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Digital Transformation in Public Management Functions for Public Information Disclosure

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Abstract**:** *This research emphasizes the conditioning of resources in the context of public management to create the openness of public information during digital transformation. A literature study from various databases related to managing resources in public management is analyzed. The intended resources include the latest technology used to protect data and privacy when discussing information disclosure in Indonesia. Digital transformation has led public management to improve and accelerate technological acceleration in the context of data analytics and create the openness of information for the public by government administrators. The strategy used to address this digital transformation in public management encompasses a comprehensive plan, including strong data protection policies, investment in technology infrastructure, and training for public employees. Thus, pieces of technology and performance management, open government, and human resource capacity development Public information disclosure results in transparency and accountability, information disclosure, and improving public services. Moreover, integrating technology into the public information ecosystem provides great potential for increasing openness, participation, and better public services.*
Keywords*: Digital Transformation; Public Management; Resources and Public Information Disclosure.*

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Introduction

The service atmosphere in Indonesia is developing in tandem with technological transformation. Likewise, concerning time, the acceleration cycle is a major factor. The extraordinary acceleration affects the form of service and the response of public services. This condition illustrates that digital transformation in public management is included in technology acceleration. The concept emphasizes using information and communication technology to increase efficiency and provide better service to the public. In this ever-evolving digital era, governments around the world increasingly realize the potential and benefits that can be obtained by adopting digital solutions in the decision-making, administration, and delivery of public services (Hadi et al., 2020; Heriyanto, 2022; Lumbanraja, 2020).

One of the important aspects of digital transformation in public management is the use of data (Hermawan et al., 2023) and sophisticated data analytics (Tulungen et al., 2022). Governments can collect, store, and analyze data from multiple sources to gain deeper insights into people's needs and preferences. Thus, public decisions can be made based on strong evidence and data, minimizing speculation and ensuring that policies and programs are following the community's real needs. For example, service transformation occurred in Sumedang Regency (Afriyani et al., 2022); Banten Province (Arianto, 2022); and Padang (Namora et al., 2023).

In addition, technology also enables the government to provide public services that are more efficient and easily accessible to the public. For example, governments can develop applications and online platforms that allow citizens to apply, pay taxes, access public information, or interact with government agencies without physically coming to an office. Thus, it saves time and money for the community and helps increase government transparency and accountability.

Digital transformation in public management also involves adopting intelligent technologies such as Artificial Intelligence (AI) and process automation (Lykidis et al., 2021). Its application in public management can assist in policy analysis, trend prediction, and more effective decision-making. Meanwhile, process automation can reduce repetitive manual workloads and allow public employees to focus on more complex, service-oriented tasks.

However, digital transformation in public management also poses challenges. Among these are those mentioned by Newman et al. (2022) including data security and privacy, gaps in access to technology, and the need to engage and train public employees to be ready to adopt new technologies. One of the biggest cases related to data security is the leak of Social Security Health Services (BPJS) data in 2021 (Jayanti, 2022). Therefore, the government needs to design a comprehensive strategy, including strong data protection policies, investment in technology infrastructure, and training for public employees.

Overall, according to Kim et al. (2023), digital transformation in public management offers great opportunities for governments to increase efficiency,

improve service quality, and create a more responsive and transparent government system. By using technology wisely, the government can bring significant positive changes to society.

Technology has changed how the government manages public information and provides services to the public in the digital transformation era. One important aspect of this transformation is the efficiency of public information disclosure, which can be achieved by implementing digital solutions. Advances in information and communication technology have enabled easier and faster access to public information, allowing citizens to be actively involved in decision-making processes and strengthening government accountability. In (Nababan, 2020), public information disclosure is created in the framework of achieving accountability, transparency, and participation and efforts that can be made by the Public Information Commission both at the central and regional levels in encouraging public information disclosure and the realization of an information society in Indonesia.

In the context of public management, technology has brought significant changes. Various digital tools and systems, such as online public information portals, unified databases, and public participation platforms, have simplified and accelerated disclosing information. In recent years, more and more governments have committed to implementing the principle of public information disclosure by leveraging the potential of existing technology.

Utilizing technology for the efficiency of public information disclosure has great benefits for society. First, easy access and transparency of public information (Wahyuningsih & Pranoto, 2020) allow the public to monitor and evaluate government actions more. In doing so, it helps increase accountability and reduce the risk of corruption in government. Second, through technology, public information can be disclosed more quickly and precisely (Supiyandi et al., 2023), speeding up decision-making processes and creating more efficient public services. Third, using technology also enables broader and more organized public participation, enabling citizens to provide their input and opinions on public policies and government programs.

However, some challenges must be faced in utilizing technology for efficiency in public information disclosure. One is data protection and privacy (Milberg et al., 2000; Sihombing, 2021). In managing sensitive public information, the government must ensure the data is safe and protected from misuse. In addition, there needs to be more access to technology among the people who need attention. The government must ensure that access to technology and digital literacy is evenly distributed to include every community group.

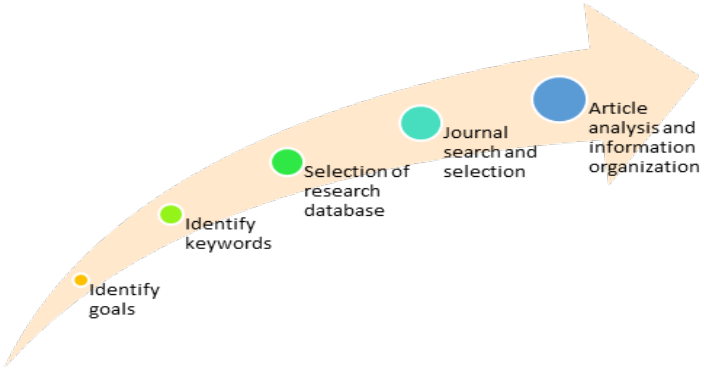
Research on this topic has been discussed several times before from various points of view. (Glavas et al., 2021) emphasize the importance of digital transformation in the public sector and the need for additional efforts to encourage it, including the acquisition of new skills and knowledge sharing, to improve public administration in Croatia. Then, Ngwenyama et al. (2023) discuss the challenges of managing social risks associated with digitalization in Denmark. Others (Gillingham & Graham, 2016)

consider how New Public Management (NPM) logics are used to construct electronic information systems (IS) in social work organizations and advise challenging them to create new IS that better support frontline practice and practitioners theoretically. Meanwhile, this article will fill the gap and explore how digital transformation and public management functions (resources) can utilize technology for efficient public information disclosure. This research looks at various initiatives and best practices that the government in Indonesia has carried out to increase access to information, strengthen public participation, and increase the efficiency of public services through technology.

Method

This study uses the literature study method by reviewing and analyzing as many as 66 journal articles. Journal sources in detail consist of reputable international journals, international journals, and accredited national journals. Data grouping is done by grouping the types of articles by topic and year. The analysis was carried out according to topic clusters, according to the sub-themes that became the research framework. The aim is to get answers to the digital transformation in public management and information.

Figure 1. Literature Review Research Steps



(Dekker et al., 2020; Reis et al., 2019)

The method combines several literature review models (Dekker et al., 2020; Reis et al., 2019; H. Wang et al., 2018). First, research trends and comparisons of previous studies are emphasized in identifying research objectives. Second, the activity of identifying keywords by making a list of keywords that are relevant to the topic. This keyword is used in the search for journals that match the topic.

Third, selecting a research database to search for relevant journals, namely using Google Scholar. Fourth, the journal search begins by using the previously identified keywords, further, it is carried out in the framework of selection based on the criteria. Fifth, the analysis of the article began to be carried out in detail by paying attention to the main findings, the methodology used, the theoretical framework, and the resulting conclusions.

Result and Discussion

Digital Transformation and Public Management Transformation

Digital transformation refers to a fundamental change in the widespread use of digital technologies within an organization or sector. In the governance context, digital transformation means adopting and integrating sophisticated information and communication technologies (ICT) in various aspects of management and public services. Digital transformation aims to increase efficiency, transparency, participation, and the quality of services provided by the Government to the public.

To meet the needs of the community, public services must also always adapt. The Deputy for Public Services at the Ministry of State Apparatus Empowerment and Bureaucratic Reform (PANRB) stated that currently, the Government is transforming public services into electronic-based public services (e-services). The implementation of information technology in public services has been carried out by the Ministry of Administrative and Bureaucratic Reform in four main aspects. The first aspect concerns providing public service information through the Sistem Informasi Pelayanan Publik Nasional (SIPPN) and the Jaringan Inovasi Pelayanan Publik Nasional (JIPPNAS).

SIPPN is a one-stop public information service that contains service delivery standards, service announcements, and service provider profiles. Meanwhile, JIPPNAS is a public service innovation information portal for accelerating development and a database of national public service innovations. The digitalization of service delivery is the second aspect. It explained that the PANRB Ministry is developing a Digital Public Service Mall (MPP) and a Public Service Portal design. This activity is often done to overcome problems in public services, such as unfragmented data and service quality that could be more optimal. The construction of a Public Service Portal as stipulated in Peraturan Presiden No. 95/2018 concerning Electronic-Based Government Systems (SPBE). The Public Service Portal will later contain electronic-based public services from strategic sectors or urgent user needs.

The application of technology in digital transformation involves various initiatives in the sense that this initiative is an entry point to make changes in government services. The intended initiatives are in the form of e-government, cloud computing, and the transformation of public management. First, e-government can be explained as an effort by the Government to provide electronic platforms and online applications to provide public services, such as paying taxes, filing applications, registering, and accessing public information.

Second, it can be categorized as big data and analytics, where this concept has several actions related to collecting, storing, and analyzing large and diverse data. The benefit in this context is to gain better insight into decision-making and public policy planning to create good public management. For example, SIPPN provides a space for self-actualization to express opinions and obtain public information assistance.

The next initiative included in third place is artificial intelligence (AI). Implementing AI in various areas is

changing the sophistication of data grouping and data utilization for public services. Such as, for example, natural language processing, predictive analytics, and chatbots to enhance interaction with the community. In terms of information disclosure, AI can be used as a tool that can accommodate society's general information needs. Ease of accessing public information, for example, regarding the number of final voter lists for the 2024 presidential election. It is a predictive and descriptive indicator for the public, reducing the feeling of uncertainty in the community regarding public services.

Fourth, cloud computing is an infrastructure that supports digital transformation in government. Using cloud infrastructure to securely store and manage data and efficiently access applications and public services. Utilizing the cloud is associated with developing the Internet of Things (IoT). This concept connects physical devices to the internet to collect real-time data, monitor public infrastructure, and improve operational efficiency. The real practice of using cloud computing and the Internet of Things in government services was evident during the COVID-19 pandemic a few years ago. The Ministry of Communication and Information of the Republic of Indonesia (2021) said that out of 2,700 government data servers, only about 3 percent use a cloud system. Its basic orientation is the non-stop provision of public services and information.

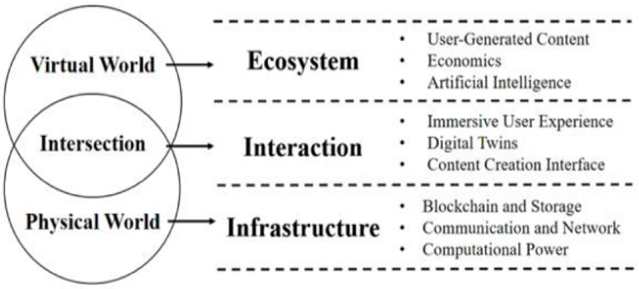
With cloud-based data storage, the government can increase its resilience to crises or disasters. Important public data can be stored in the cloud, reducing the data concentration risk in one place. Meanwhile, the services provided by government offices have become more efficient because everything is connected digitally. If necessary, the public no longer needs to visit government offices because everything can be done online, for example, making tax payments and reporting annual taxes. This condition is very supportive. Using the cloud will eliminate the duplication of ID cards, which could be more environmentally friendly because it uses paper and ink that are bad for the environment.

Even so, the government still must change and replace technological infrastructure to not produce digital waste that is more harmful to the environment. An important point in storing public digital data is ensuring its security. In this increasingly sophisticated era, cyberattacks are also increasingly widespread. However, this can be prevented by a series of policies set up to protect the privacy and security of data in the cloud. Government agencies of the same class can employ a reliable IT team to prevent cybercrime that has the potential to be bad for population data.

In one term, digital transformation in public management brings changes in implementing public management itself. This condition is due to the interaction in the metaverse of public services (see Figure 2). This public management has also led to the opinion that the revival of interest in information privacy has become a commodity in public service. Public opinion surveys show that many citizens are becoming seriously concerned about threats to the privacy of information, with levels of such concern reaching an all-time high. In response to increasing citizen concern, the media is devoting more attention to privacy issues,

and government regulation of the corporate privacy environment is increasing in many countries.

Figure 2. Intersection Metaverse in Public Services



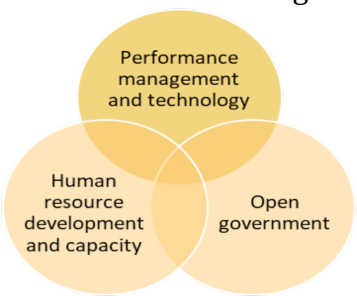
Sources: (Duan et al., 2021)

Based on the explanation above, the relationship between the digital transformation of public management and the metaverse issue Lee et al. define the metaverse as a 3-dimensional virtual world formed by a combination of converged physical and digital worlds (L.-H., Lee et al., 2021). In another definition, the metaverse is understood as meta transcendence and the universe in the form of a 3-dimensional virtual world, which is a space for avatars to engage in activities similar to everyday life in the real world, both in political, economic, social, and cultural activities (Park & Kim, 2022). Metaverse is also defined as a new form of the internet that integrates a virtual ecosystem without boundaries that users can control through avatars (Lim et al., 2022).

These three structures support the big concept so that public services can place their portion ideally. Ecosystems, interactions, and infrastructure are considered a framework for running a public service and realizing optimal public management. In the infrastructure layer, Metaverse can operate supported by technology that can operate virtual worlds, including computation, communications, blockchain, and storage (Fernandez & Hui, 2022; Zhao et al., 2022). The interaction layer has an immersive user experience component, digital twins, and content creation. Two key components are needed to create an immersive user experience: how data interacts from the physical world to the virtual world in controlling user actions and activities with their avatars (Fernandez & Hui, 2022). Moreover, secondarily, interface technology support can facilitate interactions that feel real, like through VR or AR.

In the top layer, namely the ecosystem, there are three components, including user-generated content, economics, and artificial intelligence (Duan et al., 2021). User-generated content, also known as UGC, is a variety of content created by virtual world users to fill the metaverse. Generating content can open doors to making information dissemination opportunities wider and more convergent. Meanwhile, in the artificial intelligence layer, as previously explained, it depends on the ecosystem or governance environment.

Figure 3. Aspects of Digital Transformation in Public Management



(Data Processed by Researchers, 2023)

Digital transformation in public management is bringing significant changes to how public services are implemented and accessed. The metaverse, which represents a 3-dimensional virtual world that merges the physical and digital realms, is becoming an integral part of public services, enabling citizens to engage in various activities in a virtual space. Thus, several important aspects of Indonesia's digital transformation of public management can be underlined, including performance management and technology, open government, and human resource capacity development. In the context of performance management, it is more appropriate for governments to adopt a results-based approach and use performance measurement tools to monitor the achievement of objectives and increase accountability. Furthermore, conducting partnerships and collaborations with various parties to expand their wings and across areas so that access to information is increasingly wide open. The action builds stronger relationships between government, the private sector, and civil society to achieve common goals and use resources effectively.

In the end, open government is the goal for realizing good public management in information disclosure in Indonesia. Open governments` primary goal is transparency, the disclosure of information about official decisions and activity in forms that citizens can easily read and use (Attard et al., 2015; Kassen, 2013). The government seeks to increase transparency, public participation, and access to public information in decision-making and policy implementation (Harrison & Sayogo, 2014). Thus giving rise to public innovation that encourages governments to adopt innovative practices in designing policies, providing public services, and solving complex problems. Of course, this must also be balanced with the capacity and development of human resources. It is done by developing the skills and knowledge of public employees so that they can deal with the changes and demands generated by digital transformation and public management. The combination of digital transformation and public management transformation provides a great opportunity to improve the quality and efficiency of government and provide better and more responsive public services to meet the needs of society.

Public Information Disclosure and Public Management

An important principle in democratic governance is the openness of public information in public management. There are two interrelated terms: public information disclosure influences the creation of good public management, and good public management creates information transparency for the community and government. Both positions cover open access and transparency (López & Fontaine, 2019; Lourenço, 2023; Ramírez & Tejada, 2019) in information generated and collected by governments, as well as the right of the public to access that information. In the context of public management (Schnell, 2022), public information disclosure plays an important role in promoting accountability (Gendron et al., 2001; James & John, 2006), public participation

(Lappas et al., 2022; Secinaro et al., 2022), and better decision-making (Migchelbrink & Van de Walle, 2022; Overman & Schillemans, 2022).

To realize an open and participatory government, implementing good governance means returning the function of control over governance to the community. Communities must be given access and space to play a role in making policy products and in the performance of government agencies and their officials. Formation of a strong legal basis for the community regarding the right to public information in government administration in the form of a public disclosure law. In the context of public management, public information implies that information is generated, stored, managed, sent, and received by a public agency relating to state administrators and administration and organizers and administration of other public bodies under (Law) Undang-Undang 14/2008 Keterbukaan Informasi Publik, as well as other information relating to the public interest.

Furthermore, the basic principle of public information is the right of all people. However, in practice, this is not conveyed properly and is often neglected, so public information entities no longer refer to something that is the right and authority of the public. Public bodies have treated public information like a privilege that can only be accessed by certain parties. Dissemination of information about the distribution of Social Safety Net (JPS) funds (Maryam et al., 2022; Nadia et al., 2022), for example, stops at those with special relationships with public officials. Various cases show that people experiencing poverty, who are more entitled to JPS funds, are intimidated, terrorized, or prevented from obtaining this information.

In the field of procurement, information about partners is always a secret that is kept tight, so it will take much work for the public to obtain the slightest information. On the other hand, public bodies often treat public information like a commodity that can be traded to those who need it. It is commonly faced by people trying to get information about government project tenders in various fields, between public information on the one hand and public rights on the other. On the other hand, it is as if there is a thick wall that is difficult to penetrate, namely a bureaucratic culture that is not very conducive to the implementation of information disclosure, a bureaucratic culture that gave birth to public officials who are corrupt, feudal, and very allergic to anything that smells of openness and transparency.

The biggest challenge in building a quality public information and communication system is to package an information management system and package information that is needed by the public and is of high quality, accurate, and attractive. Because information that follows public needs and is acceptable will lead to public satisfaction, the credibility of government institutions will be increasingly relied on in the eyes of the public.

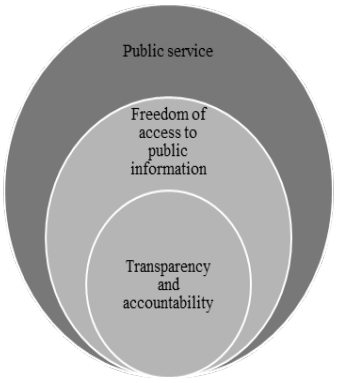
In the implementation of good governance itself, the management of human resources is something that absolutely must be addressed, so it is necessary in order to improve services (Anggadyasa & Mahyuni, 2023; Hendrawan & Suwardono, 2023). Nevertheless, nowadays, besides these

resources, information is also a resource that is no less important and must be managed properly. Decision-makers understand that information is not just an ongoing by-product but also a critical factor in determining the success or failure of a bureaucratic activity to provide the best service to the community.

Information becomes a government controller to help public institutions achieve their goals. Given this, it is also necessary to pay attention to the criteria for appropriate public information to be distributed and accessed by the public. First, accurate means free from error and not misleading for recipients of information (Kariuki et al., 2023; Pérez-Escolar et al., 2023). In addition, the information must reflect the intention. If there is interference in the delivery of information that can change or damage the contents of the information, the information to be provided must be complete, correct, and safe. Second, being timely (Basch et al., 2020; Mobbs et al., 2020) means the information received must arrive and be disseminated at the right time. Because if there is an inaccuracy in the distribution in terms of time, the information can no longer be utilized by various parties. Third, the relevance of the information to the needs of recipients and senders of information determines the success of information disclosure (Lee et al., 2020; MacFarlane et al., 2022). Fourth, economic usefulness is a criterion for considering the quality of the information conveyed (Wang & Li, 2020; Zinko et al., 2020).

In looking at the relationship between information disclosure and public management, one can see the pieces that are related between the two. The initial pieces that emerge from the relationship between the two are transparency and accountability (Michener & Nichter, 2022; Saldanha et al., 2022). Both are public information disclosures that must ensure that government actions can be monitored and evaluated by the public. Governments are held accountable for their actions and decisions by providing open access to information. These actions help prevent corruption, power abuse, and ethics breaches in public management.

Figure 4. Intersection of the Concept of Public Information Disclosure with Public Management in the Context of Resources



(Data processed by Researchers 2023)

Public participation is the second piece describing how public information relates to public management. Public information openness allows the public to be involved in decision-making and influence public policy (Novita et al., 2022). By providing broad access to information, the public can provide input, opinions, and constructive criticism of government policies and programs. Active public participation can strengthen government legitimacy and ensure the resulting policies reflect the public interest.

The next piece is better public services. Public information disclosure allows the public to obtain the information they need about public services provided by the government (Ahn & Chen, 2022). With easy access to this information, the public can access services, understand their rights, and provide feedback to improve the quality and efficiency of public services. It created another intersection, namely the emergence of innovation and development, where public information disclosure encourages innovation and development in the public sector. With open access to information and data, the government can facilitate research, technology development, and collaboration with other parties to increase the effectiveness and efficiency of public management. Available information can also be used to design evidence-based policies and promote smarter decision-making. The importance of public information disclosure in public management emphasizes the need for the government to maintain and protect people's rights to access information. It includes ensuring transparency in collecting, storing, and disseminating public information and adopting laws or policies supporting public information disclosure. This could be done by creating user-friendly online public platforms for information and feedback (Desouza & Bhagwatwar, 2017). Also, hold public consultations and surveys to get citizens' input or empower local communities to participate in decision-making. These strategies can help the government improve public participation and management by disclosing information.

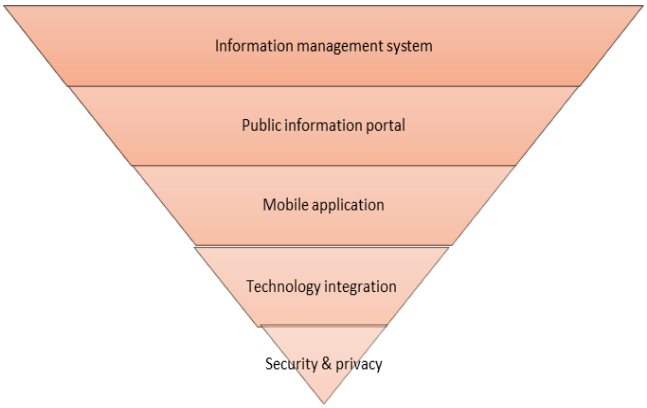
Integration of Technology Utilization in the Public Information Ecosystem

Information and communication technology development has significantly impacted the public information ecosystem (Deac, 2020). Therefore, tackling the challenges of digital transformation in public management requires a comprehensive approach. Technology acceleration is driving many changes in government structures and work strategies. All parties are forced to adapt to technology, from using technological devices to changing work functions using more sophisticated tools. This digital transformation does not only refer to tool changes but also to the level of function and implementation in everyday life. Integrating technology into the public information ecosystem is important for increasing accessibility, transparency, and efficiency in providing public information.

The utilization of technological devices in the performance of public management creates a new ecosystem to shape and lead public information. In other words, several aspects affect the formation of new ecosystems (Ahn & Chen, 2022; Dede et al., 2020) in a more effective way. This ecosystem is a model for bridging the problems of long service and massive information dissemination. First, the information management system encourages virtual ecosystems to promote public information disclosure (Nurkholis et al., 2021; S., Supiyandi et al., 2023). The use of technology in the public information ecosystem involves developing and implementing an integrated information management system. These systems can include databases that record and store public information and applications that make it easy to find and access that

information. By using a good system, the government can manage public information more efficiently, avoid data duplication, and increase the accuracy and availability of the information needed.

Figure 5. Integration of Technology Utilization in the Public Information Ecosystem



(Data processed by Researchers, 2023)

Second, elements of the public information portal can also be used to control information disclosure, so it does not run wild (Baharuddin, 2022; Rumata, 2017; Samudra et al., 2022). The establishment of a public information portal that can be accessed online is an important step in integrating the use of technology. This portal can be a single access point for the public to seek public information from various sources, such as government policies, statistical data, public reports, and information on government projects. A well-structured portal will make it easier for the public to get the information they want, increase transparency, and encourage public participation.

Third, using mobile applications in the public information ecosystem can expand the accessibility of public information to the public (Premana et al., 2022; Setiawan, 2018; Tampubolon, 2016). This application allows people to access real-time information through mobile devices like smartphones or tablets. An example is an application that gives citizens access to public services, government announcements, and relevant policy information. Mobile applications can also facilitate feedback from the public, providing opportunities for more active participation.

Fourth, the integration of technology in the public information ecosystem also includes the application of the concept of open data (Manzoor, 2023; Sánchez-Labella Martín, 2022), namely providing open and free access for the public to use and process public data provided by the government. By publicly publishing data, the public can use it for various purposes, such as research, innovation, application development, and monitoring government performance. It encourages collaboration between the government and society in utilizing public data to achieve common interests. Second, elements of the public information portal can also be used to control information disclosure so it does not run wild (Baharuddin, 2022; Rumata, 2017; Samudra et al., 2022). The establishment of a public information portal that can be accessed online is an important step in integrating the use of technology. This portal can be a single access point for the public to seek public information from various sources, such as government policies, statistical data, public reports, and information on government projects. A well-structured portal will make it easier for the public to get the information they

want, increase transparency, and encourage public participation.

Fifth, there will be a culture shock when facing the accelerated use of technology, so avoiding it requires security and privacy (Kapa et al., 2020; Zhu et al., 2020). Integrating technology into the public information ecosystem is important to ensure data security and privacy. The protection of sensitive information and individual privacy must be a top priority. Data security and protection measures, including data encryption, proper access management, and a clear privacy policy, must be implemented. Integration of the use of technology in the public information ecosystem provides great potential for increasing openness, participation, and better public services. In carrying out this integration, it is important to involve various stakeholders, involve the community in the process of developing technological solutions, and ensure inclusivity so that all levels of society can feel the benefits.

Conclusion

This research focuses on optimizing the public management of resources related to digital technology and human resources. Digital transformation is important in creating public management for public information disclosure. This digital era links public management with metaverse issues where interactions bridge physical activities with virtual activities, meaning that digital ecosystems help create good infrastructure for realizing resources in the public management function. In addition, important aspects of the digital transformation of public management in Indonesia include performance management and technology, open government, and capacity building for human resources. The intersection of public information disclosure and public management lies in transparency and accountability, freedom of access to public information, and public services. The adaptation of accelerated technology encourages the creation of a new ecosystem for public information disclosure, which leads to two-way communication between the government and the community and increases community participation.

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