

DOES "IS" INNOVATION DIFFUSION CONTRIBUTE TO THE NON-FINANCIAL PERFORMANCE OF THE VILLAGE GOVERNMENT?

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ABSTRACT

This research paper analyzes the Influence of IS innovation diffusion on the performance/ outcome of the village government. Besides this paper also determines the role of organizational support and technological advantage in determining performance. Finally, this study researched these variables as moderating between IS innovation diffusion and implementation. The primary data was collected through a survey and analyzed using the smart-pls. The result shows that the technological advantage is significantly associated with the performance of the village government. This finding contributes to the technology organization environment.

Keywords: IS Innovation Diffusion; Organization Support; Technology Advantage; Village Government; Indonesia

ABSTRAK

Penelitian ini menganalisis pengaruh difusi inovasi SI terhadap kinerja pemerintah desa. Selain itu, penelitian ini juga menentukan peran dukungan organisasi dan keunggulan teknologi dalam menentukan kinerja. Terakhir, penelitian ini juga meneliti variabel-variabel tersebut sebagai variabel pemoderasi antara difusi inovasi SI dan kinerja. Data primer dikumpulkan melalui survei dan dianalisis menggunakan smart-pls. Hasil penelitian menunjukkan bahwa keunggulan teknologi berpengaruh secara signifikan dengan kinerja pemerintah desa. Temuan ini secara teoritis berkontribusi pada technology organization environment.

Kata Kunci : Difusi Inovasi SI; Dukungan Organisasi; Keunggulan Teknologi; Pemerintah Desa; Indonesia

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INTRODUCTION

The e-government era has been accompanied by many transformations in public sector organization administration (Zavattaro & Brainard, 2019). Public sector organizations have started adopting the digital government strategy to integrate with their customer and partner institutions. The IS has become a crucial part of the toolkit for public administrators, given the capability to integrate with their partners and societies (Mergel, 2013). Due to the rising utilization of technology in the government and the interplay between the government and citizens via the website government motivate alteration in the bureaucracy of internal government (Roengtam et al., 2017). In this condition, governments have to reconsider their designs of social media and shift the rising demand for entrance to unfasten data and user involvement into a new structure that authorizes society empowerment (Hossain et al., 2018). Web-based technology has two functions: internal and external. Internally, the application of the web and other communication and information technologies has become an efficient and effective managerial tool to gather, save, arrange, and govern information and data (Adiputra et al., 2018). Externally, technology based on the web can ease public connection within society.

Swanson and Ramiller (2004) argue that IS innovation refers to the invention of digital and communications technology and its application. There are several benefits to why IS innovations must be done in an organization. Moghavvemi et al. (2012) state that IS innovation generates changes by improving its effectiveness or performance. In addition, other experts inform that the information system is a source of an organization's competitive advantage (Bharadwaj, 2000). Hence, IS innovation can create valuable resources and link to an organization's performance. Innovations diffusion refers to the procedures through which new technology is embraced by many actors throughout the community - essential for social, economic, and ecologically sustainable development (Palm, 2022). Experts have provided designs, in particular, dealing with innovation in information systems (Rogers, 1995). These designs were frequently directed as phase-based operations, such as the three phases of initiation, adoption, and implementation (Grover & Goslar, 1993). This diffusion procedure and the process is complex and dynamic; inspecting these procedures entails understanding the fundamental evolutionary shift across time (Wu & Chuang, 2010).

The previous research investigating the association between performance and IS innovation diffusion has been done largely (Ranganathan et al., 2004; Tanriverdi, 2005; Wu & Chuang, 2010; Wu & Chen, 2014; Zaitul et al., 2022). Ranganathan et al. (2004) investigate the diffusion of web technology for supply chain management (SCM) and performance. Tanriverdi (2005) research the effect of e-knowledge management and the performance of Fortune 1000 companies. In addition, Wu and Chuang (2010) determine the impact of e-supply chain management diffusion and performance. Hence, Wu and Chen (2014) researched the IS innovation diffusion and performance. They also test the TOE variables as moderating variables. Therefore, Zaitul et al. (2022) found that the diffusion of IS innovation in the village (village-based tourism) government positively affects internal process performance. Thus, they also conclude that technological advantage plays a full moderator between the diffusion and performance of the village-based tourism government. Future investigation is suggested to add another TOE variable as moderating variable and test using other village governments, such as village government with no tourism destination (Zaitul et al., 2022). Further, the role of technology organization environment (TOE) variables: organization support, and technology advantage as moderating variables between IS innovation diffusion and performance also have been conducted (Elbanna & Newman,

2022; García-Sánchez et al., 2018; Hsu et al., 2018; Wu & Chen, 2014). García-Sánchez et al. (2018) Studied the assignment of top management support (organization support) as independent and moderating variables on performance measured by reverse logistics. In addition, Hsu et al. (2018) investigate whether the organization's support contributes to service innovation and analyze its moderating role. Finally, Elbanna and Newman (2022) also examine the effect of organizational support on digital transformation and performance.

Based on prior research, studies on IS innovation diffusion and performance and the role of the TOE variables have been done using the private sector or companies – a very limited of previous studies applied to the public sector, especially the village government. The village government is Indonesia's lowest-tier government type (Antlöv et al., 2016). The IS innovation diffusion is working in this kind of organization. Therefore, it needs to study the effect of this diffusion on performance. This study aims to confirm the resources-based theory since the IS innovation diffusion produces the IS asset and IS capability (Santhanam & Hartono, 2003; Wade & Hulland, 2004). Assets are intangible or tangible resources employed to generate, make, or deliver products/services to a community or marketplace. In addition, capabilities are related to repeatable activities in utilizing assets to design, manufacture, or provide services or products to a community (Grant, 1991; Wade & Hulland, 2004). In addition, another study objective is to confirm whether the TOE framework can explain this phenomenon. Specifically, this research paper analyzes the Influence of IS innovation diffusion on the performance/ achievement of the village government. Besides this study also determines the role of organizational support and technological advantage in determining performance. Finally, this study researched these variables as moderating variables between IS innovation diffusion and performance. The research framework is shown in Figure 1.

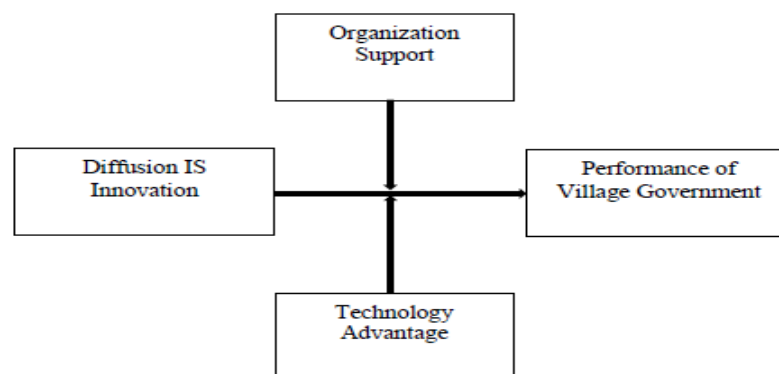


Figure 1. Research Framework

METHOD

This study involves forty-seven village governments in Pariaman City, excluding the village-based tourism government. The reason for selecting Pariaman City as the research object is that this city is moving forward as a digital city. The village administration has started the IS innovation. Four respondents from four divisions represent each village government: secretariat, general affairs, planning affairs, and financial affairs. The primary data using questionnaires are collected through a survey. Surveyors visit the village government office, leave four questionnaires, and ask them to complete them. They are given one week time to finish it. A week later, the surveyor

collected the questionnaires from the office—three variables were used in this study: dependent, independent, and moderating. Society perspective performance is the dependent variable of this study. This variable is measured by eight indicators (items) developed by experts and previous studies (Ellingson & Wambsganss, 2001; Hoque & James, 2000; Maiga & Jacobs, 2003; Solano et al., 2013; Yenyurt, 2003). The independent variable is the diffusion of IS innovation. There are two dimensions for these variables: (i) the extent to which the users' behaviors across various IS innovations and (ii) various diffusion stages (Fichman, 2001) with seven items. Finally, moderating variables are technology advantage (three items) and organization support (three items), which were adopted from previous studies (Premkumar & Roberts, 1999; Wang et al., 2010). The detail of the measurement of variables is shown in Table 1.

Table 1. Measurement of Variables

Variable	Code	Item	References
Diffusion of IS innovation	disi1	Uses a computerized system to support the routine work of employees	Fichman (2001), and Wu & Chen (2014)
	disi2	Uses a system to communicate with the community and other institutions	
	disi3	Uses a decision-making support system to support managerial decision-making by the leadership	
	disi4	Uses a knowledge management system to manage employees' intellectual assets	
	disi5	Employees use new technology in their work.	
	disi6	Employee routine work is carried out using new technology.	
	disi7	Government activities using new technology	
Organization support	ors1	The village head likes investing in new technology	Premkumar & Roberts (1999), Wu & Chen (2014), and Wang et al. (2010)
	ors2	The village head encourages employees to use new technology in their routine work.	
	ors3	The village head considers new technology as a strategic issue	
Society perspective performance	socper1	An increase in the quality of services provided to rural communities	Ellingson & Wambsganss (2001), Hoque & James (2000), Maiga & Jacobs (2003), Solano et al. (2013), Wu & Chen (2014), and Yenyurt (2003)
	socper2	An increase in the quality of services provided to rural communities	
	socper3	An increase in the usefulness of services provided to rural communities	
	socper4	An increase in village community satisfaction	
	socper5	A decrease in the waiting period for the completion of services/services to the community	
	socper6	A decrease in the number of public complaints about the services provided	
	socper7	An increase in the promotion of the image and reputation of the village government	

Variable	Code	Item	References
Technology advantage	socper8	An increase in recognition (recognition) of village government services	
	tad1	New technology helps village administrations to communicate better with other institutions and communities.	Premkumar & Roberts (1999), Wu & Chen (2014), and Wang et al. (2010)
	tad2	New technology helps the village government to get timely information for decision-making.	
	tad3	New technology helps the village government to improve its performance.	

Five Likert scales are used to respond to respondents: from very disagree (1) to very agree (5). The data is examined by employing the structural equation model (SEM-PLS) since this study is to develop the model (Chin, 1998) of the relationship between diffusion of IS innovation and performance using the TOE and resources-based theory. In addition, smart-pls are employed, and there are two assessments when using the smart-pls: structural model and measurement model evaluation or assessment (Hair et al., 2017; Vinzi et al., 2010). Measurement model assessment composes two validities: convergent (Hulland, 1999) and discriminant validity (Bagozzi & Yi, 1988; Henseler, 2010). Hence, the structural model assessment employs the Q square and R square (Hair et al., 2017).

RESULT AND DISCUSSION

One hundred and eighty-seven of the forty-seven village government respondents participated in this study. Table 2 indicates that the demographic data comprises five segments: sex, education, position, experience, and age.

Table 2. Demographic Data of The Respondent

Demographic Data	Category	Frequency	Percent
Sex	Male	39	20.86
	Female	148	79.14
Education	Diploma	17	7.49
	Bachelor	116	62.03
	Postgraduate	2	1.07
	Others	52	27.81
Position	Secretary	47	25.13
	General affair	47	25.13
	Planning affair	46	24.59
	Finance affair	47	25.13
Experience	< 5 years	86	45.98
	5-10 year	60	32.09
	> 10 years	41	21.93
Age	22- 30-year-old	61	32.62
	31-40-year-old	78	41.71
	41- 50-year-old	30	16.04
	> 50-year-old	18	9.63

The statistical description of variables is demonstrated in Table 3. The valid indicator is applied for all variables. The performance level using three indicators is 4.22 or 84.40 (100 scales) and can be categorized as high performance (Arikunto, 2010). The second variable (IS innovation diffusion) means 3.99 or 79.80 and is grouped as adequate. In addition, technology advantage has 4.12 or 82.4 and is categorized as high technology advantage. Finally, organization support has 3.91 or 78.2 and is considered adequate support from the organization.

Table 3. Statistic Descriptive of Research Variables

Indicator	N	Minimum	Maximum	Mean	Std. Deviation
soc1	187	2.00	5.00	4.18	0.47
soc2	187	3.00	5.00	4.25	0.45
soc3	187	3.00	5.00	4.24	0.48
Society Performance				4.22	
disi2	187	2.00	5.00	4.09	0.68
disi3	187	2.00	5.00	4.01	0.65
disi4	187	2.00	5.00	4.02	0.64
disi5	187	2.00	5.00	4.00	0.73
disi6	187	2.00	5.00	3.91	0.71
disi7	187	2.00	5.00	3.94	0.72
IS Innovation Diffusion				3.99	
tad1	187	2.00	5.00	4.09	0.63
tad2	187	2.00	5.00	4.13	0.64
tad3	187	2.00	5.00	4.13	0.63
Technology Advantage				4.12	
ors1	187	1.00	5.00	3.81	0.78
ors2	187	2.00	5.00	4.03	0.67
ors3	187	2.00	5.00	3.87	0.77
Organization Support				3.91	

Having analyzed several steps: measurement model assessment (Convergent and discriminant validity) and structural model assessment (Q square and R square), we can conclude that we have a valid measurement model dan good structural model. The measurement model assessment results indicate that the outer loading, Cronbach alpha, composite reliability, and average variance extracted are achieved. In addition, the discriminant validity test using the Farnell-Lacker criterion, cross-loading, and HTMT also indicates that they support the requirements. Hence, structural model assessment using the Q square (above 0) dan R square (moderate) suggests that the structural model requirement is achieved. The result using the bootstrapping output is depicted in Table 4. The first result informs the effect of the diffusion of IS innovation on society's perspective performance. The p-value indicates above 0.05 ($\beta=0.113$, p-value=0.113), and it can be concluded that the diffusion of IS innovation does not affect society's perspective performance.

The second analysis is to see the impact of the organization's support on society's perspective performance. The p-value also indicates above 0.05 ($\beta=0.060$, p-value=0.592) and means that organizational support does not have a significant relationship with society's performance. Thus, the third analysis investigates the relationship between technological advantage and society's performance. The result shows a significant association between technology advantage and society perspective

performance ($\beta=0.339$, $p\text{-value}=0.002$) at 1%. The direction of the relationship is positive. Thus, it means that high technology advantage improves society's perspective performance. The role of the organization support and technology advantage as moderating variables is not documented empirically because their $p\text{-value}$ is greater than 5%. The detail of the bootstrapping result can be seen in Table 4 and Figure 2 for the structural model.

Table 4. Bootstrapping Result

Relationship	Original Sample (O)	T Statistics (O/STDEV)	P Values	Decision
Moderating effect (interaction disi and ors) -> society perspective performance	-0.006	0.096	0.923	Not supported
Moderating effect (interaction disi and tag) -> society perspective performance	0.092	1.578	0.115	Not supported
Diffusion of IS innovation -> society perspective performance	0.113	1.425	0.155	Not supported
Organization support -> society perspective performance	0.060	0.536	0.592	Not supported
Technology advantage -> Society perspective performance	0.339	3.177	0.002	Supported

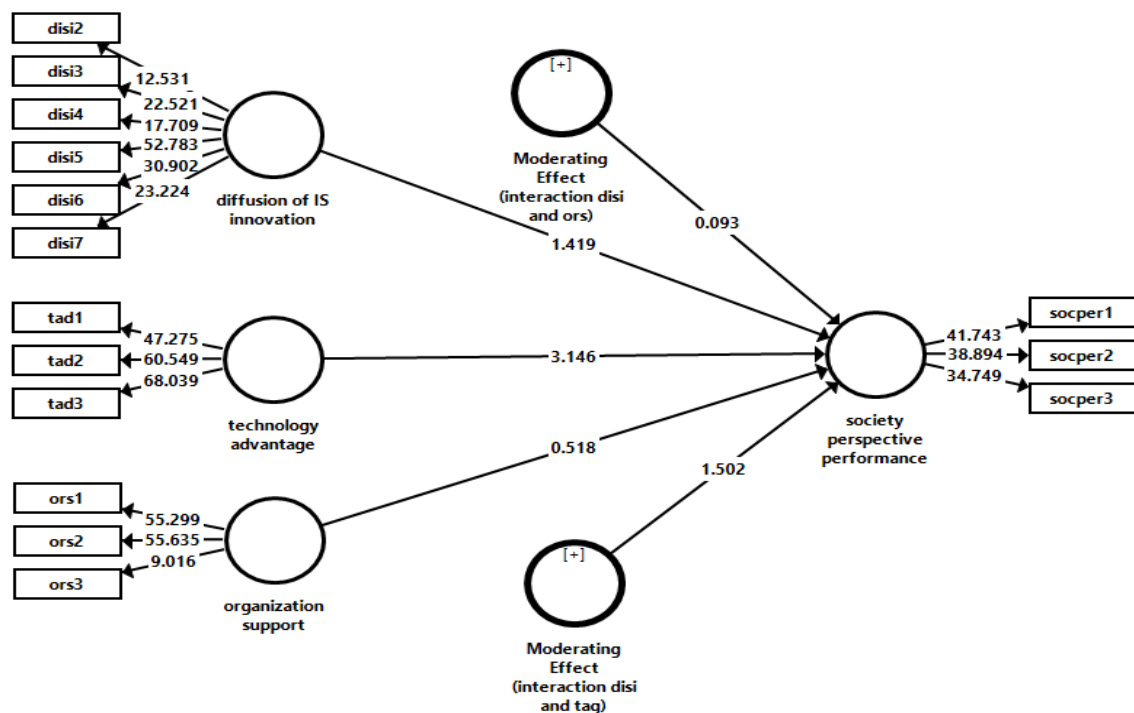


Figure 2. Structural Model

IS Innovation Diffusion and The Performance of The Village Government.

The first finding indicates no significant effect on IS innovation diffusion and performance. The result differs from the past research finding (Palm, 2022; Ranganathan et al., 2004; Tanriverdi, 2005; Wu & Chuang, 2010; Wu & Chen, 2014;

Zaitul et al., 2022). Therefore, the village government has a diffusion process and technology implementation. Still, this diffusion did not create change by improving the performance and effectiveness as expected by an expert (Moghavvemi et al., 2012). In addition, this diffusion of IS innovation failed to create a unique and valuable resource to improve the village government's performance, as suggested by the previous researcher (Wu & Chen, 2014). Therefore, this finding failed to confirm the resources-based theory (Barney, 1991).

The theory of innovation diffusion (IDT) underpins innovation diffusion. It refers to the procedures through innovation conveyed across specific lines from time to time among the social system members (Rogers, 2003). The diffusion procedures or process is dynamic and complex, incriminates an expanding concept over time, and needs a multi-phase investigation to supply insight into the difficulties of executing IS innovation and how they can be resolved in an organization (Wu & Chen, 2014). The Experts have identified the multi stages for innovation diffusion, such as two stages model: adoption and implementation (Rogers, 2003), three stages model (Grover & Goslar, 1993), and four stages model (Swanson & Ramiller, 2004), five stages model (Meyer & Goes, 1988), and six stages model (Rajagopal, 2002).

Many experts have defined the word innovation. For example, Rogers (1995) describes innovation as the premier or premature use of a plan or idea by one of a set of organizations with the same goals. IS innovation refers to communications and digital technology innovation and its application (Swanson & Ramiller, 2004). IT innovation in an organization generates changes by increasing its effectiveness or performance (Moghavvemi et al., 2012). Bharadwaj (2000) argues that the information system is a source of an organization's competitive advantage. Wu and Chen (2014) conclude that IS innovation is positioned to produce a unique and worthwhile resource (resources-based theory) connecting to firm performance. However, this finding failed to confirm the resources-based theory. A possible explanation is that public administration has unique and different characteristics compared to other types of organizations. In addition, the IS innovation in the village government has been adopted and implemented, but it fails to produce a unique and worthwhile resource.

Technology Advantage and The Performance of The Village Government

There is a significant positive relationship between technology advantage and the performance of the village government. The TOE framework can explain this significant relationship. Therefore, the village government perceived the technology to benefit the government more (Rogers, 1995). In addition, the village government evaluated the advantage of new technology before they adopted it (Premkumar & Roberts, 1999). Hence, technology adoption in village government is perceived as reduced turn-around time, better society service, declined cost, and timely information available for decision-making (Premkumar & Roberts, 1999).

This finding is consistent with previous works (Eisend et al., 2016; Erskine et al., 2019; Japutra et al., 2022; Wu & Chen, 2014) and contradict the finding of (Zaitul et al., 2022), who found that there is no direct relationship between the technology advantage and performance of the village-based tourism government. However, the technology advantage moderates IS innovation diffusion and performance (Zaitul et al., 2022). Eisend et al. (2016) found that the relative advantage of marketing over technology capabilities influences new product performance. Hence, Erskine et al. (2019) conclude that technology advantage (using a heats map) contributes to the task technology fit and decision-making performance. Finally, Japutra et al. (2022) found that the relative advantage improves customer engagement behavior with mobile commerce

applications and affects marketing performance. Therefore, the relationship between technology advantage and the village government performance is underpinned by Technology-organization-environment (TOE).

Technology Advantage Moderates the Relationship Between IS Innovation Diffusion and The Performance of The Village Government.

The role of TOE variables (technology advantage) fails to moderate the relationship between IS innovation diffusion and the performance of the village government. Therefore, these findings are inconsistent with previous results (García-Sánchez et al., 2018; Hsu et al., 2018; Wu & Chen, 2014; Zaitul et al., 2022). Wu and Chen (2014) conclude that the technology advantage plays a moderating role between IS innovation diffusion and performance. The diffusion of IS innovation in an organization needs to consider the technology organization environment or TOE framework/model to result in implementation success (Premkumar & Roberts, 1999). This model identified one of its variables: technology advantage. Technology advantage is from the word of technology in TOE. Wang et al. (2010) proposed the technology characteristics (compatibility, complexity relative, and advantage) as determinants of radio frequency identification diffusion (RFID).

The definition of relative advantage is the degree to which an innovation is viewed as supplying greater corporate welfare than the idea it replaces or the status quo (Rogers, 1995). In addition, it is sensible that organizations contemplate the advantages of adopting innovations (Wang et al., 2010). Evaluating the advantages of the new technology is a part of rational adoption decisions in an organization (Premkumar & Roberts, 1999). In addition, Premkumar and Roberts (1999) add that ICT provides several benefits to adopters: time information available for decision-making, better customer service, reduced turn-around time, and reduced cost and. No previous studies investigated the relationship between technology advantage and the performance of the village government.

Several studies analyze the effect of technology advantage and performance on other objects. For example, Wu and Chen (2014) found a relationship between technology advantage and performance. In addition, Eisend et al. (2016) investigated the marketing relative advantage over technology ability in affecting the performance of the new product and found that technology advantage is measured by relative advantage in new product performance. Hence, Erskine et al. (2019) conclude that technology advantage (using a heatmap) contributes to the task's technology relevance and decision-making performance. Finally, Japutra et al. (2022) found that the relative advantage improves customer engagement behavior with mobile commerce applications and affects marketing performance.

Organizational Support and The Performance of The Village Government

The third finding asserts that organizational support does not impact the village government's performance. These findings are supported by previous researchers (Elbanna & Newman, 2022; García-Sánchez et al., 2018; Hsu et al., 2018; Jane Lenard et al., 2014). In addition, Wu and Chen (2014) conclude that organizational support plays a role during IS innovation diffusion, significantly affecting performance. García-Sánchez et al. (2018) found a role of top management support (organization support) toward performance measured by reverse logistics.

Hence, Hsu et al. (2018) also found that top management support contributes to service innovation. Finally, top management support is also found in digital

transformation (Elbanna & Newman, 2022). This finding also indicates that the organization needed to provide a long-term strategic vision, initiative, support, and commitment to creating a positive environment for innovation (McGinnis & Ackelsberg, 1983). Therefore, this study needs to confirm the Theory of Technology Organization environment (Tornatzky & Fleischer, 1990). The reason is that the village government manager may need to understand the IS innovation fully, so they do not support the implementation.

Organizational Support Moderates the Relationship Between IS Innovation Diffusion and The Performance of The Village Government

The role of TOE variables (Organization support) also fails to moderate the relationship between IS innovation diffusion and the performance of the village government. In addition, Wu and Chen (2014) also documented the role of organization support as moderating variable between IS innovation diffusion and performance (Wu & Chen, 2014). In addition, top management support also plays a moderating variable between technological skill and reverse logistics as a proxy for performance (García-Sánchez et al., 2018). Finally, Hsu et al. (2018) found that top management support also moderates the relationship between the openness of technology adoption and service innovation.

This study needs to confirm that the integration of TOE and resources-based theory can solve the performance problem of the village government. Organizational support through top management is crucial in adopting new technologies and has been revealed to be positive (Grover & Goslar, 1993; Premkumar & Roberts, 1999). Organizational support through the support of top management is crucially necessary for the fruitful execution of any system (Lederer & Mendelow, 1988). It can advance support, commitment, a long-term strategic vision, and an initiative to generate constructive circumstances for innovation (Lee & Kim, 2007; McGinnis & Ackelsberg, 1983). Furthermore, Grover and Goslar (1993) add that organizational support is crucial for producing a supportive atmosphere and supplying sufficient assets for implementing new technology. Previous studies about the role of organization support in IS innovation diffusion or technology adoption and the village government performance were none.

The previous studies using the private sector or company were limited. Wu and Chen (2014) conducted the same study and analyzed the role of organizational support and its effect on performance. In addition, they also investigate the role of organization support as moderating variable between IS innovation diffusion and performance (Wu & Chen, 2014). García-Sánchez et al. (2018) found a role of top management support (organization support) toward performance measured by reverse logistics. In addition, top management support also plays a moderating variable between technological skill and reverse logistics as a proxy for performance (García-Sánchez et al., 2018). Hence, Hsu et al. (2018) also found that top management support contributes to service innovation. Then, leading management support moderates the association between technology adoption openness and service innovation (Hsu et al., 2018). Finally, digital transformation supports top management Elbanna & Newman, (2022).

CONCLUSION

This study aims to see the role of a resources-based view and technology organization environment in explaining variation in village government performance. Specifically, this study analyzes the effect of IS innovation diffusion on the performance of the village government. Besides this study also determines the role of

organizational support and technological advantage in determining performance. Finally, this study researched these variables as moderating between IS innovation diffusion and performance. The result shows a positive effect of the technological advantage on the performance of the village government. However, IS innovation diffusion and organizational support do not determine the village government's performance. In addition, the technological advantage and organizational support do not moderate the relationship between IS innovation diffusion and the performance of the village government.

This finding contributes to the technology organization environment in that the village government perceived the technology to benefit the government. In addition, the village government evaluated the advantage of new technology. Hence, technology adoption in village government is perceived as reduced turn-around time, better society service, declined cost, and timely information available for decision-making. Finally, the technological advantage positively influences the village government's performance. Practically, this finding can be used by the village government to improve performance. Therefore, they must use the new technology to communicate better with the partner institution, provide timely information for decision-making, and support the village government to improve performance.

This study has several limitations and offers future research avenues. First, this study was conducted in one city with a limited sample. Therefore, the next investigator can expand the area scope and the sample size to have a robust result. Second, this study analyzes the performance of the village government from limited variables from RBV and TOE. Thus, future research can expand this research by adding other variables from these theories. Finally, this study explains the performance of the village government from these two theories. Hence, future research can see why the village government's performance varies from other perspectives, such as resources dependent theory or agency theory.

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