Covid-19 impact on technology usage: An empirical evidence from Indonesia zakat institutions

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Article Info

Abstract

Purpose – The study aims to determine what factors influence the use of technology in zakat institutions in Indonesia using the Technological, Organizational, Environmental (TOE) model.

Methodology – This research is based on a quantitative online survey of 125 *amils* at zakat institutions in Indonesia. The sample consisted of 55% men and 45% women. Data were analyzed using SPSS 26 and PLS-SEM to test variables and hypotheses.

Findings – The results showed that organizational readiness and external pressure have a significant positive impact on the use of technology in zakat institutions. Interestingly, Information Technology (IT) infrastructure and interoperability do not significantly affect technology usage because technology users want it to be easy-to-understand and easy-to-use. Thus, an easy-to-understand and easy-to-use technology give an excellent opportunity to achieve the zakat institution's goals.

Originality – This study is one of the first to examine the impact of the variables in the TOE Model on technology usage in Indonesian zakat institutions during the COVID-19 pandemic.

Research limitations – This study was conducted using cross-sectional data, which has limitations in explaining the relationship between variables that are likely to change over time. In addition, some respondents were not familiar with the proposed questionnaire. Lack of understanding may cause respondents to answer questions improperly.

Practical implications – The results are essential for all stakeholders of *zakat* institutions, especially policymakers, to increase the use of technology to affect the performance of zakat institutions in the context of the realization of *zakat, infaq, sadaqah* (ZIS) collection in Indonesia.

Cite this article:

Introduction

Corona Virus Disease 2019 (Covid-19) has an enormous impact on human life and the economic sector (Leite et al., 2020). The increasing number of cases seems unstoppable and uncontrollable (Jon Cohen & Kupferschmidt, 2020). The virus's rapid spread has resulted in death, and psychological harm as more and more people are being isolated. The spread of the virus has also

caused many countries to implement lockdown policies (Kaur et al., 2020).

Individuals and organizations must move from offline to online modes of interaction following the imposition of lockdowns in different countries. An organization must change to thrive and expand, whether in business or the social sector. As a result, incorporating technology into corporate operations is a must (Kaur et al., 2020). When an institution has the digital transformation to expand, the digital technology solution will perform well (Winarsih et al., 2021).

Users of emerging technologies are growing in a variety of countries. According to the Global Digital Overview (2020), Indonesia has 175.4 million internet users, or 64 percent of the total population, and 160 million active social media users, or 59 percent of the total population. As a result, individuals today are more likely to use technology to carry out their operations in various ways, including purchasing essentials, volunteering, doing business, sending merchandise, and performing other tasks. Technology is seen as a medium for making work more pleasant and productive (Rachman & Salam, 2018).

Zakat institutions must use technologies to increase the realization of Islamic social finance, such as zakat, infaq, sadaqah, and other social funds. Especially in organizations that raise and distribute Islamic social finance, such as using social media, websites, and payment applications in collecting zakat. According to Forum Zakat and Filantropi Indonesia (2020), using technologies to expand ZIS collection is critical during and after the Covid-19 pandemic to improve the performance of Zakat institutions. According to Ahmed et al. (2015), Islamic Social Finance plays an essential role in eradicating social injustice and marginalization. Zakat's economic investment is projected to be between $200 billion and $1 trillion (Rehman & Pickup, 2018).

With a Muslim population of 87.18 percent or 232.5 million people, Indonesia has excellent Islamic social finance potential, according to statistics from the Global Islamic Economic Report (2018). According to Badan Amil Zakat Nasional (2019), zakat, infaq, sadaqah, and other social fund collections in Indonesia have increased dramatically over the last ten years, increasing from IDR 1.2 trillion in 2009 to IDR 10.22 trillion in 2019. During the Covid-19 pandemic, zakat, infaq, and sadaqah collections rose by 46% from January to July 2020. It is none other than the massive use of technology in the collection process (Kompas, 2020). However, this amount is still far from the potential zakat in Indonesia of 217 trillion. Thus, the zakat institution still needs more effort to increase the collection's realization (Canggih et al., 2017).

For an organization to improve operational effectiveness and change for the better, it must use technology extensively. Several studies have been conducted to determine the use of technology in zakat institutions. Elsayed and Zainuddin (2020) found that increasing zakat information system technology (ZIST) will improve zakat institutions' performance in Malaysia both in terms of collection and distribution. Johari and Yusoff (2019) also found that Financial Technology's existence makes it easier for *muzakki* to pay zakat. At the same time, it also makes it easier for *mustahik* to obtain zakat. However, no research explains the impact of the TOE Model on the use of technology in zakat institutions in Indonesia during the Covid-19 pandemic. Hence, this research aims to examine the factors that influence technology usage in the Zakat Institution, enabling the zakat institution to improve its services in terms of ZIS collection. This research's primary objective is to investigate the Covid-19 impact on technology usage in the Indonesian zakat institution through the Technology, Organization, and Environmental (TOE) Model. This research only focuses on Islamic social finance collected by the Zakat Institutions in Indonesia.

Literature Review

Zakat Institution in Indonesia

The management of zakat funds in Indonesia has been regulated by Law Number 23 of 2011 concerning Zakat Management (Suprima & Rahman, 2019). The zakat management law regulates the Zakat Management Organization (Organisasi Pengelola Zakat/OPZ), which may operate in Indonesia. The OPZs mentioned in the law are the National Board of Zakat (BAZ) and the Amil Zakat Institute (LAZ), such as Dompet Dhuafa, Rumah Zakat, and Inisiatif Zakat Indonesia (IZI), etc. Collecting, distributing, and empowering zakat in Indonesia must be integrated with the

National Board of Zakat (BAZNAS). The National Board of Zakat (BAZNAS) is an executive government agency to collect or manages zakat. Zakat management is carried out gradually or in stages by the manager or *amil*. The BAZNAS and the Amil Zakat Institution (LAZ) are integrated organizations with a hierarchical relationship (Suprima & Rahman, 2019).

BAZNAS is a non-structural government institution that is independent and accountable to the president through the minister. At the same time, LAZ is a zakat management institution fully formed by the community, confirmed, fostered, and protected by the government. LAZ can be formed from the sub-district. LAZ at the central level can be formed by Islamic community organizations, foundations, or non-governmental organizations that have a national level and operate nationally (Purbasari, 2015; Pangiuk, 2020). In Law Number 23 of 2011, it is explained that BAZNAS functions to plan, implement, and control the collection, distribution, and utilization of zakat as well as to provide accountability reports on the implementation of zakat management.

Theory Acceptance Model (TAM)

The theory Acceptance Model (TAM) was first introduced by Davis (1989), which is a derivative of the Theory of Reasoned Action (TRA) initiated by Fishbein and Ajzen (1975). TRA explains that there are reactions and perceptions of technology use, ultimately impacting attitudes in accepting the technology. TAM states that behavioral intention to use is determined by two beliefs: perceived usefulness and perceived ease of use (Sayekti & Putarta, 2016). Someone will tend to use an application or believe in using a particular system because he believes that the application or system can improve his performance. It is called perceived usefulness. However, sometimes even if a system is believed to improve performance, the user will not consider the system's performance improvement if it is complicated to use. So, there needs to be one more thing that is an additional consideration for using a system, namely perceived ease of use. Perceived ease of use is a condition in which a person believes that there is an ease in using a particular system (Davis, 1989). TAM in this study is related to the dependent: technology usage, where two beliefs influence a person's tendency to use technology, perceived usefulness and perceived ease of use, as stated by (Davis, 1989). In this study, the authors want to know the impact of the TOE Model on technology usage based on TAM.

TOE Model

TOE model developed by Tornatzky and Fleischer (1990). This model describes three things that affect the implementation of technology and information in an organization. The three things are technology, organization, and environment. The technology perspective describes the technology adopted by a company in carrying out its primary operations (Teo et al., 2006). The technology perspective explains how a company uses the existing technology in the company. Bendoly and Kaefer (2004) stated that companies with standard IT infrastructure have made it easier to expand their business. The organizational perspective explains an organization's readiness to use technology, human resources, financial side, and others. Amabile (1988) found that management skills, the drive to innovate from the organization, and the organization's resources help increase innovation. The environmental perspective describes how an organization can continue to adapt to the surrounding environment, such as facing external pressures and adapting to government laws (Shahzad et al., 2020). Miles et al. (1978) found that an organization will be concerned about innovation when faced with a competitive environment.

Previous Studies

Several types of research have been done to identify the role and technology usage in an institution. Elsayed and Zainuddin (2020) found that increasing ZIST will improve zakat institutions' performance in Malaysia in terms of collection and distribution. Esrati et al. (2018) also found that zakat institutions believe technology can improve zakat management and service systems. Utami (2019) found that the interest in paying zakat cannot be fully implemented if it is not supported by increased financial literacy, transparency of zakat reports, and acceleration and optimization of

digital zakat management in Islamic banking.

Another result from Yahaya and Ahmad (2019) found that the performance expectancy, social influence, and facilitating conditions; significantly affected the acceptance of financial technology among *mustahik* in zakat distribution. Meanwhile, effort expectancy has no considerable impact. In the same year, Johari and Yusoff (2019) found that Financial Technology's existence makes it easier for *muzakki* to pay zakat. Another research investigated by Rusydian and Widiastuti (2019) found an increase in the productivity of zakat institutions in Indonesia in the 2011-2016 timeframe. Increased productivity due to technological changes.

In the business context, Teo et al. (2006) found that a lack of top management support, unresolved technical matters, a lack of e-commerce strategy, and a lack of ability to assess the cost-benefit of investing in e-commerce are the main factors that hinder the spread of Business-to-Business. Cavalcante (2013) found that corporations will use new, more sophisticated technology to expand their existing business models. Another research investigated by Shahzad et al. (2020) found that organizational readiness, e-commerce knowledge, and supply chain integration significantly impacted e-commerce. In contrast, IT infrastructure and external pressure had no significant effect on e-commerce use. Sukma (2016) found that technological and organizational factors influence the use of K-Cloud, while environmental factors do not affect the use of K-Cloud at the Ministry of Communication and Information Technology of the Republic of Indonesia.

Ngah et al. (2017) found that technology, organization, and the environment had a significant relationship with the implementation of halal warehousing activities. In the context of technology usage, Jahangir and Begum (2007) found that perceived usefulness, ease of use, data security, privacy, and customer attitudes have a significant positive relationship to customer adaptation to using e-banking services. Solomon and Klyton (2020) found that using ICT by individuals positively affects economic growth. Increasing ICT development can be done with policies that support ICT and a skilled workforce.

Research Framework

The research framework explains the relationship between the independent variables (IV) and the dependent variable (DV). There are three independent variables: technology, organization, and environment included. It is the TOE model. In this study, Technology usage became the dependent variable. Based on the relationship between variables, the research framework is depicted in Figure 1.
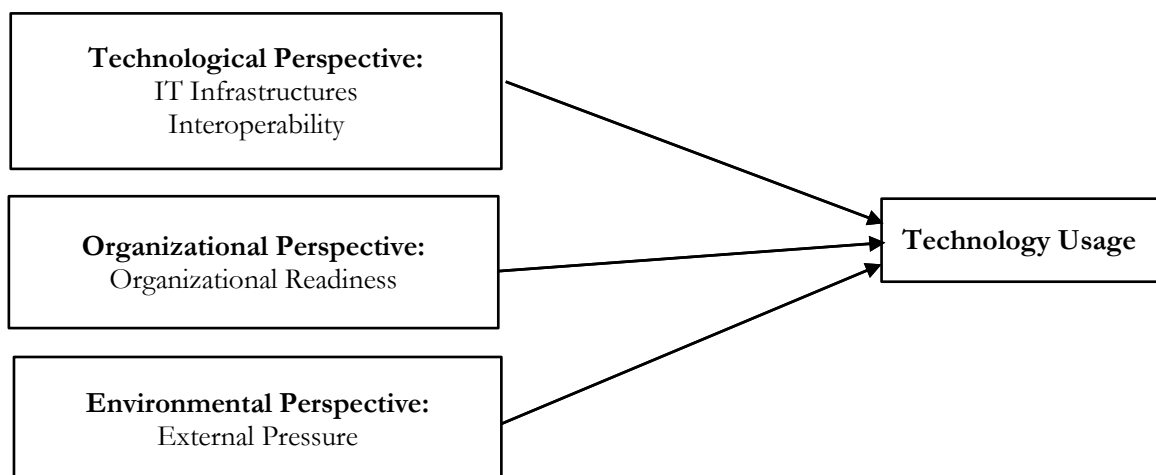
Figure 1: Theoretical Framework Propose and Hypotheses Relationship

Technological Perspective: IT infrastructure describes all IT infrastructure owned and used by zakat institutions. Telecommunications, software, and hardware are part of the IT infrastructure (Shahzad et al., 2020). Table 1 shows IT infrastructure and interoperability indicators that exist in zakat institutions. According to Weill and Vitale (2002), the existence of an IT infrastructure that is flexible and has adequate capabilities significantly impacts company performance. In addition, a

complete telecommunications infrastructure and database measure an organization's ability to develop its business (G. Premkumar & Ramamurthy, 1995).

Meanwhile, interoperability is related to the connectedness or integration between one technology and another. Research conducted by Teo et al. (2006) stated that the existence of interoperability would increase the efficiency of a company. However, in the context of zakat institutions, does interoperability have a significant positive effect on the use of technology? In this study, we want to investigate the impact of IT infrastructure owned by zakat institutions and interoperability between technologies on the use of technology. Therefore, we propose hypotheses:

H_1: IT Infrastructures have a significant positive impact on technology usage
H_2: Interoperability has a significant positive impact on technology usage

Organizational Perspective: In this case, organizational readiness relates to how an organization or company prepares to innovate (Grover, 1993). According to Asif and Mandviwalla (2005), organizational readiness is a vital variable in an organization's adoption and use of technology. Organizational readiness can include the ability of an organization to adapt its culture to changes in the use of technology, continuously build new skills, and support from all components within the organization. In this study, we want to investigate the impact of organizational readiness on technology usage. Therefore, we propose a hypothesis:

H_3: Organizational Readiness has a significant positive impact on technology usage

Environmental perspective: In this case, external pressure relates to an organization dealing with external parties such as competitors, customers, or the government (Tornatzky & Fleischer, 1990). The competitive environment, be it business partners, customers, government regulations, or social and legal environment, affects the behavior of companies in developing their business (Teo et al., 2006). In the context of zakat institutions, we want to investigate the impact of external pressure on the use of technology. Therefore, we propose a hypothesis:

H_4: External Pressure has a significant positive impact on technology usage

Table 1: TOE Framework

Construct	Item	Measure	References
IT Infrastructures	IT1	Adequate IT Infrastructure in Zakat Institution during Covid-19	Broadbent et al. (1999); Grover (1993)
	IT2	The existing muzakki database infrastructure	Grover (1993); Grover et al. (1995)
	IT3	Current telecom infrastructure in Zakat Institution	Grover (1993); Grover et al. (1995)
	IT4	Adequately IT expertise in the Zakat Institution	Broadbent et al. (1999)
Interoperability	IN1	Interoperability between new-financial technology and legacy system in collecting ZIS	Janssens & Cuyvers (1991)
	IN2	Adequate integration between ZIS collecting technology with existing application and system	Janssens & Cuyvers (1991); Premkumar (2000)
	IN3	Interoperability between ZIS technology and ziswaf collecting partner (Bank, E-Commerce, etc.)	Angeles et al. (2001); Premkumar (2000)
	IN4	The existing mechanisms for protecting data and information when paying ZIS using technology	Premkumar (2000)
	IN5	Adequate ZIS payment system using technology	Angeles et al. (2001)
	IN6	Robust, Stable, and standardized IT Infrastructure	Angeles et al. (2001)

Construct	Item	Measure	References
Organ. Readiness	OR1	Abilities in adjusting the culture of zakat institution with changes in technology usage	Barrett (1999)
	OR2	Abilities in adjusting changes in the job description and organizational structure during Covid-19	Angeles et al. (2001); Grover et al. (1999)
	OR3	Re-design the business processes	Angeles et al. (2001); Grover et al. (1999)
	OR4	Adequate support from all departments in the context of technology usage	Angeles et al. (2001); Grover et al. (1995)
	OR5	Continuous innovation from the institution	Grover (1993)
	OR6	Keeping IT staff adequately trained on up-to-date ZIS financial technologies	Angeles et al. (2001)
	OR7	Enough time to develop a new skill	Grover et al. (1995)
	OR8	External Consultant support	(Gable, 1996); Grover et al. (1995)
External Pressure	EP1	Support from government regulations in the use of ZIS collection technology	Tornatzky & Fleischer (1990)
	EP2	Competitive pressure from the other zakat institution in technology usage	Angeles & Nath (2000); Sheikh et al (2018)
	EP3	Pressure from muzakki and the need to be relevant in technology usage	Angeles & Nath (2000); Hashim (2006)
Technology Usage	TU1	Technology usage increases zakat institution's performance	Davis (1989)
	TU2	Technology usage increase productivity	Davis (1989)
	TU3	Using technology reduces the time on unproductive activities	Davis (1989)
	TU4	Interaction with technology is easy to understand	Davis (1989)
	TU5	Technology provides helpful guidance in performing a task	Davis (1989)

Research Methods

Data Collection

This research uses a quantitative approach where data is collected by the survey method using Google Forms. We distributed this research questionnaire from December 15, 2020, until the end of December 2020. In this study, 126 respondents answered. However, only 125 respondents could be used for data analysis after sorting the data. Respondents are amil zakat at the Zakat Management Organization (OPZ), both the National Board of Zakat (BAZNAS) and the Amil Zakat Institution (LAZ). Demographic segregation is based on sex, age, education level, and position in the zakat institution. Besides, we also asked which technology platforms were encouraged to pay zakat the most. Data were analyzed using PLS (Partial Least Square). This research consists of independent variables and dependent variables. Measurement of technology, organization, and environment variables uses a Likert scale of 1 to 5 to determine respondents' responses to the questions, especially the impact of Covid-19 on technology usage.

Sample Profile

Table 2 shows the positions of the respondents. Most of the respondents are staff in zakat agencies and institutions. Overall, the staff who answered worked in the role of; marketing, funding, budget control, sharia compliance, reporting, administration, reporting, finance, *da'wah* program, zakat advisor, zakat researcher, *mustahik* verifier, IT, distribution, and supervision. The other respondents are the head of the division/department, zakat researcher, manager, corporate secretary, and director.

Table 3 shows respondents according to sex, age, and level of education. Of the 125 respondents, there were 69 men and 56 women. There are 92 (74%) respondents aged 20-30 years,

18 (14%) respondents aged 31-40 years, there are 10 (8%) respondents aged 41-50 years, and there are 5 (4%) respondents above 50 years. Based on the level of education, there were 103 (82.4%) respondents who graduated with undergraduate degrees, 9 (7.2%) respondents were graduates with masters, 8 (6.4%) respondents were diploma graduates, 4 (3.2%) respondents were graduates from high school, and 1 (0.8%) is Doctoral graduates.

Table 2. Respondents According to Position

Position	Frequency	Percent (%)
Staff	94	75.2
Manager	9	7.2
Head of division	14	11.2
Zakat Researcher	2	1.6
Head of Branch	2	1.6
Director	2	1.6
Corporate Secretary	2	1.6
Total	**125**	100

Table 3. Respondents According to Sex, Ages, and Level of Education

Respondents	Number	Percent (%)
Sex:		
Men	69	55.2
Women	56	44.8
Ages:		
20-30	92	74
31-40	18	14
41-50	10	8
Above 50	5	4
Level of Education:		
Senior High School	4	3.2
Diploma	8	6.4
Undergraduate	103	82.4
Masters	9	7.2
Ph.D.	1	0.8

Table 4. Respondents According to Province

Province	Frequency	(%)
Jakarta	35	28.0
West Java	29	23.2
Banten	17	13.6
East Java	8	6.4
South Sulawesi	7	5.6
West Nusa Tenggara	8	6.4
Yogyakarta	5	4.0
Central Java	3	2.4
North Sumatera	4	3.2
Riau	2	1.6
East kalimantan	3	2.4
Bengkulu	1	0.8
Batam	1	0.8
South Sumatra	1	0.8
West Sumatra	1	0.8
Total	**125**	**100**

Table 4 Shows respondents by province where they work. Overall, respondents who answered came from 15 provinces. Most respondents came from the province of Jakarta.

Data Analysis

The impact of technology use on the National Zakat Board and institutions is analyzed from three perspectives: technology, organization, environment, or the TOE Model approach. The research data were analyzed using SmartPLS 3.3.2 to perform model testing. Testing the relationship between two quantitative and continuous variables uses the correlation technique to evaluate the research hypothesis. One hundred twenty-five respondents from various zakat organizations in Indonesia participated in this research survey. SPSS 26 is used to check outliers, delete unanswered data, and perform data normality tests.

Meanwhile, the SmartPLS 3.3.2 statistical application is used to analyze survey data. According to Chin et al. (1996), the minimum number of samples used in research using the PLS-SEM method is in the range of 30-100. So, 125 respondents can be said to be sufficient. The discussion will focus on the research objectives and hypotheses that have been set. The survey contains five Likert scale responses to questions about using technology in zakat institutions during the Covid-19 pandemic. Respondents were also asked what platform Muzakki uses most to pay zakat to BAZNAS or LAZ. Figure 2 below shows the answers of 125 respondents about the medium most often used to pay zakat.
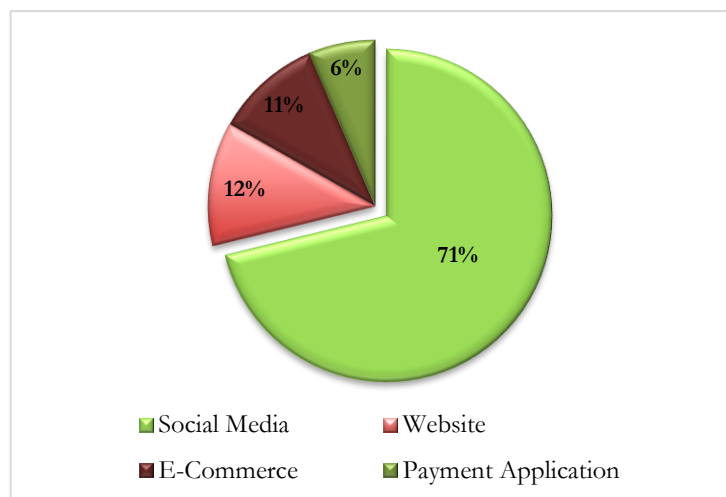

Figure 2. Technology Platform that Encourages Muzakki to Pay ZIS

Assessment of Measurement Model

The first step that needs to be done in conducting an analysis using SmartPLS 3.3.2 is to assess the measurement model. The outer model sets the relationship between the analyzed variables or indicators and the latent variables. It serves to ensure the reliability and validity of the construct. Composite reliability (CR) was used to measure the reliability indicator. There are two types of validity in PLS-SEM; convergent and discriminant validity. Convergent validity determines the relationship between indicators (items) and their latent constructs or variables or a set of indicators representing a latent variable. Convergent validity is known from the Average Variance Extracted (AVE) value. Meanwhile, discriminant validity is the loading factor value on the latent variable with its indicators (Hair et al., 2014; Hair et al., 2017). It is illustrated by the Fornel Larcker criteria and cross-loading values.

Individual Item Reliability and Validity

Several preconditions must be done before testing the hypothesis. The first step that must be done is to use composite reliability (cr) to determine the consistency reliability of all indicators in the model (Cronbach & Meehl, 1955). Ideally, the value of composite reliability is greater than 0.7 (Hair

et al., 2010). Table 5 shows that all values of composite reliability have values above 0.7. The second step is assessing validity, namely knowing the convergent validity and discriminant validity values. Convergent validity is considered adequate when the average variance extracted (AVE) is 0.5 or more. AVE values of less than 0.5 should be removed to improve data quality (Hair et al., 2014). A value of 0.5 or more means that one latent variable can explain more than half of the indicators' variance on average (Hair et al., 2014). In this study, the AVE values for each construct were above 0.5. That is, this study passed the convergent validity test. External pressure (EP) value is 0.535, IT Infrastructures (IT) is 0.573, Interoperability (IN) is 0.538, Organizational Readiness (OR) is 0.519, and Technology usage (TU) is 0.636.
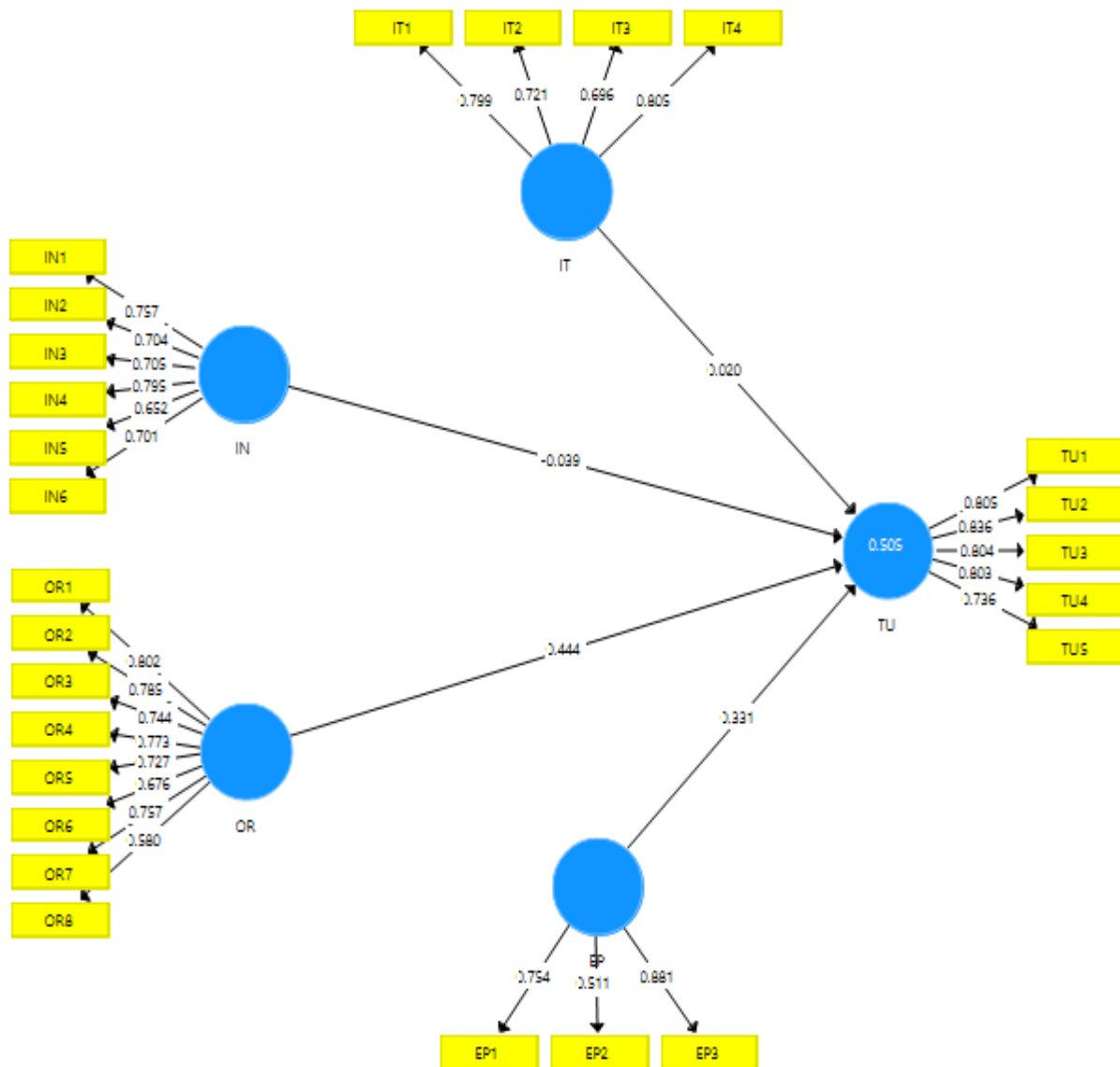

Figure 3. The Assessment Measurement

     Table 5 shows the value of outer loading—the greater the outer loading value, the stronger the relationship between the indicator and the variable. In social science, indicators with outer loading below 0.7 (between 0.4 and 0.7) can be maintained if they affect research validity (Hair et al., 2017). The table results show that all constructs pass the reliability test and have a valid measure according to parameter estimates and statistical significance (Chow & Chan, 2008). Figure 3 shows the complete model result; the R square (R^2) value is 0.505. It means that the independent variable (exogenous constructs) has an effect of 0.505 on the dependent variable (endogenous construct). According to Hair et al. (2017), the value of 0.505 explains that the dependent variable has a moderate effect on the dependent variable.

Table 5. Internal Consistency Reliability and Convergent Validity

Construct	Items	Outer Loading	Composite Reliability	Average Variance Extracted (AVE)
TU	TU1	0.805	0.897	0.636
	TU2	0.836		
	TU3	0.804		
	TU4	0.803		
	TU5	0.736		
IT	IT1	0.799	0.842	0.573
	IT2	0.721		
	IT3	0.696		
	IT4	0.805		
IN	IN1	0.757	0.866	0.519
	IN2	0.704		
	IN3	0.705		
	IN4	0.795		
	IN5	0.652		
	IN6	0.701		
OR	OR1	0.802	0.902	0.538
	OR2	0.785		
	OR3	0.744		
	OR4	0.773		
	OR5	0.727		
	OR6	0.676		
	OR7	0.757		
	OR8	0.58		
EP	EP1	0.754	0.768	0.535
	EP2	0.511		
	EP3	0.881		

Discriminant Validity

The next step is to conduct a discriminant validity test, as Anderson and Gerbing (1988) proposed. Discriminant validity describes how a construct is different from other constructs or how much the indicators represent a construct (Hair et al., 2010; Gholami et al., 2013; Hair et al., 2014). The way to evaluate discriminant validity is to look at Fornell and Larcker's (1981) criterion and cross-loading indicators' value. Cross-loading provides a condition that each item's loadings have a higher value than the cross-loadings on other variables. Fornell and Larcker's (1981) discriminant validity looks at the comparison of constructs and the square root of AVE, where each construct's AVE value must be higher than the highest square correlation with other constructs.

Meanwhile, Cross loading provides a condition that each item's loadings have a higher value than the cross-loadings on different constructs. In this study, Fornell and Larcker's criterion for external pressure (EP) was 0.732, the value of IT infrastructures (IT) was 0.757, organizational readiness (OR) was 0.733, and interoperability (IN) was 0.721, and technology usage (TU) was worth 0.798. Tables 6 and 7 show the Fornell-Larcker Criterion and Cross loadings values.

Table 6. Fornell-Larcker Criterion

	EP	IE	OR	TI	TU
EP	0.732				
IT	0.516	0.757			
OR	0.730	0.764	0.733		
IN	0.493	0.733	0.682	0.721	
TU	0.646	0.501	0.674	0.441	0.798

Table 7. Cross Loadings

	EP	IE	OR	TI	TU
EP1	0.754	0.475	0.593	0.472	0.453
EP2	0.511	0.306	0.372	0.181	0.208
EP3	0.881	0.380	0.614	0.387	0.633
IT1	0.458	0.799	0.586	0.510	0.455
IT2	0.239	0.721	0.469	0.498	0.224
IT3	0.227	0.696	0.419	0.563	0.219
IT4	0.496	0.805	0.729	0.654	0.475
OR1	0.503	0.610	0.802	0.505	0.557
OR2	0.602	0.584	0.785	0.464	0.562
OR3	0.535	0.535	0.744	0.429	0.534
OR4	0.593	0.617	0.773	0.486	0.513
OR5	0.537	0.613	0.727	0.573	0.478
OR6	0.396	0.621	0.676	0.614	0.333
OR7	0.549	0.593	0.757	0.633	0.510
OR8	0.551	0.305	0.580	0.344	0.403
IN1	0.354	0.612	0.570	0.757	0.264
IN2	0.379	0.511	0.490	0.704	0.365
IN3	0.211	0.604	0.448	0.705	0.262
IN4	0.383	0.670	0.568	0.795	0.359
IN5	0.377	0.416	0.388	0.652	0.265
IN6	0.398	0.370	0.469	0.701	0.351
TU1	0.432	0.397	0.486	0.312	0.805
TU2	0.459	0.458	0.562	0.372	0.836
TU3	0.527	0.347	0.492	0.222	0.804
TU4	0.584	0.408	0.541	0.377	0.803

Variance Inflation Factor (VIF)

Table 8 shows the correlation value for the Variance Inflation Factor (VIF). The results showed that all constructs had a VIF value of less than 5.0. according to Hair et al. (2017), if the VIF value is less than 5.0, the study data is free from serious collinearity problems.

Table 8. VIF Values

	EP	IE	OR	TI	TU
EP					2.165
IT					3.042
OR					3.970
IN					2.348
TU					

Hypotheses Testing

A structural model assessment is known by looking at a direct relationship model. This analysis produces the path coefficient and t-values. Based on Hair et al. (2017), if the t-value is greater than 1.96 with a significance level of the p-value of 0.05 (5%), the independent variable significantly affects the dependent variable. Among the four hypotheses tested in this study, two hypotheses were supported, and two were not supported. Table 9 below shows the Results of Hypotheses Testing.

The structural model in PLS-SEM describes the relationship between all latent variables in research on endogenous constructs. This study's results indicate that the four existing hypotheses support two hypotheses. The p-value for external pressure is 0.001, the p-value for IT Infrastructure is 0.855, the p-value for organizational readiness is 0.003, and the p-value for interoperability is 0.698. The variables that represent the organization and the environment, namely organizational readiness and external pressure with a beta value of 0.331 and 0.444, have a

significant positive effect on the use of technology; this means that they support H$_3$ and H$_4$. The technological factors represented by IT Infrastructure and interoperability with a beta value of 0.020 and -0.039 have no significant effect on the use of technology during the Covid-19 period in zakat institutions in Indonesia; this means that they do not support H$_1$ and H$_2$.

Besides, we also tried to evaluate the R Square (R$_2$) value used to measure the model's predictions' accuracy. R$_2$ describes the combined value of exogenous variables against endogenous variables. Values between 0 and 1. 0.25 represent a weak prediction accuracy level, 0.5 represents a moderate predictive accuracy level, and 0.75 represents a substantial prediction accuracy level (Henseler et al. 2009; Hair et al. 2011). R$_2$ in this study was 0.505 or moderate. Cross-validated redundancy (Q$_2$) is a way to determine the predictive relevance of the inner model. The value of Q$_2$ in this study is 0.300. Q$_2$>0 shows evidence that the observed values have been reconstructed well. Thus exogenous constructs have predictive relevance over endogenous constructs (Hair et al., 2017). The f$_2$ describes the effect size. This study's f$_2$ of external pressure, IT infrastructures, organizational readiness, and interoperability were 0.102, 0.000, 0.100, and 0.001. In general, the f$_2$ of this study is small. The rules for assessing the effect size are 0.02, 0.15, and 0.35, which means small, medium, and large (Cohen, 1988).

Table 9. Path Coefficient and Hypotheses Testing

Relationship	Path Coefficient	SD	t values	P Values	Decision
EP → TU	0.331	0.102	3.241	0.001	Supported
IT → TU	0.020	0.111	0.183	0.855	Not Supported
OR → TU	0.444	0.146	3.036	0.003	Supported
IN → TU	-0.039	0.101	0.389	0.698	Not Supported

Results and Discussion

The research results are in line with the objectives. This study aims to provide information about what factors influenced the use of technology in zakat institutions in Indonesia during the Covid-19 period. In the context of applications that encourage *muzakki* to pay zakat, infaq, and sadaqah (ZIS), among 125 respondents, we found that most *muzakki* (71.2%) were motivated to pay ZIS through social media technology platforms such as Facebook, Instagram, WhatsApp, etc. Following data from the Global Digital Overview Report (2020), out of 175.4 million internet users in Indonesia, 160 million actively use social media. The rest is driven by other technology platforms such as e-commerce, websites, and payment applications in the Playstore. It happens because the general public uses social media applications the most.

In analyzing the data, exogenous constructs were diagnosed with endogenous variables. The hypothesis's formulation follows a questionnaire distributed to amil in zakat institutions in Indonesia. In general, there are two statistical applications used to perform the analysis. SPSS 26 is used to test data normality. All variables passed the Skewness-Kurtosis normality test, with the value range of each variable still between -1.96 to +1.96. After the normality test, the analysis used SmartPLS 3.3.2. Two of the four hypotheses are supported, and two are not supported. It means that two hypotheses support the organization's perspective and the environment, and one perspective is not supported, namely the perspective of technology.

Organizational readiness (H$_3$) had a significant positive effect on the use of technology in zakat institutions during Covid-19. It is very appropriate because organizational readiness is related to the ability of the zakat organization to adapt its culture to changes in the very rapid use of technology during the Covid-19 period. Besides, organizational readiness is also associated with zakat institutions' ability to continue providing adequate training regarding the technology used to adjust to the rapid changes during Covid-19. Organizational readiness makes zakat institutions able to adapt to new challenges. In addition, organizational readiness is related to the ability to innovate and upgrading of new skills of the amil in zakat institutions. This finding is supported by many studies, such as research conducted by Shahzad et al. (2020) and Alam et al. (2011). These results are also consistent with research conducted by Premkumar and Roberts (1999), Ismail and Azwadi (2013), and Ngah et al. (2017) in the context of SMEs and Halal warehousing.

External pressure (H_4) had a significant positive effect on the use of technology in zakat institutions during Covid-19. This study found that the use of technology in zakat institutions in Indonesia during Covid-19 is positively influenced by regulatory support from the government, competition between zakat institutions, and the urge to constantly adjust to the needs of muzakki in zakat payments. This finding proves that zakat institutions will be encouraged to increase the use of technology when there is strong regulatory support. Competition between zakat institutions is not an obstacle to the progress of zakat institutions in the context of the use of technology, but it will lead to increased innovation and service improvement. This study's results are consistent with the results of research conducted by Premkumar and Roberts (1999), Lertwongsatien and Wongpinunwatana (2003), Sophonthummapharn (2009), and Ngah et al. (2017) in SMEs and Halal warehousing.

Meanwhile, IT infrastructure and interoperability did not significantly affect the use of technology in Indonesia's zakat institutions during Covid-19. The possible reason is that the increasingly complex technological infrastructure such as the zakat payment system will increase the difficulty of muzakki in understanding the technology provided by zakat institutions because a zakat payment technology must be user-friendly and easy to understand. For example, the simpler the interface of a zakat payment application will make it easier for muzakki to understand and use the application. It also follows research conducted by Govinnage and Sachitra (2019), and Shahzad et al. (2020).

It also applies in the context of interoperability, which does not significantly affect technology usage. As research conducted by Shahzad et al. (2020), the complexity of technology will cause difficulties in using technology. The connection between the zakat payment technology and all the zakat institution technologies will cause the complexity of the technology interface even though the indicators used for the technology usage in this study are perceived usefulness and perceived ease of use according to the Theory Acceptance Model (TAM). So, it is natural that interoperability does not affect significantly because, in this study, the technology usage indicator is only two things. Interoperability will not significantly affect the use of technology because it will cause system complexity. Likewise, it has no significant effect regarding variations in technology use because the measuring tool is whether it is useful or easy to understand when the muzakki uses a payment technology.

The more frequent use of zakat collection technology by *muzakki* will undoubtedly improve zakat institutions' performance in zakat collection. A good environment in the form of competition for zakat collection with other zakat institutions, regulatory support from the government, and the drive always to be relevant to the needs of muzakki affects the use of technology. Based on this, the organizational readiness in using technology needs to be maintained and enhanced by zakat institutions to improve the zakat collection performance.

On the other hand, good external pressure makes the performance of the zakat institution even better. In external pressure, Indonesia is a country with many zakat institutions, both BAZNAS and LAZ. Each zakat institution must understand and learn how to develop zakat collection by other institutions and how they can effectively collect the zakat. The research results show that other zakat institutions are influencing the use of technology. However, in terms of IT Infrastructure and interoperability, the complexity of IT infrastructure is not significant for technology use. So, we need a technology design that is easily understood by the general public.

Conclusion

Although Indonesia's zakat collection has increased yearly, it is still far from its existing potential. So, an efficient zakat collection approach is needed. Data from Forum Zakat & Filantropi Indonesia 2020) shows the importance of using technology in collecting zakat. By analyzing the development of zakat organizations, this study tries to understand the factors that encourage and hinder the use of technology. This study uses the TOE framework divided into four variables: IT Infrastructure, interoperability, organizational readiness, and external pressure. Organizational readiness and external pressure are shown to have a significant relationship. Meanwhile, IT infrastructure and technology interoperability does not have a significant relationship. It is

consistent with Govinnage & Sachitra's (2019) research and Shahzad et al. (2020). The reason is that the increasingly complex IT infrastructure makes it increasingly tricky for technology users to use and understand technology.

This study's limitation is that there are difficulties for some respondents to understand some of the questions in the questionnaire; this may lead to improper answers from respondents. Future researchers need to consider other variables and indicators that might lead to improved use of technology in zakat institutions. In the end, this study recommends future researchers investigate other factors that may affect the use of technology to improve the performance of zakat institutions and use longitudinal data.

Author Contributions

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