

Evaluation of the Success of E-Log Book Implementation for Handline Fishing Gear at Bitung Fishing Port

ABSTRACT

Ensure optimal and sustainable management of fishery resources and the preservation of fishery resources, accurate fisheries data is essential. One way to achieve this, is by using fishing log books. Improvements have been made by developing an electronic-based fishing log book (e-log book) that is Android-based, paperless, and capable of offline mode. However, an evaluation of the use of e-log books in the perspective of captains (users), has not been conducted. This research aims at assessing user satisfaction propensity and evaluating the extent of the success of the implementation of the e-log book for handline fishing gear at Bitung Fishing Port (PPS) using the DeLone and McLean model. The sampling method employed is purposive sampling, with 115 respondents consisting of handline captains who use e-log books. The research was carried out for 3 (three) months in January – March 2023. The data analysis was conducted using propensity test and PLS-SEM. The propensity test results indicate that the implementation of e-log books at Bitung Fishing Port is in the high category at 77.39%. The PLS-SEM analysis results indicate that out of the four proposed hypotheses, not all were supported and accepted. The quality of the system and service influences user satisfaction, and user satisfaction also affects net benefits. However, the quality of information does not impact user satisfaction. The conclusion drawn from this study depicts that, the satisfaction of handline fishing gear captains regarding the implementation of e-log books at Bitung Fishing Port is at a "high" level. Meanwhile, the e-log book application implementation still faces some challenges or aspects that need improvement to achieve the expected level of success.

Keywords: E-log book; Handline; Bitung Fishing Port; DeLone and McLean Model

1. INTRODUCTION

Bitung City, located in the North Sulawesi Province, is an area focused on the development of the fisheries sector [1]. The imposition of a moratorium on permits for foreign vessels since November 2014 has impacted fish processing units, disrupting company operations due to reduced fish supplies [2]. Almost a decade after that event, the marine fisheries in Bitung City have gradually revived. The fisheries production volume in Bitung Fishing Port in 2020 amounted to 53,462 tons, experiencing a production increase of 4,568 tons or a 9.3% rise from 2019 [3]. Bitung City has infrastructure that supports the loading and unloading of goods to and from the city [1]. As an international port, Bitung Port has the capacity to be a gateway for distribution and is closest in distance to export destination countries [4]. Bitung City's export volume, reached 33,876 tons in 2013, while the average from 2004 to 2013 was 23,565 tons [5].

Based on the data from Bitung Fishing Port, there are five main types of fishing gear used: gillnets, handlines, longlines, poles and lines, and purse lines. The dominant landed fish species are skipjack tuna (37%), followed by yellowfin tuna (30%), frigate tuna (17%), bullet tuna (10%), and mackerel (0.8%) [3]. Among these, the primary favourite is tuna or yellowfin tuna due to its high market value. For tuna weighing above 30 kg (30 and above), the price ranges from Rp. 20,000 to Rp. 78,000, based on quality grades such as AB, C, local, and reject [6]. The tuna processing industry in Bitung City comprises fresh tuna, frozen tuna, and tuna loin industries exported to various countries [7]. The implications of the moratorium policy have favoured small-scale fishing enterprises. Fish catch has increased as larger vessels decreased, with fishing grounds closer, thus reducing production costs [2];[8]. Fishing efforts using handlines have promising income prospects, potentially contributing positively to the welfare improvement of fishermen [6]. In 2021, the number of handline fishing gears recorded was 659 units out of 1,088 units, with the highest count in 2020 at 706 units out of a total of 1,118 fishing fleet [3].

Having accurate fishery data is crucial to maintaining the optimal and sustainable management of fishery resources while protecting their sustainability. However, according to Ramdhani et al. [9] and Manshur [10], doubts persist regarding the validity, quality, and updates of fishery data, making it challenging to use in management strategies. Ramdhani et al. [9] recommend establishing a catch recording system adhered to by fishing industry stakeholders and developing easily usable data reporting procedures. Setyadji et al. [11], argue that bound data like logbooks form the foundational principles of fishery management due to their strong spatial, temporal, and strata coverage without requiring substantial costs. Additionally, Trionawan et al. [12] highlight that logbooks offer support for collecting fishery statistical data, including information about fishing areas, fish types, and volumes.

However, traditional logbooks have shortcomings, such as manual entry on paper prone to dirt, damage, loss, readability issues, inaccurate location records, and inefficiencies [12];[13]. To address these limitations, an electronic-based fishing logbook, known as an electronic logbook (e-logbook), has been developed. This application operates on Android, eliminates the need for paper, and functions in offline mode. The adoption of e-logbooks for fishing is considered a crucial step in fisheries management efforts in Indonesia [11];[12]. According to Setyadji et al. [11], the use of e-logbooks represents a significant stride in implementing sustainable fisheries management in Indonesia. Despite some remaining drawbacks, data collected via e-logbooks holds substantial potential as the primary data source for fisheries resource management.

The evaluation of e-logbook usage in fishing, particularly from the perspective of boat captains as users, has yet to be conducted comprehensively. This research aims at assess user satisfaction propensity and evaluate the extent of the success of the implementation of the e-log book for handline fishing gear at Bitung Fishing Port (PPS) using the DeLone and McLean model.

2. LITERATURE REVIEW

2.1. E-Log book

Based on Law Number 31 of 2004, as amended by Law Number 45 of 2009 [14] concerning Fisheries, the term "log book" refers to the captain's written daily report on fishing activities or fish transport. According to Regulation of the Minister of Marine Affairs and Fisheries Number 10 of 2021 [15] concerning Business Activity and Product Standards in Risk-Based Licensing in the Marine and Fisheries Sector, Regulation of the Minister of Marine Affairs and Fisheries Number 33 of 2021 [16] concerning Fish Catch Log Books, Monitoring Above Fishing Vessels, and Fish Transport Vessels, Inspection, Testing, and Marking of Fishing Vessels, as well as Compliance with the Management of Fisheries Supervision and the Regulation of the Director General of Capture Fisheries Number 11/PER-DJPT/2018 [17] concerning Technical Guidelines for the Implementation of Fish Catch Log Books, the definition of a fish catch log book is a written daily report by the captain or fisherman regarding fishing activities and daily operations of fishing vessels.

According to Regulation of the Minister of Marine Affairs and Fisheries Number 33 of 2021 [16] concerning Fish Catch Log Books, Monitoring Above Fishing Vessels and Fish Transport Vessels, Inspection, Testing, and Marking of Fishing Vessels, as well as Compliance with the Management of Fisheries Supervision, an electronic logbook, from now on referred to as an e-log book, is a fish catch log book filled out and submitted electronically by the captain or fisherman. The Regulation of the Director General of Capture Fisheries Number 11/PER-DJPT/2018 [17] concerning Technical Guidelines for the Implementation of Fish Catch Log Books defines the e-log book as an application for electronically/digitally reporting data on fish catch results, independently filled out by the captain during departure, throughout fishing operations, upon arrival, and electronically submitted to the fish catch log book information system abbreviated as SILOPI in Indonesian.

2.2. DeLone McLean ISSM

Every organization has its own information system needs, such as business requirements and goals. Organizations must be able to create and enhance effective information systems to support their performance and achieve their objectives [18].

Evaluating the success of information system implementation is a complex phenomenon due to various factors that need to be considered and various measures that can be used to assess its success. The primary reason for using the DeLone and McLean Model (2003) [19] is its flexibility in mediating the role of trust in shaping customer satisfaction. The DeLone and McLean Model (2003) [19] aims to provide an understanding of the quality dimensions of satisfaction and satisfaction toward the success of the information system. This model was initially developed based on information research by Shannon & Weaver (1949) [20], who argued that the success of information systems could be assessed at three levels: technical, semantic, and effectiveness. In complementing their model, DeLone and McLean (1992) [21] also adopted Mason's (1978) [22] perspective, who viewed the effectiveness of information systems as a series of events from the beginning to the outcomes. DeLone and McLean (1992) [21] established nine relationships among six variables (information quality, system quality, use, user satisfaction, individual impact, and organizational impact).

Responding to the criticism raised by Seddon and Kiew (1996) [23], stating that system use is a behavior unsuitable for use in a causal model, DeLone and McLean (2003) updated their model. The changes include the dimension of intention to use as an alternative to the use dimension. The variable intention to use can be used in specific contexts because it is challenging to interpret the multidimensional aspects of the use variable. The mismatch of the use variable in a causal model, as stated by Seddon and Kiew (1996) [23], can be addressed by the intention to use the variable because it is not a behavior but an attitude. In the updated DeLone and McLean Model (2003) [19], it is argued that although information quality and system quality are the most important constructs for measuring the success of individual systems, service quality is the most critical factor for measuring the success of information systems as a whole. Additionally, the updated model integrates individual and organizational impacts into net benefits.

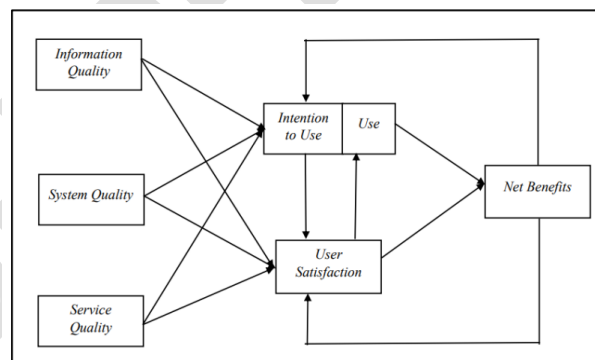


Figure 1. DeLone and McLean 2003 ISSM

2.3. The Scientific Approach

The study took place over three months from January to March 2023 at Bitung Fishing Port, Bitung City, North Sulawesi Province. This research adopted a quantitative methodology focused on collecting and analyzing numerical or statistical data. In this methodology, the variables used to measure the success of e-logbook implementation were based on the DeLone and McLean 2003 ISSM (Information System Success Model) framework.

The study excluded the usage dimension of e-logbooks due to their mandatory nature, as per Minister of Maritime Affairs and Fisheries Regulation No. 33 of 2021 [16]. The rationale for not including the usage variable in this research was based on arguments put forth by Amriani and Iskandar [18] and Haura et al. [24], stating that the usage variable is difficult to measure in a

mandatory context. Research focusing on mandatory system usage tends to yield inconsistent results. When system usage is mandatory, the level of system usage provides limited information about the success of the system [25]; [26]. Research by Rai et al. [27] indicates that when usage becomes an obligation, the level of usage provides relevant information to a limited extent. The measure of usage does not always accurately reflect users' responses to mandatory information systems [28].

Building upon the literature review outlined earlier, this research adopts the Information System Success model by DeLone and McLean (2003) [19] and incorporates the research model conducted by Amriani and Iskandar [18]. This aligns with the research approach that considers the specific context of e-logbook implementation in a mandatory environment. The hypotheses formulated in this study are as follows: H1: System quality significantly and positively influences user satisfaction; H2: Information quality significantly and positively influences user satisfaction; H3: Service quality significantly and positively influences user satisfaction; H4: User satisfaction significantly and positively influences net benefits.

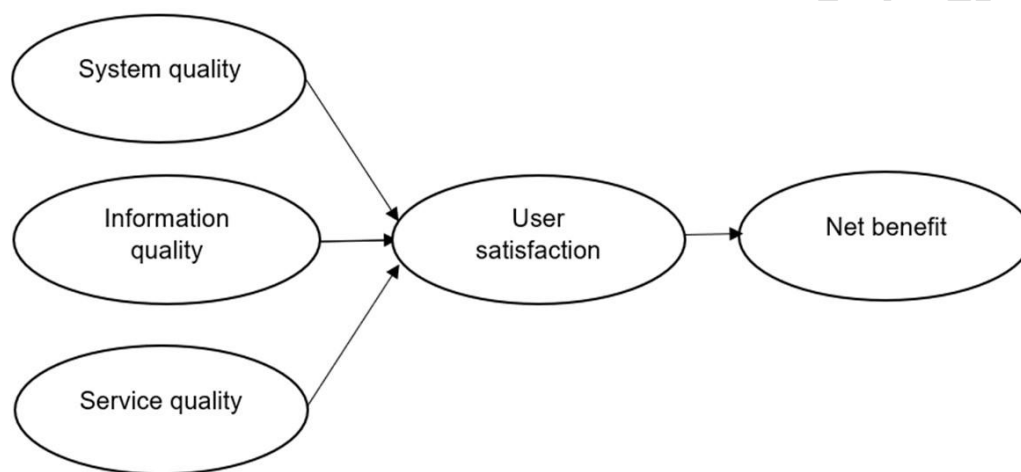


Figure 2. Hypothesis

3. METHODOLOGY

3.1. Research Variables and Research Instruments

Here are the variables introduced by Delone and McLean in this model:

Table 1. Research Variables

Latent Variables	Operational Definition
System Quality (Exogenous)	User Perception Regarding the Quality of Software Used to Operate the E-logbook for Fish Capture
Information Quality (Exogenous)	The user perception of the e-logbook for fish capture regarding the accuracy, completeness, format, and precision of the information generated by the system.
Service Quality (Exogenous)	The user perception regarding the responsiveness, tangibility, and empathy received/enjoyed by the users of the e-logbook system for fish capture from the management (Bitung Fishing Port) and developers.
User Satisfaction (Endogenous)	Feedback and responses that emerge from users after using the information system.
Net Benefit (Endogenous)	The impact of using the e-logbook for fish capture on users includes job performance, productivity, faster work, and

Table 1 shows that, this study has two dependent (endogenous) variables to be analyzed: user satisfaction and net benefits. Meanwhile, the independent (exogenous) variables used in this study are system quality, information quality, and service quality. Thus, this study will examine the influence of the independent variables (X), namely system quality, information quality, and service quality, on the dependent variables (Y), which are user satisfaction and net benefits. The research instruments are tailored to the indicators of each variable in the Delone and Mclean information.

Table 2. Indicators of each variable

	Indicator	Code	Adopted from
System Quality			
1	<i>Ease of use</i>	SQ1.0	Rahayu <i>et al.</i> [29]
2	<i>Reliability</i>	SQ2.0	Rahayu <i>et al.</i> [29]
3	<i>Response Time</i>	SQ3.0	Rahayu <i>et al.</i> [29]
4	<i>Language</i>	SQ4.0	Iivari [30]
Information Quality			
1	<i>Accurate</i>	IQ1.0	Rahayu <i>et al.</i> [29]
2	<i>Completeness</i>	IQ2.0	Rahayu <i>et al.</i> [29]
3	<i>Format</i>	IQ3.0	Rahayu <i>et al.</i> [29]
Service Quality			
1	<i>Empathy</i>	SEQ1.0	Rahayu <i>et al.</i> [29]
2	<i>Responsiveness</i>	SEQ2.0	Rahayu <i>et al.</i> [29]
3	<i>Tangible</i>	SEQ3.0	Parasuraman <i>et al.</i> [31]
User Satisfaction			
1	Kepuasan Menyeluruh (Overall Satisfaction)	US1.0	Rahayu <i>et al.</i> [29]
2	<i>Expectation</i>	US2.0	Chin and Lee [32]
3	<i>Service</i>	US3.0	Bailey and Pearson [33]
Net Benefits			
1	<i>Job performance</i>	NB1.0	Rahayu <i>et al.</i> [29]
2	<i>Productivity</i>	NB2.0	Rahayu <i>et al.</i> [29]
3	<i>Work More Quickly</i>	NB3.0	Davis [34]
4	<i>Problem solution</i>	NB4.0	Yoga <i>et al.</i> [35]

3.2. Sampling Method

The sampling method used is purposive sampling. The selection of respondents for the sample includes active fishing boat captains with vessel sizes above 5 Gross Tonnage (GT) who utilize the e-logbook at the Bitung Fishing Port. With the consideration that PLS-SEM calculations do not require strict assumptions about the distribution of observed variables or sample size ([36]; [37]) and according to Hamid & Anwar (2019) [38] the recommended minimum sample size for Structural Equation Model (SEM) is around 100 samples. This study opted for a sample size of 115 respondents.

3.3. Data analysis

Analyzing propensity for user satisfaction uses validity, reliability and propensity tests. Meanwhile, the method used to analyze the success of e-logbook implementation employs PLS-

SEM with the assistance of the SmartPLS software. Partial Least Square (PLS) Structural Equation Model (SEM) is employed to explore the predictive relationships between latent/construct variables by examining the interactions or influences among these latent/construct variables. The discussion starts by evaluating the measurement model (outer model) and the structural model (inner model). The subsequent step involves testing the significance of relationships and influences among variables (hypothesis testing) based on the structural model that has undergone bootstrapping procedures.

4. RESULTS AND DISCUSSION

4.1. Result

4.1.1. Profile of Research Respondents

Before analysing the successful implementation of the e-logbook information system, a descriptive analysis was performed to understand the characteristics of the respondents used in the study.

Table 3. The Profile of Respondents in the Handline Captain Research at Bitung Fishing Port

Characteristics	Frequency	Percentage
Age		
21-30	6	5.22%
31-40	36	31.30%
41-50	61	53.04%
51-60	12	10.43%
Level of education		
Elementary school	47	40.87%
Junior high school	39	33.91%
Senior high school	28	24.35%
College	1	0.87%
Gross Tonnage (GT)		
1-10	23	20.00%
11-30	86	74.78%
31-60	6	5.22%

The number of respondents involved in this study was 115 individuals. Table 3 shows that the respondents' ages were predominantly 41-50 years, totaling 61 individuals (53.04%). Following that, the age category of 31-40 years consisted of 36 individuals, 51-60 years had 12 individuals, and the lowest category, 21-30 years, included 6 individuals. The education levels of the handline captains ranged from elementary school to bachelor's degrees. Most had completed elementary school (47 individuals, 40.87%), with only one holding a bachelor's degree (0.87%). Regarding the vessel size categories, the 11-30 GT category was dominated by 86 individuals, followed by 1-10 GT with 23 individuals, and lastly, 31-60 GT with 6 individuals.

4.1.2. Assess User Satisfaction Propensity

According to Sugiyono [39], a valid instrument implies a measurement tool used to obtain data (measure) is valid. Validity indicates that the instrument can be utilized to measure what should be measured. It is deemed valid if the significance is less than 0.05 and the R-count is greater than the R-table. Based on the validity test results, it is evident that each item in the questionnaire has an R-count greater than the R-table (0.176) and holds a positive value, as well as all item significances being less than 0.05. Consequently, those statement items are considered valid.

Reliability reflects the level of stability and consistency among respondents in answering questions related to constructs, which constitute dimensions of a variable and are arranged in the form of a questionnaire, with the criterion that a Cronbach's Alpha coefficient greater than 0.6 indicates a reliable questionnaire [40], the results of the reliability test show that the user satisfaction variable has a Cronbach's Alpha value of (0.715) > 0.6. Therefore, the user satisfaction variable can be considered reliable.

There's a calculation based on categorising user satisfaction variables for handline fishing gear at Bitung Fishing Port, involving 115 respondents with a total of 4 questionnaire items. The highest score obtained is 16, and the lowest is 4. Responses are categorized into four groups: AS (strongly agree), A (agree), D (disagree), and SD (strongly disagree). According to Mardapi [41], data categorization is divided into four: very high, high, low, and very low. After determining the minimum score (X min) and maximum score (X max), the ideal average value (Mi) is found using the formula $Mi = \frac{1}{2} (X \max + X \min)$. The excellent standard deviation (SDi) is calculated using the formula $Mi = \frac{1}{6} (X \max + X \min)$. The scoring criteria guideline is as follows: $X \geq Mi + 1 SDi$ is very high, $Mi + 1 SDi > X \geq Mi$ is high, $Mi > X > Mi - 1 SDi$ is low, and $X < Mi - 1.SBi$ is very low. Based on these calculations, the ideal mean for the user satisfaction variable is 12, and the ideal standard deviation is 4. Based on these calculations, a distribution table of propensity can be created as follows:

Table 4. Distribution of User Satisfaction Variable Categories

Propensity criteria	Frequency	Percentage	Categories
$X \geq Mi + 1 SDi$	2	1.74%	Very High
$Mi + 1 SDi > X \geq Mi$	89	77.39%	High
$Mi > X > Mi - 1 SDi$	24	20.87%	Low
$X < Mi - 1.SBi$	0	0.00%	Very Low

Based on the table above, the frequency of handline fishing gear captains' responses to the implementation of the e-logbook at Bitung Fishing Port falls into the following categories: very high, 2 respondents (1.74%); high, 89 respondents (77.39%); low, 24 respondents (20.87%); and no responses categorized as very low (0.0%). Therefore, the propensity of user satisfaction responses among handline fishing gear captains towards the implementation of the e-logbook at Bitung Fishing Port is categorized as high, encompassing 77.39% of the respondents.

4.1.3. Implementation of E-Log Book Application

This study employed the Delone and McLean Information System Success Model consisting of 5 latent variables and 17 indicator variables. The data analysis process was conducted using SmartPLS 3.2.9 software. At this stage, the research evaluated the outer model (measurement model) to assess the validity and reliability of the utilized variables [37];[42]. Subsequently, an evaluation of the inner model (structural model) was performed to comprehend the relationships among latent variables. Finally, hypothesis testing was carried out to examine the validity of the proposed hypotheses.

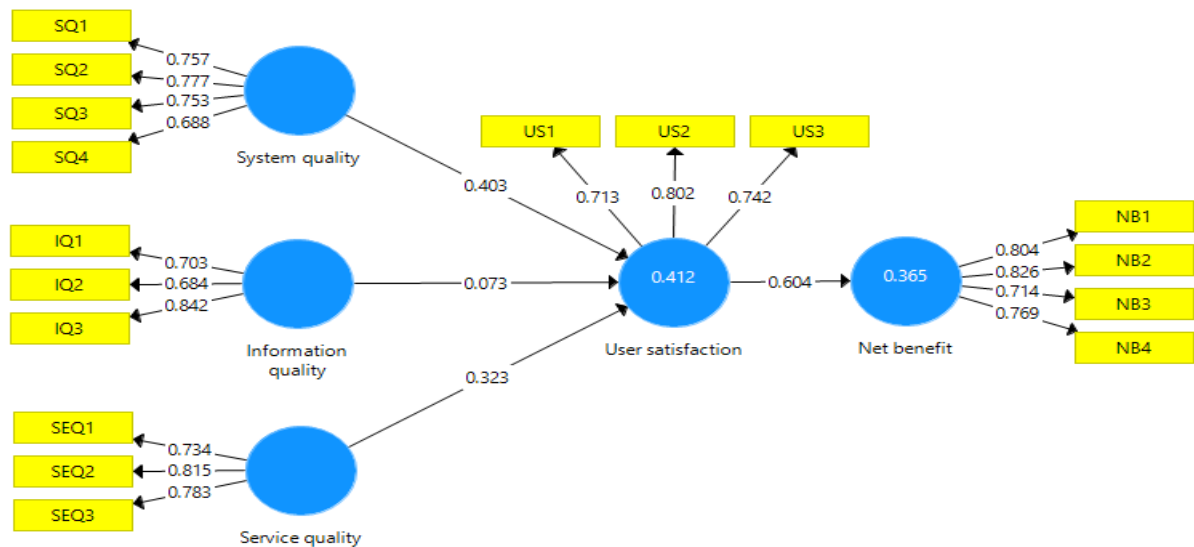


Figure 3. PLS-SEM Analysis Results for Loading Factor Values

The loading factor < 0.5 serves as a parameter for Convergent Validity testing; indicators below this threshold could be considered for removal. However, if an indicator falls between 0.5-0.7 in the loading factor, it might not need to be eliminated, provided the Average Variance Extracted (AVE) score is > 0.5 [43]. The results of the convergent validity calculations can be presented in the table below:

Table 5. Loading Factor Values

	Information quality	Service quality	System quality	User satisfaction	Net benefits
IQ1	0.703				
IQ2	0.684				
IQ3	0.842				
SEQ1		0.734			
SEQ2		0.815			
SEQ3		0.783			
SQ1			0.757		
SQ2			0.777		
SQ3			0.753		
SQ4			0.688		
US1				0.713	
US2				0.802	
US3				0.742	
NB1					0.804
NB2					0.826
NB3					0.714
NB4					0.769

Table 6. Average Variance Extracted (AVE)

	Average Variance Extracted (AVE)
Information quality	0.557
Service quality	0.605

System quality	0.554
User satisfaction	0.567
Net benefits	0.607

From Tables 5 and 6, all the research indicator loading factors are above 0.5, and all constructs, including variables such as system quality, information quality, service quality, usage, user satisfaction, and net benefits, have an Average Variance Extracted (AVE) value above 0.5, indicating the validity of these variables. It can be concluded that the test for convergent validity has been fulfilled. Discriminant validity is evaluated by comparing the square root of the Average Variance Extracted (AVE) value with the correlation between constructs [44];[45]. The former should be higher than the latter [46]. The discriminant validity test uses the Fornell-Larcker Criterion, as indicated by the results in Table 7.

Table 7. The Fornell-Larcker Criteria

	User satisfaction	Information quality	Service quality	System quality	Net benefits
User satisfaction	0.753				
Information quality	0.410	0.746			
Service quality	0.495	0.434	0.778		
System quality	0.552	0.490	0.350	0.744	
Net benefits	0.604	0.453	0.263	0.625	0.779

The results in Table 7 indicate that all variables exhibit good discriminant validity, where the square root of the Average Variance Extracted (AVE) for each construct is higher than the correlation value between one variable and another. This suggests that the Fornell-Larcker Criterion for discriminant validity is valid. Based on the cross-loading and Fornell-Larcker Criterion results, it can be concluded that each indicator used has sufficient discriminant validity to represent its respective variable. The reliability test is conducted using composite reliability to assess the reliability of the measurement tool [47]. The composite reliability value should be greater than 0.7, although a value of 0.6 is still acceptable [48]. Based on the construct test results in Table 8 above, it's evident that all variables have composite reliability values > 0.78. This indicates that all tested variables meet the recommended criterion of > 0.70, demonstrating high levels of reliability for these variables.

Table 8. Results of *Composite Reliability*

	Composite Reliability
Information quality	0.789
Service quality	0.821
System quality	0.832
User satisfaction	0.797
Net benefits	0.861

The structural model's feasibility test involves calculating R-squared (R²) values [49];[50]. This analysis helps determine the extent of the exogenous variables' influence on the endogenous ones [51]. According to Abdillah and Hartono [46], a higher R² value signifies a better predictive model. Ghozali [52] suggests an R² of 0.67 indicates a well-categorized model. An R² result between 0.33 and 0.67 suggests a moderately categorized model. Meanwhile, an R² value of 0.33 suggests a weakly categorized model. The user satisfaction results at 0.412 falls into the moderate category. This means that the user satisfaction construct can be determined by system, information, and service quality, accounting for 41.2%. For comparison, the remaining 58.8% is

influenced by other factors beyond this research. The net benefit exhibits a moderate influence with a result of 0.365. This indicates that 36.5% of the impact comes from user satisfaction, while factors outside the scope of this study influence the remaining 63.5%.

Tabel 9. Nilai *R-square*

	R-square
User satisfaction	0.412
Net benefit	0.365

In analyzing correlations between variables, hypothesis testing is employed to assess the significance of the relationships among these variables. If the path coefficient is > 0 , it's interpreted as a positive influence. Conversely, if the path coefficient is < 0 , it's interpreted as a negative influence [43]. T-statistics and P-values are used to determine significance. This study uses a two-tailed significance level, with a T-statistic value of 1.96 and a P-value of 0.05 (significance level = 5%) [53].

Table 9. Results of hypothesis tests

Hypothesis	Original Sample (O)	T Statistics	P Values	Conclusion
Information quality \Rightarrow User satisfaction	0.073	0.496	0.620	Rejected
Service quality \Rightarrow User satisfaction	0.323	2.481	0.013	Accepted
System quality \Rightarrow User satisfaction	0.403	4.316	0.000	Accepted
User satisfaction \Rightarrow Net benefits	0.604	10.799	0.000	Accepted

4.2. Discussion

The results of the hypothesis testing support all the hypotheses with a positive direction of relationships. Both system quality and service quality exhibit a significant positive influence on user satisfaction. Furthermore, findings from the hypothesis testing also confirm that user satisfaction has a positive impact on net benefits. Based on the path coefficient values, it is evident that the system quality variable has a more significant influence on user satisfaction than the service quality variable.

The parameter estimation for testing the influence of Information Quality on User Satisfaction shows an original sample/path value of 0.073, which is positive. The T-Statistic value of 0.496 is smaller than the $Z \alpha = 0.05$ (5%) = 1.96. A P-value of 0.620 > 0.05 indicates that Information Quality has a positive yet insignificant effect on User Satisfaction. The hypothesis proposing that Information Quality has a positive but insignificant impact on User Satisfaction is rejected. Information Quality denotes the quality of outputs generated by the information system, such as the data from the e-log book concerning fishing activities. The expectation is for accurate, complete, and precise data and information to support the implementation of measurable fishing policies, especially in the planning of the fishing sector. For the captains, these reports become a requirement for the next ship's departure documents. Surprisingly, the quality of information does not affect user satisfaction. Despite the assistance provided by the Information Quality in the e-log book application for users' reporting and fisheries data recording, users have not attained adequate satisfaction. This outcome aligns with the findings of Rachman [54], Amriani and Iskandar [18], and Bahrudin et al. [55].

The parameter estimation for testing the influence of Service Quality on User Satisfaction indicates an original sample/path value of 0.323, which is positive. The T-Statistic value of 2.481 is greater than the $Z \alpha = 0.05$ (5%) = 1.96. A P-value of 0.013 < 0.05 suggests that Service Quality has a positive and significant impact on User Satisfaction. In other words, the hypothesis is accepted. This study found that the services provided to users of the information system, such

as empathy, responsiveness, and tangible aspects, contribute to user satisfaction with the system. This indicates the significance of these constructs. These findings support the Information System Success Model by DeLone and McLean [19], asserting that service quality is one dimension of information system success. The impact of service quality on user satisfaction is consistent with Rachman [54], Arfian et al. [56], and Meilani et al. [57].

The parameter estimation for testing the influence of System Quality on User Satisfaction indicates an original sample/path value of 0.403, which is positive. The T-Statistic value of 4.31 is greater than the $Z \alpha = 0.05$ (5%) = 1.96. With a P-value of $0.00 < 0.05$, it suggests that System Quality significantly impacts User Satisfaction. In other words, the hypothesis is accepted. This implies that an improvement in System Quality leads to an increase in User Satisfaction, and conversely, a decrease in System Quality leads to a reduction in User Satisfaction. These findings align with Iivari's [30] study on mandatory accounting and financial information system implementation. The results are also consistent with research by Bahrudin et al. [55], Noviyanti [58], Pambudi [59], Amriani and Iskandar [18], and Meilani et al. [57].

The parameter estimation for testing the influence of User Satisfaction on Net Benefits indicates an original sample/path value of 0.604, which is positive. The T-Statistic value of 10.79 is greater than the $Z \alpha = 0.05$ (5%) = 1.96. With a P-value of $0.00 < 0.05$, it suggests that User Satisfaction significantly impacts Net Benefits. In other words, the hypothesis is accepted. This implies that an increase in User Satisfaction leads to an increase in Net Benefits, and conversely, a decrease in User Satisfaction leads to a reduction in Net Benefits. The direct effect of User Satisfaction on Net Benefits is 0.604, indicating that a one-unit increase in User Satisfaction can result in a 60.4% increase in Net Benefits. The sense of satisfaction stemming from the improved transition from logbook to e-log book, meeting the needs for task completion, instills confidence in users about the e-log book's performance, influencing productivity and task efficiency. These findings further reinforce previous studies by Amriani and Iskandar [18], Haura et al. [24], and Meilani et al. [57]. Based on the previous analysis and discussion, it is evident that the performance of the e-logbook application at Bitung Fishing Port cannot be empirically considered successful using the approach in the DeLone and McLean success model. Three hypotheses are accepted, while one is not accepted based on the research findings. This study also indicates that the mandatory use of information systems only automatically guarantees user satisfaction.

The conceptual framework of this paper comprises dimensions of system quality, information quality, and service quality, along with their impact on user satisfaction and the subsequent consequences on net benefits. This framework provides a valuable evaluation guide for information systems. We recommend that policymakers systematically evaluate the performance of implemented information systems, emphasizing the perceived benefits by users of the e-logbook information system. In line with Petter et al. (2008) [60], measuring the benefits of information systems at the organizational level requires caution to ensure that individuals assessing organizational benefits possess the appropriate qualifications and positions. The research steps outlined in this study can be adopted in surveys to identify potential weaknesses or strengths in these factors.

Our findings indicate that both system and service quality significantly influence user satisfaction. Therefore, these variables should be considered for future improvements in the information system. This is crucial because high user satisfaction will translate into net benefits, ultimately impacting the success of the e-logbook information system. Enhancing system quality through factors such as Ease of use, Reliability, Response Time, Language, and service quality through Empathy, Responsiveness, and Tangible is expected to increase net benefits directly or indirectly.

5. CONCLUSIONS

The conclusion drawn based on the analysis results is as follows:

1. The satisfaction of handline gear captains regarding the implementation of the e-log book at Bitung Fishing Port is categorized as high at (77.39%). This high level of satisfaction among captains is evidenced by respondents' ratings, indicating fulfilled services and expectations as they no longer need to jot down details on paper, satisfying users, particularly captains, and encouraging them to revisit the e-log book application.

2. The implementation of the e-log book application in the handline gear at Bitung Fishing Port can only empirically be considered successful based on some approaches used in the DeLone and McLean success model. Not all of the four proposed hypotheses could be confirmed and accepted. The research results indicate that system quality and service quality influence user satisfaction, and user satisfaction also impacts the net benefits obtained. However, the quality of information was not found to influence user satisfaction significantly.

This research demonstrates that the mandatory use of information systems only automatically leads to user satisfaction. As a result, the implementation of the e-logbook application still encounters various challenges or areas that require enhancement to reach the envisioned level of success by the DeLone and McLean success model. Policy-makers should systematically and periodically evaluate the implemented information systems, focusing on users who perceive the benefits of the information system. Improving system quality through factors such as Ease of use, Reliability, Response Time, Language, and service quality through Empathy, Responsiveness, and Tangible is expected to enhance user satisfaction, which will, in turn, be translated into net benefits, influencing the success of the e-logbook information system. This research faces several limitations, such as Limited Scope, which encompasses the Bitung Fishing Port environment but only partially encompasses the usage of the e-logbook application across all units within the Directorate General of Capture Fisheries. Therefore, the results of this study may be considered a partial evaluation. There is also a Limitation in Sample Size that needs attention; obtaining a larger sample would enhance the representation and reliability of the research results. For future research, expanding the research object by involving more units within the Directorate General of Capture Fisheries is recommended to obtain a more comprehensive overview of the success of implementing the e-logbook application. Additionally, the sample size can be increased to ensure the research results are more representative and reliable.

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