness of technological infrastructure such as the internet network and the system devices used, as well as ensure that the system is able to run in real-time so that services to service users do not experience delays." (Mildawaty Noer, Deputy Branch Manager of Operational Support, interview, April 2026)

The statement shows that resource factors, especially the readiness of technological infrastructure, are the main determinants of the smooth operation of the e-billing system.

"... A good e-billing system must be supported by network stability and optimal data integration, so that the process of issuing a memorandum of service can run smoothly. With good system integration, the administration process becomes faster, more accurate, and able to increase service user satisfaction." (Taufik Rahmat Nasution, Deputy Branch Manager of Operations Support, interview, April 2026)

From the aspect of system maintenance, Nelly Afrizal as Billing Administration added that server maintenance continues to be carried out

regularly to maintain smooth data synchronization, especially in the face of high transaction volumes. This shows that system management is carried out in a sustainable and professional manner.

"... In the implementation of the e-billing system, skills are needed from officers, because the data input process must be carried out carefully so that there are no errors in the issuance of service memorandums. With the training provided, officers increasingly understand the flow of the system so that errors in input can be minimized." (Dody Anto RA, Loading and Unloading Administration, interview, April 2026)

This shows that the disposition factor, namely employee commitment and competence, has supported the successful implementation of the e-billing system.

"... Coordination between departments continues to be improved to ensure the smooth delivery of information to service users related to payment notes. With good communication between work units, the service process becomes faster and well coordinated." (Annisa Farahanum Fauzi, Junior Operational Support Officer, and Joehan Syah Redha, Junior Officer Commercial and Customer Service, interview, April 2026)

Sufian as the Guideman (Ship Guidance Officer) added that the coordination between the field officer and the administration department is running well so that the suitability of operational data can be maintained and there are no delays in the administrative process. This shows that the bureaucratic structure factor, namely coordination between work units, has run effectively.

"... Socialization related to the use of the e-billing system continues to be carried out so that the understanding of service users is increasing." (Rahmad Ramadhan, Social and Environmental Responsibility Staff, interview, April 2026)

Based on the results of the interview, it can be concluded that the implementation of the e-billing system at the Port of PT Pelabuhan Indonesia (Pelindo) Lhokseumawe has run optimally, characterized by the readiness of technological infrastructure, routine system maintenance, good human resource skills, effective coordination between departments, and increased understanding of service users on system usage procedures.

Obstacles and Efforts to Implement the E-Billing Digital Payment System on the Port Service Memorandum at the Port of Lhokseumawe City

In the implementation of the e-billing system, there are various obstacles faced by the port from technical factors, human resources, and from the service users themselves.

"... In the implementation of the e-billing system, the condition of the internet network needs to be maintained so that the service process can run smoothly, especially in data synchronization and the issuance of service notes. Monitoring of the system is carried out periodically so that any potential disruptions can be immediately identified and handled quickly." (Mildawaty Noer, Deputy Branch Manager of Operational Support, interview, April 2026)

Nelly Afnizar as Billing Administration added that server capacity continues to be increased to adjust to transaction volume, while Dody Anto RA as Loading and Unloading Administration said that data adjustments between

field conditions and systems continue to be carried out in a coordinated manner to maintain the accuracy of operational data.

Based on the results of the interview, it can be concluded that various challenges in the implementation of the e-billing system, such as network stability, server capacity, adjustment of operational data, and understanding of service users, can be overcome well through improving technological infrastructure, maintaining the system regularly, providing periodic training to employees, strengthening coordination between work units, and continuous socialization to service users.

Referring to the theory of policy implementation by George C. Edward III, the success of the implementation of the e-billing digital payment system on port service notes at the Port of Lhokseumawe City can be analyzed through four factors. First, in terms of resources, the availability of technological infrastructure such as a stable internet network, an integrated system, and regular server maintenance are the main factors that support the smooth operation of the e-billing system.

Second, from the aspect of disposition, competence and commitment of human resources also determine the success of implementation, where employees who have received training are able to work more carefully and accurately in data input. Third, from the aspect of bureaucratic structure, coordination between work units, both between administrative, operational, and field officers, runs effectively so that the process of issuing a memorandum of service can take place without significant obstacles. Fourth, from the aspect of communication, socialization carried out continuously to service users has been proven to increase their understanding of digital payment procedures.

Based on these four factors, it can be concluded that the implementation of the e-billing system at the Port of Lhokseumawe City has been running optimally, although there are still aspects that need to be improved, especially related to network stability, server capacity, and operational data adjustments.

The obstacles found, namely network stability, server capacity, and operational data adjustment, are interrelated to the four factors of policy implementation: network stability and server capacity affect the resource aspect, while operational data adjustment affects aspects of bureaucratic structure and disposition. The efforts made by the port, such as improving technological infrastructure, routine system maintenance, employee training, strengthening coordination, and continuous socialization, are basically steps to strengthen these four factors simultaneously so that the implementation of the e-billing system can run more optimally.

CONCLUSIONS AND RECOMMENDATIONS

This study concludes that the implementation of the e-billing digital payment system on port service notes at PT Pelabuhan Indonesia (Pelindo) Lhokseumawe Branch has generally run optimally based on policy implementation factors according to George C. Edward III, namely communication, resources, disposition, and bureaucratic structure. This system has been able to increase efficiency, transparency, and accuracy in the payment process for port services, supported by the readiness of technological

infrastructure, system maintenance, human resource competence, and good coordination between work units. However, the implementation of this system still faces obstacles in the form of network stability, server capacity, and operational data adjustments.

Based on these findings, this study recommends that PT Pelabuhan Indonesia (Pelindo) Lhokseumawe Branch continue to improve the quality of technology infrastructure, carry out regular and scheduled system maintenance, improve training for employees, and strengthen coordination between work units. For service users, it is recommended to be more active in learning and following the socialization of the procedures for using the e-billing system. The implications of this study show that strengthening infrastructure, system maintenance, human resource training, and continuous coordination and socialization are needed to increase the effectiveness of the implementation of the e-billing digital payment system in a sustainable manner.

FURTHER STUDY

This research has limitations because it was only conducted at one research location, namely PT Pelabuhan Indonesia (Pelindo) Lhokseumawe Branch, so the results of the research cannot necessarily be generalized to all ports managed by PT Pelabuhan Indonesia in other regions that have different operational characteristics. This research was also conducted in a relatively short period of time and most of the data was obtained through interviews and observations, so it is highly dependent on the subjectivity of the informant. Therefore, further research is recommended to involve more informants and examine other aspects, such as the level of user satisfaction quantitatively and the security of the information system, in order to obtain more comprehensive research results.

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