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User Satisfaction with the Semeton LH Chatbot: An Integrated TAM and DeLone-McLean Approach

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Abstract. Digital transformation in public services has encouraged the adoption of chatbots as effective and efficient tools for communication and information delivery. The Central Lombok Regency Environmental Agency developed the Semeton LH chatbot to improve public access to environmental service information. This study aims to analyze user satisfaction with the Semeton LH chatbot by integrating the Technology Acceptance Model (TAM) and the DeLone and McLean Information Systems Success Model. A quantitative approach was employed using Partial Least Squares Structural Equation Modeling (PLS-SEM) with SmartPLS, based on data collected from 96 respondents. The measurement model evaluation indicates that several indicators met validity and reliability criteria; however, some constructs still showed limitations in convergent and discriminant validity, particularly in the Average Variance Extracted (AVE) and Heterotrait-Monotrait Ratio (HTMT) values. Therefore, the structural findings should be interpreted cautiously. The results show that Attitude Toward Using (ATU) has a positive and significant effect on Behavioral Intention to Use (BI) and User Satisfaction (US). In addition, Perceived Ease of Use (PEOU) and Perceived Usefulness (PU) significantly influence ATU. Overall, user satisfaction is primarily shaped by positive attitudes formed through perceived ease of use and perceived usefulness.

Keywords: Government chatbot, Public service chatbot, User satisfaction, Technology Acceptance Model, DeLone and McLean Information Systems Success Model.

1. INTRODUCTION

The development of information and communication technology has encouraged government agencies to transform towards digital-based public services as an effort to increase efficiency, transparency, and the quality of services to the public[1]. One form of digital innovation that is increasingly being applied in public services is the use of chatbots as an automated means of interaction between the government and the public[2]. In this context, chatbots play a strategic role in accelerating access to information, expanding service reach, and increasing institutional responsiveness in meeting user needs[3]. The Central Lombok Regency Environmental Agency has implemented the Semeton LH chatbot as a service and information delivery medium for various environmental services, such as environmental approvals, environmental laboratories, institutional information, and public complaints services[4]. This chatbot implementation is part of an effort to modernize information technology-based public services, which is expected to provide fast, easy, and accurate services to the public[5].

Although the Semeton LH chatbot has been used as a digital service tool, to date there has been no structured and measurable evaluation of the level of user satisfaction with this service[6]. This condition makes it difficult for agencies to assess the extent to which chatbots are able to optimally meet user needs, expectations, and experiences[7]. Several obstacles, such as limited chatbot response, inconsistent information quality, and varying levels of perceived ease of use by the public, have the potential to impact user satisfaction with the services provided[8]. In addition, various other factors, such as perceptions of ease of use, perceived benefits, system quality, information quality, service quality, and the level of digital literacy and literacy culture of the community, are thought to influence the acceptance and success of chatbot use in the context of public services[9].

A number of previous studies have examined technology acceptance using the Technology Acceptance Model (TAM) and information system success using the DeLone and McLean Information Systems Success Model separately[10]. However, research that integrates these two models in the context of evaluating user satisfaction with government public service chatbots, particularly considering additional factors such as digital literacy and literacy culture, is still relatively limited. This condition indicates a

research gap that needs to be further studied to gain a more comprehensive understanding of the factors that influence user satisfaction with government chatbot services[11].

While the Technology Acceptance Model (TAM) explains user acceptance behavior through perceived usefulness and perceived ease of use, it does not sufficiently capture system-related dimensions such as information quality and service quality[12]. On the other hand, the DeLone and McLean Information Systems Success Model evaluates system success comprehensively but does not fully explain users' behavioral acceptance[13]. Therefore, integrating these two models provides a more comprehensive framework for evaluating user satisfaction with chatbot-based public services, particularly in government contexts [6].

Based on these conditions, this study aims to analyze the satisfaction of Semeton LH chatbot users through the integration of the Technology Acceptance Model (TAM) and the DeLone and McLean Information Systems Success Model with the Partial Least Squares Structural Equation Modeling (PLS-SEM) approach[14]. The integration of the two models was carried out to gain a more comprehensive understanding of the relationship between user perceptions of technology, the quality of the chatbot system, and the level of user satisfaction in utilizing digital services[15]. This research is expected to provide theoretical contributions in the development of a chatbot user satisfaction evaluation model in the public sector, while also providing practical contributions to the Central Lombok Regency Environmental Service as evaluation material and a basis for improving the quality of chatbot services in supporting the development of more effective, responsive, and sustainable digital public services[16].

2. METHOD

2.1. Research Stages

This research was conducted through several systematic stages designed to ensure a structured and comprehensive research process. Each stage reflects the process from problem identification to conclusion drawing, as shown in Figure 1.

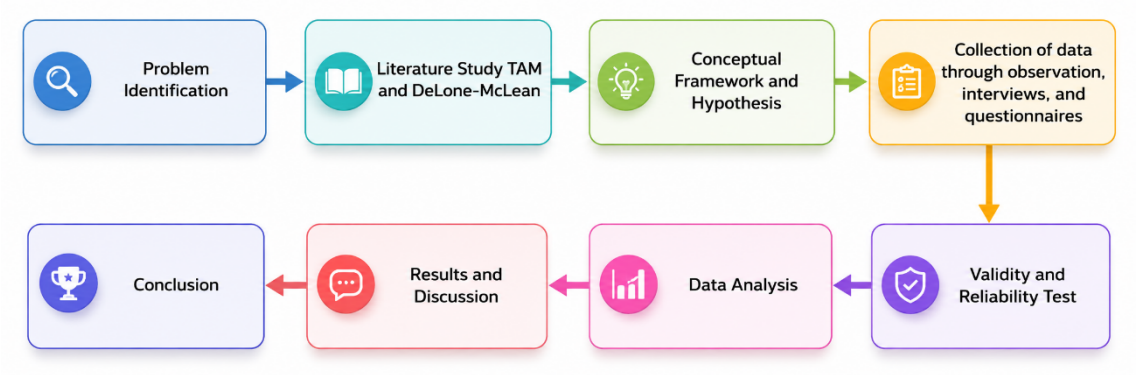

Figure 1. Research Stages

1) Identification of problems

The problem identification phase aims to identify various issues that arise in the use of the Semeton LH chatbot. These issues were identified through initial observations, field conditions, and the development of digital-based public services. The primary focus of this phase was the lack of clear and structured measurements of user satisfaction levels and the factors influencing that satisfaction.

2) Literature review

In the literature review stage, researchers studied theories, concepts, and previous research results related to the research topic. The literature review focused on two main models: the Technology Acceptance Model (TAM), which is used to understand user perceptions and the level of technology acceptance, and the DeLone & McLean Information Systems Success Model, which is used to assess system quality, information quality, and service quality. The results of this literature review serve as the basis for determining research variables and indicators, and developing a conceptual framework.

3) Conceptual Framework and Hypothesis

Based on the literature review, the researchers developed a conceptual framework describing the relationships between the research variables. At this stage, research hypotheses were also formulated, containing tentative assumptions regarding the direct influence, influence through intermediary variables, and the influence of moderator variables on user satisfaction with the Semeton LH chatbot.

4) Data Collection (Observation, Interviews, and Questionnaires)

The data collection phase was conducted to obtain primary data from respondents. Data collection techniques used included observation to understand the chatbot's workflow and functionality, interviews to obtain an overview of chatbot usage (if necessary), and a questionnaire as the primary instrument to measure user perceptions, attitudes, and satisfaction levels based on predetermined indicators. The questionnaire was distributed to members of the public who had used the Semeton LH chatbot.

5) Validity and Reliability Test

The collected data was then tested to determine the quality of the research instrument. Validity testing was conducted to ensure that each statement in the questionnaire accurately measured the variables being studied, while reliability testing aimed to ensure the consistency and reliability of respondents' responses.

6) Data analysis

In the data analysis stage, researchers process and analyze data using statistical methods. This analysis includes descriptive analysis to describe respondent characteristics and the tendencies of their responses, as well as inferential analysis to test research hypotheses based on the model used.

7) Results and Discussion

The results and discussion phase presents the research findings obtained from the data analysis. These findings are then discussed by connecting them to the Technology Acceptance Model (TAM), the DeLone & McLean model, and previous research findings, providing a more in-depth explanation of the meaning and implications of the research findings.

8) Conclusion

In the final stage, researchers draw conclusions based on the results and discussions. These conclusions address the research objectives and problem statement, and may include recommendations that will hopefully provide input for improving the quality of the Semeton LH chatbot.

2.2. Conceptual Framework

The conceptual framework of this study was developed through the integration of the Technology Acceptance Model (TAM) and the DeLone & McLean information systems success model, with the aim of analyzing various factors influencing user satisfaction with chatbot systems. This model illustrates the relationship between user perception variables, system quality, and literacy aspects in shaping user behavior and satisfaction levels. Furthermore, the relationships between the constructs in this study are formulated in the form of hypotheses, which are presented in Figure 2.

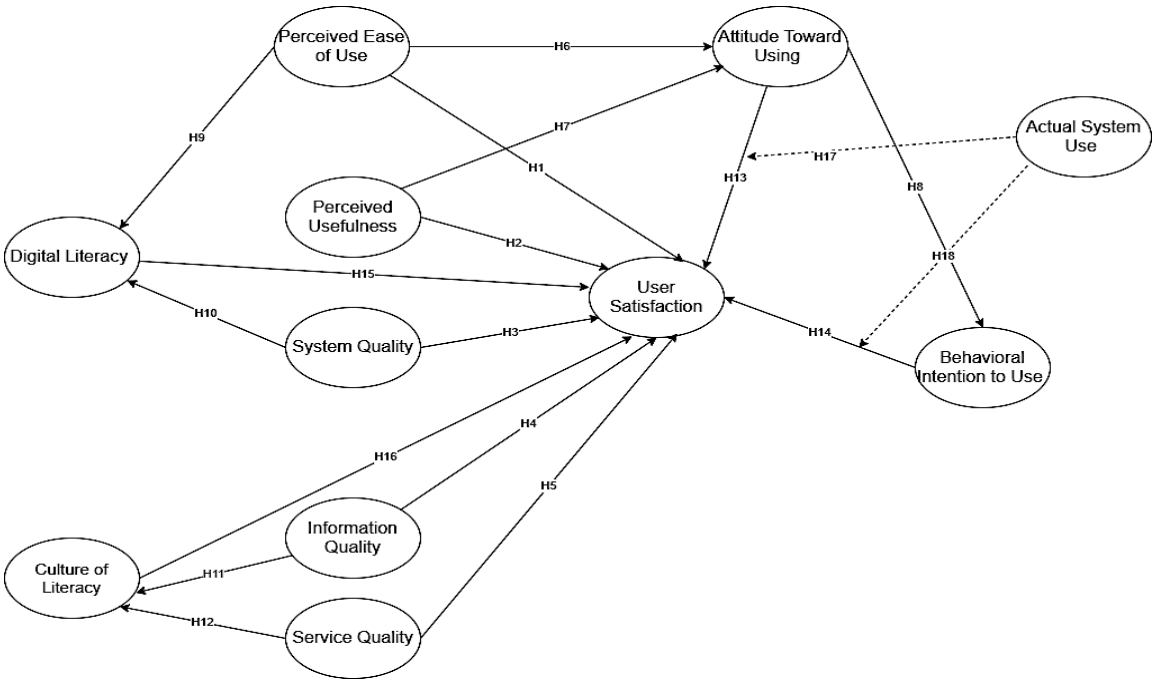

Figure 2. Conceptual Framework of the Research

H1: Perceived Ease of Use (PEOU) has a positive influence on user satisfaction (US). The Perceived Ease of Use in the Technology Acceptance Model proposed by Fred Davis explains that users will accept a system if the system is easy to understand and not difficult to use. When a system feels simple, clear, and not confusing, users will feel more comfortable. This comfort ultimately increases their satisfaction in using the system[17], [12].

H2: Perceived Usefulness (PU) has a positive influence on user satisfaction (US). Perceived Usefulness describes users' beliefs that the system can provide tangible benefits, such as helping work become faster or more effective. If users perceive these benefits, they

are likely to be satisfied because the system is perceived to make a positive contribution[18][19].

H3: System Quality (SQ) has a positive influence on user satisfaction (US)
System quality refers to the technical quality of a system, including access speed, stability, security, and ease of navigation. In the information systems success model introduced by William H. DeLone and Ephraim R. McLean, system quality is a critical factor in determining user satisfaction. A stable and less disruptive system will provide a better user experience and increase user satisfaction[20][21].

H4: Information Quality (IQ) has a positive influence on user satisfaction (US)
Information quality relates to the level of accuracy, relevance, completeness, and timeliness of the information provided. Information presented clearly and easily understood will help users understand services or make decisions, thereby increasing satisfaction[22][23].

H5: Service Quality (ServQ) has a positive influence on user satisfaction (US)
Service quality refers to the quality of service provided to users, such as speed of response, timeliness of assistance, and friendliness. Good service makes users feel cared for and appreciated, which has a positive impact on satisfaction levels[23][24].

H6: Perceived Ease of Use (PEOU) has a positive influence on Attitude Toward Use (ATU)
Ease of use not only increases satisfaction but also shapes users' attitudes toward the system. If a system is easy to learn and operate, users will have a more positive outlook toward its use[13][25].

H7: Perceived Usefulness (PU) has a positive influence on Attitude Toward Use (ATU)
The perceived benefits of a system will influence user attitudes. When a system is perceived as useful and delivers tangible results, users will develop a more favorable attitude toward using the system[26][27].

H8: Attitude Toward Use (ATU) has a positive influence on Behavioral Intention to Use (BI)

A positive attitude toward a system will encourage the intention to continue using the system. Within the TAM framework, attitude is a crucial factor in determining a user's future behavioral intentions[28], [29].

H9: Digital Literacy (DL) has a positive influence on Perceived Ease of Use (PEOU)

Digital literacy reflects users' ability to understand, access, and utilize digital technology effectively. Users with higher levels of digital literacy are more likely to perceive the Semeton LH chatbot as easy to use, because they are familiar with digital interfaces and can navigate chatbot features more confidently. Therefore, better digital literacy can enhance users' perceptions of ease when interacting with the system[30][31].

H10: System Quality (SQ) has a positive influence on Digital Literacy (DL)

A good system quality allows users to learn and adapt to technology more optimally. A stable and accessible system supports increased digital literacy[32][33].

H11: Information Quality (IQ) has a positive influence on Literacy Culture (CL)

High-quality information encourages users to read, understand, and use information more wisely. Gradually, this can form better literacy habits or a culture[34][35].

H12: Service Quality (ServQ) has a positive influence on Literacy Culture (CL)Services accompanied by education and guidance in using the system can foster learning habits in users, thereby supporting the formation of a culture of literacy[36][37].

H13: Attitude Toward Use (ATU) has a positive influence on user satisfaction (US)

Users who have a positive attitude toward a system tend to enjoy the process of using it. This attitude contributes to a sense of satisfaction after using the system[38], [39].

H14: Behavioral Intention to Use (BI) has a positive influence on user satisfaction (US)

The intention to continue using a system usually stems from previous positive experiences. The stronger this intention, the more likely users are to be satisfied with the system they use[40][41].

H15: Digital Literacy (DL) has a positive influence on user satisfaction (US)
Users with good digital literacy skills will more easily understand the system's features and functions. This makes the user experience smoother and more enjoyable, thereby increasing user satisfaction[42].

H16: Literacy Culture (CL) has a positive influence on user satisfaction (US)
A strong culture of literacy encourages users to actively seek and understand information. Effective interactions with the system will result in more positive experiences and increased satisfaction[43][11].

H17: Actual System Usage (ASU) moderates the effect of Attitude Toward Use (ATU) on user satisfaction (US)
Actual use of the system can strengthen the relationship between attitudes and satisfaction. The more frequently users actually use the system, the greater the impact of positive attitudes on satisfaction levels[25][44].

H18: Actual System Usage (ASU) moderates the effect of Behavioral Intention to Use (BI) on user satisfaction (US)
Actual use also strengthens the relationship between intention and satisfaction. If users actually realize their intentions by using the system, this direct experience will increase perceived satisfaction[13][15].

2.3. Sampling Technique and Respondent Criteria

This study employed a purposive sampling technique. Respondents were selected based on the following criteria: (1) having used the Semeton LH chatbot at least once, (2) residing in Central Lombok Regency, and (3) being willing to participate voluntarily in completing the questionnaire. A total of 96 valid responses were obtained and included in the analysis.

2.4. Sample Size Justification

The sample size of 96 respondents is considered sufficient for PLS-SEM analysis based on the ten-times rule, which recommends a minimum sample size of ten times the largest number of structural paths directed at a particular endogenous construct. Therefore, the

sample size in this study meets the minimum requirement for structural model estimation.

2.5. Questionnaire Development and Pretest

The questionnaire items for Perceived Ease of Use (PEOU), Perceived Usefulness (PU), Attitude Toward Using (ATU), and Behavioral Intention to Use (BI) were adapted from Davis (1989)[45]. Meanwhile, System Quality (SQ), Information Quality (IQ), Service Quality (ServQ), and User Satisfaction (US) were adapted from the DeLone and McLean Information Systems Success Model (2003). The Digital Literacy (DL), Literacy Culture (CL), and Actual System Use (ASU) constructs were adapted from relevant prior studies. Before distribution, the questionnaire was reviewed by academic experts and pretested on several respondents to ensure clarity, readability, and content validity[46].

2.6. Moderation Analysis Procedure

Moderation analysis was conducted using the product indicator approach in SmartPLS. Interaction terms were created between Actual System Use (ASU) and the predictor variables, namely Behavioral Intention to Use (BI) and Attitude Toward Using (ATU), to examine whether actual usage strengthened the relationships between these variables and User Satisfaction (US).

3. RESULTS AND DISCUSSION

3.1. Respondent Data and Scale

Based on Table 1, this study involved 96 respondents, with the number of women (52) slightly higher than men (44). Most respondents were in the age range of 17–25 years (39) and 26–35 years (32). In terms of education, the majority of respondents were high school/high school graduates or equivalent (80), and most worked as farmers or fishermen (56), reflecting the characteristics of a community with a secondary education level and a work background in the agricultural sector. All respondents came from Central Lombok Regency and most were residents of rural areas (82), so the results of the study more accurately reflect the conditions of rural communities, including potential limitations in access to technology.

In this study, respondents' perceptions were measured using a five-point Likert scale, ranging from 1 ("strongly disagree") to 5 ("strongly agree"), to provide a quantitative picture of respondents' level of agreement with the indicators studied.

Table 1. Respondent Data

Variables	Category	Frequency
Gender	Woman	52
	Man	44
Age	< 17 years	9
	> 45 years	4
	17 – 25 years old	39
	26 – 35 years old	32
	36 – 45 years old	12
last education	Bachelor's Degree (S1)	10
	Elementary School / Equivalent	6
	Postgraduate (S2/S3)	4
	High School / Vocational School	80
	Diploma (D1/D2/D3)	0
	Junior High School / Equivalent	0
Work	Civil Servants (ASN)	7
	Housewife	7
	Others, please specify:	12
	_____	
	Private sector employee	3
	Farmers / Fishermen	56
	Businessman	7
Residence	Central Lombok Regency	96
	Other Regencies/Cities in NTB Province	0
	Outside NTB Province	0
Residential Area	Rural	82
	Urban	14

3.2. Evaluation of the Measurement Model

The measurement model in this study was evaluated to assess indicator reliability, convergent validity, and construct reliability before examining the structural relationships. Based on Table 2, several indicators showed outer loading values above the recommended threshold of 0.70, indicating acceptable indicator reliability. However, some indicators demonstrated lower loading values, particularly within the Literacy Culture, Digital Literacy, Information Quality, and User Satisfaction constructs, suggesting the need for further refinement. These findings indicate that although the measurement model shows acceptable reliability in several constructs, some validity limitations remain and should be considered when interpreting the structural model results.

Table 2. Evaluation of Measurement Model

Variables	indicator	Code	Outer Loading
Actual System Use	frequently use the Semeton LH chatbot.	ASU1	0.685
	Use the chatbot whenever needed.	ASU2	0.834
	Make the most of the chatbot features available.	ASU3	0.74
	Continue using the chatbot regularly.	ASU4	0.764
Attitude Toward Using	feel happy using Semeton LH chatbot.	ATU1	0.744
	feel that chatbots are the right medium for DLH services.	ATU2	0.738
	Have a positive attitude towards using chatbots.	ATU3	0.728
	feel comfortable interacting with the Semeton LH chatbot.	ATU4	0.776
Behavioral Intention to Use	intend to use the Semeton LH chatbot again in the future.	BI1	0.732
	Will use chatbot if need DLH information.	BI2	0.725
	willing to recommend the chatbot to others.	BI3	0.811
	prefer chatbots over manual service.	BI4	0.65
Literacy culture	accustomed to seeking information independently	CL1	0.589
	have a habit of reading digital information	CL2	0.646
	interested in using technology to obtain information	CL3	0.643
	Use chatbots as a source of information.	CL4	0.772
Digital literacy	able to operate digital technology well	DL1	0.773
	understand how to use chatbots	DL2	0.737
	able to evaluate digital information	DL3	0.593

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Variables	indicator	Code	Outer Loading
	accustomed to using government digital services	DL4	0.511
	able to use chatbot independently	DL5	0.726
Information	The information provided by the chatbot is accurate.	IQ1	0.722
quality	The information provided is relevant to user needs.	IQ2	0.637
	The information presented is easy to understand.	IQ3	0.628
	The information provided by the chatbot is presented comprehensively.	IQ4	0.569
	Chatbot information is always updated.	IQ5	0.734
Perceived Ease of Use	Semeton LH chatbot is easy for users to learn.	PEOU1	0.700
	Interaction with the chatbot is easy to understand.	PEOU2	0.677
	Users do not experience any difficulties while using the chatbot.	PEOU3	0.705
	The chatbot is easily accessible through the DLH website.	PEOU4	0.632
	Using a chatbot doesn't require much effort.	PEOU5	0.648
Perceived Usefulness	Chatbots help to get environmental information quickly.	PU1	0.731
	Chatbots improve the effectiveness of Environmental Agency services.	PU2	0.67
	Chatbots make it easier for people to get official information.	PU3	0.695
	Chatbots improve the quality of information services.	PU4	0.564
	Chatbots are beneficial to the general public.	PU5	0.789
System Quality	This chatbot has a fast response time.	SQ1	0.755
	This chatbot rarely experiences glitches or errors.	SQ2	0.648
	The chatbot interface is attractive and easy to use.	SQ3	0.586
	The chatbot system is operating stably.	SQ4	0.707
	Chatbots can be accessed at any time.	SQ5	0.745
Quality of	This chatbot provides responsive service.	ServQ1	0.617
Service	This chatbot helps solve user problems.	ServQ2	0.737
	This chatbot provides reliable service.	ServQ3	0.775
	The chatbot provides consistent service.	ServQ 4	0.657
	The chatbot provides a good service experience.	ServQ5	0.592

Variables	indicator	Code	Outer Loading
User satisfaction	Users are satisfied with the performance of the Semeton LH chatbot.	US1	0.694
	The chatbot meets user expectations.	US2	0.727
	Users feel helped by the presence of chatbots.	US3	0.695
	Users are satisfied with the information services provided by the chatbot.	US4	0.667
	Overall, users were satisfied with the chatbot.	US5	0.525

3.3. Path Coefficients-Mean, STDEV, T values, p values

Hypothesis testing in this study was carried out using the bootstrapping method in SmartPLS software to assess the significance of the relationship between variables in the research model. The hypothesis acceptance criteria were determined based on T-statistics values > 1.96 and P-values < 0.05, indicating a significant influence between the tested constructs. Based on the results of the bootstrapping analysis, there were several relationships between variables that were proven to have a significant influence. The Attitude Toward Using (ATU) variable showed a positive and significant influence on Behavioral Intention to Use (BI) with a path coefficient value of 0.679, a T-statistic value of 8.621, and a P-value of 0.000. These results indicate that the more positive the user's attitude towards the Semeton LH chatbot, the higher their intention to continue using the chatbot.[15]. In addition, Attitude Toward Using (ATU) was also proven to have a positive and significant effect on User Satisfaction (US) with a coefficient value of 0.342, T-statistics of 2.671, and P-values of 0.008. These findings indicate that the level of user satisfaction is greatly influenced by their attitude in accepting and experiencing the benefits of using chatbots[1].

The Digital Literacy (DL) variable also shows a positive and significant influence on Perceived Ease of Use (PEOU), with a coefficient value of 0.679, T-statistics of 7.410, and P-values of 0.000. This indicates that the higher the user's digital literacy level, the greater their perception of the ease of use of the Semeton LH chatbot. Furthermore, Perceived Ease of Use (PEOU) is proven to have a positive and significant influence on Attitude Toward Using (ATU) with a coefficient value of 0.346, T-statistics of 3.425, and P-values of 0.001. These findings indicate that the ease of use of the system plays an

important role in shaping users' positive attitudes towards the technology used. The Perceived Usefulness (PU) variable also has a positive and significant influence on Attitude Toward Using (ATU) with a coefficient value of 0.479, T-statistics of 4.807, and P-values of 0.000. This shows that the greater the benefits users feel from the chatbot, the more positive their attitude towards using the system[44].

On the other hand, Service Quality (ServQ) was proven to have a positive and significant effect on Literacy Culture (CL) with a coefficient value of 0.462, T-statistics of 3.256, and P-values of 0.001. These results indicate that good chatbot service quality can encourage an increase in user literacy culture in utilizing government digital services. In addition, System Quality (SQ) also has a positive and significant effect on Digital Literacy (DL) with a coefficient value of 0.648, T-statistics of 8.776, and P-values of 0.000. This indicates that good system quality, such as access speed, stability, and ease of navigation, can support an increase in users' ability to use digital technology effectively[33]. However, some relationships between variables do not show a significant influence on User Satisfaction (US). The variables Actual System Use (ASU), Behavioral Intention to Use (BI), Culture Literacy (CL), Digital Literacy (DL), Information Quality (IQ), Perceived Ease of Use (PEOU), Perceived Usefulness (PU), Service Quality (ServQ), and System Quality (SQ) do not have a significant direct influence on user satisfaction, because all P-values in these relationships are greater than 0.05. In addition to testing the direct effect, this study also tested the moderating effect of Actual System Use (ASU) on the relationship between Behavioral Intention to Use (BI) and Attitude Toward Using (ATU) on User Satisfaction (US). The results of the analysis show that the interaction of Actual System Use × Behavioral Intention to Use has a P-value of 0.258, while the interaction of Actual System Use × Attitude Toward Using has a P-value of 0.506. Since both values exceed the significance limit of 0.05, it can be concluded that Actual System Use is unable to moderate the relationship between Behavioral Intention to Use and Attitude Toward Using on User Satisfaction. Overall, the results of the study indicate that the main factor contributing to the formation of Semeton LH chatbot user satisfaction is Attitude Toward Using (ATU), which is influenced by Perceived Ease of Use (PEOU) and Perceived Usefulness (PU). This finding strengthens the relevance of the integration of the Technology Acceptance Model (TAM) and DeLone & McLean models in explaining the factors that influence user satisfaction with chatbot services in the public service sector[9].

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Table 3. Path coefficients-Mean, STDEV, T values, p values

Variables	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values
Actual System Use -> User Satisfaction	0.112	0.120	0.114	0.977	0.328
Attitude Toward Using -> Behavioral Intention to Use	0.679	0.680	0.079	8,621	0.000
Attitude Toward Using -> User Satisfaction	0.342	0.326	0.128	2,671	0.008
Behavioral Intention to Use -> User Satisfaction	-0.063	-0.074	0.126	0.502	0.616
Literacy Culture -> User Satisfaction	0.159	0.153	0.094	1,699	0.089
Digital Literacy -> Perceived Ease of Use	0.679	0.681	0.092	7,410	0.000
Digital Literacy -> User Satisfaction	0.224	0.248	0.144	1,556	0.120
Information Quality -> Literacy Culture	0.201	0.215	0.127	1,584	0.113
Information Quality -> User Satisfaction	-0.099	-0.087	0.102	0.973	0.330
Perceived Ease of Use -> Attitude Toward Using	0.346	0.341	0.101	3,425	0.001
Perceived Ease of Use -> User Satisfaction	-0.109	-0.120	0.142	0.769	0.442
Perceived Usefulness -> Attitude Toward Using	0.479	0.484	0.100	4,807	0.000
Perceived Usefulness -> User Satisfaction	0.128	0.135	0.137	0.936	0.349
Service Quality -> Literacy Culture	0.462	0.462	0.142	3,256	0.001
Service Quality -> User Satisfaction	0.113	0.114	0.109	1,031	0.303
System Quality -> Digital Literacy	0.648	0.652	0.074	8,776	0.000
System Quality -> User Satisfaction	0.211	0.206	0.126	1,672	0.095
Actual System Use x Behavioral Intention to Use -> User Satisfaction	0.157	0.148	0.139	1,131	0.258
Actual System Use x Attitude Toward Using -> User Satisfaction	-0.088	-0.095	0.133	0.665	0.506

3.4. R-square-Overview

Based on the results of the R-square (R^2) value analysis, the User Satisfaction variable has a value of 0.695, which indicates that the model is able to explain 69.5% of the variation in user satisfaction, while the remaining 30.5% is explained by other factors outside the research model. This value indicates a strong predictive ability of the model. In addition, the Attitude Toward Using variable has an R^2 value of 0.577, Behavioral Intention to Use of 0.460, Perceived Ease of Use of 0.461, Digital Literacy of 0.420, and Culture Literacy of 0.382, which indicates the model's explanatory ability is in the moderate category.

Table 4. R-square-Overview

	R-square	adjusted
Attitude Toward Using	0.577	0.568
Behavioral Intention to Use	0.460	0.455
Literacy Culture	0.382	0.368
Digital Literacy	0.420	0.414
Perceived Ease of Use	0.461	0.455
User Satisfaction	0.695	0.652

3.5. Convergent Validity and Internal Consistency Reliability

Convergent validity was evaluated using outer loading values and Average Variance Extracted (AVE), while internal consistency reliability was assessed through Cronbach's Alpha, rho_A, and Composite Reliability (CR). Most constructs demonstrated acceptable reliability with Composite Reliability values above 0.70. However, several constructs did not fully meet the recommended AVE threshold of 0.50, including Literacy Culture, Digital Literacy, Information Quality, Perceived Ease of Use, Perceived Usefulness, Service Quality, System Quality, and User Satisfaction. These results indicate limitations in convergent validity, suggesting that some indicators may not adequately capture their intended constructs and that the structural findings should therefore be interpreted cautiously.

Table 5. Construct Reliability and Convergent Validity

Variables	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	Average variance extracted (AVE)
ASU	0.752	0.761	0.843	0.574
ATU	0.735	0.735	0.834	0.557
BI	0.711	0.731	0.821	0.535
CL	0.586	0.61	0.759	0.443
DL	0.698	0.726	0.804	0.456
IQ	0.678	0.685	0.794	0.437
PEOU	0.699	0.699	0.805	0.453
PU	0.729	0.746	0.821	0.482
ServQ	0.704	0.711	0.809	0.461
SQ	0.732	0.75	0.819	0.478
US	0.69	0.704	0.797	0.443

Note: CA = Cronbach's Alpha; rho_A = Dijkstra–Henseler's Rho; CR = Composite Reliability; AVE = Average Variance Extracted.

3.6. Fornell-Larcker Discriminant Validity

Discriminant validity was assessed using the Fornell–Larcker criterion by comparing the square root of each construct's AVE with the correlations between constructs. Although several diagonal values were higher than the corresponding inter-construct correlations, some values were relatively close, indicating potential overlap between constructs. Therefore, while the model shows partial evidence of discriminant validity, the results should be interpreted with caution and supported by additional HTMT analysis.

Table 6. Discriminative Validity – Criteria Fornell-Larcker

Variables	ASU	ATU	BI	CL	DL	IQ	PEOU	PU	ServQ	SQ	US
ASU	0.758										
ATU	0.645	0.747									
BI	0.679	0.679	0.732								
CL	0.563	0.571	0.614	0.666							
DL	0.711	0.637	0.661	0.634	0.675						
IQ	0.599	0.618	0.641	0.519	0.617	0.661					
PEOU	0.714	0.675	0.674	0.625	0.678	0.595	0.673				
PU	0.653	0.717	0.679	0.605	0.584	0.576	0.687	0.694			
ServQ	0.674	0.676	0.720	0.600	0.635	0.687	0.628	0.579	0.679	0.691	
SQ	0.636	0.651	0.697	0.559	0.647	0.653	0.639	0.667	0.647	0.666	
US	0.655	0.741	0.629	0.634	0.686	0.547	0.597	0.671	0.634	0.691	0.666

3.7. Discriminant Validity of HTMT

Discriminant validity in this study was evaluated using the Heterotrait-Monotrait Ratio (HTMT) method to assess whether each construct could be empirically distinguished. Based on Table 7, several HTMT values exceeded the recommended threshold (<0.85 or <0.90), indicating weaknesses in discriminant validity and potential overlap between some constructs, such as ASU and DL, PEOU and ASU, ATU and US, and ServQ and BI. These findings suggest that the measurement model still requires refinement, particularly through the review and improvement of overlapping indicators. Therefore, the structural relationships identified in this study should be interpreted with caution, and future research is recommended to strengthen construct validity before further confirming the model.

Table 7. Discriminant Validity – HTMT Criterion

VAR	ASU	ATU	BI	CL	DL	IQ	PEOU	PU	ServQ	SQ	US	ASU x BI	ASU x ATU
ASU													
ATU	0.855												
BI	0.924	0.924											
CL	0.833	0.865	0.917										
DL	0.961	0.892	0.923	0.982									
IQ	0.822	0.844	0.888	0.825	0.891								
PEOU	0.982	0.926	0.928	0.981	0.938	0.841							
PU	0.879	0.967	0.924	0.906	0.819	0.803	0.943						
ServQ	0.937	0.935	1.026	0.903	0.897	0.997	0.891	0.814					
SQ	0.811	0.829	0.936	0.787	0.854	0.918	0.851	0.850	0.892				
US	0.869	1.010	0.843	0.911	0.937	0.770	0.831	0.887	0.896	0.836			
ASU x BI	0.395	0.453	0.441	0.386	0.428	0.404	0.583	0.455	0.530	0.487	0.318		
ASU x ATU	0.365	0.507	0.429	0.406	0.415	0.390	0.606	0.504	0.494	0.443	0.349	0.951	

3.8. Discussion

The findings of this study indicate that Attitude Toward Using (ATU) is the primary factor influencing user satisfaction with the Semeton LH chatbot[45]. This suggests that users' positive attitudes toward the chatbot play an essential role in determining their satisfaction with the service. The significant effects of Perceived Ease of Use (PEOU) and Perceived Usefulness (PU) on Attitude Toward Using (ATU) support the core assumptions of the Technology Acceptance Model (TAM), which emphasizes that ease of use and perceived usefulness shape positive user attitudes toward technology adoption. Interestingly, several direct paths from system-related variables, including System Quality, Information Quality, and Service Quality, to User Satisfaction were not statistically significant. This may indicate that these quality dimensions influence satisfaction indirectly through users' attitudes rather than directly[46].

From the DeLone and McLean perspective, System Quality and Service Quality appear to contribute indirectly by supporting Digital Literacy and Literacy Culture, which may enhance users' ability to interact effectively with digital public services. Overall, these findings suggest that improving user satisfaction with the Semeton LH chatbot should focus on enhancing usability, perceived usefulness, and user engagement, while future research should refine the measurement instrument to improve construct validity[13].

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This research model was analyzed using the Partial Least Squares Structural Equation Modeling (PLS-SEM) approach by combining constructs from the Technology Acceptance Model (TAM) and the information system success model to explain satisfaction and use of the chatbot system[44]. The results of the analysis show that Perceived Ease of Use (PEOU) and Perceived Usefulness (PU) play a role in shaping user attitudes, which then influence the intention to use and ultimately impact actual use[12]. In addition, quality aspects such as system quality, information quality, and service quality also contribute to user satisfaction levels. Meanwhile, digital literacy and literacy culture also influence users' ability to optimally utilize the system[1]. The path coefficient value indicates the difference in the strength of influence between variables, while the R-square value of the endogenous construct indicates that the model has a fairly good ability to explain the variables studied. Overall, these findings suggest that the success of chatbot use may be associated with a combination of technological factors, system quality, and user characteristics.[13].

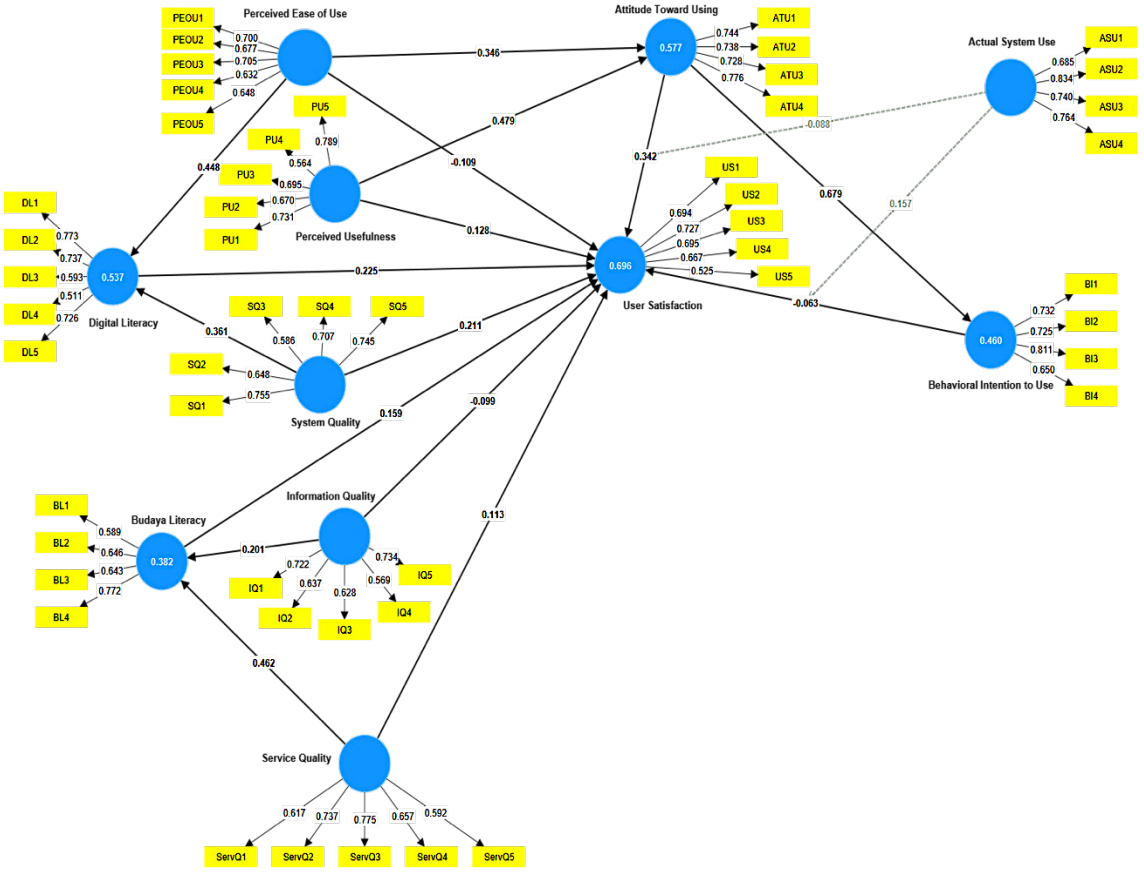

Figure 3. Research Model

4. CONCLUSION

This study examined user satisfaction with the Semeton LH chatbot through the integration of the Technology Acceptance Model (TAM) and the DeLone and McLean Information Systems Success Model using the PLS-SEM approach. The findings indicate that Attitude Toward Using (ATU) is the main significant predictor of User Satisfaction (US), while Perceived Ease of Use (PEOU) and Perceived Usefulness (PU) significantly contribute to the formation of positive user attitudes. However, the structural findings should be interpreted cautiously because the measurement model showed several limitations, including low AVE values and HTMT values exceeding recommended thresholds, indicating weaknesses in convergent and discriminant validity. In addition, the study involved only 96 respondents from Central Lombok Regency, which limits the generalizability of the findings. Future research is recommended to refine the measurement instrument, improve construct validity, and involve a larger and more diverse sample to strengthen the robustness of the model.

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