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IMPLEMENTATION OF CHATBOT IN THE GOVERNMENT SECTOR: ITS IMPACT ON TAXPAYER SATISFACTION WITH DGT SERVICES

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Abstract
This study aims to evaluate the influence of ease of use, information quality, trust, responsiveness, and data security on taxpayer satisfaction in utilizing the chatbot of the Directorate General of Taxes (DGT). The study population consists of taxpayers who use the DGT chatbot, with a sample selected through a quota sampling method until reaching a quota of 100 respondents. Data collected from these 100 respondents were analyzed using the SEM-PLS model. The analysis results indicate that information quality and data security significantly enhance taxpayer satisfaction. Conversely, trust in the chatbot has a negative but insignificant impact, while ease of use and chatbot responsiveness show positive but insignificant effects on satisfaction. The implications of this research highlight the importance of improving information quality and data security to optimize chatbot services, as well as the need for greater attention to ease of use, trust, and responsiveness to enhance user experience. This study contributes to understanding the factors influencing taxpayer satisfaction and provides practical recommendations for improving chatbot services in the public sector.
Keywords: Chatbot implementation, Data security, Organization performance, Public sector, Taxpayer's satisfaction

INTRODUCTION

In recent years, the development of Artificial Intelligence (AI) has advanced rapidly and has been implemented across various sectors, including government institutions. One popular application of AI is chatbot, which are computer programs capable of simulating human conversations and providing interactive services automatically. In Indonesia, chatbot have been adopted by several government agencies. According to DDTC (2023), the Directorate General of Taxes (DGT) had introduced chatbot named Fiska and Fisko. This chatbot aim to provide convenience for taxpayers.

Based on the Annual Report of Directorate General of Taxes (2024a), since their introduction in February and official launch on September 25, 2023, the DGT chatbot have facilitated 893,554 interactions as of December 2023. With 1,155 answer repositories available, as reported by DDTC (2023), the chatbot operate 24/7, offering accurate responses automatically.

The DGTs' objective of providing convenience for taxpayers through chatbot services highlights the importance of achieving user satisfaction. To measure this, it is necessary to identify the factors influencing user satisfaction.

One critical factor is perceived ease of use, which plays a key role in chatbot implementation. A study by Mostafa & Kasamani (2022) confirmed that ease of use enhances users' initial trust in the technology, ultimately increasing their intention to use and engage with it. Strengthen by Pillai & Sivathanu (2020), ease of use was a significant factor of customer satisfaction. This aligns with the Technology Acceptance Model (TAM) proposed by Davis (1989), which suggested that if a technology is easy to use, users are more likely to adopt and feel satisfied with it. However, Alshibly et al. (2024) found that ease of use didn't have significant impact on customer satisfaction. This contradiction needs to be investigated futher more.

The next factor of user satisfaction is information quality. Research by Magno & Dossena (2023) found that the quality of information provided by chatbot positively impacts customer satisfaction. That result is strengthened by D. M. Nguyen et al. (2021) which found

that information quality had significant effect of satisfactory. Align with other previous researches, Q. Chen et al. (2023) implied that the quality of chatbot service impact customer satisfaction. Akdemir & Bulut (2024) also found that communication quality impact the satisfaction with chatbot usage. When chatbot deliver accurate, timely, and relevant information, they enhance user experience and strengthen the relationship between customers and the organization. Furthermore, the study indicated that chatbot system quality indirectly affects customers' perception of information quality, which in turn influences their satisfaction. As all of the previous researches tested all private sector sample, investigation needed if it gives the same result in public sector.

Trust in chatbot is another critical factor. Mostafa & Kasamani (2022) found that a user's initial trust in a chatbot significantly affected their intention to keep using the service. According to Eren (2021), perceived trust in chatbot significantly impacted customer satisfaction. When customers believe that a chatbot can deliver accurate and secure services, they are more satisfied with their interactions. Additionally, V. T. Nguyen et al. (2023) revealed that factors such as anonymity and personalized interactions can boost customer trust in chatbot technology, particularly in the hospitality industry. More over, according to Naqvi et al. (2024), credibility had a significant impact on customer satisfaction. Not stopping on that, Q. Chen et al. (2023) also revealed the same result as cognitive and affective trust positively affected the customer loyalty. These theories needed to be investigated in public sector to see if it has same effect.

Chatbot responsiveness has also been proven to affect customer satisfaction. A study by J.-S. Chen et al. (2021) demonstrated that chatbot responsiveness, measured by the speed and accuracy of responses, positively influenced the intrinsic and extrinsic value of customer experiences in e-retailing. Inline with Xie et al. (2023), responsiveness significantly affected customer satisfaction. Responsiveness is thus essential for creating satisfying and valuable customer experiences. However, it is contradicted with what Alshibly et al. (2024) found that responsiveness didn’t affect customer satisfaction. Thus, the contradiction needs further investigation to prove the theories.

The rise in fraudulent activities impersonating the DGT has become a prominent issue in recent discussions. The Directorate General of Taxes (2024b) published information on various fraud schemes and preventive measures. Alongside the growing use of technology, including chatbot in the public sector, data security has become an increasingly important concern. In the context of privacy security, research by Bouhia et al. (2022) identified perceived privacy risks as a factor influencing customer interactions with chatbot. Furthermore, for internal purpose, Baig & Yadegaridehkordi (2025) also found that security and privacy was positively related to the staff satisfaction. Align with the others, Almohesh (2024)’s finding implied that the participant was concerned about the privacy. When customers feel confident that their privacy is protected, they are more likely to be satisfied with the services provided. With higher data security demand for taxpayer’s profile, further investigation needed to see if it affects the satisfaction.

Research on the factors affecting chatbot user satisfaction in the public sector, particularly in the DGT, is still limited. The influence of data security on taxpayer trust, in particular, has yet to be investigated. Previous studies have shown that factors such as perceived ease of use, information quality, trust in chatbot, and chatbot responsiveness significantly impact customer satisfaction across various sectors. By incorporating data security—a more in-depth aspect of privacy—based on the findings of previous researches as novelty, this research aims to analyze how these factors influence taxpayer satisfaction with DGT chatbot. The study is expected to contribute significantly to understanding the factors that enhance the

effectiveness of chatbot in tax services and improve satisfaction within the public sector, particularly in the context of taxation services.

LITERATURE REVIEW

The Technology Acceptance Model (TAM)

The Technology Acceptance Model (TAM) was first introduced by Davis (1989). This theory is used to explain the factors influencing an individual's decision to adopt or use a new technology. TAM proposes that two primary variables affect technology acceptance: perceived ease of use (the degree to which a person believes that using the technology will be effortless) and perceived usefulness (the extent to which a person perceives that the technology will enhance their performance or productivity).

Internal Accounting Control System

The Internal Accounting Control System is a set of procedures designed to safeguard assets, ensure the accuracy of accounting records, and support compliance with regulations. According to COSO (Committee of Sponsoring Organizations), internal control comprises five key elements: control environment, risk assessment, control activities, information and communication, and monitoring (Bina Nusantara University, 2015). This system is essential for preventing errors and fraud in financial reporting while ensuring the integrity of accounting processes. In the context of the chatbot at the Directorate General of Taxes, this system is relevant for ensuring the security of tax data and taxpayers' compliance with regulations.

Service Quality

Service quality is a crucial aspect that influences customer satisfaction and consumer loyalty. According to Tjiptono (2007), service quality is the effort to fulfill consumer needs and desires while ensuring accurate delivery to meet customer expectations. Zeithaml et al. (2009) further elaborate that service quality comprises five key dimensions: tangibles (physical evidence), reliability, responsiveness, assurance, and empathy. High-quality service fosters sustained customer satisfaction and enhances loyalty. In the service industry, customers are more likely to make repeat purchases if they are satisfied with the service provided. Therefore, improving service quality is a significant strategy for maintaining and expanding the customer base. In the context of this study, aspects such as ease of use, information quality, trust in services, and responsiveness are critical elements that shape customers' overall perception of service quality.

Customer Satisfaction

Customer satisfaction is the result of consumers' evaluation of the products or services they consume. According to Kotler & Keller (2006), customer satisfaction is the feeling that arises after comparing expectations with the actual performance of a product. If the performance of a product or service exceeds expectations, customers will feel satisfied or even highly satisfied. Schiffman & Kanuk (2007) explained that customer satisfaction is influenced by perceptions of the quality of services and products received. This highlights the importance for companies to maintain service and product quality to achieve optimal customer satisfaction.

In perspective of DGT, taxpayer satisfaction is measured through the Kring Pajak Service Support Satisfaction Index, as referenced in the 2023 annual report of the Directorate General of Taxes (2024a). This index reflects the level of taxpayer satisfaction with the services provided. Taxpayer satisfaction is one of the key factors determining the overall performance of Kring Pajak.

Perceived Ease of Use

The TAM posits that perceived ease of use is a key determinant influencing the adoption of a technology. The research conducted by Pillai & Sivathanu (2020) revealed that the ease of use of chatbot influenced the intention to adopt and use them across various sectors, including

tourism and hospitality. Similarly, Mostafa & Kasamani (2022) stated that the ease of use of chatbot enhanced users' intention to engage and increases customer involvement. This is in line with the TAM introduced by Davis (1989), which posits that users were more inclined to adopt and feel satisfied with a technology if it is easy to use. However, a recent study by Alshibly et al. (2024) found that ease of use did not significantly influence customer satisfaction. Based on this, it can be assumed that the ease of use of chatbot has a positive impact on taxpayer satisfaction.

H1: The ease of use of chatbot has a positive impact on taxpayer satisfaction.

Information Quality

The theory of customer satisfaction states that satisfaction is influenced by consumers' perceptions of the quality of services received (Kotler & Keller, 2006). Satisfaction occurs when the quality of service meets or exceeds customer expectations. Zeithaml et al. (2009) emphasize that one of the critical dimensions of service is the quality of information provided to customers.

Research by Magno & Dossena (2023) found that the quality of information provided by chatbot significantly influenced customer satisfaction in the retail context. That finding is further supported by the study of D. M. Nguyen et al. (2021), which demonstrated that information quality had a significant impact on satisfaction. Consistent with prior research, Q. Chen et al. (2023) suggested that the quality of chatbot services influenced customer satisfaction. Similarly, Akdemir & Bulut (2024) discovered that the effectiveness of communication played a significant role in shaping user satisfaction with chatbot interactio

In the context of tax services, the quality of information is crucial because taxpayers rely on such information to accurately understand tax regulations. Based on this, it can be assumed that the quality of information in chatbot services positively impacts taxpayer satisfaction.

H2: The quality of information in chatbot services positively influences taxpayer satisfaction.

Trust in Chatbot

Trust is a crucial element in technology-based service interactions, including chatbot. According to Zeithaml et al. (2009), service quality is determined by several dimensions, one of which is assurance. Assurance encompasses customers' trust in a service provider regarding security, accuracy, and reliability. In the context of chatbot, users are more likely to trust the service when the chatbot demonstrates reliability in delivering accurate and secure tax-related information. This trust enhances users' positive perceptions of the quality of services provided by the chatbot.

Research by Mostafa & Kasamani (2022) revealed that initial trust in a chatbot influenced users' intentions to continue using the service. Additionally, Eren (2021) highlighted that perceived trust in chatbot significantly impacted customer satisfaction in banking services. V. T. Nguyen et al. (2023) stated that anonymity and personalization can boost customer trust in using chatbot. Moreover, Naqvi et al. (2024) found that credibility significantly affected the customer satisfaction. Building on this, Q. Chen et al. (2023) also found similar results, indicating that both cognitive and affective trust had a positive impact on customer loyalty.

In the context of taxation, trust is crucial, as users must feel confident that the service provided is accurate. Based on this, it can be assumed that trust in chatbot positively affects taxpayer satisfaction.

H3: Trust in chatbot positively influences taxpayer satisfaction.

Chatbot Responsiveness

Responsiveness is one of the five key dimensions of service quality, as defined by Zeithaml et al. (2009). It refers to the promptness and efficiency with which services are

delivered to customers. In the context of chatbot, responsiveness pertains to their ability to address taxpayers' inquiries or requests swiftly and in a timely manner. According to Tjiptono (2007), a responsive service reduces waiting times, resolves issues more efficiently, and ultimately enhances customer satisfaction.

Research by J.-S. Chen et al. (2021) indicated that chatbot responsiveness in the context of e-retailing significantly influenced customer experiences and improves customer satisfaction. According to Xie et al. (2023), responsiveness had a significant impact on customer satisfaction, making it a crucial factor in shaping positive and valuable customer experiences. However, this finding contradicts the study by Alshibly et al. (2024), which concluded that responsiveness did not influence customer satisfaction. In the context of tax services, chatbot responsiveness is crucial to ensuring that taxpayers can resolve their issues promptly and efficiently. Based on this premise, it can be assumed that chatbot responsiveness has a positive impact on taxpayer satisfaction.

H4: Chatbot responsiveness positively influences taxpayer satisfaction.

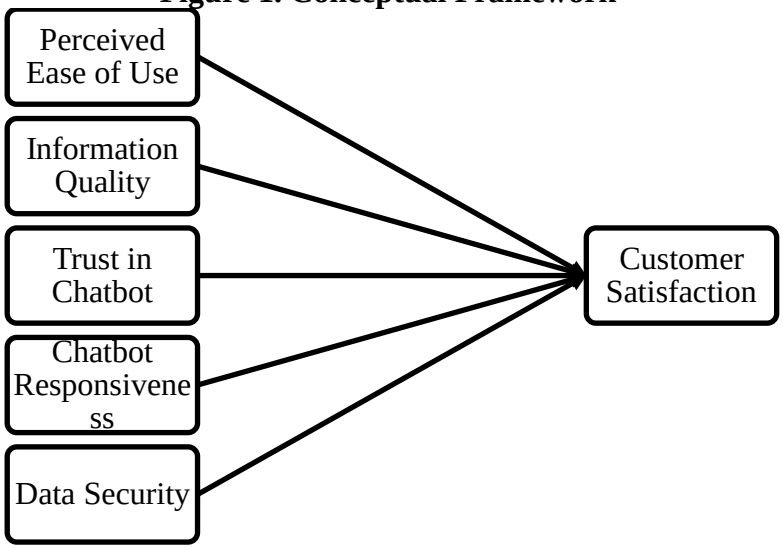
Data Security

The relationship between data security and the theory of internal accounting control systems can be observed through how the implementation of robust internal controls influences the effectiveness of data protection. Secure data safeguards the achievement of internal control objectives, particularly in terms of the reliability of financial information and regulatory compliance. Conversely, weak internal controls can increase the risk of data breaches, ultimately undermining public trust and leading to legal issues.

Although there has not been specific research addressing data security in the context of tax service chatbot, a study by Bouhia et al. (2022) revealed that concerns over privacy security significantly affected user interactions with chatbot. For internal purposes, Baig & Yadegaridehkordi (2025) also discovered that security and privacy had a positive correlation with staff satisfaction. Similarly, Almohesh (2024) found that participants expressed concerns regarding privacy. Adequate data security can enhance user trust and satisfaction in interacting with government chatbot services. In the context of tax services, data security issues are even more critical, as chatbot technology may handle sensitive information related to taxes and taxpayers' personal data. Based on this, it can be assumed that data security positively impacts taxpayer satisfaction.

H5: Data security positively affects taxpayer satisfaction.

Figure 1. Conceptual Framework



Source: Author's Work

METHODS

This study employs a causal quantitative research design. Its primary objective is to examine the influence of Perceived Ease of Use, Information Quality, Trust in Chatbot, Chatbot Responsiveness, and Data Security on taxpayer satisfaction. This approach aims to identify causal relationships between the investigated variables.

The study's population comprises all taxpayers who use the DGT chatbot services in Indonesia. The sample will be selected using the quota sampling technique, which involves selecting respondents based on specific criteria until the desired quota is reached (Sugiyono, 2016). The respondents include taxpayers who have used the DGT chatbot services and completed the questionnaire, with a target of 100 respondents.

Data will be collected through an online questionnaire distributed to chatbot users. The questionnaire consists of closed-ended questions measured using a 4-point Likert scale, where 1 indicates "strongly disagree," 2 indicates "disagree," 3 indicates "agree," and 4 indicates "strongly agree." The questionnaire is designed to measure both the independent and dependent variables.

The questionnaire will include two main sections: a demographic section and a variable measurement section. The demographic section will cover respondent profiles such as age, user type (registered or unregistered taxpayer), and taxpayer category (individual or corporate). The variable measurement section consists of items developed based on existing literature for each variable, with each item assessed using the 4-point Likert scale.

The list of questions in the questionnaire is based on prior studies that capture the variables being measured. For the Perceived Ease of Use variable, the questions are adopted from the study by Mostafa & Kasamani (2022). For the Information Quality variable, the questions are derived from the research conducted by Magno & Dossena (2023). Trust in Chatbot items are adapted from V. T. Nguyen et al. (2023). Chatbot Responsiveness items are based on the study by J.-S. Chen et al. (2021). Data Security items are drawn from the research by Bouhia et al. (2022) with modifications to suit the context of DGT chatbot services, which do not request any personal information. Lastly, the Taxpayer Satisfaction variable items are adopted from the study by Jiménez-Barreto et al. (2021). These questions are summarized in Table 1.

Table 1. Questionnaire Question List

No	Variable	Question
1	Perceived Ease of Use	- My interaction with the DGT chatbot is clear and easy to understand. - I find the DGT chatbot easy to use. - Learning to operate the DGT chatbot is simple for me.
2	Information Quality	- The DGT chatbot provides me with the necessary information. - The DGT chatbot responds to my questions as I expect. - The DGT chatbot offers sufficient information.
3	Trust in Chatbot	- I feel secure when interacting with the DGT chatbot. - I trust that the DGT chatbot delivers the best service. - I believe the DGT chatbot provides services tailored to my needs and requests.
4	Chatbot Responsiveness	- The DGT chatbot responds quickly. - The DGT chatbot is always available when I need it. - Connecting with the DGT chatbot is easy.
5	Data Security	- I feel confident that my personal data is safe while using the DGT chatbot.

		- I am assured that the DGT chatbot does not collect personal information about me. - I trust the confidentiality of the information from my interactions with the DGT chatbot.
6	Taxpayer Satisfaction	- Overall, I am satisfied with my experience using the DGT chatbot. - The DGT chatbot's service exceeds my expectations. - The DGT chatbot aligns closely with my vision of an ideal customer service technology.

Source: Processed Data

This study employs regression analysis to examine the relationship between independent and dependent variables. The data analysis steps include: (1) Descriptive Analysis: Describing the characteristics of the sample and the distribution of respondents' answers; (2) Validity and Reliability Tests: These tests are conducted to ensure that the measurement instruments are valid and reliable; (3) Normality Test: This test ensures that the data distribution is normal and suitable for hypothesis testing; and (4) Hypothesis Testing: Hypotheses will be tested using a t-test to determine the influence of independent variables (ease of use, information quality, trust, responsiveness, and data security) on the dependent variable (taxpayer satisfaction). These statistical tests will be performed using the SEM-PLS model with the SmartPLS 4.0 application.

RESULTS AND DISCUSSIONS

Descriptive Analysis

The mean scores for perceived ease of use range from 3.19 to 3.31, indicating that respondents generally find the DGT chatbot user-friendly and straightforward. The lowest score is associated with learning to operate the chatbot, suggesting this aspect might require slight improvement. The standard deviation values are close to 1, reflecting consistent responses among participants.

Information quality has a mean score between 3.03 and 3.1. Respondents find the chatbot provides sufficient information and meets their expectations. However, the slightly lower mean for the response to specific questions suggests room for enhancement in delivering precise answers. The consistency of responses is evident with standard deviation values near 1.

Scores for trust in chatbot range from 3.05 to 3.14, implying that respondents generally trust the chatbot to provide tailored services and deliver quality. The lowest score reflects a need to improve personalized services. Standard deviation values suggest moderate agreement among participants.

With mean scores ranging from 3.13 to 3.3, respondents perceive the chatbot as responsive and easy to access when needed. The highest score is for quick responses, while the lowest relates to ease of connection. Standard deviation values, again close to 1, indicate consistent responses.

Data security mean scores range from 3.03 to 3.06, suggesting that respondents feel reasonably secure about their data when using the chatbot. The highest score reflects confidence in personal data safety, whereas the confidentiality of information scored slightly lower. Consistent responses are observed with standard deviation values close to 1.

Mean scores range from 2.92 to 3.09, indicating general satisfaction with the chatbot. However, the lowest score, reflecting unmet service expectations, highlights an area for improvement. The alignment of the chatbot with ideal customer service technology scored higher but still leaves room for enhancement. Standard deviation values indicate moderate consistency.

Table 2. Results of Descriptive Analysis of Research Variables

Variable	Item	N	Mean	Standard deviation	Scale min	Scale max
Perceived Ease of Use	My interaction with the DGT chatbot is clear and easy to understand	100	3.31	1.017	1	4
	I find the DGT chatbot easy to use		3.21	1.013	1	4
	Learning to operate the DGT chatbot is simple for me		3.19	0.977	1	4
Information Quality	The DGT chatbot provides me with the necessary information	100	3.1	1.109	1	4
	The DGT chatbot responds to my questions as I expect		3.03	1.135	1	4
	The DGT chatbot offers sufficient information		3.03	1.127	1	4
Trust in Chatbot	I feel secure when interacting with the DGT chatbot	100	3.11	0.999	1	4
	I trust that the DGT chatbot delivers the best service		3.14	1.068	1	4
	I believe the DGT chatbot provides services tailored to my needs and requests		3.05	1.108	1	4
Chatbot Responsiveness	The DGT chatbot responds quickly	100	3.3	1.015	1	4
	The DGT chatbot is always available when I need it		3.13	0.997	1	4
	Connecting with the DGT chatbot is easy		3.18	1.033	1	4
Data Security	I feel confident that my personal data is safe while using the DGT chatbot	100	3.06	0.988	1	4
	I am assured that the DGT chatbot does not collect personal information about me		3.03	1.044	1	4
	I trust the confidentiality of the information from my interactions with the DGT chatbot		3.03	0.995	1	4
Taxpayer Satisfaction	Overall, I am satisfied with my experience using the DGT chatbot	100	3.09	1.078	1	4
	The DGT chatbot's service exceeds my expectations		2.92	1.083	1	4

	The DGT chatbot aligns closely with my vision of an ideal customer service technology	3.03	1.044	1	4

Source: SmartPLS Processed Data

Validity and Reliability Test Results

Ghozali (2021) stated that a questionnaire is declared valid if the questionnaire items are able to measure what is expressed. According to him, a good Average Variance Extracted (AVE) value for validity testing is more than 0.50.

Table 3. Average Variance Extracted Validity Test Results

Variable	Average variance extracted (AVE)	Result
Perceived Ease of Use	0.878	Valid
Information Quality	0.941	Valid
Trust in Chatbot	0.901	Valid
Chatbot Responsiveness	0.901	Valid
Data Security	0.949	Valid
Taxpayer Satisfaction	0.929	Valid

Source: SmartPLS Processed Data

After the data is declared valid, reliability testing needs to be carried out. Ghozali (2021) stated that a questionnaire is considered reliable if there is consistency in the answers to the statements. The questionnaire data can be said to be reliable when the Cronbach Alpha value is > 0.7.

Table 4. Average Variance Extracted Validity Test Results

Variable	Cronbach's alpha	Result
Perceived Ease of Use	0.930	Reliable
Information Quality	0.969	Reliable
Trust in Chatbot	0.945	Reliable
Chatbot Responsiveness	0.945	Reliable
Data Security	0.973	Reliable
Taxpayer Satisfaction	0.962	Reliable

Source: SmartPLS Processed Data

Based on the results of the Cronbach Alpha test, all variables are declared reliable. Valid and reliable data can be used for further testing.

Data Normality Test Results

The data that has been deemed valid and reliable still needs to undergo a normality test to determine whether hypothesis testing will use parametric or non-parametric methods. Ghozali (2021) states that a normality test is necessary to ensure that the data can be used in regression models. The normality test employed in this study is the skewness and kurtosis test. Data distribution is considered normal if the skewness and kurtosis values at a significance level of 0.05 fall within the range of -1.96 to 1.96.

Table 5. Results of Skewness and Kurtosis Normality Tests

Variable	Item	Excess kurtosis	Skewness	Result
Perceived Ease of Use	My interaction with the DGT chatbot is clear and easy to understand	0.167	-1.237	Normal
	I find the DGT chatbot easy to use	-0.050	-1.080	Normal
	Learning to operate the DGT chatbot is simple for me	0.042	-1.047	Normal
Information Quality	The DGT chatbot provides me with the necessary information	-0.705	-0.871	Normal
	The DGT chatbot responds to my questions as I expect	-0.986	-0.726	Normal
	The DGT chatbot offers sufficient information	-0.849	-0.784	Normal
Trust in Chatbot	I feel secure when interacting with the DGT chatbot	-0.145	-0.958	Normal
	I trust that the DGT chatbot delivers the best service	-0.370	-0.985	Normal
	I believe the DGT chatbot provides services tailored to my needs and requests	-0.754	-0.817	Normal
Chatbot Responsiveness	The DGT chatbot responds quickly	0.330	-1.276	Normal
	The DGT chatbot is always available when I need it	-0.206	-0.943	Normal
	Connecting with the DGT chatbot is easy	-0.196	-1.033	Normal
Data Security	I feel confident that my personal data is safe while using the DGT chatbot	-0.225	-0.880	Normal
	I am assured that the DGT chatbot does not collect personal information about me	-0.432	-0.865	Normal
	I trust the confidentiality of the information from my interactions with the DGT chatbot	-0.249	-0.866	Normal
Taxpayer Satisfaction	Overall, I am satisfied with my experience using the DGT chatbot	-0.618	-0.863	Normal
	The DGT chatbot's service exceeds my expectations	-0.945	-0.605	Normal
	The DGT chatbot aligns closely with my vision of an ideal customer service technology	-0.545	-0.811	Normal

Source: SmartPLS Processed Data

Based on the results of skewness and kurtosis testing, the data has a normal distribution. This means that using the data, it can be continued with parametric testing with regression analysis.

Hypothesis Testing Results

The hypothesis regarding the impact of **Perceived Ease of Use** on user acceptance and engagement was rejected in this study, as indicated by the insignificant positive effect

(coefficient = 0.092, p = 0.212, sig. = 0.212). This finding contradicts classical TAM theory introduced by Davis (1989), which posits that perceived ease of use significantly influences user intention to adopt a system. According to Davis, an easier-to-use system enhances user satisfaction and increases technology adoption rates.

Comparing this result with previous studies, Pillai & Sivathanu (2020) found that perceived ease of use had a significant positive effect on the adoption of digital learning platforms. Similarly, Mostafa & Kasamani (2022) provided empirical evidence that perceived ease of use is a crucial determinant in chatbot acceptance, highlighting that users prefer interactions with minimal cognitive effort.

However, the findings of this study align more closely with those of Alshibly et al. (2024), who reported that perceived ease of use did not significantly impact user engagement in chatbot applications. It suggested that ease of use alone may not be sufficient to drive user engagement in modern AI-driven systems.

A possible explanation for the divergence in results lies in the contextual factors of technology adoption. While Davis (1989) and subsequent studies found perceived ease of use to be a strong predictor in structured and productivity-oriented environments, its influence might diminish in more complex or dynamic applications such as chatbot. User expectations have evolved, and usability may now be considered a baseline requirement rather than a differentiating factor in adoption decisions.

Therefore, the rejection of the perceived ease of use hypothesis in this study suggests that while ease of use remains relevant, other variables could have a stronger impact on public sector chatbot service. Future research should explore these interactions further, considering evolving technological landscapes and user expectations.

On the other hand, as presented in Table 6, **Information Quality** has a significant positive effect (coefficient = 0.497, t = 4.183, sig. = 0.000), leading to the acceptance of the hypothesis. This finding aligns with several prior studies, confirming that high-quality information contributes positively to user trust and engagement with digital platforms. However, while some studies support this conclusion, others offer contrasting perspectives that highlight potential limitations.

Magno & Dossena (2023) emphasize that information quality is a fundamental driver of user satisfaction in digital environments. This aligns with the current study's findings, reinforcing the idea that high-quality information positively influences user perception and system utility.

Similarly, D. M. Nguyen et al. (2021) found that information quality significantly impacts users' perceived usefulness of online platforms. This supports the current study’s conclusion that information quality plays a vital role in shaping user experiences and system credibility.

Q. Chen et al. (2023), however, offer a nuanced perspective by arguing that while information quality is essential, its effect can be moderated by contextual factors such as user expertise and system design. This suggests that while information quality is generally beneficial, its influence may vary depending on user characteristics, potentially introducing variability in its effectiveness.

Contrary to the positive consensus, Akdemir & Bulut (2024) present a critical viewpoint, arguing that information quality alone is insufficient to drive user engagement. They suggest that while high-quality information is necessary, it must be complemented by an intuitive and responsive system design to maximize user satisfaction and adoption rates.

Overall, the findings of this study support the established theory that information quality positively influences user perception and system effectiveness. The statistical evidence from Table 6 corroborates this assertion, showing a strong and significant positive relationship.

Information quality also significantly affect the public sector, similar to the private sector. However, as highlighted by previous research, its impact may be contingent on additional factors, such as user experience levels and system design elements. These insights provide a broader perspective on the role of information quality and suggest avenues for further investigation into its interaction with other usability factors.

Next, the hypothesis regarding **Trust in Chatbot** predicted a positive effect, but the statistical analysis results indicate otherwise. The coefficient value is -0.058, with a standard deviation of 0.153 and a t-value of 0.473. The significance level is 0.318, indicating that the effect is statistically insignificant. Consequently, the result suggests an insignificant negative effect, leading to the rejection of the hypothesis.

This finding contradicts several previous studies that highlight the critical role of trust in chatbot adoption and user satisfaction. For instance, Mostafa & Kasamani (2022) emphasized that trust is a key determinant in users' willingness to engage with chatbot-based services, particularly in customer service contexts. Their study found a strong positive correlation between chatbot trust and user engagement, which aligns with the hypothesis in the current study but diverges from its findings. Similarly, Eren (2021) demonstrated that trust in chatbot interactions significantly enhances customer satisfaction and behavioral intention to use chatbot.

Conversely, the current study's result contrary with findings from V. T. Nguyen et al. (2023), who identified that trust in chatbot was a significant factor to user engagement, particularly when users perceive AI limitations in human-like interactions. Additionally, Naqvi et al. (2024) stated that chatbot trustworthiness was a factor to drive user acceptance. This suggests that trust has strong influence on user behavior.

Furthermore, Q. Chen et al. (2023) pointed out that users showed increase of satisfactory when they had trust in chatbot interaction. This study offers different result from previous researches. For public sector chatbot user, trust isn't significantly influence their satisfaction to the chatbot system.

Hence, while many studies support the notion that trust in chatbot fosters user adoption and satisfaction, the current findings suggest that trust alone does not have a statistically significant impact in this case. The inconsistency with previous literature highlights the complexity of public sector chatbot-user interactions, where additional factors may moderate the influence of trust. Future research should explore these moderating variables to provide a more comprehensive understanding of the role of trust in chatbot acceptance.

The hypothesis regarding **Chatbot Responsiveness** predicted a positive effect on user engagement and acceptance. However, the statistical results indicate that this effect is not significant. The coefficient value is 0.074, with a standard deviation of 0.100 and a t-value of 0.748. The significance level is 0.227, leading to the conclusion that chatbot responsiveness does not have a statistically significant effect. As a result, the hypothesis is rejected, implying that responsiveness alone may not be a decisive factor in determining user perception.

These findings diverge from several previous studies that emphasize the importance of chatbot responsiveness in shaping user satisfaction and engagement. J.-S. Chen et al. (2021) found that chatbot responsiveness significantly enhances user trust and experience, particularly in customer service interactions. Their study demonstrated that faster and more adaptive chatbot responses increase user retention and satisfaction, which contrasts with the present study's result indicating an insignificant effect.

Similarly, Xie et al. (2023) reported a strong positive relationship between chatbot responsiveness and user intention to continue using chatbot. However, the current study's rejection of this hypothesis suggests that chatbot responsiveness, while important, may not independently drive user acceptance in all contexts.

Conversely, the findings align with Alshibly et al. (2024), who argued that chatbot responsiveness alone does not guarantee a positive user experience. This perspective provides a possible explanation for the present study's findings, as it suggests that responsiveness alone may not be sufficient to significantly influence user attitudes.

Therefore, while previous research generally supports the idea that chatbot responsiveness enhances user experience, the current findings indicate that it may not always have a statistically significant effect, especially in public sector. This suggests that chatbot responsiveness should be considered in conjunction with other critical factors, such as response quality and contextual relevance, to fully understand its impact on user acceptance. Future research should explore these moderating influences to provide a more nuanced perspective on chatbot effectiveness in various contexts.

Last but not least, the hypothesis regarding **Data Security** predicted a positive effect on user trust and acceptance. The statistical results confirm this prediction, as the coefficient value is 0.416, with a standard deviation of 0.088, a t-value of 4.688, and a significance level of 0.000. These results indicate a significant positive effect, leading to the acceptance of the hypothesis. This finding suggests that data security plays a crucial role in influencing user trust and engagement with chatbot systems.

This finding is strongly supported by previous research. Bouhia et al. (2022) found that perceived data security is one of the most influential factors in determining user trust in AI-driven services. Similarly, Baig & Yadegaridehkordi (2025) argued that data security concerns significantly impact users' willingness to adopt chatbot. This aligns with the present study's result, which indicates that enhanced security measures contribute to increased public sector user trust and acceptance.

Additionally, Almohesh (2024) provided further evidence that users are highly sensitive to data privacy risks, particularly in chatbot interactions where personal or financial information may be exchanged. This supports the notion that perceived security is a key driver of chatbot adoption either in private or public sector.

However, some studies suggest that while data security is important, it may not be the sole determinant of user trust. For example, Baig & Yadegaridehkordi (2025) also noted that usability and performance sometimes outweigh security concerns in influencing user engagement. In cases where a chatbot is exceptionally efficient and helpful, some users may still use it despite minor security concerns. This suggests that while data security is a significant factor, other variables, such as usability and response accuracy, should also be considered when designing chatbot systems.

Overall, the present study's findings confirm the theory that data security also has a significant positive effect on user trust and acceptance in public sector, aligning with previous research. The strong statistical significance underscores the need for chatbot developers to implement robust security measures to foster trust and encourage widespread adoption. Future research should explore how different security protocols and user education strategies can further enhance trust and engagement with chatbot technologies.

Table 6. T-test Results

Variable	Direction Prediction	Coeffi cient	Std. Dev	t	Sig.	Result	Conlcusi on
Perceived Ease of Use	Positive	0.092	0.105	0.799	0.212	Insignifica nt positive effect	Rejected
Information Quality	Positive	0.497	0.125	4.183	0.000	Significant positive effect	Accepted

Trust in Chatbot	Positive	-0.058	0.153	0.473	0.318	Insignificant negative effect	Rejected
Chatbot Responsiveness	Positive	0.074	0.100	0.748	0.227	Insignificant positive effect	Rejected
Data Security	Positive	0.416	0.088	4.688	0.000	Significant positive effect	Accepted

Source: SmartPLS Processed Data

CONCLUSION

Conclusion

This research investigated factors influencing taxpayer satisfaction with the DGT chatbot, focusing on perceived ease of use, information quality, trust in chatbot, chatbot responsiveness, and data security. Utilizing data from 100 respondents and employing the SEM-PLS model for analysis, the study revealed that information quality and data security significantly impact satisfaction, while perceived ease of use and chatbot responsiveness have positive but statistically insignificant effects. On the other hand, trust in chatbot has negative but insignificant effects toward taxpayers' satisfaction. These findings highlight the importance of high-quality information and robust data security in optimizing chatbot services, especially in public sector.

The study's novelty lies in emphasizing data security as a critical factor in public sector chatbot adoption, addressing an area previously underexplored. It suggests that while technical usability and responsiveness are foundational, long-term taxpayer satisfaction relies on enhancing user trust through secure systems and accurate, relevant information delivery. This research provides practical insights for refining chatbot implementations in public services, advocating for balanced development that aligns user expectations with robust technological infrastructure.

Recommendation

To enhance taxpayer satisfaction, it is crucial for the DGT to prioritize improving the quality of information delivered through the chatbot. Providing accurate, relevant, and timely information should remain a primary goal to ensure a seamless user experience. Furthermore, data security must be continually strengthened to build trust and confidence among users. By addressing privacy concerns and implementing advanced security measures, the DGT can foster a secure environment for interactions. While ease of use and responsiveness are secondary to satisfaction, focusing on user-friendly interfaces and prompt response mechanisms can still enhance overall service quality.

This study highlights the interplay between data security, information quality, and user satisfaction. Future theoretical frameworks should explore these relationships in depth, particularly in the context of public services. Developing a comprehensive model that incorporates emerging factors, such as personalization and adaptability of chatbot services, could provide new insights into user behavior and technology acceptance.

To address the limitations of this study, future research should expand the sample size and diversify the demographics to include various user profiles. Investigating the role of cultural factors and digital literacy in shaping user satisfaction could offer valuable perspectives. Additionally, longitudinal studies that track changes in user satisfaction over time would provide a deeper understanding of how updates to chatbot services impact user perceptions.

Further research into advanced chatbot features, such as natural language processing improvements and multilingual capabilities, could also contribute to enhanced service delivery.

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