HONG KONG JOURNAL OF SOCIAL SCIENCES

香港社會科學學報

第一的第 63 期 (2024 春/夏) Vol. 63 Spring/Summer 2024

Open Access Article https://doi.org/10.55463/hkjss.issn.1021-3619.63.17

Interpretative Structural Modeling in Implementing Digital Competence: Empirical Study of Indonesia's Ministry of Agrarian Affairs and Spatial Planning

Heri Mulianto, Mohammad Syamsul Maarif, Nimmi Zulbainarni, Nur Hasanah

School of Business, IPB University, Bogor, Indonesia

Received: April 21, 2024 ▪ Reviewed: May 16, 2024

▪ Accepted: May 27, 2024 ▪ Published: June 30, 2024

Abstract:
This study aims to develop digital competency in Indonesia's Ministry of Agrarian Affairs and Spatial Planning/National Land Agency (ATR/BPN). Digital transformation at the ATR/BPN faces several problems, such as the lack of technological infrastructure, where limited Internet access in some regions in Indonesia may still lead to limited Internet access, which can hinder the implementation of digital technology. This study used interpretive structural modeling (ISM) to identify the main obstacles to implementing the digital competence of the Ministry. A focus group discussion determined the relationship between elements of mutual influence, cause-effect, and incoherence. The criteria for being considered experts are those who have experience leading the agricultural and spatial planning fields in Indonesia, such as the Head of the Human Resources Development Center, Head of the Organization and Personnel Bureau, organization and human resources experts, academics, IT experts, General Inspector and General Director of the Ministry. The activity elements needed to plan actions that influence the digital competency development program for state civil apparatus (ASN) within the ATR/BPN consist of five elements: a) preparation of ASN digital competency standards, b) preparation of a digital competency development system, c) strengthening comprehensive digital transformation adaptively, d) building a digital cultural collaboration ecosystem, and e) developing a digital talent program for ATR/BPN.

Keywords: digital competence, digital transformation, interpretative structural modeling, performance, state civil apparatus.

實施數位能力的解釋性結構模型：印尼土地事務與空間規劃部的實證研究

摘要：
本研究旨在培養印尼土地事務和空間規劃部/國家土地局的數位能力。土地事務與國土規劃部/國土局的數

位轉型面臨一些問題，例如缺乏技術基礎設施，印尼某些地區的網路存取受限仍可能導致網路存取受限，從而阻礙數位技術的實施。本研究使用解釋結構模型來確定該部實施數位能力的主要障礙。焦點小組討論確定了相互影響、因果和不一致等要素之間的關係。被視為專家的標準是那些在印尼農業和太空規劃領域具有領導經驗的人，例如人力資源發展中心負責人、組織和人事局局長、組織和人力資源專家、學者、資訊科技專家、部總督察兼總司長。規劃影響土地事務與國土規劃部/國土局內國家民用機構數位能力發展計畫的行動所需的活動要素包括五個要素：a）準備國家民事機構數位能力標準，b）準備數位能力發展系統，c）適應性加強全面數位轉型，d）建構數位文化協作生態系統，e）制定土地事務與國土規劃部/國土局土地事務與國土規劃部/國土局數位人才計畫。

关键词：数字能力、数字化转型、解释结构建模、性能、国家民事机构。

1. Introduction

The World Digital Competitiveness Ranking produced by the IMD World Competitiveness Center in 2022 measures the capacity and readiness of countries to adopt and explore digital technology as the primary driver of organizational transformation in the business, government, and broader society sectors. Indonesia was ranked 51st out of 63 countries assessed, below Thailand (40) and Malaysia (31). The assessment methodology uses three digital competitiveness variables: (1) Competency, including Talent, Training, Education, and Scientific Concentration; (2) Technology, including a regulatory, capital, and technological framework; and (3) Long-Term Readiness, namely, Adaptive Attitudes, Business Agility, and IT Integration. Digital competencies are used for various purposes, especially in employment, education, training, and lifelong learning (Syamsari et al., 2023). Different countries have attempted to formulate digital competency components that must support the implementation of digital transformation, such as DigComp, the Essential Digital Skills Framework (EDSF), the International Evaluation of Educational Achievement (IEA), the International Computer and Information Literacy Study (ICILS), the 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 state civil apparatus (*Aparatur Sipil Negara* or ASN in Indonesian) positions based on the Minister of State Apparatus Empowerment and Bureaucratic Reform Regulation Number 38 of 2017, still general in nature not describing digital competence (Rumata & Nugraha, 2020).

Previous research shows that digital innovation is the impact of digital competence, contributes to company performance, and positively affects financial and non-financial performance. Other research shows that digital competence makes companies more adaptable. However, very little data 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 planners a set of guidelines for designing and implementing competitive strategies and allocating appropriate resources. Ministry strategy makers would find the fuzzy AHP to be a valuable aid to give organization resources to specific systems. This study expanded the application of the fuzzy AHP by focusing on the public sector and provided controls for market-level influences by restricting itself to ministries. This study begins with a hierarchy underpinning the relationship between factors, actors, 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, the implications and further research of the findings and limitations are presented together.

Many digitalization initiatives have failed to produce the expected results due to policy and governance changes (Saleh & Awny, 2020). Rupp (2017) argued that the lack of digital competence. Digital transformation in the public sector requires the development of various competencies as they play a critical role in preparing future civil servants for modern governance (Kausch-Zongo & Schenk, 2022). In their work on digital competencies, Kausch-Zongo & Schenk (2022) focused on public administration students and analyzed their technical, social, informational, and epistemological competencies. Competency identification requires stakeholder involvement (Kaur & Lodhia, 2019).

Digital transformation at the ATR/BPN faces several problems, such as the lack of technological infrastructure, where limited Internet access in some regions in Indonesia may still lead to limited Internet access, which can hinder the implementation of digital technology everywhere. Next is HR capacity, where there are limited skills. There is a need to improve HR skills for new technologies and data management. In addition, changes in organizational culture despite cultural changes within the organization are necessary to embrace technological change. Furthermore, there are also difficulties in integrating different systems in various units or branches of the Ministry of Agrarian Affairs/BPN. Next, budget prioritization is important to prioritize budgets for projects that support digital transformation with maximum impact. Addressing this problem requires a holistic strategy that involves coordination between various stakeholders, including

the government, private sector, and civil society. In addition, full commitment from organizational leadership and political support can be critical to success in facing such challenges.

Broomfield & Reutter (2021) revealed the three most important challenges in considering competency in the public sector: managing changes in organizational culture, issues related to privacy and security, and overcoming obstacles related to regulations and regulations. Busch et al. (2022) analyzed the competencies currently needed by the government and found five main competency categories, namely technical, socio-technical, organizational, managerial, and political-administrative competencies. Nwankpa & Roumani (2016) stated that digital transformation plays an essential role by mediating the impact of digital skills, data technology, and bodily capabilities. The industry must understand the importance of digital transformation and how to use data technology to improve corporate capabilities.

According to a report from the Ombudsman (2020), there are two essential aspects to land issues, known as systemic issues and system analysis (by the system), and the second relates to individual issues (by individuals). According to Ramaditya et al. (2023), low digital competency can create opportunities for misuse of the digital land management system and result in the loss of guaranteed civil rights over land to the community. This situation impacts the increase in disputes, conflicts, and cases, as well as the organizational performance of the Ministry of ATR and BPN. The Ministry of PANRB, in the results of the evaluation of implementing the Electronic Based Government System (SPBE) for the Ministry of ATR/BPN, also provided recommendations regarding the importance of developing the competency of human resources in implementing SPBE. On the other hand, the Decree of the Minister of ATR/BPN Number 333/2019 concerning Position Competency Standards within the Ministry of ATR/BPN does not yet regulate the digital competencies that must be mastered by employees.

Mastery of digital competencies according to ASN position level can at least be used for a) ASN planning; b) procurement of ASN; c) career development; d) competency development; e) placement of state civil servants; f) promotion and mutation of ASN; g) competency test; h) state civil service management information system, and; i) ASN succession planning group (talent pool) (Article 16, PERMEN PAN-RB No. 38 of 2017). Competency is also an important indicator in implementing the merit system, namely, ASN management policies based on qualifications, competencies, and performance that are applied fairly, fairly, and without discrimination (Law No. 5 of 2014 concerning ASN).

2. Literature Review

The study's application of resource-based view theory (RBV) highlights the importance of resources and capabilities in gaining a competitive edge. Strategic organizational management changed its emphasis from external to internal during the 1990s (Wright et al., 2017). The advantages, disadvantages, opportunities, and risks specific to the firm's industry form the basis of an external guide. By identifying the resources, skills, and talents needed to gain a competitive edge, an internal focus directs managerial attention to internal resources (Wright et al., 2017).

"Technological, cognitive, and social knowledge, skills, and attitudes to apply ICT to investigate and solve problems and further develop that knowledge" are particularly referred to as "digital competence" (Hofmann & Ogonek, 2018). At all levels of government, public administrations must evaluate and comprehend the digital competences of the personnel they require. The European Commission (Directorate General of Informatics, 2018), for instance, has emphasized at the supranational level that these capabilities involve modifications to leadership styles, methods of operation, and thought patterns. Krpálek et al. (2021) conducted research on personnel professional development in the Czech public sector. According to the research findings, a set of future competences required to deal with digital transformation can be formed by combining soft skills with abilities from the Industry 4.0 domain. According to this study, self-management, internal and external communication, and teamwork are highly valued qualities. According to Ruben (2019), effective leadership is predicated on five competencies: (1) analytical competency; (2) personal competence; (3) competency communication; (4) organizational competence; and (5) position competency. Intentional changes brought about by technological advancements are referred to as "digital transformation" (Bresciani et al., 2021). The tendency of businesses to adopt and use data analysis, mobile technology, cloud computing, social media, and artificial intelligence when performing business processes and providing customer service is known as "digital transformation" at the organizational level (Jedynak et al., 2021). Using digital tools and technologies, companies can apply digital transformation as a strategy to adapt their processes, procedures, and culture to the demands of a constantly changing market. Support for diverse technologies and innovations that result in unique structures, activities, and arrangements that either completely or partially replace established norms is another often used definition of digital transformation.

3. Research Methodology

This study used ISM analysis to identify the main obstacles to implementing the Digital Competency Model. The ISM method is a modeling technique developed for strategic policy planning (Marimin, 2017). Fuzzy Interpretive Structural Modeling is a Soft System modeling method assisted by computer applications to help identify relationships between ideas and fixed structures in complex issues. The ISM

method applied by Saxena (1992), is an interactive planning method that allows a group of people working as a team to develop a structure that defines the relationships between elements in a set. Answering simple questions provided the structure. The elements to be structured (such as goals, obstacles, problems, and so on) are determined by the group at the beginning of the fuzzy ISM planning session. The fuzzy ISM method analyzes system elements and solves them in a graphical form from the direct relationships between them and hierarchical levels (Attri et al., 2013). The fuzzy ISM technique transforms unclear mental models into visible system models.

The fuzzy ISM represents the relationships between elements in a cluster, where relationships with 0 and 1 are measurable, and clear relationships provide better results. The fuzzy ISM not only provides a vision of the relationships between various system elements but also proposes a structure according to the importance and influence of other critical data elements and provides visual representation.

The fuzzy ISM method has been widely used, especially for analyzing structural elements based on contextual relationships (Saxena et al., 1992). The design of the digital competency development model refers to the elements developed by Saxena et al. (1992), who formulated nine key elements (1) affected community sectors, (2) needs of the program, (3) main obstacles to the program, (4) desired changes, (5) objectives of the program, (6) benchmarks to assess each goal, (7) activities required for action planning, (8) activity measures to evaluate the results achieved by each activity, (9) institutions involved in implementing the program. Each element is then described into several sub-elements in more detail until deemed adequate. Research can determine the number of critical ones as analytical tools based on the results of interviews and discussions with experts. ISM explains the IV sector power–dependence matrix for each sub-element as follows:

1. *Sector I:* weak driver-weak dependent variables (autonomous). Sub-elements in this sector generally do not relate to the system and may have little relationship, although the relationship can be strong.
2. *Sector II:* weak driver-strongly dependent variables (dependent). Generally, the sub-elements in this sector are non-independent.
3. *Sector III:* strongly driver-strongly dependent variables (linkage). The sub-elements in this sector must be studied carefully because the relationship between sub-elements is unstable. Action on a sub-element impacts others, and feedback on the influence can magnify the impact.
4. *Sector IV:* strong driver-weak-dependent variables (independent). The sub-elements in this sector are the remaining parts of the system and are called sub-elements or independent variables.

4. Results and Discussion

This study used ISM to identify the main obstacles in implementing the digital competence of the Ministry. A focus group discussion determined the relationship between elements in mutual influence, cause-effect, and non-relatedness (Marimin, 2017). The preparation of the list of questions for formulation involved several experts. The criteria for being considered experts are those who have experience leading the agricultural and spatial planning fields in Indonesia, such as the Head of the Human Resources Development Center, Head of the Organization and Personnel Bureau, organization and human resources experts, academics, IT experts, General Inspector and General Director of the Ministry.

4.1. Institutions or Groups Affected by Replanting Investment Activities

The MICMAC analysis produces factor elements distributed in each sector. Based on the driver power (DP) and dependent variables (D) values, the affected institutional elements or groups are grouped into sectors I (autonomous), II (dependent), III (linkage), and IV (driver power). Driver power is a sub-element that affects other sub-elements. Figure 1 shows that the sub-elements are in sector I (autonomous), which means that all affected institutions or groups do not have weak DP-weak D. In Sector II (dependent/impact recipients), the DP value is weak-D strong, namely ASN. Sector III (linkage) has a strong DP-strong D value. The sub-elements included in this sector can influence each other's elements in the sector. Based on the elements of institutions or groups that are affected (impacted), namely heads of Satker/Central and Regional Units, human resource development centers, organizational and personnel bureaus, digital transformation implementation auditors, and Pisatin. Sector IV (independent) has a strong DP-weak D. The sub-elements included in this sector are the power drivers or determinants of the other sub-elements. This means that the Ministry of Administrative and Bureaucratic Reform is the element most affected by this activity, where this institution or group is linked to institutions that act as driving power.

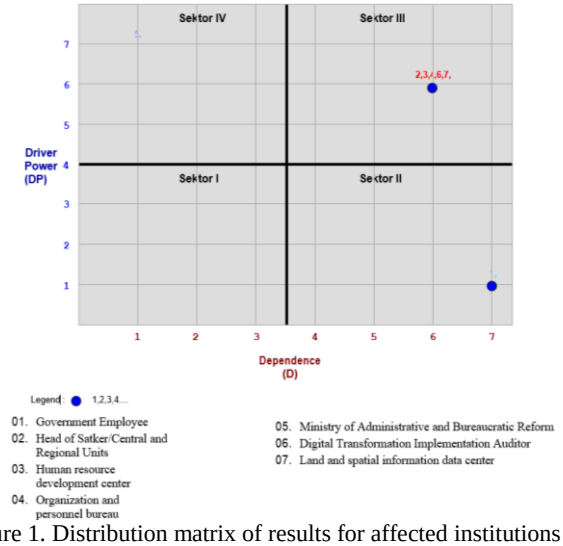


Figure 1. Distribution matrix of results for affected institutions and groups (The authors)

The elements of institutions or groups affected consist of six elements: 1) ASN, 2) Heads of Satker/Central and Regional Units, 3) Center for human resource development, 4) Organization and personnel bureau, 5) Ministry of Administrative and Bureaucratic Reform, 6) Auditors for the implementation of digital transformation, and 7) Pisatin. Based on the results of the matrix analysis, it can be concluded that Kemenpan RB is the driver power (main driving force). Meanwhile, the affected institutions or groups that act as second driver power are the heads of Satker/Central and Regional Units, human resource development centers, organizational and personnel bureaus, auditors for the implementation of digital transformation, and Pusdatin, as shown in Figure 2.

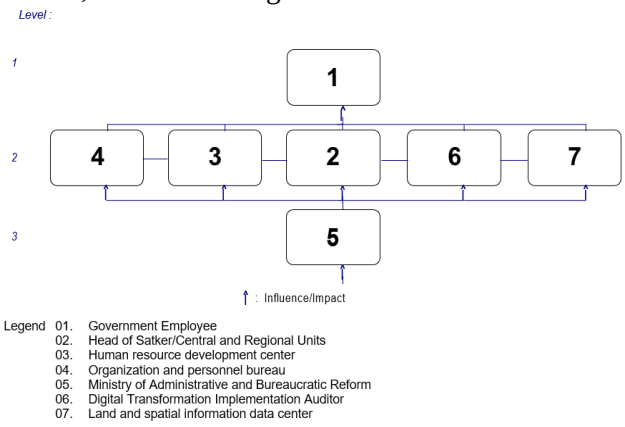
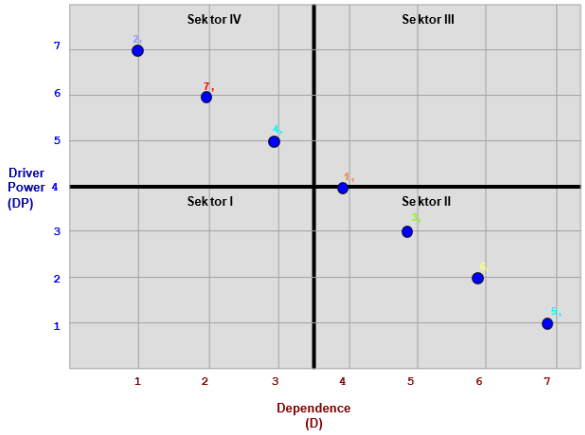


Figure 2. Hierarchical structure model of affected institutions and groups (The authors)

4.2. Needs of the Digital Competency Development Program for ASN within the Ministry of ATR/BPN

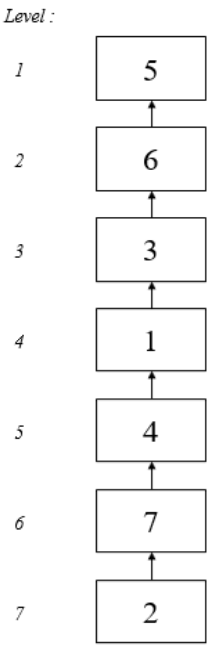
The MICMAC analysis produces factor elements distributed in each sector. Based on the driver power (DP) and dependent variables (D) values, the affected institutional elements or groups are grouped into sectors I (autonomous), II (dependent), III (linkage), and IV (driver power). Driver power is a sub-element that affects other sub-elements. Based on Figure 3, it is evident that the sub-elements in sector I (autonomous) have weak DP-weak D. In the Sector II (dependent/impact recipient) sector, the DP values are weak-D strong, namely: availability of digital transformation audit results, availability of ICT facilities and infrastructure, and availability of ASN digital competency standards. Sector III (linkage) has a strong DP-strong D value. The sub-elements included in this sector can influence each other's elements in the sector. Based on program needs, namely ASN ATR/BPN develops their digital competencies. Sector IV (independent) has a strong DP-weak D. The sub-elements included in this sector are the driver power or determinants of other sub-elements, namely, the commitment of ATR/BPN leadership to developing digital competencies, Availability of digital competency development programs, and changes in digital culture.



Legends:
01. ATR ASNs who develop digital competencies
02. Commitment of ATR/BPN Leadership in developing digital competence
03. Availability of ASN digital competency standards
04. Availability of digital competency development programs
05. Availability of digital transformation audit results
06. Availability of ICT infrastructure
07. Changes in digital culture

Figure 3. Matrix of needs results from the ASN digital competency development program within the Ministry of ATR/BPN (The authors)

The required elements of the ASN digital competency development program within the Ministry of ATR/BPN consist of seven elements: 1) ATR/BPN ASNs who develop their own digital competency, 2) ATR/BPN leadership commitment in developing digital competency, 3) Availability of ASN digital competency standards, 4) Availability of digital competency development programs, 5) Availability of digital transformation audit results, 6) Availability of ICT facilities and infrastructure, and 7) Changes in digital culture. Based on the results of the matrix analysis, it is clear that the commitment of ATR/BPN leadership in developing digital competence is the main driving force, and digital culture change is the second driving force, as seen in Figure 4.



Legends:
1. BPN ATR ASNs who develop digital competence

2. Commitment from ATR/BPN leadership in developing
3. Availability of ASN digital competency standards
4. Availability of digital competency development programs
5. Availability of digital transformation audit results
6. Availability of ICT infrastructure
7. Changes in digital culture

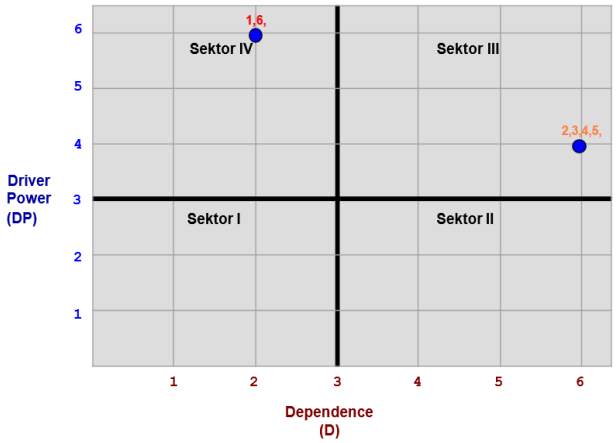
Figure 4. Hierarchical structure model of needs for the ASN digital competency development program within the Ministry of ATR/BPN (The authors)

4.3. The Main Obstacle in the Digital Competency Development Program for ASN within the Ministry of ATR/BPN

The MICMAC analysis produces factor elements distributed in each sector. Based on the driver power (DP) and dependent variables (D) values, the affected institutional elements or groups are grouped into sectors I (autonomous), II (dependent), III (linkage), and IV (driver power). Driver power is a sub-element that affects other sub-elements.

Figure 5 shows that there are no sub-elements in Sector I (autonomous) and Sector II (dependent/recipient of the impact). Sector III (linkage) has a strong DP-strong D value. The sub-elements included in this sector can influence each other's elements in the sector. Based on these elements, the main obstacles are the absence of ASN digital competency standards, the absence of a digital competency development system, the limited number of digital transformation auditors, and the inadequate ICT infrastructure, including in sector III.

Sector IV (independent) has a strong DP-weak D. The sub-elements included in this sector are the power drivers or determinants of the other sub-elements. Elements in this sector include the work head's awareness of the importance of developing digital competence and resistance to implementing digital culture.

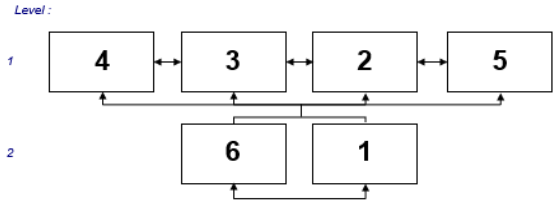


Legends:

01. Awareness of work unit heads regarding the importance of developing digital competence
02. There are no ASN digital competency standards
03. There is no digital competency development system
04. Limited number of digital transformation auditors
05. Limitations of inadequate ICT infrastructure
06. Resistance to digital culture implementation

Figure 5. Matrix of the distribution of the results of the main obstacles in the Digital Competency Development Program for ASN within the Ministry of ATR/BPN (The authors)

The main obstacles faced in the digital competency development program for ASN within the Ministry of ATR/BPN consist of six elements: 1) Awareness of the head of the work unit regarding the importance of developing digital competence; 2) absence of digital competency standards for ASN; 3) absence of a digital competency development system; 4) Limited number of digital transformation auditors; 5) Limited ICT infrastructure that is inadequate; and 6) Resistance to implementing digital culture. Based on the results of the matrix analysis, it is known that the work unit head's awareness of the importance of developing digital competence and resistance to implementing digital culture is the driving force behind the obstacles faced, as seen in Figure 6.



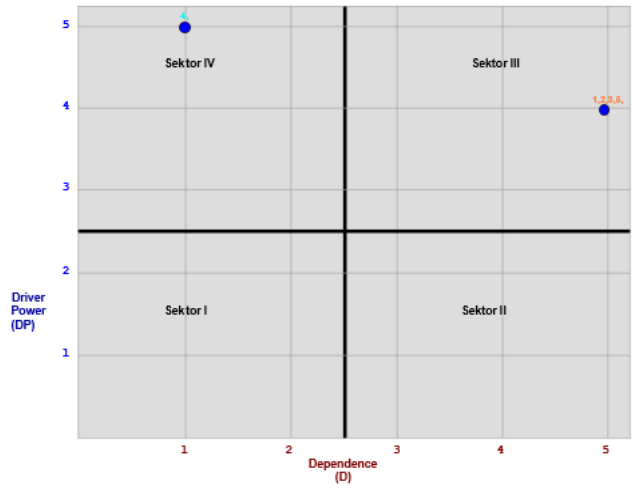
Legends:

1. The head of the work unit is aware of the importance of developing digital competence.
2. There are no ASN digital competency standards.
3. There is no digital competency development system.
4. Limited number of digital transformation auditors
5. Limitations of inadequate ICT infrastructure
6. Resistance to digital culture implementation

Figure 6. Hierarchical structure model of the main obstacles to the Digital Competency Development Program for ASN within the Ministry of ATR/BPN (The authors)

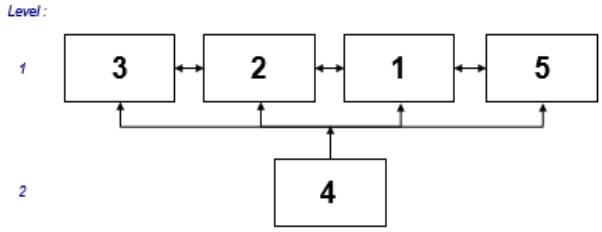
4.4. Possible Changes in the Digital Competency Development Program for ASN within the Ministry of ATR/BPN

The MICMAC analysis produces factor elements distributed in each sector. Based on the driver power (DP) and dependent variables (D) values, the affected institutional elements or groups are grouped into sectors I (autonomous), II (dependent), III (linkage), and IV (driver power). Driver power is a sub-element that affects other sub-elements. Based on Figure 7, there are no sub-elements in sector I (autonomous) and Sector II (dependent/recipient of impacts). Sector III (linkage) has a strong DP-strong D value. The sub-elements included in this sector can influence each other's elements in the sector. Based on the elements of change that are possible, changes to ASN position competency standards, changes to the merit system toward digital competency-based, business processes, and changes to electronic-based governance (SPBE) are included in sector III. Sector IV (independent) has a strong DP value (weak D, the sub elements included in this sector are power drivers or determinants of other sub-elements. Elements in this sector include organizational culture changes.



Legends:
01. Changes in ASN position competency standards
02. Changes in the merit system toward digital competency-based
03. Changes in business processes
04. Organizational culture change
05. Changes in electronic-based governance (SPBE)
Figure 7. Distribution matrix of program requirements results (The authors)

The elements of change possible in the Digital Competency Development Program for ASN within the Ministry of ATR/BPN consist of five elements: 1) Changes in ASN position competency standards, 2) Changes in the merit system toward digital competency-based, 3) Business changes process, 4) Changes in organizational culture, and 5) Changes in electronic-based governance (SPBE). Based on the results of the matrix analysis, it is known that changes in organizational culture are the driving power (main driving force) of possible changes as shown in Figure 8.



Legends:
1. Changes in ASN position competency standards
2. Changes in the merit system toward digital competency-based
3. Changes in business processes
4. Changes in organizational culture
5. Changes in electronic-based governance (SPBE)
Figure 8. Hierarchical structure model of possible changes in the Digital Competency Development Program for ASN within the Ministry of ATR/BPN (The authors)

4.5. The Aim of the Development Program Is to Develop Digital Competency for ASN within the Ministry of ATR/BPN

The MICMAC analysis produces factor elements distributed in each sector. Based on the driver power (DP) and dependent variables (D) values, the affected institutional elements or groups are grouped into sectors I (autonomous), II (dependent), III (linkage), and IV (driver power). Driver power is a sub-element that affects other sub-elements. Based on Figure 9, there are no sub-elements in Sector I (autonomous) and Sector II (dependent/recipient of impacts). Sector III (linkage) has a strong DP-D strong value, there are several elements, including increasing organizational performance and achieving excellent service (bureaucratic reform). Sector IV (independent) has a strong DP value (weak D, several elements included in this sector include the creation of a digital competency development system and the implementation of good SPBE.

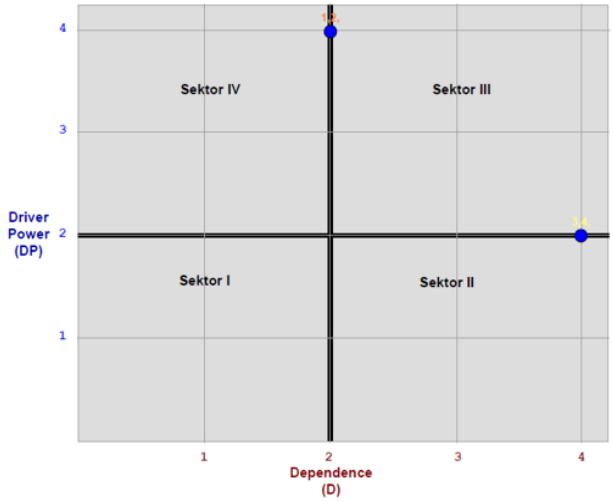
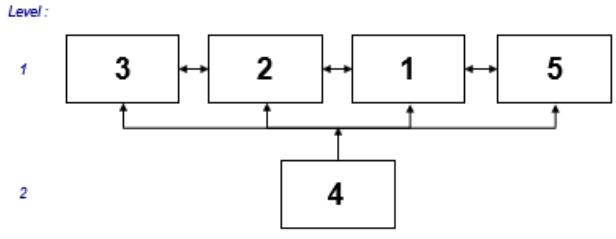


Figure 9. Results distribution matrix of the objectives of the ASN Digital Competency Development Program within the Ministry of ATR/BPN (The authors)

The objective elements of the Digital Competency Development Program for ASN within the Ministry of ATR/BPN consist of four elements: 1) Creation of a digital competency development system, 2) Implementation of good SPBE, 3) Increased organizational performance, and 4) Achievement of excellent service (bureaucratic reform). Based on the results of the matrix analysis, it is known that the creation of a digital competency development system and the implementation of good SPBE are the driving power (main driving force) of program needs, as shown in Figure 10.



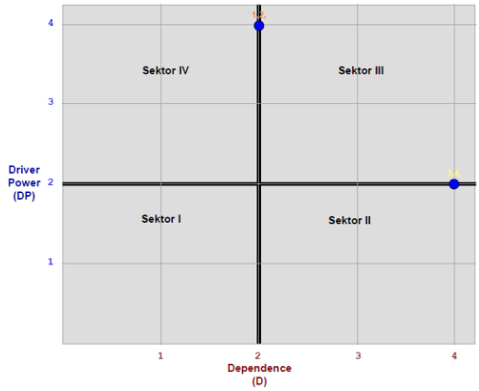
Legends:
01. Creation of a digital competency development system
02. Implementation of SPBE
03. Increased organizational performance
04. Achieving excellent service (bureaucratic reform)
Figure 10. Hierarchical structure model of the ASN Digital Competency Development Program within the Ministry of ATR/BPN (The authors)

4.6. Benchmarks for Assessing Each Objective of the Digital Competency Development Program for ASN within the Ministry of ATR/BPN

The MICMAC analysis produces factor elements distributed in each sector. Based on the driver power

(DP) and dependent variables (D) values, the affected institutional elements or groups are grouped into sectors I (autonomous), II (dependent), III (linkage), and IV (driver power). Driver power is a sub-element that affects other sub-elements.

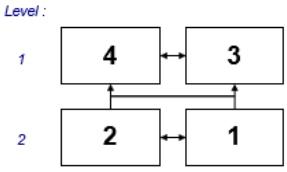
Figure 11 shows that there are no sub-elements in sector I (autonomous), which means there are no elements of the desired goal, including those with weak DP-weak D. In the Sector II (dependent) sector, the elements that have a weak DP-strong D value are the participation ratio in the digital competency development program for ASN and achievement of the SPBE management aspect assessment. The elements included in Sector III (linkage) that have a strong DP-D strong value are the number of findings from the Digital Transformation Audit Results. Sector IV (independent) has a strong DP value—weak D. The sub-elements included in this sector are power drivers or determinants of other sub-elements. Sub-elements in this sector include the implementation of the Ministry's values regarding the ASN Digital Culture Program and the digital competency mastery ratio based on job competency standards.



Legends:
01. Ratio of ASN participation in digital competency development programs
02. Digital competency mastery ratio based on job competency standards
03. Number of findings from the digital transformation audit
04. SPBE management aspect assessment
05. Implementation of the Ministry's Values in relation to the ASN Digital Culture Program

Figure 11. Results distribution matrix: benchmarks for assessing each objective of the Digital Competency Development Program for ASN within the Ministry of ATR/BPN (The authors)

The benchmark elements for assessing each objective of the Digital Competency Development Program for the ASN in the environment consist of five elements: (1) the ratio of participation in digital competency development programs for ASN, 2) Ratio of digital competency mastery based on job competency standards, 3) Number of findings from transformation audit results digital, 4) Achievements of the SPBE management aspect assessment, 5) Implementation of the Ministry's values regarding the ASN Digital Culture Program. Based on the results of the matrix analysis, it is known that the implementation of the Ministry's values regarding the ASN Digital Culture Program is the driver power (main driving force) of the changes that must be made, while the institution's second driver power is the digital competency mastery ratio based on the job competency standards, as seen in Figure 12.

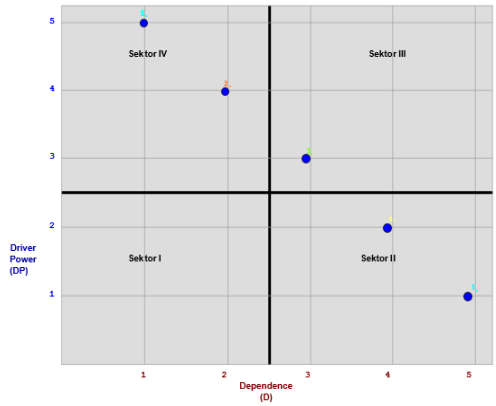


Legends:
1. Ratio of participation in digital competency development programs
2. Digital competency mastery ratio based on standards
3. Number of findings from the digital transformation audit
4. Assessment of SPBE management aspects
5. Implementation of the Ministry's values in relation to the ASN Digital Culture Program

Figure 12. Hierarchical structure model: benchmarks for assessing ASN within the Ministry of ATR/BPN (The authors)

4.7. Activities Needed to Plan Actions That Influence the Digital Competency Development Program for ASN within the Ministry of ATR/BPN

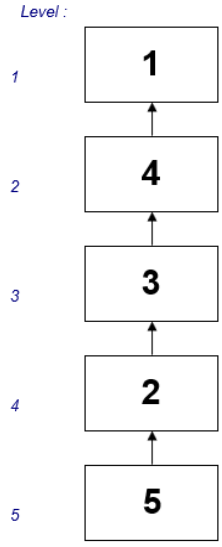
The MICMAC analysis produces factor elements distributed in each sector. Based on the driver power (DP) and dependent variables (D) values, the affected institutional elements or groups are grouped into sectors I (autonomous), II (dependent), III (linkage), and IV (driver power). Driver power is a sub-element that affects other sub-elements. Figure 13 shows that there are no sub-elements in sector I (autonomous), which means that there are no activity elements needed to achieve change that have weak DP-weak D. In the Sector II sector (dependent/impact recipients), elements with weak DP-strong D value are the preparation of ASN digital competency standards and the preparation of a digital competency development system. Sector III (linkage) has a strong DP-D value. The sub-elements included in this sector are sub-elements that can influence each other's elements in the sector. Based on the activity elements needed to achieve change included in this sector, these are strengthening comprehensive digital transformation in an adaptive manner, building a digital cultural collaboration ecosystem, and developing a digital talent program for ATR/BPN. Finally, it is known that there are no elements included in Sector IV (independent).



Legends:
01. Preparation of ASN digital competency standards

02. Preparation of a digital competency development system
03. Strengthening comprehensive digital transformation in an adaptive manner
04. Build a digital cultural collaboration ecosystem
05. Development of a digital talent program for ATR/BPN
Figure 13. Results distribution matrix hierarchical structure model activities needed to plan actions that influence the Digital Competency Development Program for ASN within the Ministry of ATR/BPN (The authors)

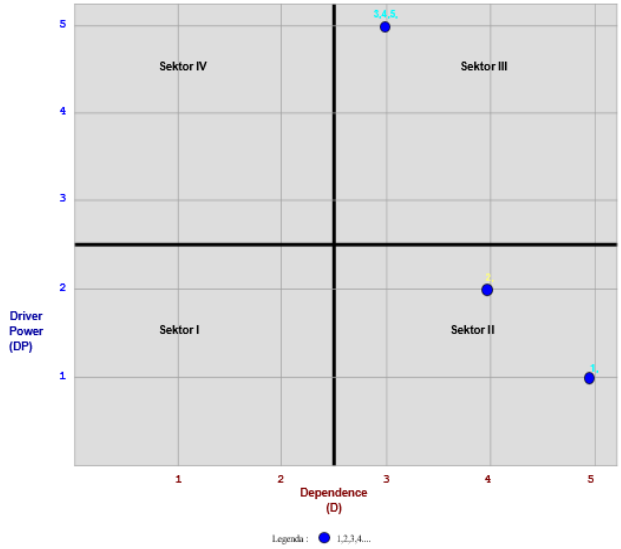
The activity elements needed to plan actions that influence the Digital Competency Development Program for ASN within the Ministry of ATR/BPN consist of five elements: 1) Preparation of ASN digital competency standards; 2) Preparation of a digital competency development system; 3) Strengthening comprehensive digital transformation in an adaptive manner; 4) Building a digital cultural collaboration ecosystem; and 5) Developing a digital talent program for ATR/BPN. Based on the results of the matrix analysis, strengthening comprehensive digital transformation in an adaptive manner, building a digital cultural collaboration ecosystem, and developing digital talent programs for ATR/BPN are the driving forces of the activity elements needed to achieve change, as shown in Figure 14.



Legends:
1. Preparation of ASN digital competency standards
2. Preparation of a digital competency development system
3. Strengthening comprehensive digital transformation in an adaptive manner
4. Building a digital cultural collaboration ecosystem
5. Development of a digital talent program for ATR/BPN
Figure 14. Hierarchical structure model: activities needed to plan actions that influence the Digital Competency Development Program for ASN within the Ministry of ATR/BPN (The authors)

4.8. Activity Measures to Evaluate the Results Achieved by Each Activity of the Digital Competency Development Program for ASN within the Ministry of ATR/BPN

The MICMAC analysis produces factor elements distributed in each sector. Based on the driver power (DP) and dependent variables (D) values, the affected institutional elements or groups are grouped into sectors I (autonomous), II (dependent), III (linkage), and IV (driver power). Driver power is a sub-element that affects other sub-elements. Based on Figure 15, there are no sub-elements in sector I (autonomous) and Sector II (dependent/recipient of impacts). Sector III (linkage) has a strong DP-D value. The sub-elements included in this sector are sub-elements that can influence each other's elements in the sector. Based on the activity size elements included in this sector, they are the determination of ASN position competency standards that adopt digital competency, implementation of a digital competency-based merit system, and SPBE implementation level. Sector IV (independent) has a strong DP-weak D. The sub-elements included in this sector are the power drivers or determinants of the other sub-elements. Elements in this sector include the Establishment of a digital culture program to assess the implementation of the Ministry's values.



Legends:
01. Establishment of ASN position competency standards that adopt digital competency
02. Determination of a Digital Culture Program for assessing implementation of Ministry's values
03. Implementation of a digital competency-based merit system
04. SPBE implementation level

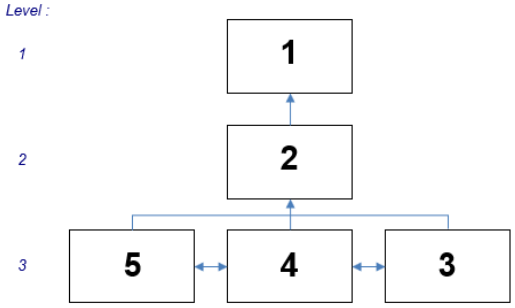
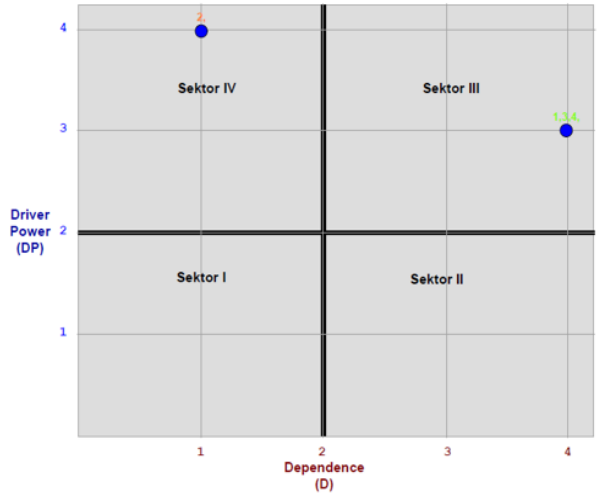


Figure 15. Matrix of the distribution of activity results required to achieve change (The authors)

Elements measurement of activities to evaluate the results achieved by each activity of the Digital Competency Development Program for ASN within the Ministry of ATR/BPN consists of four elements: 1) Determination of competency standards for ASN positions that adopt digital competency, 2) Determination of the Program Digital Culture in the Assessment of the implementation of Ministry's values, 3) Implementation of the digital competency based merit system, and 4) SPBE implementation level. Based

on the results of the matrix analysis, it is clear that the establishment of a digital culture program to assess the implementation of the Ministry's values is the driving force of the activity elements needed to achieve change, as shown in Figure 16.



Legends:
1. Determination of the adopted ASN position competency standards
2. Determination of the Digital Culture Program in the implementation assessment
3. Implementation of a digital competency-based merit system
4. SPBE implementation level

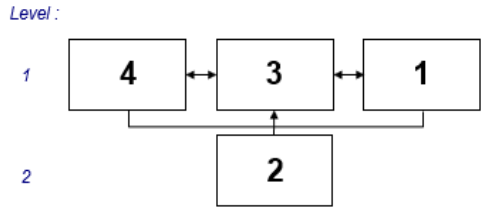


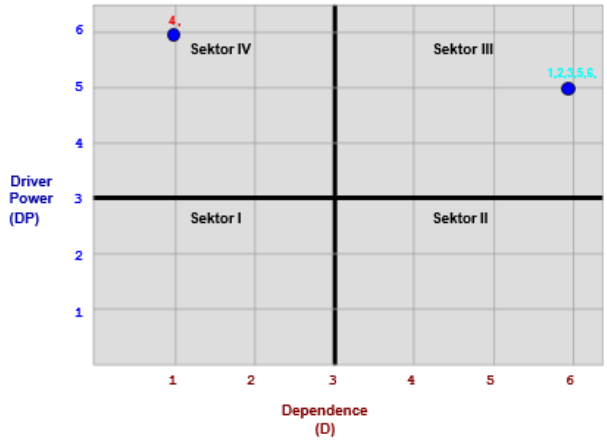
Figure 16. Hierarchical structure model of activity measures (The authors)

4.9. Institutions Involved in Implementing the Digital Competency Development Program for ASN within the Ministry of ATR/BPN

Institutions involved in implementing the Digital Competency development program for ASN in the Environment. MICMAC analysis produces factor elements that are distributed in each sector. Based on the driver power (DP) and dependent variables (D) values, the affected institutional elements or groups are grouped into sectors I (autonomous), II (dependent), III (linkage), and IV (driver power). Driver power is a sub-element that affects other sub-elements.

Based on Figure 17, there are no sub-elements in sector I (autonomous) and Sector II (dependent/recipient of impacts). Sector III (linkage) has a strong DP value-strong D. The sub-elements included in this sector can influence each other's elements in the sector. Based on these elements, the institutions or groups involved are included in this element: Pisatin; Organization and Personnel Bureau; HR Development Center; Inspectorate; and Central/Regional Working Unit.

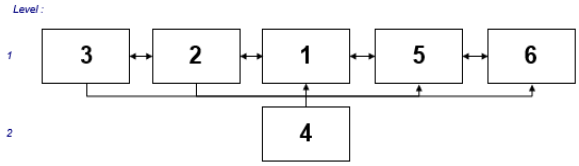
Sector IV (independent) has a strong DP-weak D. The sub-elements included in this sector are the power drivers or determinants of the other sub-elements. This means that the Ministry of Administrative and Bureaucratic Reform is the element most involved in this activity, where this institution or group is linked to institutions that act as driving power.



Legends:
01. Land and spatial information data center
02. Organization and personnel bureau
03. HR Development Center
04. Ministry of Administrative and Bureaucratic Reform
05. Inspectorate
06. Central/Regional Working Unit

Figure 17. Matrix of distribution of results of institutions or groups involved in implementing the digital competency development program for ASN within the Ministry of ATR/BPN (The authors)

The elements of the institutions or groups involved consist of six elements: 1) Pisatin, 2) Organization and Personnel Bureau, 3) HR Development Center, 4) MenpanRB, 5) Inspectorate, and 6) Central/Regional Working Unit. Based on the results of the matrix analysis, Kemenpan RB is the driver power (main driving force) as seen in Figure 18.



Legends:
01. Land and spatial information data center
02. Organization and personnel bureau
03. HR Development Center
04. Ministry of Administrative and Bureaucratic Reform
05. Inspectorate
06. Central/Regional Working Unit

Figure 18. Hierarchical structure model of institutions or groups involved in implementing the digital competency development program for ASN within the Ministry of ATR/BPN (The authors)

To emphasize the importance of digital competence, digital culture, digital transformation, and digital culture in shaping the nature and scale of the Indonesian Ministry of ATR, these factors must be strengthened to continue. This research also succeeded in analyzing the effectiveness of the digital competency variables in improving digital leadership competency, digital transformation, and digital culture so that they can improve the performance of ASN in the Ministry of ATR/BPN. This research also contributes to the competency model that is being applied to the current

Job Competency Standards. ASN competency is not only related to technical skills or expertise but also includes other aspects, such as integrity, ethics, communication skills, and social impact. Understanding the impact on society is important because the ASN is responsible for public interest and community services. Therefore, the evaluation of public worker competencies must include digital dimensions to reflect the comprehensive roles and responsibilities of conducting digital transformation. The Ministry of ATR/BPN seeks to improve the performance of electronic-based services through various regulations and policies in the field of land and spatial planning. The Ministry of ATR/BPN must establish digital transformation as part of the road map for future strategic planning. Digital transformation is an effort to realize the organization's vision of providing world-standard land and space management services. The strategic plan in question starts from this year and includes improving data quality, digital transformation, and the world's standard electronic services in the future.

5. Conclusion

The activity elements needed to plan actions that influence the Digital Competency Development Program for ASN within the Ministry of ATR/BPN consist of five elements a) Preparation of ASN Digital Competency Standards, b) Preparation of a digital competency development system, c) Strengthening comprehensive digital transformation adaptively, d) Building a digital cultural collaboration ecosystem, and e) Developing a digital talent program for ATR/BPN. Design and build a model for developing digital competency for ASN within the Ministry of ATR/BPN. Preparing digital competency standards at the Ministry of ATR/BPN, participation ratios, and digital leaders' involvement are necessary. Apart from that, the involvement of the entire Pusdatin ecosystem, the ORPEG Bureau, HR, work units, and inspectorates is needed to help implement digital competency development in the organization.

6. Limitations and Further Study

This study used ISM to identify the main obstacles in implementing the digital competence of the Ministry. A focus group discussion determined the relationship between elements in mutual influence, cause-effect, and non-relatedness (Marimin, 2017). Preparing the list of questions for formulation involved several experts. The criteria for being considered experts are those who have experience leading the agricultural and spatial planning fields in Indonesia, such as the Head of the Human Resources Development Center, Head of the Organization and Personnel Bureau, organization and human resources experts, academics, IT experts, General Inspector and General Director of the Ministry.

References

[1] AHAMMAD, MOHAMMAD, F., GLAISTER, K.W., & GOMES, E. (2020). Strategic agility and human resource management. *Human Resource Management Review*, 30, 100700.

[2] HUCKLE, S., BHATTACHARYA, R., WHITE, M., & BELOFF, N. (2016). Internet of Things, Blockchain and Shared Economy Application. *Procedia Computer Science*, 98, 461–466.

[3] KAUR, A., & SUMIT, K.L. (2019). Akuntansi keberlanjutan, akuntabilitas dan pelaporan di sektor publik: Gambaran umum dan saran untuk penelitian masa depan. *Penelitian Akuntansi Meditari*, 27, 498–504.

[4] KAUSCH-ZONGO, J., & SCHENK B. (2022). Kompetensi dan penggunaan teknologi umum dalam pendidikan administrasi publik: Sebuah studi evaluasi dengan mempertimbangkan pelatihan kerja dan studi di rumah. *Jurnal Kota Cerdas dan Pembangunan Regional*, 6, 55–65.

[5] MARIMIN, M. (2017). *Teori dan Aplikasi sistem Pakar dalam Teknologi Manajerial*. Bogor: IPB.

[6] MUJIANTO, M., RAMADITYA, M., MUSTIKA, M., TANURAHARJO, H., & MARONRONG, R. (2022). Dampak Pandemi COVID-19 pada UMKM Warung Ritel Tradisional di Indonesia dan Strategi Bertahannya. *Jurnal STEI Ekonomi*, 30(2), 60–74. https://doi.org/10.36406/jemi.v30i02.494

[7] NWANKPA, J.K., & ROUMANI, Y. (2016). IT capability and digital transformation: A firm performance perspective. In: *2016 International Conference on Information Systems, ICIS 2*016.

[8] RAMADITYA, M., EFFENDI, S., & BURDA, A. (2023). Survival and human resource strategies of private higher education in facing an era of change: Insight from Indonesia. *Frontiers in Education*, 8, 1141123. DOI: 10.3389/feduc.2023.1141123

[9] RUMATA, V.M., & NUGRAHA, D.A. (2020). Rendahnya tingkat perilaku digital ASN kementerian kominfo: Survei literasi digital pada instansi pemerintah. *Jurnal Studi Komunikasi (Indonesian Journal of Communications Studies)*, 4(2), 467. https://doi.org/10.25139/jsk.v4i2.2230

[10] RUPPM, C. (2017). E-Government in Europa — Warum es in Österreich gut Funktioniert. *Public Governance*, Autumn/Winter, 4–5. Retrieved from https://publicgovernance.de/media/E-Government_in_Europa_warum_es_in_Oesterreich_gut_funktioniert.pdf

[11] SALEH, A., & AWNY, M.M. (2020). Digital transformation strategy framework. In: *29th International Conference of the International Association for Management of Technology: Towards the Digital World and Industry X.0, IAMOT 2020*.

[12] SAXENA, J.P., SUSHIL, & VRAT, P. (1992). Hierarchy and classification of program plan elements using interpretive structural modeling: A case study of energy conservation in the Indian cement industry. *Systems Practice*, 5(6), 651–670. https://doi.org/10.1007/BF01083616

[13] SYAMSARI, S., RAMADITYA, M., MUDITOMO, A., NASRULLAH, N., & HASBULLAH, H. (2023). Analysis of community participation in waste management that supports the agricultural sector in Takalar. *International Journal of Research in Business and Social Science*, 12(3), 525–529. https://doi.org/10.20525/ijrbs.v12i3.2559

参考文:

[1] 艾哈邁德，穆罕默德，F.，格萊斯特，K.W.，與戈麥斯，E.（2020）。策略敏捷性和人力資源管理。人力資源管理評論，30, 100700。

[2] 哈克，S.，巴塔查里亞，R.，懷特，M.，與貝洛夫，N.（2016）。物聯網、區塊鏈和共享經濟應用。普羅奇迪亞電腦科學，98，461–466。

[3] KAUR, A. 與 SUMIT, K.L.（2019）。公共部門的可持續發展會計、問責制和報告：概述和未來研究建議。冥想會計研究，27，498–504。

[4] KAUSCH-ZONGO, J. 與 SCHENK B. (2022)。公共行政教育中的能力和一般技術使用：一項考慮在職培訓和家庭學習的評估研究。智慧城市與區域發展雜誌，6，55-65。

[5] 馬裡敏，M.（2017）。管理技術專家系統理論與應用。茂物：异戊二烯醇。

[6] MUJIANTO, M. 、 RAMADITYA, M. 、 MUSTIKA, M. 、 TANURAHARJO, H. 與 MARONRONG, R. (2022)。新冠肺炎大流行對印尼傳統零售攤位中小微型企業的影響及其生存策略。史丹利經濟學雜誌，30(2), 60–74。https://doi.org/10.36406/jemi.v30i02.494

[7] NWANKPA, J.K. 與 ROUMANI, Y. (2016)。它能力與數位轉型：公司績效觀點。請參閱：2016 年國際資訊系統會議。

[8] RAMADITYA, M.、EFFENDI, S. 與 BURDA, A. (2023)。面對變革時代的私立高等教育的生存和人力資源策略：印尼的見解。教育前沿，8, 1141123。

[9] RUMATA, V.M. 與 NUGRAHA, D.A.（2020）。通訊和資訊部公務員數位行為水準較低：政府機構數位素養調查。傳播研究期刊（印尼傳播研究期刊），4(2), 467。

[10] RUPPM, C. (2017)。歐洲的電子化政府－為什麼它在奧地利運作良好。公共治理，秋/冬，4-5。取自 https://publicgovernance.de/media/E-Government_in_Europa_warum_es_in_Oesterreich_gut_funktioniert.pdf

[11] SALEH, A. 與 AWNY, M.M.（2020）。數位轉型策略框架。請參閱：國際技術管理協會第 29 屆國際會議：邁向數位世界和工業 X.0。

[12] SAXENA, J. P., SUSHIL 與 VRAT, P. (1992)。使用元素解釋結構模型的專案計劃的層次結構和分類：印度水泥產業節能案例研究。系統實踐，5(6), 651–670。https://doi.org/10.1007/BF01083616

[13] SYAMSARI, S. 、 RAMADITYA, M. 、 MUDITOMO, A. 、 NASRULLAH, N. 與 HASBULLAH, H. (2023)。社區參與支持塔卡拉農業部門的廢棄物管理的分析。國際商業和社會科學研究雜誌，12(3), 525–529。https://doi.org/10.20525/ijrbs.v12i3.2559