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Adoption of Digital Services by Muslim Communities in Central Java

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Abstract

Adopting digital services is a logical consequence of welcoming the digital era, but in-depth studies on digital services still need to be completed. This quantitative research aims to determine the effect of relative advantage, compatibility, and complexity technology on adopting digital services in Muslim communities in Central Java. The sample of this study is the Muslim community and users of digital services in Central Java, selected by incidental sampling techniques. Multiple linear regression analysis tools were used with the help of SPSS software to test the effect of independent variables with dependents. The results prove that relative advantage, compatibility, and complexity significantly positively affect the adoption of services.

Keywords: *relative advantage, compatibility, complexity, adoption of digital services*

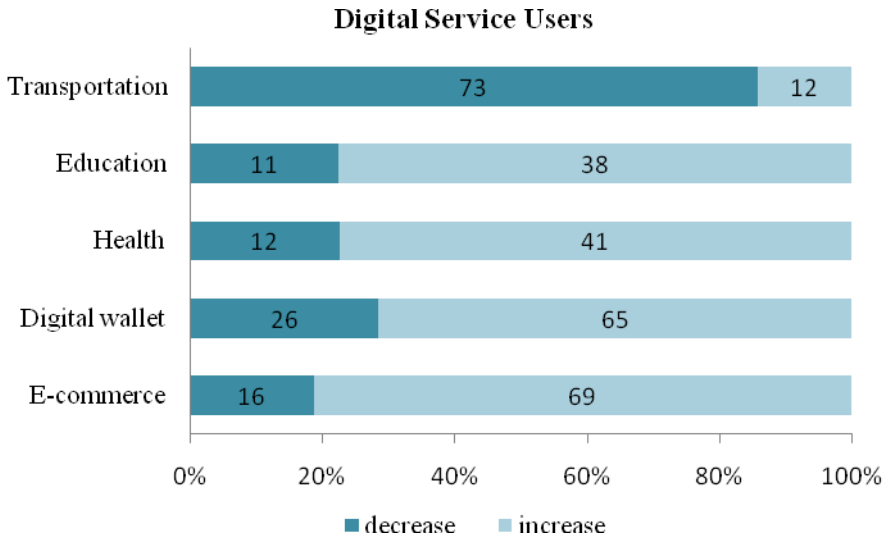
A. Introduction

At the beginning of 2020, the whole world was shocked by the presence of a virus that caused the shaking of the world economy (Kasdi & Saifudin, 2020); even at this time, the world economy was in an economic crisis which was worse than the financial crisis that occurred in 2008 (Hoang et al., 2021). Due to this coronavirus, many small and medium enterprises (SMEs) and companies are threatened to go out of business (Amankwah-Amoah et al., 2021). Government efforts to reduce deaths due to exposure to Covid-19, including policies to stay at home and social distancing (Bassi et al., 2020). The Covid-19 outbreak has also changed how people live and access information (Ofosu-Ampong & Acheampong, 2022). So it must create digital technology and services that can facilitate and help humans meet their needs, one of which is adopting digital services.

Digital services come with changes in people's lifestyles that are increasingly developing and interested in using technology to buy something (Martins et al., 2019; Saifudin, n.d.-a). Several institutions in Indonesia have transformed into the digital world (Saifudin, n.d.-b), such as education (Puspita et al., 2020), banking, finance, government (Suparto & Saifudin, 2021), business (Mustika & Saifudin, 2021), health, transportation, and others. Digital financial services are related to digital wallets, QRIS, digital banking,

and digital wallets. Meanwhile, banking institutions that have implemented digital services are Motion, Blu, SeaBank, TMRW, PermataME, LINE Bank, Neobank, Digibank, Bank Jago, and Jenius (Aeni, 2022).

Digital service users in Indonesia itself are increasing. This is an interesting fact to be examined more deeply related to the increase in digital service users in Indonesia; the data can be seen in the graph below:

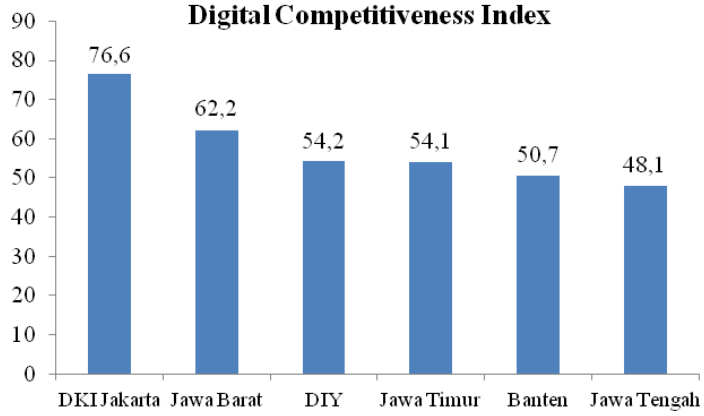


Graph 1. Digital Service Users (Lidwina, 2020)

Based on data from the databox (Lidwina, 2020), service users often use several digital services in Indonesia. E-Commerce users increased by 69%, which shows that many consumers currently use E-Commerce to buy necessities. Digital wallet users have increased by 65%; this illustrates that consumers use digital wallets more for shopping transactions.

Healthcare users increased by 41%, meaning service users now use healthcare apps more for consultations and getting healthcare. Education service users increased by 38%; this illustrates that education service users are currently more interested in using educational service applications to help the learning process at home. Meanwhile, transportation service users only increased by 12%. This happens because some people are still bound by the policy to stay at home, so consumers decide to reduce the use of these transportation services.

In addition, one of the provinces in Indonesia with 26.5 million internet users from the total population of Indonesia and striving to transform the government into the digital world is the province of Central Java (Jatengprov, 2022). However, Central Java, with many internet users, is still in the last position of other provinces on Java Island for digital competitiveness. Digital competitiveness in Java Island can be seen in the graph below:



Graph 2. Digital Competitiveness Indeks (Ahdiat, 2023)

It can be seen from data taken from the databox (Ahdiat, 2023) that the highest digital competitiveness position in Java Island is occupied by DKI Jakarta, with an index value of 76.6. Meanwhile, Central Java was ranked last for digital competitiveness with an index of 48.1. This fact is interesting to study more deeply because Central Java, with high internet users but for the position of digital competitiveness, still occupies the lowest position.

Previous studies in terms of digital adoption emphasized how humans are required to be able to innovate using technology amid the Covid-19 pandemic. So that they can still carry out their activities and still be able to maintain their economy during the Covid-19 pandemic. However, there is an interesting fact to be studied more deeply, namely Central Java with high internet users, but the position of digital competitiveness still occupies the lowest position. Therefore, a deeper study of digital adoption is needed as to what motivates them to use technology to feel comfortable and interested.

Several researchers have researched digital adoption. Previous research has shown that relative advantage affects the adoption of digital services. This is supported by research conducted by Lutfi et al. (2022), which states that relative advantage can influence

someone to use services by utilizing technology. Research by Lin et al. (2021) proves that relative advantage can increase a person's confidence to use technology in utilizing services. Research by Kwabena et al. (2021) states that relative advantage significantly affects technology adoption.

The research of de Villiers et al. (2020), whose research results revealed that relative advantage motivates someone to adopt technology. Research by Nguyen et al. (2022) proves that relative advantage is essential for technology adoption. However, several studies challenge this and state that relative advantage does not affect the adoption of digital services. Shetu et al. (2022) research revealed that relative advantage does not significantly affect digital adoption. Research by Sahin. (n.d.) (2021), which proves that relative advantage does not significantly affect technology adoption.

Previous research has shown that compatibility affects the adoption of digital services. The results of this study are supported by several previous studies, such as research conducted by Yoon et al. (2020), with the results proving that technology compatibility affects technology adoption. Wen Ni's (2020) research explains that compatibility affects digital adoption. Research by Lin et al. (2021) shows that compatibility increases trust for technology adoption. Research by Kwabena et al. (2021) proves that compatibility significantly affects technology adoption.

Research by Yang et al. (2021) proves that compatibility has a positive and significant effect on digital adoption. Research by de Villiers et al. (2020) proves that compatibility positively affects digital adoption. However, some research results contradict this by stating that compatibility does not affect the adoption of digital services. The research conducted by Lutfi et al. (2022) with the study's results proves that compatibility does not significantly affect digital adoption. Research by Shetu et al. (2022) states that compatibility does not have a significant relationship to digital adoption.

Previous research has shown that complexities affect the adoption of digital services. This is supported by previous studies, such as those conducted by Lutfi et al. (2022), stating that complexity can influence someone to use services by utilizing technology. Research by de Villiers et al. (2020) states that complexity positively affects digital

adoption. Research Ofosu-Ampong & Acheampong (2022) states that complexity significantly affects digital adoption.

However, several studies contradict this by stating that complexity does not affect the adoption of digital services. The study is like the one by Kumar Bhardwaj et al. (2021), proving that complexity has no effect on technology adoption. Trachuk & Linder's (2017) research proves that complexity only significantly influences the adoption of digital technology.

Given the research gap from previous studies, a deeper study is needed about digital adoption and what motivates them to use technology so that they feel comfortable and interested in using the technology. This study is exciting and different from previous studies because it examines the adoption of digital services of Muslim communities in the Central Java region that researchers have never used. This research reveals what motivates the Muslim community of Central Java to use technology to utilize services.

B. Literature Review

2.1. Diffusion of Innovation Theory

The theory of diffusion of innovation (DOI) was first introduced by Rogers in 1962. This theory defines innovation as an idea, object, or practice that each individual perceives, and diffusion is defined as the process of such innovation to be communicated to social systems (Ali et al., 2019). Currently, technology is one of the innovations in all sectors. After Covid-19, all sectors, such as education, business, and health, continue using technology to carry out existing policies. The government also uses technology to provide accessible, fast, and efficient public services. This shows the acceptance of innovation in society.

Acceptance, adoption, or rejection of technology-based products and services can determine the success or failure of an innovation (Jayasundara, 2021). There have been many digital services spread in the community. The community can adopt digital services if they have adequate facilities.

2.2. Adoption Digital Services

Public services today have shifted to digitalization. Technology has been developing for a long time, but the Covid-19 outbreak has increased opportunities for the use of

technology. As a result, after Covid-19 ends, people are still comfortable using technology to interact and transact. Technology provides benefits in recording people's files or data. In facilitating the community, the Central Java government has created applications in every government institution that make it easier for the public to access them. To the extent to which people access digital service platforms that have been developed and integrated, it can be said that people have adopted digital services (Chakraborty et al., 2020).

There are five stages in adopting digital services (Jayasundara, 2021). First, knowledge, the two invitations, the three decisions, the four implementations, and the five confirmations. In this stage of confirmation, individuals can adopt or reject an innovation. The community can maximally adopt digital services if the available applications have compatibility, relative advantages, and complexity.

2.3. Relative Advantage

Relative advantage is the extent to which innovation is better than its alternatives (Wang et al., 2018). Individuals will adopt innovations when believing they are more beneficial than alternatives (Yuen et al., 2021). Digital innovation today is one of the easy services through electronic devices and internet networks. The existence of these two items makes services to the public faster and more efficient. One example of a public servant is service to a hospital. Almost every hospital provides applications as a means of service to patients. Patients can consult through the application without having to meet face-to-face, or a patient can register for the examination online through the available application. This is more efficient than a patient having to come in for a queue and wait for a scheduled examination with long consequences.

Time effectiveness is a relative advantage for society. According to Ofosu-Ampong & Acheampong (2022), relative advantage is an essential factor in communities considering adopting digital services. Based on research by Kwabena et al. (2021) states that relative advantage has a significant effect on technology adoption. The results of this study are supported by the research of de Villiers et al. (2020), whose research reveals that relative advantage motivates someone to adopt technology. From this explanation, the author proposes the following hypothesis:

H1: Relative advantages positively affect the adoption of digital services

2.4. Compatibility

Compatibility is a condition where digital services have a level consistent with the habits or needs of service users and previous experiences. According to Ahmad et al. (2019), compatibility is the level of conformity of new technology with previous technology that already exists in society. Digital services in the community continue to be updated in features to maintain the suitability of current needs. It is known that human needs will continue to evolve. Therefore, digital services also continue to experience feature suitability to human needs.

The suitability of features in digital services will affect people's decisions to adopt these digital services. If people feel that the latest digital services are not as needed, they will likely reject the available innovations and not adopt digital services. High suitability indicates that society needs fewer changes in habits in adopting something (Yuen et al., 2021). Based on research by Yoon et al. (2020) proves that the compatibility of technology affects technology adoption. Wen Ni (2020) explains that compatibility affects digital adoption. From this explanation, the author proposes the following hypothesis:

H2: Compatibility positively affects the adoption of digital services

2.5. Complexity

Complexity can be described as a problem or something challenging to solve. Rogers stated that complexity is a condition where innovation is relatively tricky to use (AlBar & Hoque, 2019). Technology that is easy to understand and use is very suitable for digital services to the community. The government, as a party that understands the needs of its people, can implement simple digital services.

If complexity can be handled properly, then there will be a possibility for society to adopt digital services. Based on research conducted by Lutfi et al. (2022), complexity can influence someone to use services by utilizing technology. From this explanation, the author proposes the following hypothesis:

H3: Complexity negatively affects the adoption of digital services

C. Research Methods

This study used a quantitative approach. Quantitative research is a type of research that aims to examine specific samples or populations, where data collection usually uses

research instruments. Data analysis is statistical or quantitative to test hypotheses set or made (Sugiyono, 2016).

The population in this study is Muslim people who have used digital services in institutions available in Central Java. The sampling method in this study used incidental sampling techniques. The incidental sampling method is based on accidental or accidental encounters with researchers in Central Java institutions that can be used as samples if the person is suitable as a data source (Sugiyono, 2016).

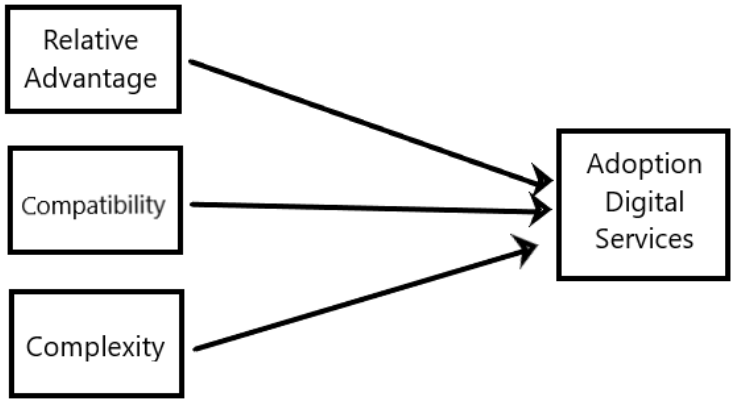
The data taken is primary data. The data was obtained using an online questionnaire. Based on Siva et al. (2019), online questionnaires on online survey services such as google forms obtaining research data become more accessible and faster with the presence of tools such as mobile phones and stable internet connections. On the questionnaire, there are several statements with answer options in which there are 5 points of Likert scale type. Likert scale points start from strongly disagree to agree (Dost et al., 2020) strongly.

This study used a tool to measure data using multiple linear regression methods. The goal is to predict changes in the value of certain variables when other variables change (Muhartini et al., 2021). Multiple linear regression has more than one independent variable as a predictor (Alita et al., 2021).

This study uses SPSS V.25 data processing tool as a data analysis tool. Not only for analyzing data but SPSS V.25 is also used to test validity and reliability. The research framework is shown in Figure 1 below:

Figure 1

Conceptual Model



Demographically respondents are shown in Table 1.

Table 1. Information on Demographic

Demographic	Percentage
Gender	
Male	34.1
Female	65.9
Age	
17-20	64.3
21-25	32.5
26-30	1.6
31-35	0.8
36-40	0.8
Regency/City	
Blora Regency	1.6
Boyolali Regency	8.7
Demak Regency	11.9
Grobogan Regency	4.0
Jepara Regency	0.8
Karanganyar Regency	0.8
Kebumen Regency	0.8
Kendal Regency	4.8
Klaten Regency	0.8
Kudus Regency	1.6
Magelang Regency	1.6
Pati Regency	1.6
Pemalang Regency	0.8
Purworejo Regency	0.8
Semarang Regency	42.1
Sragen Regency	2.4
Salatiga City	12.7
Semarang City	2.4
Education	
Senior High School	82.5
Associate's Degree	0.8
Bachelor	16.7
Profession	
Financial Services Sector	0.8
Personal Services Sector	0.8
General Services Sector	0.8

Health Sector	0.8
Manufacturing Sector	1.6
Field of Social Worker	0.8
Field of Education	5.6
Trade Sector	4.8
Students	78.6
Other	5.6
Pendapatan	
Less than 2 million	88.9
2-4 million	7.9
5-7 million	0.8
More than 7 million	2.4

Source: 2023 Data Processing Results

Table 2. The result of KMO and Bartlett of Sphericity

Testing	Value
Sample Adequacy KMO	0. 882
Bartlett of Sphericity	0.000*

*significant at $\alpha<0.05$
Source: 2023 Data Processing Results

From the KMO and Bartlett test of sphericity, it can be seen that the KMO value is 0.882, which means the value is better (Ghozali, 2021). While the Bartlett of Sphericity score is 0.000, which means the test results are significant. From validity testing, it can also be seen that this research instrument is valid.

Table 3. Convergent Validity and Reliability Test

Item	P-Correlation
Relative Advantage (CR=0.885)*	
Information retrieval efficiency	0.697**
Interaction efficiency	0.780**
Ease of exploration and information retrieval	0.681**
Ease of interaction	0.766**
Get more control	0.634**
More profit	0.751**
Compatibility (CR=0.797)*	
Compatibility with online services	0.690**
Compatibility with online interaction	0.726**
Compatibility with lifestyle	0.700**

There is no conflict with the online service	0.585**
Compatibility with online work style	0.695**
Complexity (CR=0.866)*	
Easy to navigate	0.688**
Easy to learn	0.736**
Easy to log in and access	0.696**
Interaction and exploration are understandable	0.696**
Easy access overall	0.746**
Adopsi digital services (CR=0.788)*	
Will take advantage of online services	0.686**
Do not hesitate to provide personal data on online services	0.617**
Retrieve information from online services	0.534**
Request information from online services	0.680**
Conduct financial transactions with online services	0.604**
I will take advantage of online services next	0.632**

*reliable (Cronbach alpha>0.6)
**valid (Pearson Correlation>r table 0.1472)
Source: 2023 Data Processing Results

Table 3 displays the instrument reliability test values by calculating the Cronbach alpha value. These calculations show that the Cronbach alpha value for the relative advantage variable is 0.885, the compatibility variable is 0.797, the complexity variable is 0.866, and the digital services adoption variable is 0.788. Reliable research instruments can be concluded from the value of Cronbach's alpha that exceeds 0.6 (Ghozali, 2021). In addition, all indicators used in this study are valid; it is proven that the Pearson correlation value of each indicator is greater than the r table value of 0.1472.

D. Result and Discussion

1. Result

From the first hypothesis test (see Table 4), an R-value of 0.552, an R Square value of 0.305, and an Adjusted R Square value of 0.299 were obtained. From the value of R Square, it can be interpreted that the relative advantage variable forms 30.5% of the variation in digital services adoption. In other words, 69.5% of digital services adoption is shaped by variables other than relative advantage.

Relative advantage has a positive and significant influence on adopting digital services. This can be seen from the regression test results of 0.305, with a calculated t-

value of 7.369 and a significance value of 0.000. A significance value smaller than 0.05 means that if the large Muslim community feels the relative advantage today, the adoption of digital services is getting stronger.

Furthermore, the second hypothesis test results obtained an R-value of 0.712, an R Square value of 0.507, and an Adjusted R Square value of 0.503. From the value of R Square, it can be interpreted that compatibility variables form 50.7% of the variation in digital services adoption. In other words, 49.3% of digital services adoption is formed by variables other than compatibility.

Compatibility has a positive and significant influence on the adoption of digital services. This can be seen from the regression test results of 0.507, with a calculated t-value of 11.289 and a significance value of 0.000. A significance value smaller than 0.05 means that if compatibility is more suitable for today's Muslim society, the adoption of digital services will strengthen.

Table 4. Test Result of Direct Effect Determinant Coefficient and Adjusted R Square, Uji t, dan Uji F

Determinant Coefficient & Adjusted R	**RA→AE**	**CT→AE**	**CX→AE**
R	0.552	0.712	0.558
R^2	0.305	0.507	0.311
Adjusted R Square	0.299	0.503	0.306
Standardized Coefficient Beta			
T	7.369	11.289	7.490
Sig.	0.000	0.000	0.000
Result of the F test			
F	54.297	127.445	56.094
Sig.	0.000	0.000	0.000

*Significance (Sig.<0.05)
Source: 2023 Data Processing Results

It is then based on the results of testing the third hypothesis, an R-value of 0.558, an R Square value of 0.311, and an Adjusted R Square value of 0.306. From the value of R Square, it can be interpreted that complexity variables form 31% of the

variation in digital services adoption. In other words, 69% of digital services adoption is shaped by variables other than complexity.

Complexity has a positive and significant influence on the adoption of digital services. This can be seen from the regression test results of 0.311, with a calculated t-value of 7.490 and a significance value of 0.000. A significance value smaller than 0.05 means that if complexity is easier to use by Muslim communities in Central Java, then the adoption of digital services will strengthen.

2. Discussion

This research was conducted by taking three independent variables: Relative Advantages, Compatibility, and Complexity to the Adoption of Digital Services in Muslim Communities in Central Java. Which shows the following results:

a. The Effect of Relative Advantages on Digital Services Adoption

The results of this research analysis show that relative advantages positively and significantly influence the adoption of digital services in Central Java. This is evidenced by the results of a regression test of 0.305, with a calculated t-value of 7.369 and a significance value of 0.000. This illustrates that user perceptions of the capabilities or advantages provided by digital services have a strong positive impact on adopting digital services. The results of this analysis, under the research of Lutfi et al. (2022), (Nguyen et al., 2022), and de Villiers et al. (2020), state that relative advantages have a significant effect on the adoption of digital services.

The advantages or capabilities offered in digital services include information efficiency, interaction efficiency, ease of exploration, the many benefits obtained, and outstanding control in utilization. This ability can attract users to adopt and use digital services more. This is essential in encouraging users to feel satisfied with digital services and increasing widespread acceptance and use.

b. Compatibility Effect on Digital Services Adoption

The results of subsequent research analysis show that compatibility positively and significantly influences the adoption of digital services in

Central Java. Judging from the regression test results of 0.507, with a calculated t-value of 11.289 and a significance value of 0.000. This means illustrating that the suitability or interrelationship between the digital services offered and users' needs strongly and significantly influences the adoption of digital services. This research is under the results of an analysis by Wen Ni (2020), Lin et al. (2021), and Kwabena et al. (2021), which states that compatibility has a positive effect on the adoption of digital services.

In this context, users are more likely to adopt and use digital services if they are suitable and compatible with the needs, devices, platforms, and digital environments they use without significant problems. This high level of connectedness and compatibility makes users feel more comfortable and motivated to adopt and utilize these digital services.

c. The Effect of Complexity on Digital Services Adoption

The results of the subsequent research analysis show that complexity positively and significantly influences the adoption of digital services in Central Java. With a regression test result of 0.311, a calculated t-value of 7.490, and a significance value of 0.000. This means that the more complex a digital service is, the higher the likelihood that people will adopt digital services. This result is also in line with research by Lutfi et al. (2022), Trachuk & Linder (2017), and Ofosu-Ampong & Acheampong (2022), which states that complexity has a significant effect on digital service adoption.

Users are adopting digital services for easy navigation, access, and exploration. This is because complexity shows the level of sophistication and usefulness of a service for users, and digital services have unique features that cannot be found in other services or become a differentiating factor that is attractive to users. Then the user will commit to utilizing the service on an ongoing basis.

E. Conclusion

Based on the formulation of the problem, hypotheses, and research results, it can be concluded that there is a positive and significant influence on the research entitled "Adoption of Digital Services by Muslim Communities in Central Java." Based on the data that has been collected and tests that have been carried out using the effect determinant coefficient testing method, it can be concluded that there is a positive and significant influence between the three independent variables, namely relative advantages, compatibility, and complexity on the adoption of digital services. First, the benefits felt by the public in using digital services are a factor that drives the adoption of digital services. Secondly, the suitability of digital services to the needs of the Muslim community of Central Java also plays an essential role in increasing the adoption of digital services. Third, the low level of compatibility in the use of digital services, providing ease of access and understanding for the Muslim community of Central Java, also affects the adoption of digital services so significantly.

F. Recommendation

This research enriches the literature on the trend of technology adoption and digital services among Muslim communities. In this study, new insights are presented on the factors of community activities that affect the adoption of digital services. In addition, this study also provides recommendations to governments, technology developers, and other stakeholders to encourage wider technology adoption among Muslim communities. It is also recommended to develop training programs to improve the understanding and skills of the Muslim community regarding the adoption of digital technology. However, it should be noted that this study is only limited to Muslim communities. Therefore, it is hoped that researchers in the future can expand the object of research and not be limited to an area and social aspects. Thus, further researchers are expected to be able to obtain better and more varied results.

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