

Catalyzing Public Sector Transformations with Digital Competencies: An Empirical Study of Indonesia's Ministry of Agrarian and Spatial Planning

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Abstract. Grounded in the resource-based view (RBV) of ministry to improving competitive advantage, the current study attempts to recommend an alternative strategy of development of digital competencies in improving ministry of agrarian and spatial planning performance. The processing technique used to determine the strategy is the fuzzy Analytical Hierarchy Process (FAHP). This research was conducted in Ministry of Agrarian and spatial planning by conducting Focus Group Discussion (FGD) and in-depth interviews with several experts. The experts consist of the Head of the Human Resources Development Center, Head of Organization and Personnel Bureau, Organization and Human Capital Expert, Academician, IT Expert, Ministry inspector general and General director of ministry. The results show that the most dominant factor in improving performance is digital competencies and the actor is the leaders. The following finding is that creation of a digital competency development system is the main objective to improve ministry of agrarian and spatial planning performance and the prior alternative strategy to recommend is by strengthening comprehensive and adaptive digital transformation.

Keywords: Digital Competencies, Organizational Performance, Organizational Transformation, Public Sector.

1. Introduction

Transforming processes and services in the public sector within the framework of digital transformation requires comprehensive organizational efforts (Mergel 2019). Hofmann and Ogonek (2018) identified four main competency areas needed by public sector organizations, namely technical, cognitive, social awareness and impact competencies. Technical competence includes selecting information technology that is appropriate, flexible and adaptive to new technological developments. Social competence is related to ethics and self-confidence in using technology and utilizing forms of collaborative interaction that are possible through information technology. Apart from that, it is able to overcome challenges related to the digitization of processes, documents and services.

Digital competencies have been used for various purposes, especially in the context of employment, education and training, and lifelong learning (Vuorikari et al. 2016). Various countries have attempted to formulate digital competency components that must be mastered to support the implementation of digital transformation, such as DigComp, Essential Digital Skills Framework (EDSF), International Evaluation of Educational Achievement (IEA), International Computer and Information Literacy Study (ICILS), Competences, Qualifications and Occupations (ESCO) Defined the Digital Competencies, and the Irish Government's Digital Skills Framework. In Indonesia, the Government regulates Competency Standards for ASN Positions based on the Minister of State Apparatus Empowerment and Bureaucratic Reform Regulation Number 38 of 2017 and is still general in nature, does not describe digital competency (Rumata and Nugraha 2020).

Broomfield and Reutter (2021) reveal the three most important challenges in considering competency in the public sector, namely skills in managing changes in organizational culture, issues related to privacy and security, and overcoming obstacles related to regulations and regulations. Research from Nwankpa and Roumani (2016) states that digital transformation plays a more colorful role by mediating the impact of digital skills or data technology and bodily capabilities. The public organization must understand the importance of digital transformation and how to use data technology capabilities to improve corporate capabilities.

President Joko Widodo (2020) at the Digital Transfer Programming RATAS said that aspects of the future regime require a Dilan or Digital Serving Regime. This requires updates in public services via electronic (systems). Second, institutional deepening and simplification is needed. Third, we need to improve the quality of our human resources, and fourth, we need to update the management regulations. Multi-criteria decision-making (MCDM) methods help reach important decisions that are not straightforward. The underlying principle of MCDM is that decisions should be based on multiple criteria (Cheng, Li, & Yu, 2005). Since the problems associated with strategic change systems are becoming increasingly complex, it appears that comprehensively handling all problems using a single set of guidelines or decision models seems complicated. The analytic hierarchy process (AHP) uses deduction and induction to decompose problems into a hierarchy of simple factors and subfactors. It makes the corresponding measurements according to comparisons (Saaty, 1980). The AHP method has been widely used to assist in decision-making. Still, the AHP method has not escaped criticism in its use because it is considered unbalanced in the pairwise comparison rating scale. The AHP scale in the form of a 'crisp' number is considered less able to handle uncertainty. One approach is to use a fuzzy logic approach. Using fuzzy methods allows decision-makers to incorporate qualitative and quantitative data into the decision model. For this reason, decision-makers usually feel more confident to give an assessment in the form of a range rather than an assessment in the form of a specific value (Marimin et al., 2013).

Previous research shows that digital innovation is the impact of digital competence and contributes to company performance and has a positive effect on financial and non-financial performance. other research shows that digital competence makes companies more adaptable. However, there is still very little data that can determine how strong the influence of digital competence has on ministry performance. Such a strategy can offer the Ministry of Agrarian Affairs and Spatial Planning/National

Land Agency (Ministry of ATR/BPN) Performance strategy makers a set of guidelines for designing and implementing competitive strategies and allocating appropriate resources, respectively. Ministry strategy makers would find the fuzzy AHP to be valuable aids to give organization resources to specific systems. This study has expanded the application of the fuzzy AHP by focusing on the public sector and has provided controls for market-level influences by restricting itself to ministry. This study begins with the hierarchy underpinning the relationship between factor, actor, objectives, and alternative strategies for achieving ministry performance. The research method subsequently employed is fuzzy AHP. The results of this study are presented and discussed. Finally, implications and further research of the findings and limitations are acknowledged together.

2. Literature Review

The resource-based view theory (RBV) used in this study emphasizes the critical role of resources and capabilities in creating competitive advantage. The 1990s were when strategic organizational management shifted from an external focus to an internal focus (Wright et al., 2017). An external guide is based on the strengths, weaknesses, opportunities, and threats of the firm's industry. An internal focus shifts managerial attention to internal resources by identifying the assets, competencies, and capabilities to create a competitive advantage (Wright et al., 2017).

Digital competence specifically refers to technological, cognitive, and social knowledge, skills, and attitudes in order to apply ICT to investigate and solve problems and develop that knowledge further” (Hofmann and Ogonek 2018). Public administrations at different levels of governance need to assess and understand the digital competencies of the employees they need. At the supranational level, for example, the European Commission (Directorate General of Informatics 2018) has highlighted that these competencies include changes in thinking patterns, ways of working and leadership. Krpálek et al. (2021) conducted research in the domain of staff professional development in the public sector in the Czech Republic. Research findings show that the combination of soft skills and skills from the Industry 4.0 domain helps form a series of future competencies needed to face digital transformation. This study reports a high need for competencies in teamwork, internal and external communication, and self-management. Ruben (2019) argues that effective leadership itself is based on five competencies: (1) analytical competency; (2) personal competence; (3) competency communication; (4) organizational competence; and (5) position competency.

Digital transformation refers to intentional changes that occur as a result of technological advances (Bresciani et al. 2021). At the organizational level, digital transformation is defined as the tendency of companies to shift towards adopting and utilizing data analysis, mobile technology, cloud computing, social media, and artificial intelligence when carrying out business processes and serving customers (Jedynak et al. 2021). Digital transformation as an approach that organizations use to make changes to their culture, business processes and procedures to meet the requirements caused by dynamic market changes through the incorporation of digital tools and technologies. Another common definition of digital transformation includes the support of various technologies and innovations that produce unusual structures, activities and arrangements, which partially or completely replace traditional rules.

3. Research Method

The AHP was developed by Saaty (1986) as a tool in decision-making. Saaty (1986) describes three principles used in solving problems with detailed logical analysis underlying AHP: hierarchy, determining priorities, and logical consistency. AHP is a method that pays attention to subjective factors such as perception, preference, experience, and intuition. The Analytical Hierarchy Process (AHP) approach is one of the analytical tools used to assist managerial decision-makers. Thus, AHP can be used to analyze these decision areas. The principle of analytical thinking in solving problems is detailed logical analysis (Saaty, 1993). There are three main principles in AHP, namely: (1) the principle of hierarchical arrangement; (2) the principle of setting priorities; and (3) the principle of logical

consistency (Saaty, 1993).

The hierarchical arrangement is made by identifying the knowledge or information being observed, starting with complex problems described into their primary elements. These main elements are described into their parts again and hierarchically. Assessment of each level of the hierarchy is assessed through pairwise comparisons. According to Saaty (1983), a scale of 1 to 9 is the best scale for expressing opinions for various problems. A scale of 1-9 is set as a consideration in comparing pairs of elements at each level of the hierarchy to an element at the top level. A scale with nine units can describe the degree to which we can distinguish the intensity of the relationship between elements. According to Saaty (1993), the pairwise comparison matrix is declared consistent if the consistency ratio (CR) is 10%. The AHP scale in the form of a 'crisp' number is considered less able to handle uncertainty. Therefore, the original AHP scale should be close to the other methods. One approach is to use a fuzzy logic approach. Fuzzy logic is a logic that has a value of ambiguity or fuzziness between two values. The fuzzy approach, especially the triangular fuzzy number to the AHP scale, is expected to minimize uncertainty. It is hoped that the results from the verification process of strengthening entrepreneurial innovation strategies in coastal areas will be more accurate. The combination of the AHP method with the fuzzy concept approach covers the weaknesses in AHP, namely problems with criteria that have more subjective characteristics. (Rahardjo et al. 2002). The fuzzy AHP method is used for selecting an alternative and adjusting the problem by combining of fuzzy theory and hierarchical structure analysis (Marimin et al., 2013).

The decision-making stages in the Fuzzy AHP Method are to define the problem and determine the desired solution. After that, create a hierarchical structure. Each stage is the hierarchy that has been compiled is given weight by forming a pairwise comparisons matrix that describes the relative contribution or influence between one element and another. After determining the scale, the next step is data entry by entering the numbers obtained from filling out questionnaires by Fuzzy AHP experts. After data entry in the pairwise comparison tool for Fuzzy AHP. in this section, pairwise comparison results will be obtained from each criterion, sub-criteria, and alternative strategies. This result can be determined the priority vector for each element. A fuzzy set is the development of the crisp set. A crisp set will only have two possible memberships: being a member or not being a member. On the other hand, fuzzy set members have a fuzzy value between false and true (unclear). If the firm set only recognizes black or white, the fuzzy set can recognize black, gray, and white. Each fuzzy set can be expressed by a membership function, a curve that shows the data input points into its membership which has an interval between 0 to 1. After that, selecting criteria and making rank to know the priority decision is made.

3.1. Development of the Hierarchy Model

Before data collection, it is required to develop a conceptual model for a decision problem. A hierarchy is a specific type of system, based on the assumption that the entities can be grouped into disjoint sets, with the entities of one group influencing those of other groups (Saaty, 1980). Establishing a hierarchical structure to evaluate capabilities and ecosystem is necessary to select an appropriate change strategy. The central part of the qualitative component of Fuzzy AHP, as Figure 1, drives all criteria for the overall goal. The relevant literature was used to identify the critical criteria to pursue a change strategy to improve ministry Agraria and Spatial Planning Performance. As mentioned earlier, the first level of the evaluation framework is that the focused goal of a government employees on digital competency development strategy in the ATR/BPN environment.

The compilation of a list of questions for the formulation involved several experts. The criteria used as experts are those who have experience leading in Agrarian and Spatial Planning in Indonesia, such as Head of the Human Resources Development Center, Head of Organization and Personnel Bureau, Organization and Human Capital Expert, Academician, IT Expert, Ministry inspector general and General director of ministry. As shown in Figure 2, the preparation of hierarchy begins with the focus

of the problem, namely formulating Digital Competency Development Strategy in the Ministry Of Agraria And Spatial Planning DKI Jakarta Region. After that, determine the factors, actors, objectives, and alternative strategies based on focus group discussion and in-depth interviews to validate the hierarchy structure. The first hierarchy is the factors that influence the strategy system of ministry of agrarian and spatial planning in Indonesia are: (a) digital competency, (b) Electronic Based Government System Management; (c) Digital Culture, d) Digital Leadership; (e) Digital Transformation Audit. The second hierarchy is the actor who plays a role in the development of the digital competency in the ministry of Agraria and spatial planning are: (a) Head of Regional Office, (b) organization and personnel bureau, (c) Inspectorate, (d) Ministry of Administrative and Bureaucratic Reform, (e) Human Resources Development Center, (f) Land and spatial information data center.

The third hierarchy is the objectives to be achieved in the development of the digital competency for achieving performance are: (a) Achieving performance for bureaucratic reform, (b) Creation of a digital competency development system, (c) Realization of Ease of Doing Business (d) Realization of the Electronic Based Government System. The fourth hierarchy is an alternative strategy that can be carried out in developing a digital competency for achieving performance: (a) Creation of Digital Competency Standards, (b) Strengthening digital transformation policies, (c) Building a digital collaboration ecosystem, (d) Development of digital talent programs. The hierarchical model is as below.

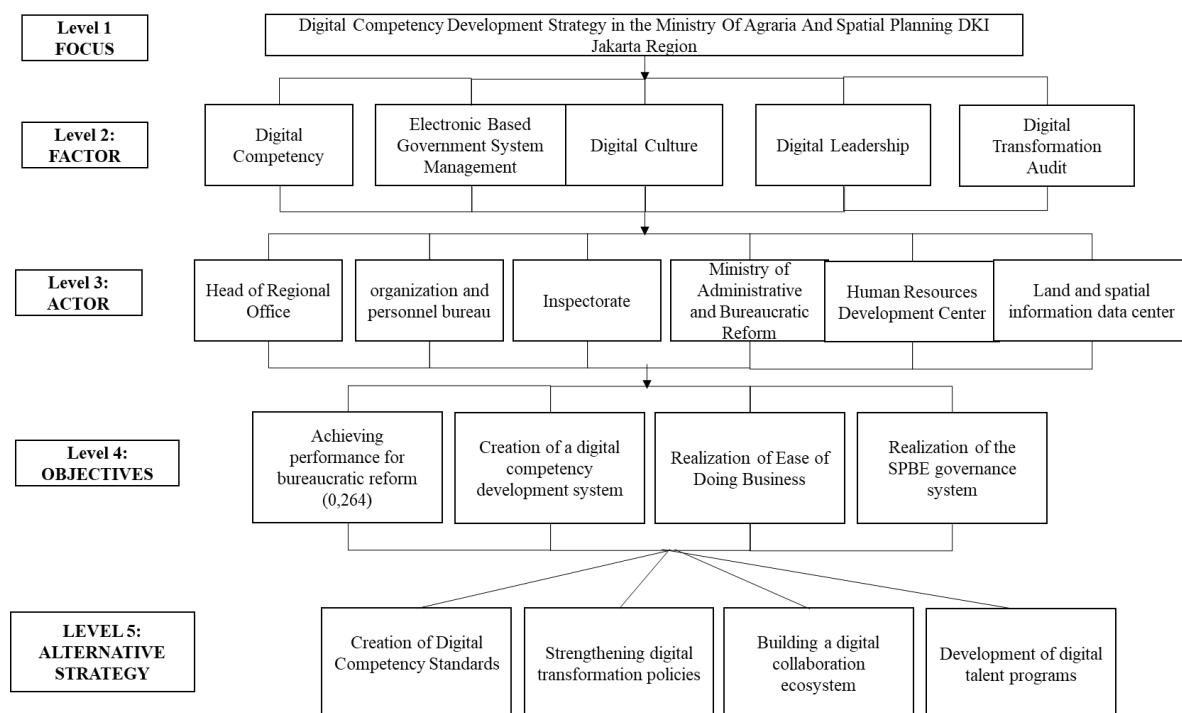


Fig.1: Hierarchical model

After the hierarchy is created, the seven experts are asked to compare the elements at each level based on pairwise comparisons to estimate the relative importance of the elements at the previous level. A ratio scale was used. The ratio scale used is a scale of 9 (Saaty, 1989), with a definition of the importance level of 1, which means equally important, three means slightly more important, five means more critical, seven means very clearly more critical, and nine means absolute more important.

Tabel 1. Fuzzy Number Conversion

No	AHP Scale	Information	Triangular Number
1	1	Equally Important	(1,1,3)
2	3	A Little More Important	(1,3,5)
3	5	Obviously More Important	(3,5,7)
4	7	Very Obviously More Important	(5,7,9)
5	9	Absolute More Important	(7,9,9)

Source: Marimin *et al.* (2013)

The fuzzy system is a structured and dynamic numerical estimator. This system can develop intelligent systems in an uncertain and inappropriate environment (Marimin et al., 2013). This system predicts a function with fuzzy logic. Fuzzy logic is part of Boolean logic, which is used to hold the concept of degrees of truth, namely the truth value between true and false. Fuzzy logic often uses linguistic and verbal information. In fuzzy logic, there are several processes, namely fuzzy collection, application of if-then rules, and fuzzy inference processes. To determine the degree of membership in FAHP, a function rule in a triangular fuzzy number (TFN) is used, which is arranged based on a linguistic set. The number at the intensity of interest in the AHP is transformed into the set of TFN scales. TFN consists of three membership functions, namely the lowest value (l), the median value (m), and the highest value (u). Triangular fuzzy number (TFN) is a fuzzy set theory that helps measure human subjective judgments using language or linguistics. The essence of fuzzy AHP lies in pairwise comparisons described by a ratio scale associated with the fuzzy scale.

4. Result and Discussion

Digital competence as a combination of knowledge, skills and behavior towards the use of digital means. Furthermore, Perifanou and Economides (2019) define digital competence as a person's knowledge, skills and attitudes to access, use, create and share digital resources efficiently, as well as communicate and collaborate with other people using digital technology for certain purposes. Currently, the Job Competency Standards for State Civil Servants do not yet accommodate the digital competency model. Perifanou and Economides (2019) compiled existing types of competencies into a Digital Competence Actions Framework or DiCAF competency. The Digital Competency Model uses verbs based on the abilities that a person can perform in using information technology, such as; identify, search, search, investigate, locate, access, analyze, manage, interpret, process, solve problems, design, create, communicate, share, integrate, evaluate etc. Perifanou and Economides group competencies based on work commonly carried out in IT use, including combining several similar competencies to create a digital competency model that is more concise, complete and easy to use.

According to the Inspectorate General of the Ministry of ATR/BPN at the 2023 National Working Meeting, the increase in land service performance is also accompanied by misuse of accounts due to a lack of understanding of the importance of digital identity. The limited number of auditors who understand electronic-based service business processes, as well as weak supervision of application security systems have provided opportunities for electronic data manipulation, bypass systems and overlapping land plots as well as manipulation of electronic data and land plot areas using the tools available in land service applications. Electronic signature users are required to secure their digital identity in the form of user and password for their respective electronic system accounts. Users are strictly prohibited from providing passwords to other parties. Understanding the importance of not sharing accounts is actually an example of the digital competency that employees must have, so that the digital transformation process can be carried out well.

Table 2. Factor weight on a strategy to improve Ministry ATR/BPN performance

No	Factor	Priority	Priority
1	Digital Competency	0,211	1
2	Electronic Based Government System Management	0,195	5
3	Digital Culture	0,198	3
4	Digital Leadership	0,199	2
5	Digital Transformation Audit	0,197	4

Then the actors that play a role in table 2. in improving performance in ministry are Head of Regional office (0.233), ministry of administrative and bureaucratic reform (0.190), organization and personnel bureau (0.181), Inspectorate (0.124), Human Resources Development Center (0.127) and Land and spatial information data center (0.121). Digital leadership is critical to fostering organizational performance. More specifically, successful performance is achieved when leaders have the skills to make their organization's unfavorable situations and failed strategic decisions worse in a pragmatic, efficient, and responsive manner (Ahammad et al. 2020). Organizational performance is a description of precise communication, continuous improvement, flexibility, and the existence of an organizational team characterized by self-awareness, maturity, enthusiasm, self-discipline, and improvisation (Stettina and Heijstek 2011). These attributes require the presence of leaders who share power, responsibility, and decision making among their subordinates to ensure team trust and motivation exist (Klein et al. 2006). Thus, leadership style in an organization plays an important role in developing and enhancing organizational performance.

This study in line with previous research found that digital leaders influence employee behavior and competence (Erhan et al. 2022), leading to improved performance. Digital leadership combines digital competence with digital culture. Today's digital leaders must adopt a global mindset, communicate with others, and be more inventive in cultivating an innovative culture within their organizations. In addition, organizational culture is a set of shared fundamental beliefs that a study group shares as it relates to external adaptation and internal integration issues. According to Wang et al (2019), top managers have an important but challenging role in building a culture of innovation, namely a digital culture for the digital era. A digital leader is responsible for planning and executing corporate plans and creating or assisting in modifying culture, including establishing a digital culture, to increase corporate competitiveness. Digital leaders realize organizational assets well, achieve high levels of performance and help digital business strategies (De Araujo, 2021).

Table 3. Actor weight on the strategy to improve Ministry of ATR/BPN performance

No	Actor	Priority	Priority
1	Head of Regional Office	0,233	1
2	Organization and personnel bureau	0,181	3
3	Inspectorate	0,148	4
4	Ministry of Administrative and Bureaucratic Reform	0,190	2
5	Human Resources Development Center	0,127	5
6	Land and spatial information data center	0,121	6

The main objective obtained from the analysis of the strategy for development digital competency in ministry performance is the Creation of a digital competency development system (0,288), Achieving performance for bureaucratic reform (0,264), the realization of the SPBE governance system (0,232), Realization of Ease of Doing Business (0,216) The detailed results with their weights and priorities are

presented in table 3. The use of IT has brought significant changes in processes, structures and infrastructure in the ministry. The literature assesses that digital competency system is expected to use digital resources to generate differentiated value (Bharadwaj et al. 2013).

Table 4. Objective weight on the strategy to improve ATR BPN performance

No	Objective	Priority	Priority
1	Achieving performance for bureaucratic reform	0,264	2
2	Creation of a digital competency development system	0,288	1
3	Realization of Ease of Doing Business	0,216	4
4	Realization of the SPBE governance system	0,232	3

The alternative strategy that is considered the most reliable and becomes the main priority in supporting development of digital competency achieving ministry agrarian and spatial planning performance is the Strengthening digital transformation policies (0,295). And Third is Building a digital collaboration ecosystem (0,246) and the fourth is Development of digital talent programs (0,189). Digital transformation enables organizations to leverage digital technologies for widespread human relations, data, information and knowledge. Anecdotal evidence suggests that digital transformation fosters digital business strategies that lead to process improvements and modularization (Bharadwaj et al., 2013). As a result, digital transformation enables the creation of new ideas and communication between business partners in the value chain. Building on network externalities generated by using digital technologies or processes, organizations can achieve better supply chain visibility, knowledge transfer, and operational efficiency (Westerman et al., 2014). This research also support previous research shows that digital transformation system moderates the impact of digital capabilities on public organization performance, positively influencing financial and non-financial performance. Other research shows that digital capabilities make organization more adaptable and more effieient (Drnevich & Croson, 2013).

Second is Creation of Digital Competency Standards (0,270). The Ministry of ATR/BPN is starting digital transformation by strengthening the digital literacy standards of employees within the Ministry of ATR/BPN. McKinsey (2014) explains that an organization needs to internalize digital transformation on an organizational scale so that it has a positive impact on company development. Apart from that, human resource constraints must be overcome so that congruence between planning and implementation is created. According to him, 75% of the obstacles to digital transformation are not technical problems but reluctance and fear of facing change, HR readiness, old bureaucracy that is still applied after the transformation has occurred and risks that are not measured properly. Managing digital transformation requires critical capability and resource readiness (Wang et al., 2021). According to Carcary et al. (2016), an organization needs to do this to develop many talents in various fields, Through digital competency standards, ministry can increasingly leveraging digital capabilities to improve their operational models, operational procedures, and consumer experiences (Westerman et al., 2012). According to a recent study (Rupeika-Apoga et al., 2022).

Third is Building a digital collaboration ecosystem (0,246). Nowadays, the economic climate is increasingly deteriorating, with limited resources and demands that are increasing and becoming more complex. Therefore, it is important for an institution to consider digital collaboration and strategic partnerships as a way to respond to existing challenges. Norris-Tirrell and Clay (2010:2) emphasize that almost all problems today seem too complex to be handled individually or by organizations working alone. The benefit of collaboration between group leaders is none other than the creation of new, more complex innovations that can solve existing difficult problems. Apart from that, all existing resources are utilized productively, maximizing existing capacity to meet community needs, and increasing skills and experience for both parties (Arifin et al. 2022).

Lastly, development of digital talent programs (0,189). Talent is the primary source of an institution or organization (Ramaditya et al., 2023). This is because it is very beneficial to talent-focused institutions, such as helping to improve rankings, which will improve organizational performance by quality servicing and learning (Ramaditya, et al., 2023). Thus, ministry staff must be empowered (Salvioni et al., 2017). This is in line with Baporikar & Smith (2019) , who states that by developing digital talent management, public organization performance will also increase.

Tabel 5. Alternative strategies in achieving Performance.

No	Alternative Strategy	Priority	Priority
1	Creation of Digital Competency Standards	0,270	2
2	Strengthening digital transformation policies	0,295	1
3	Building a digital collaboration ecosystem	0,246	3
4	Development of digital talent programs	0,189	4

5. Conclusion

The primary purpose of this study was to select an alternative strategy in development of digital competency towards performance. digital competencies according to government worker position level can at least be used for career development, competency development, placement of state civil servants, competency test. Digital Competency is also an important indicator in implementing the merit system, namely ASN management policies based on qualifications, competencies and performance which are applied fairly, fairly and without discrimination. There are two key aspects to land issues, known as systemic issues and system analysis and the second is related to individual issues. Low digital competence can create opportunities for misuse of the digital land management system and result in the loss of guaranteed civil rights over land for the community. This situation has an impact on the increase in disputes, conflicts and cases as well as the organizational performance of the Ministry of Agrarian and Spatial land. Thus, the result shown that the alternative strategy that is considered the most reliable and becomes the main priority in supporting development of digital competency achieving ministry agrarian and spatial planning performance is the Strengthening digital transformation policies. This also need to support by the head of the Head of Regional Office as the main actor to empowering, role model and support the implementation of digital competency in ministry of agrarian and spatial planing in Jakarta.

This study offers empirical evidence that digital competencies can catalyze transformations and performance improvements in public sector institutions, by enabling leadership and cultural change. However, the capabilities may not directly influence outcomes, requiring intermediate.

transformations. The research makes valuable contributions regarding competency-driven public sector reforms. Further studies can build on these findings using more rigorous data collection approaches and exploring contingent factors.

5.1. Limitation and Future Directions

The study was faced with various limitations, showing the need for further investigations. First, the sample size was limited to ministry agrarian and spatial land based in Jakarta, Indonesia. Therefore, future studies should use a broader representation of institutions in other geographic locations. Second, this study used a single data source and a cross-sectional design, leading to a common bias, and generalization between variables. Future studies, then, should use a longitudinal design to obtain data from various sources. Also, a longitudinal approach with a larger sample should be considered to improve generalizability.

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