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AI-Based Digital Transformation as a Driver of Individual Taxpayer Compliance

Islamiah Kamil[1]
Faculty of Business and Social, Dian Nusantara University
West Jakarta, Indonesia
Islamiah.kamil@undira.ac.id

Hendi Prihanto[2]*
Faculty of Economic And Business, Prof. Dr. Moestopo University (Religious)
Jakarta, Indonesia
hendiprihanto@dsn.moestopo.ac.id
*corresponding author

Yolifiandri[3]
Faculty of Business and Social, Dian Nusantara University
West Jakarta, Indonesia
yolifiandri@undira.ac.id

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Abstract

Purpose – This study aims to examine how Artificial Intelligence (AI)-based digital transformation in tax administration contributes to individual taxpayer compliance in Indonesia. The urgency of this research arises from the rapid adoption of AI technologies particularly e-filing and e-billing systems that are designed to enhance efficiency in tax processing, taxpayer monitoring, and the enforcement of tax regulations. Despite this advancement, limited empirical studies have explored the effectiveness of AI-based tools in fostering compliance among individual taxpayers.
Design/Methodology/Approach – A quantitative research approach is employed, utilizing survey data collected from individual taxpayers who use digital tax services in the Jakarta, Bogor, Depok, Tangerang, and Bekasi (Jabodetabek) regions. The study applies statistical analysis techniques to assess

the relationship between AI-based digital transformation variables (such as automation, accessibility, accuracy, and user experience) and individual taxpayer compliance indicators, including timeliness, accuracy of reporting, and adherence to tax obligations.
Results – Preliminary findings indicate that AI-based digital transformation particularly through the integration of e-filing and e-billing systems significantly enhances taxpayer compliance by reducing human error, improving accessibility, and increasing taxpayers' trust in the system. The analysis reveals that automation and real-time feedback features play a crucial role in ensuring more consistent and accurate tax reporting. However, challenges such as digital literacy gaps and system reliability still affect adoption rates among older taxpayers and small business owners.
Research limitations/Implications – This research is limited to individual taxpayers in urban areas and may not fully capture compliance behaviors in rural regions with lower digital infrastructure. Future studies are encouraged to expand the sample coverage and include comparative analysis across different taxpayer segments. The findings have practical implications for policymakers and the Directorate General of Taxes (DGT) to strengthen AI adoption strategies that promote voluntary compliance while maintaining fairness and transparency.
The study contributes to the growing body of literature on digital taxation by providing empirical evidence on the role of AI in shaping more efficient, accountable, and citizen-oriented tax administration in the digital era.

Keywords: Artificial Intelligence (AI), E-Filling, E-Billing, Tax Digitalization, Taxpayer Compliance

Introduction

In today's digital age, Artificial Intelligence (AI) is being used as an important tool to make work more efficient and effective in many areas, including tax matters. In Indonesia, the Directorate General of Taxes (DGT) has launched several digital services, like online tax filing and electronic billing, to help make tax compliance easier and support taxpayers in meeting their tax responsibilities. The e-filing system allows taxpayers to submit their Annual Tax Returns (SPT) online, while e-billing facilitates digital tax payments. AI-based digital transformation in both systems is expected to increase transparency, reduce administrative burdens, and minimize errors in tax filing and payment. Although more people are using digital tools in tax matters, many taxpayers in Indonesia still don't follow the rules properly. Research shows that even with these new technologies, many people struggle to use them because they don't understand how they work or don't have enough knowledge about the system (Kurniawan, 2021). Also, the use of AI in tax management is still very early in Indonesia, so there isn't

much research yet about how it affects people's tax behavior. Hutabarat (2021) says that AI could help find cases where people aren't following tax laws and make the monitoring process more efficient by using predictions. However, technical and social challenges, such as technological infrastructure readiness and resistance to change, need to be overcome to achieve maximum results. Therefore, this research is crucial to empirically measure the extent to which AI implementation in e-filing and e-billing impacts individual taxpayer compliance.

According to DN (Direktorat Jenderal Pajak, 2023), the implementation of Artificial Intelligence (AI) in e-filing and e-billing systems has brought significant changes to tax services in Indonesia. AI is used to improve efficiency and accuracy in tax filing and reporting. For example, AI can assist taxpayers in calculating and reporting Income Tax (PPh) by providing a database of the latest regulations as a reference in calculations. Furthermore, AI can access withholding/collection evidence, transactions, and taxpayer financial information to automatically calculate the amount of tax owed. This makes it easier for taxpayers to fulfill their tax obligations more quickly and accurately.

However, the adoption of AI technology in e-filing and e-billing systems still faces several obstacles. One major challenge is the unequal level of technological literacy among taxpayers. Research shows that taxpayer perceptions of e-filing are influenced by ease of use, awareness of benefits, education, transparency, and information security. A lack of understanding and education regarding this technology can hinder e-filing adoption among taxpayers (Nurseha & Fidiana, 2019). Furthermore, limited digital infrastructure in some regions also hinders the implementation of AI in e-filing and e-billing systems. Unequal internet access makes it difficult for taxpayers in certain regions to access digital tax services. This results in low adoption rates of AI technology in the tax system in those regions. To overcome these obstacles, efforts are needed to increase technological literacy and educate taxpayers about the benefits of using AI in e-filing and e-billing systems (Agusetiawati et al., 2024; Kamil et al., 2025).

Furthermore, the government needs to strengthen digital infrastructure so that AI-based tax services are accessible to all taxpayers in Indonesia. This way, the implementation of AI in the tax system can run optimally and provide maximum benefits for taxpayers and the government (Abdul Rosyid et al., 2024).

The problem formulation in this research is as follows:

1. Does AI-based digital transformation in e-filing tax administration impact individual taxpayer compliance?
2. Does AI-based digital transformation in e-billing tax administration impact individual taxpayer compliance?

The aim of this research is to empirically prove:

1. To analyze and measure the impact of AI-based digital transformation in e-filing tax administration on individual taxpayer compliance.
2. To analyze and measure the impact of AI-based digital transformation in e-billing tax administration on individual taxpayer compliance.

The urgency of this research lies in the importance of understanding the impact of AI technology implementation in tax administration on taxpayer compliance. Amidst the complexity of the tax system, AI-based digital transformation is expected to facilitate taxpayers in fulfilling their obligations, improve tax administration efficiency, and reduce errors and potential fraud. However, without in-depth empirical evaluation, it is difficult to assess the effectiveness of this transformation in the Indonesian context. Therefore, this research will make an important contribution to developing policy recommendations that can help the Directorate General of Taxes (DGT) optimize the application of AI technology in taxation and improve tax compliance among individual taxpayers.

The novelty lies in the impact of AI-based digital transformation on individual taxpayer compliance. Most previous studies have focused more on the general implementation of AI technology in tax administration or on tax institutions. This study specifically evaluates the impact of AI-based digital transformation on individual taxpayer compliance, an aspect that has received relatively little attention despite its significant impact on state tax revenue.

Literature Review & Hypothesis

Literature Review

Artificial intelligence (AI) technology has become a crucial component of digital transformation across various sectors, including tax administration. AI is being applied to improve efficiency in taxpayer data processing, form-filling automation, data validation, and monitoring of tax violations. Research by Sijabat (2020) shows that AI can reduce human error in tax reporting and accelerate administrative processes. Even though more people are using digital tools for taxes, many individuals in Indonesia still don't follow tax rules properly. Some research shows that even with these new technologies, many people struggle to use them because they don't know much about computers or aren't clear on how the system works (Kurniawan, 2021). Also, using AI in tax work is still very new in Indonesia, so there isn't much real research showing how it affects people's tax behavior. According to Hutabarat (2021), AI could help find people who aren't paying their taxes and make it easier to keep track of tax matters by using predictions based on data.

AI is used to automate different tasks in tax administration, like handling taxpayer information, checking documents, and finding mistakes. This technology can look at a lot of data quickly and instantly,

which helps make decisions faster. According to the OECD (2022) AI can also identify suspicious data patterns and assist tax authorities in detecting potential tax violations. AI helps tax authorities monitor taxpayer compliance through more in-depth data analysis. This technology can spot patterns of tax problems, like people avoiding taxes or changing financial statements. A study by Nuryani et al. (2024) found that using AI can help reduce mistakes made by humans during audits and make the process of checking taxes faster and better. Amrullah et al. (2024) revealed that AI is equipped with security features to protect taxpayer data from threats such as hacking and data misuse, by detecting anomalous patterns and cyber threats.

The e-filing and e-billing systems are part of making tax work easier using digital tools. These systems help make tax reporting and paying taxes more convenient, clear, and accurate. Sijabat (2020) say that e-filing lets people report their taxes online, so they don't have to go to the tax office. E-billing makes paying taxes easier by handling it electronically. A local study by Setiawan (2019) shows these systems help taxpayers work more efficiently, but not everyone understands how to use them, especially in places where people aren't very familiar with digital technology. E-filing is a way for people to report their taxes online instead of doing it by hand. It helps reduce the need to visit the tax office and makes the whole process simpler. E-billing is an electronic tax payment system that allows taxpayers to create billing codes to make payments online through designated banks or payment institutions. This system aims to increase transparency and accuracy in tax payments.

These two systems complement each other, ensuring an end-to-end tax administration process. After tax reporting is completed via e-filing, payments can be made directly via e-billing without requiring manual intervention. This integration increases efficiency for both taxpayers and tax authorities. The integration of e-filing and e-billing systems creates a synergistic framework that strengthens taxpayer compliance. Through e-filing, taxpayers are able to submit their tax reports accurately and efficiently, while e-billing ensures that payments are processed punctually and recorded digitally. Together, these systems establish a more transparent and efficient tax administration ecosystem.

The digital transformation driven by Artificial Intelligence (AI) has initiated fundamental changes within the tax administration landscape, particularly in enhancing taxpayer compliance. The OECD (2022) highlights that the incorporation of AI technologies in tax systems facilitates the identification of potential tax evasion patterns, generates more precise filing recommendations, and fosters stronger relationships between tax authorities and taxpayers through personalized and data-driven services. Empirical research by Saptono et al. (2023) further suggests that the

application of AI contributes to building taxpayer trust, which in turn promotes voluntary compliance. In addition, the adoption of AI-based digital systems in taxation improves overall operational efficiency and transparency. AI capabilities such as automated form completion, real-time data verification, and digital payment reminders simplify the compliance process for taxpayers (OECD, 2022).

Moreover, the utilization of big data analytics enables early detection of irregular tax patterns, thereby expediting audit processes and minimizing potential tax losses (Direktorat Jenderal Pajak, 2023).

Complementary AI-based tools such as chatbots and virtual assistants further enhance user experience by offering timely assistance and accurate responses to taxpayer inquiries, ultimately increasing satisfaction and reinforcing public confidence in the digital tax system (Saptono et al., 2023). The conceptual framework of this study is designed to illustrate the relationship between the independent variables and the dependent variable, as outlined below:

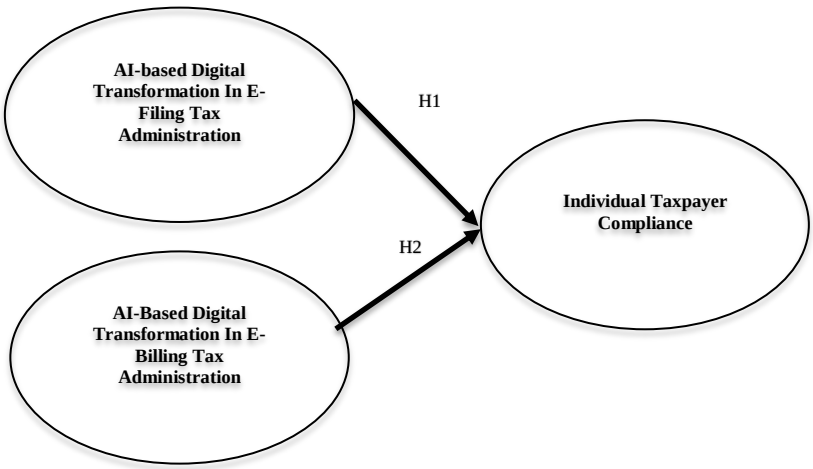

Figure 1
Conceptual Framework of the Research

The hypothesis of this research is as follows:

H_1: AI-based digital transformation in e-filing tax administration has an impact on individual taxpayer compliance.

H_2: AI-based digital transformation in e-billing tax administration has an impact on individual taxpayer compliance.

Research Method

This study employs a causal research design aimed at examining the relationship between specific independent variables (Xn) and dependent variables (Yn). The variables investigated include X1= AI-based digital transformation in e-filing tax administration, X2= AI-based digital transformation in e-billing tax administration, and Y= individual taxpayer compliance. To test the hypotheses, statistical methods were utilized to determine the strength and direction of influence among these variables.

A quantitative research approach was adopted to objectively analyze how AI-based digital transformation in tax administration—implemented through e-filing and e-billing systems—affects individual taxpayer compliance. This approach enables precise measurement and statistical validation using numerical data. According to Sugiyono (2017), quantitative methods are particularly appropriate for investigating causal relationships between variables and for generating conclusions that can be generalized across populations.

The research was conducted using a survey design, with data collected from individual taxpayers who actively use digital tax services, such as e-filing and e-billing, within the Jakarta, Bogor, Depok, Tangerang, and Bekasi (Jabodetabek) regions. The selection of the Jabodetabek area was intentional, as it represents a densely populated and economically dynamic urban setting with diverse taxpayer characteristics. Studying this area allows for a comprehensive understanding of how AI technology is adopted and how it influences taxpayer behavior in a highly digitalized and complex tax environment.

Data collection was carried out through an online structured questionnaire, which provided respondents with convenience and flexibility in completing their responses. Prior to distribution, the questionnaire underwent validity and reliability testing to ensure the research instrument effectively captured the constructs being measured.

The population of this study consisted of individual taxpayers registered in the Greater Jakarta area who utilize digital taxation systems for tax reporting and payment activities. This population was chosen because Greater Jakarta serves as Indonesia's primary economic hub, characterized by a high level of digital adoption. Additionally, the significant number of taxpayers using e-filing and e-billing in this region provides a representative sample for analyzing the relationship between AI-based digital transformation and taxpayer compliance. The study employed a purposive sampling technique, wherein respondents were deliberately selected based on specific criteria that align with the research objectives. As noted by Sekaran & Bougie (2016), purposive sampling is suitable when the study demands participants who possess particular characteristics

directly related to the phenomenon or variables under investigation. The criteria used in sample selection were:

1. Individual taxpayers who have been registered in the e-filing and e-billing system for at least one year.
2. Domiciled in the Jabodetabek area.
3. Have experience in reporting and paying taxes using a digital tax system.

In quantitative research, determining a representative sample size can be calculated based on the number of indicators in the questionnaire. For each indicator, it is recommended to take a minimum of 5-10 respondents. With a 30-question questionnaire, the recommended sample size is a minimum of 150 to 300 respondents. Hair et al. (2019) suggest a rule of 5-10 respondents per indicator to produce valid and reliable data. This approach is important to ensure that research results have sufficient statistical power to effectively analyze the relationships between variables. Based on the calculation of 20 x 10 construct indicators, the minimum sample size required is 200 respondents.

The data obtained from the questionnaire will be analyzed using SPSS software version 22. SPSS is a statistical analysis tool commonly used in quantitative research because of its ability to process data with various analysis techniques that are appropriate to the research objectives. According to Ghozali (2018), SPSS is a reliable tool for analyzing survey data and helps researchers draw accurate conclusions based on the processed data. The analysis used in this study is multiple linear regression, where the independent variables (the use of AI-based e-filing and e-billing) will be tested for their influence on the dependent variable (individual taxpayer compliance). Multiple linear regression was chosen because this technique can analyze the influence of more than one independent variable on a single dependent variable, in accordance with the needs of this study. Linear regression also allows researchers to determine the extent of influence each independent variable has on the dependent variable.

The data analysis process begins with classical assumption tests to ensure that the data meets the requirements of regression analysis, such as normality, multicollinearity, and heteroscedasticity. Normality tests are conducted to determine whether the data distribution is normal, while multicollinearity tests aim to ensure there is no strong correlation between the independent variables. Heteroscedasticity tests are used to determine whether there is unequal residual variability across the data range. After classical assumption tests, multiple linear regression analysis is performed to test the hypotheses.

The results of this analysis will show whether the use of AI-based e-filing and e-billing has a significant impact on individual taxpayer compliance. The regression coefficient value (β) will show how much influence each independent variable has on taxpayer compliance, while the

significance value (p-value) will be used to determine whether the influence is statistically significant. In addition, a coefficient of determination (R^2) test will be conducted to determine how much variability in taxpayer compliance can be explained by the independent variables studied.

According to Hair et al. (2019), a high coefficient of determination indicates that the regression model used has good predictive ability. With this approach, this research is expected to provide a deeper understanding of the impact of AI in the digital tax system on individual taxpayer compliance and provide a basis for developing technology-based tax policies in the future.

Results and Discussion

Based on the data obtained, Table 1 shows that the descriptive statistics of the AI-based digital transformation variable in e-filing tax administration can be seen in the X1.4 indicator having the lowest average value with a value of 3.76 and the X1.3 indicator having the highest average value with a value of 4.10. Overall, respondents' responses to the questionnaire's confidentiality questions varied.

Table 1 displays descriptive statistics of AI-based digital transformation in e-billing tax administration based on collected data findings, indicating that indicator X2.5 has the lowest average value of 4.17 and indicator X2.4 has the highest average value of 4.46. Overall, respondents' responses to the questionnaire's confidentiality questions varied.

Based on the collected data, Table 1 illustrates the descriptive statistics for the Individual Taxpayer Compliance variable. It can be seen that indicator Y5 has the lowest average value of 4.20, and indicator Y4 has the highest average value of 4.34. In general, respondents' responses to the questionnaire statements varied.

The model's ability to explain how much of the variation in the dependent variable is accounted for is checked using a coefficient of determination. In this study, the coefficient of determination is used to see how well the independent variables, which are AI-Based Digital Transformation in E-Fling Tax Administration (X_1) and AI-Based Digital Transformation in E-Billing Tax Administration (X_2), explain the dependent variable, which is Individual Taxpayer Compliance (Y). The following is the test for the coefficient of determination in this study.

Table 1
Descriptive All Variabel and Hypotesis Testing

Variabel	Min	Max	Mean	Std. Dev	Koef	T stat	Sig
X.1 (TRFM.E-Filling)	2	5	4.10 – 3.76	0.71	0.479	11,222	0.00
X.2 (TRFM.E-biling)	2	5	4.46 – 4.17	0.76	0.434	10,794	0.00
Y (Individual Compliance)	2	5	4.34 – 4.20	0.66	-	-	-
F = 397,361	-	-	-	-	-	-	0.00
R^2 = 0.799 (79,9%)	Good Fit						
n = 200							
Regression Equation	**YWPOP Compliance = 2,038α + 0.479TRFM.E-filling + 0.434TRFM.E-billing + e**						

Source: SPSS Data Processing (2025)

Looking at the table above, the coefficient of determination is 0.799. This means that the variables AI-Based Digital Transformation in E-Filing Tax Administration and AI-Based Digital Transformation in E-Billing Tax Administration together explain 79.9% of the variation in Individual Taxpayer Compliance. The remaining 20.1% is due to other factors not considered in this study.

The F-test checks if all the independent variables in the model together have a significant effect on the dependent variable. To decide this, compare the calculated F-value with the critical F-value from the table, or check if the significance level is less than 0.05.

From table 1, we can see that the Fcount value in the research model is 397.361, and the F table value is 2.65 (with degrees of freedom df1 = 2, which is k-1 or 3-1, and df3 = 197, which is n – k or 200 – 3). Since Fcount is greater than Ftable (397.361 > 2.65), and the significance level is 0.000, which is less than 0.05, this shows that the variables AI-Based Digital Transformation in E-Filing Tax Administration and AI-Based Digital Transformation in E-Billing Tax Administration together have a significant impact on Individual Taxpayer Compliance. The t-test is a statistical method used to check if an independent variable has a partial or individual effect on the dependent variable. A significant t-value means that the variable has a meaningful impact on the outcome. Based on table 1, we can draw conclusions about the hypothesis tests for each independent

variable affecting the dependent variable as follows:

a. The AI-Based Digital Transformation variable in E-Filing Tax Administration has a significant probability result of 0.000. This means the significant value of 0.000 is less than 0.05, and the t-test result of 11.222 is greater than the t-table value of 0.675. Therefore, it can be concluded that AI-Based Digital Transformation in E-Filing Tax Administration has a significant influence on Individual Taxpayer Compliance.
b. The AI-Based Digital Transformation variable in E-Billing Tax Administration also has a significant probability result of 0.000. This indicates that the significant value of 0.000 is less than 0.05, and the t-test result is greater than the t-table value of 0.675. Hence, it can be concluded that AI-Based Digital Transformation in E-Billing Tax Administration has a significant effect on Individual Taxpayer Compliance.

Multiple linear regression analysis was used to determine whether the independent variables, namely AI-Based Digital Transformation in E-Filing Tax Administration (X1) and AI-Based Digital Transformation in E-Billing Tax Administration (X2), as a whole, have an influence on the dependent variable, which is Individual Taxpayer Compliance (Y). Based on table 1, the results of the multiple linear regression test in this study obtained the following equation:

1. Constant
   The constant value of Individual Taxpayer Compliance is 2.038 if, assuming other variables remain the same or have no different values, the AI-Based Digital Transformation in E-Filing Tax Administration (X1) and AI-Based Digital Transformation in E-Biling Tax Administration (X2) variables have the same value as 2.038.
2. AI-Based Digital Transformation Coefficient in E-Filing Tax Administration
   Based on table 1, the regression coefficient of AI-Based Digital Transformation in E-Filing Tax Administration is 0.479, which means that if the AI-Based Digital Transformation variable in E-Filing Tax Administration increases, the Individual Taxpayer Compliance variable will increase, and vice versa, if the AI-Based Digital Transformation variable in E-Filing Tax Administration decreases, the Individual Taxpayer Compliance variable will decrease.
3. AI-Based Digital Transformation Coefficient in E-Billing Tax Administration
   Based on table 1, the regression coefficient of AI-Based Digital Transformation in E-Billing Tax Administration is 0.434, which means that if the AI-Based Digital Transformation variable in E-Billing Tax Administration increases, the Individual Taxpayer Compliance variable will increase, and vice versa, if the AI-Based Digital Transformation variable in E-Billing Tax Administration

decreases, the Individual Taxpayer Compliance variable will decrease.

Artificial Intelligence (AI)-based digital transformation in e-filing tax administration has a significant impact on individual taxpayer compliance. Based on the results of the hypothesis test, a significant probability value of 0.000.

However, this study also revealed challenges similar to those reported by Cahyadini et al. (2024), such as limited digital literacy and unequal access to technological infrastructure. Therefore, outreach, education, and infrastructure improvement are crucial to ensuring the success of this transformation. Overall, this research is consistent with previous studies showing the positive impact of AI on improving tax compliance, although supporting measures are needed to address existing challenges.

AI-based digital transformation in e-billing tax administration also has a significant impact on individual taxpayer compliance. The results of the hypothesis test show a significant probability value of 0.000 and a tcount of 10.794 > t table 0.675, with a regression coefficient of 0.434. This indicates that the AI-based e-billing system positively influences taxpayer compliance, where every improvement in the AI-based e-billing digital transformation will increase taxpayer compliance. The AI-based e-billing system makes things easier for taxpayers with automatic billing code generation features, real-time payment verification, and payment deadline reminders. This is in line with research by Adha et al. (2024) which states that AI-based algorithms play a key role in creating an efficient and transparent tax system. The reliability of AI in recording transactions accurately and transparently helps encourage taxpayers to fulfill their obligations consistently.

However, as revealed in research by Cahyadini et al. (2024), e-billing implementation also faces similar obstacles, such as low technological literacy and concerns about data security. To overcome these obstacles, strengthening the principles of digital tax administration and taking steps to improve technological literacy and taxpayer data protection is necessary.

The findings of this study align with earlier research, such as the work done by Amrullah et al. (2024), which highlighted how AI can help make tax administration more efficient and transparent. This study also agrees with the perspective presented by Cahyadini et al. (2024) that AI-based digital transformation offers significant opportunities but requires regulatory reforms and implementation strategies to address existing challenges. However, these results add more specific empirical evidence on the impact of e-filing and e-billing on individual tax compliance, reinforcing previous conclusions.

This research also aligns with the findings of Adha et al. (2024), who showed that AI in tax administration not only improves efficiency but also builds taxpayer trust in the system. Overall, the results support the

conclusion that AI-based digital transformation plays a significant role in improving individual taxpayer compliance, although implementation challenges remain a concern that needs to be addressed.

Conclusion and Recommendation

Conclusion

Based on the discussion from the previous chapter, here are some key conclusions from this research:

1. AI-based digital transformation in the e-filing system has a significant impact on individual taxpayer compliance. This system can improve the efficiency and accuracy of tax reporting through automated form filling, data validation, and deadline reminders. Furthermore, AI enhances transparency and accountability in tax oversight, thereby increasing taxpayer trust in the system.
2. AI-based digital transformation in the AI-based e-billing system also significantly impacts individual taxpayer compliance. With features such as automatic billing code generation, real-time payment verification, and payment reminders, e-billing helps taxpayers fulfill their tax obligations in a timely and consistent manner.

Recommendation

This study has some things to think about. It only looked at one particular area, so the findings might not show what's happening for people who pay taxes in other areas, especially those who don't have good access to technology. Also, the number of people who took part was not very big, and they were only those who use electronic filing and billing systems. This could mean the results are not fully accurate because they don't include people who don't use these systems. For further research, it is recommended to expand the scope of the study, including areas with limited technology, and increase the number and diversity of respondents, such as those who have not yet used the technology. Research should also include variables such as tax awareness, technological literacy, and perceptions of tax fairness. Collaboration with the Directorate General of Taxes or related institutions can provide access to more valid data for analysis. This research contributes to the development of theory on technology adoption and provides practical guidance and policies to improve tax efficiency and transparency.

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