POLICY & GOVERNANCE REVIEW | PGR

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Submitted: 14 August 2023, Revised: 25 September 2023, Accepted: 26 September 2023

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Policy & Governance Review
ISSN 2580-4820
Vol. 7, Issue 3, pp. 261-279
DOI: https://doi.org/10.30589/pgr.v7i3.782

Human Resources and Technology Integration in Effective Public Management

Abstract

This study aims to explore effective public management within the framework of the integration of human resources and technology. By utilizing current literature review approaches, this study focuses on sources published within the last decade. Employing keywords related to human resource and technology integration on platforms like Google Scholar, the research aims to extract relevant and significant information from a wide range of scholarly materials. The findings in this study confirm that the integration of human resources and technology in public management is an essential foundation for creating responsive, transparent, and high-quality public services. Managing public management and optimizing public services in accelerating technology includes using digital platforms; human adaptation to technology; transparency and participation of the technology community; and data security. Meanwhile, the integration of human resources and technology in innovation and development can be described in the use of technology and data analysis; collaboration, and improvement of human resources; as well as a survival strategy not to change. Finally, to see the management of change in public management in a technological framework from the aspects of technology adoption, changes in organizational culture, service efficiency and improvement, HR training and development, and monitoring and evaluation.

Keywords:
human resources; integration; technology; public management

Introduction

In an era filled with rapid technological advances, public management is in a significant paradigmatic change. The use of information technology has changed the way we access, store, and manage data, and has enabled more efficient communication and greater accessibility of

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information. On the other hand, the role of human resources in public organizations remains important in designing and implementing policies, as well as ensuring effective management (Ihejirika et al., 2021; Kassie et al., 2020; Sun et al., 2021). When technology is wisely applied, its potential to transform public governance and services is enormous. This transformation has been known as the new hybrid world that promotes public service innovation using technology in the digitalization era (Emery & Giauque, 2014; Kusumasari et al., 2023). Administrative processes can be improved, data management can become more accurate and real-time, and community involvement can be increased through digital platforms (Balcerzak et al., 2022; Guo et al., 2022a). However, it is essential to remember that technology is only a tool, and its success depends on the skill and vision of the human resources professionals who use it.

By understanding the dynamics between human capital and technology in the context of effective public management, we can design more holistic and sustainable strategies to address ongoing change. In this journey, we will explore the latest research, identify the best patterns, and formulate recommendations to support public management that is adaptive (McCord & Pilliod, 2022), efficient (Al Yami et al., 2022), and responsive (Vansteenwegen et al., 2022) to societal demands and technological advances. Meanwhile, public management has a close relationship with human resources and technology because the three interact and influence each other to achieve organizational and societal goals effectively. In (Centobelli et al., 2018) terms of managing efficiency and effectiveness, the link between human resources, technology, and public management helps improve the efficiency and effectiveness of public organizations. Proper technology integration and good human resource management can result in more efficient processes, faster decision-making, and more targeted management of resources.

Technology has the potential to improve the quality and accessibility of public services (Tassabehji et al., 2019). In the context of public services, this digitalization can have a variety of effects on co-production and co-creation activities, such as changes in agency, reliance, participation, roles, and relationships between public service consumers and organizations (Trischler & Westman Trischler, 2022) However, the success of this technology depends on the ability of human resources to implement and utilize it effectively. Trained and competent human resources will be able to integrate technology with public service processes to provide maximum benefits to the community.

Technology-based public management encourages innovation and development. By integrating advanced technologies such as big data analysis (Guo et al., 2022b; Roski et al., 2014), artificial intelligence

(van Noordt & Misuraca, 2022; Wilson, 2022), and other technologies (Vu & Lim, 2022), public organizations can develop more innovative solutions (Filgueiras, 2022; Peng & Tao, 2022) and responsive to environmental changes (Barak-Corren & Kariv-Teitelbaum, 2021). In other words, technology can be used to increase transparency in public management, such as through e-government platforms that allow citizens to easily access information and public services. Thus, human resources in the public sector need to ensure that the information provided is accurate and timely.

On the other hand, changes, and acceleration of technology in Indonesia can change the existing government management structure. This change was welcomed by the evolution of technology which affected the quality of human resources (Chowdhury et al., 2023). In the creation of change management, technology often triggers changes in the organization. Managing this change requires involving human resources in designing implementation strategies, providing training, and ensuring that staff can adapt to new technologies. The use of technology in data analysis and decision-making can assist public management in making more informed and accurate decisions. However, human resources need to understand how to use the data effectively to take appropriate steps (Bahuguna et al., 2023). Overall, the integration of human resources and technology in public management is essential for optimizing public services, increasing efficiency, and achieving organizational goals as well as being responsive to the ever-evolving societal demands.

In the context of the education sector, public management can be represented in the form of launching public education programs aimed at increasing access to education and the quality of education for all citizens. Public management is involved in planning, managing funds, evaluating school performance, training teachers, and supervising the implementation of the program. The main goal is to increase literacy and ensure that every child gets a quality education. On the other hand, in the field of public health services, there is a synchronized availability of BPJS facilities with community access (Slater, 2022). In addition, the Government implemented an e-government platform (Ninkov et al., 2021; Upadhyay et al., 2022) to facilitate public access to government services via the Internet. Public management is involved in platform design, data security, online service provision, and interaction with the public. The goal is to increase transparency, efficiency, and accessibility of public services such as e-KTP, e-KK, and various platforms that facilitate tax payments.

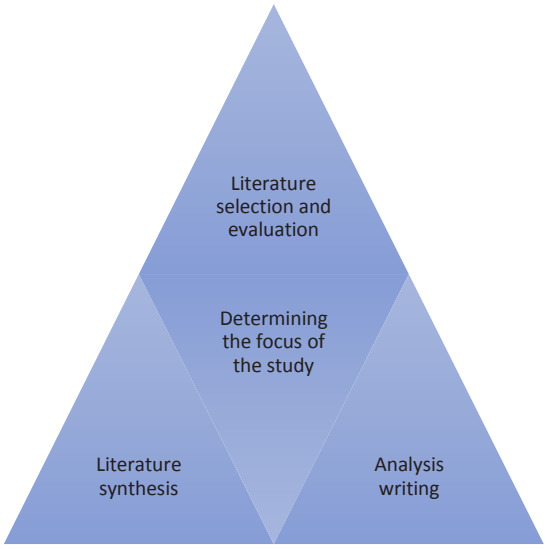
Referring to the preceding discussion, it becomes evident that the landscape of public management is susceptible to shifts in its operational dynamics. Some previous articles have been studied on this topic. First, observing China, (Hui et al., 2017) analyzes the development of human resources in science and technology (HRST), highlighting challenges and recommendations for enhancing innovation and global competitiveness. Then, Sundari et al. (2022) examine the effectiveness of the Information Technology-Based Public Service Management (SIBERAS) application during the Covid-19 pandemic in Indonesia, highlighting improved service access and management in certain village governments. Furthermore, Valle-Cruz & García-Contreras (2023) focus on AI-driven transformation and smart data management's implications in the public sector, focusing on operational changes and challenges in providing efficient, transparent services for public value. Back to the theory, however, Information technology (IT) had played a part in the early NPM thinking, but always as one element out of several elements and was never integrated into the concept as such. Information technology (IT) had played a role in early NPM thought, but only as one of numerous factors, and was never fully

incorporated into the framework (Greve, 2015). Therefore, in this study, two major things that intersect with public management are human resources and technology that are integrated into an organization to fulfill this gap, since the previous research focuses on one sector or region. Changes in function and implementation of both have a significant impact on the implementation of public management itself. The biggest challenge is responding to human resources who need to adapt to information and technology disruptions.

Method

This study uses a literature study method that emphasizes the topic of public management and intersects with its functions. In the research process, the integration of technology and human resources is used as keywords as well as indicators to find articles that are allied. The source of the search engine in this study is Google Scholar, which the researchers themselves limit the year of publication Several articles have been collected from the last 10 years that have correlations and similarities in the keyword's public management, human resources, and technology. This step was completed by making use of the advanced search engine on Google Scholar. Furthermore, to describe the steps of the analytical method, first, determine the focus of the exploratory study according to the keywords (Ninkov et al., 2021). Second, selection and evaluation of literature, where the selection of literature is adjusted to the criteria that have been made and evaluate the methodology, relevance, and accuracy (Abbas et al., 2022). We have chosen to exclusively include articles published in English due to the extensive review process involved. Third, synthesis of literature by analyzing to find patterns of similarities and differences from existing keywords (Ahadi et al., 2022). Fourth, write an analysis as the result to conclude several indicators (Rodríguez-Bolívar et al., 2018).

Figure 1.
Research Method



Source: Abbas et al., 2022; Ahadi et al., 2022; Rodríguez-Bolívar et al., 2018; Upadhyay et al., 2022

Results and Discussion

Management of Public Management and Optimization of Public Services within the Framework of Technology Acceleration

Technology acceleration is having a significant impact on organizational management, changing the way organizations operate, communicate, manage resources, and respond to any changing environment. In the ever-evolving digital era, technological innovations affect the entire spectrum of management, from strategic planning to day-to-day operations. The way technology acceleration works can target many fields. The most found is that technology intersects directly with humans, this is because humans are both subjects and objects of technology (Spahn, 2020). In practice, operational efficiency can be seen as the link with management in shaping and reducing the dependence of the policy-making process. Technology allows the automation of decision-making processes (Rosin et al., 2022), reduces dependence on manual work (Dornelles et al., 2022), and increases efficiency (Wang & Ren, 2022). Integrated management systems, business software, and automation tools enable organizations to manage routine tasks more

quickly and accurately. For example, Google's company practices in managing its human resources are becoming more modern and dynamic. The manifestation of Google's public management is in the implementation of Project Oxygen (Marler & Boudreau, 2017), an effort to determine the best quality from the best managers. Google has found that accessibility, strong communication, and empowering team members are among the most valuable traits of a good manager. After drawing their conclusions, they found eight common behaviors exhibited by the top-performing managers and then coached the rest. Treatment that habituates its employees to adapt to technology through "Googlified" facilities.

If you look at the data-driven decision-making aspect, this is a common feature of how technology works in various fields. Technological developments have made it possible to collect and analyze larger and faster data. This enables management to make better decisions based on more accurate and real-time information. It doesn't stop there, the extension of technological acceleration in the implementation of human resources targets aspects of innovation and development of products and services (Bertot et al., 2016). Technology enables organizations to design, develop, and launch new products and services more quickly. The ability to respond quickly to market trends can provide a competitive advantage.

In the case of Cisco, an organization as well as a Human Resource Management (HRM) technology company that is capable of innovation and technological revolution in managing internally and externally. Public management carried out by this organization carries out management transparency with technological sophistication. So that the human resource development approach makes it possible to learn while completing projects to achieve goals. Through this approach managers can find out the progress of the team starting from the performance of the team, how they produce results, implement priorities, and the level of involvement of everyone. Cisco has proven successful in implementing this move so that the company is ranked number one in the Fortune 100 Best Companies to Work For and can attract the best talent to help achieve business goals (Chen, 2017).

Based on the conventional way of making decisions, the digital era changes the perspective and way of working holistically. Remote working, which was previously impossible to do, today has become a ritual in every organization. Because technology reduces space and time (Yu Novikova & Khairova, 2019). In other words, technology has made remote work or working from home more possible. This influences management in designing an organizational structure that facilitates remote work, ensures effective communication, and maintains productivity. In addition, inefficient public management, and organizational and corporate activities emphasize structured collaboration and communication. As for the implications of this practice, technology facilitates collaboration between teams and organizational members located in different locations. Digital communication tools, such as email, instant messaging, and online collaboration platforms, facilitate faster and more efficient communication.

Public management emphasizes the basic principles of the profession and focuses on public managers as practitioners of the profession. Where public management practices pay more attention to the internal operations or implementation of government organizations or non-profit organizations rather than legislative institutions, judicial institutions, or other public sectors. Furthermore, audience or public satisfaction is also determined by the integration of human resources with technology. Technology has changed the way customers interact with organizations (Sørensen & Torfing, 2019). The use of online

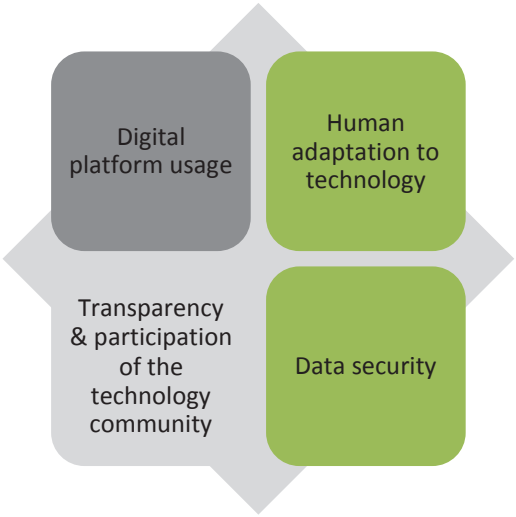
platforms and social media allows for more direct and personalized interactions with customers, increases customer satisfaction, and allows companies to respond more quickly to feedback. It doesn't stop there, organizations that can quickly adopt technology will be better prepared to deal with external changes, such as regulatory changes, market trends, or environmental conditions.

In the digital era, the availability of data is the key to the effectiveness of an organization's public management. So along with the acceleration of technology, data protection becomes very important. Organizational management must ensure the security of customer, employee, and corporate data in an increasingly complex technological environment. The acceleration of technology changes the management paradigm, encouraging organizations to adapt, innovate, and optimize the use of technology for sustainability and success in a constantly changing business environment.

Management and optimization of public services in accelerating technology is an approach that is very relevant in the digital era. Along with advances in information and communication technology, governments and public institutions in various countries are increasingly making use of technological innovations to provide more efficient, fast, and responsive services to the public. In (Aoki, 2020) public service management in this context covers various aspects, including strategic planning, digital platform development, HR training, inter-agency coordination, and performance measurement. The goal is to create an environment that allows citizens to access government services more easily, speed up administrative processes, and increase citizen satisfaction. Furthermore, the optimization of public services in accelerating technology involves strategic steps to create effective and efficient public management.

First, the use of a digital platform means that the government provides an online platform to access various services, such as resident registration, paying taxes, applying for permits, or reporting community problems. This platform must be user-friendly, safe, and easily accessible to all groups. As in the practice of presidential elections in America (López-López et al., 2020), general elections can be carried out online and minimize the occurrence of human error in its implementation.

Figure 2.
Optimizing Public Management in Technology Acceleration



Source: Research Data, 2023

Second, technology can be used to automate repetitive administrative processes, reducing the time it takes to complete these tasks. To that end, the synchronization of human resource methods in managing policies is related to the proper use of data. It also refers to the security of public data for the public as well. Data collected through technology can provide valuable insights for designing more targeted policies and assessing the effectiveness of services. It does not stop at just strengthening technology and data; human resources must also be prepared to form an ideal ecosystem. Public employees need to receive training to operate technology, interact with the public online, and understand the importance of good data management. This technology adaptation needs to be pursued to overcome

deviations in the function of public management; for example, the WikiLeaks case which discusses public information without any filter from policymakers in 2020 (Hallsby, 2020).

The third relates to transparency and community participation (Simelio-Solà et al., 2021), referring to the basic principles of development communication that communicators and communicants have equal rights in carrying out management. It should be emphasized that the human connection as a resource for change cannot be separated from changes and technological acceleration. Where, technology can also be used to increase government transparency, provide information to the public, and facilitate community participation in the decision-making process. Transparency and public participation are two important aspects of public management that can be improved through the use of technology. The combination of transparency and citizen participation with technology can result in governments that are more responsive, accountable, and better able to respond to the needs of their citizens.

Transparency is an important principle in public management which means that the government must open information, processes, and decisions to the public. With transparency, the government can build public trust and avoid corrupt practices. Technology enables transparency through public information portals (Lnenicka & Nikiforova, 2021). Governments can build online platforms that provide easy access to public information, such as budgets, policies, performance data, and ongoing programs. Online reports and audits play a role in presenting annual reports, audits, and financial records openly on online platforms, enabling the public to monitor the management of public funds. Furthermore, project tracking where technology enables real-time tracking of development projects and ongoing public services. Communities can see the project progress and provide feedback.

Public participation in the process of decision-making and policy formulation is an important element in responsive public management (Rowe & Shepherd, 2002). With technology, citizen participation can be significantly increased through online consultations. Governments can hold public consultations through online platforms, enabling citizens to provide opinions on certain policies or programs (Linders, 2012). Applications or online complaint portals allow people to report problems or provide suggestions to the government, which can be used as a basis for improvement. The e-petition platform allows citizens to initiate online petitions about certain issues which can then be taken into consideration by the government (Setyoko et al., 2023). Overall, the use of technology in public management strengthens transparency and citizen participation, enabling citizens to engage more actively in decision-making processes, overseeing the use of public resources, and holding the government accountable. This supports a government that is more open, efficient, and able to better respond to societal needs.

Fourth, data security becomes important when humans carry out technology-based public management processes (Wang, 2019). In the digital era, it is important to maintain the privacy and security of people's data. A strong security system must be implemented to protect personal information (Tamás, 2015). The application of technology in public services must be evaluated periodically to ensure its effectiveness. Feedback from the community should be taken as material for improvement. The management and optimization of public services in accelerating technology is a step toward a government that is more efficient, inclusive, and responsive to the needs of society. This is an important evolution in efforts to improve the quality of life and advance society in the digital age.

Integration of Human Resources and Technology in Innovation and Development

In the case of profit organizations, the integration of human resources with technology can create significant innovation and development. As in the case study at Hilton Worldwide Holdings which is recognized globally as one of the best service companies today. Hilton was able to conquer technology acceleration and integrate their management with technology acceleration. Hilton's secret to success lies in large part in its strategic approach to managing its corporate culture. This company culture is important because it represents how employees work well together in daily life and projects. Hilton introduced several methods that he applied, namely the balanced scorecard and the team member survey (Úbeda-García et al., 2021).

The balanced scorecard is a method that seeks to intertwine the company's vision, strategy, and goals with the performance of team members. This allows them to use basic KPIs as indicators such as revenue maximization, customer loyalty, employee satisfaction, skills training, and diversity. In this method, employees can see how their role and performance can affect the company and find the best practices. Meanwhile, the team member survey is a complement to the balanced scorecard which Hilton can find out from employee feedback. This method is carried out globally once a year and produces several data such as corporate ethics, leadership effectiveness, development, and others. By managing the culture in such a way, Hilton employees at all levels are highly engaged and motivated to properly contribute to the company's mission.

Technological evolution (Osiurak et al., 2023) has had a significant impact on modern human adaptation. Technological developments, especially in the fields of communication, transportation, science, and computing, have changed the way we live, work, communicate, and interact with the environment. Public management also puts an important concept in fundamental change. Communication technologies such as the internet and social media have enabled modern humans to be globally connected. Information can be spread quickly and easily, connecting people from different countries, cultures, and backgrounds. It broadens our horizons, enables the exchange of ideas, and increases intercultural understanding.

In addition, changes in government communications have become faster, easier, and more flexible. Email, instant messaging, video calls, and social media allow us to communicate in near real-time without geographical boundaries (Brady & Crockett, 2023). It has changed the way we interact and collaborate in work, education, and everyday life. The Internet is a limitless source of information. We can seek knowledge on various topics easily. This enables independent learning, increases access to education, and provides opportunities for many people to learn and develop.

Technology has changed education, both in the teaching and learning process and in learning methods. Online learning and digital learning resources have become increasingly common. This provides flexibility in obtaining education and training. Ease of Mobility shows that transportation technology, such as airplanes and motorized vehicles, has shortened travel distances and times. This allows for greater mobility, both on personal and work trips. The phenomenon of automation and digitalization has changed the way work is done. There are improvements in production efficiency and business processes. Jobs that require technological and digital capabilities are increasing, and flexibility in work is increasingly important.

Technology devices, such as smartphones, smartwatches, and wearable tech, have become an integral part of the modern lifestyle. They influence the way we manage our time, monitor our health, exercise, and interact with our surroundings. It is

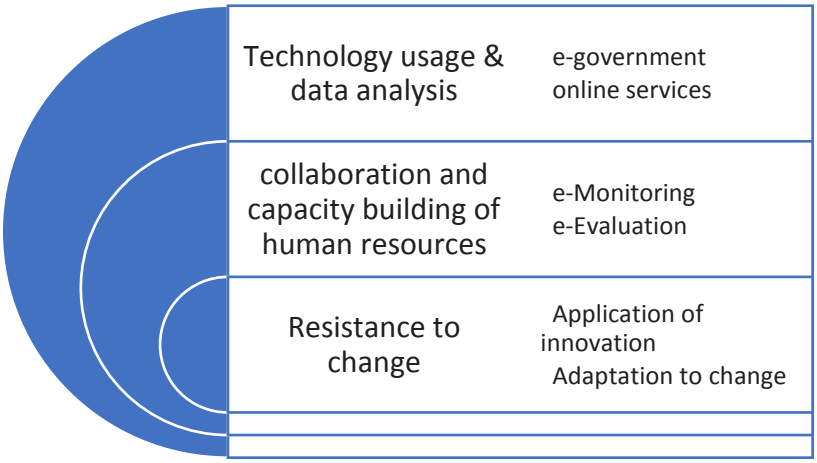
important to remember that while technological evolution brings many benefits, there are also challenges and ethical considerations that need to be addressed. In adopting new technologies, we need to ensure that these innovations positively support human development and consider their impact on society, the environment, and other aspects of modern life (Tikk-Ringas, 2023).

The integration of human resources and technology in innovation and development in public management is an essential approach to creating public services that are more effective, efficient, and responsive to changing times. In an era of ever-evolving technology, governments, and public institutions must maximize the potential of their human resources and utilize advanced technology to achieve better service goals (Liu et al., 2023). The way integration works in innovation and development in public management involves various tools and human characteristics as resources.

The correlation of the two brings technology to bigger and faster data collection and analysis. Resources skilled in data interpretation can identify trends, and community needs, and measure the effectiveness of policies or programs. It lays the foundation for better innovation. This can be seen in e-government practices and online services. HR integration with technology can improve public services by digitizing services and presenting services online. This not only increases efficiency but also provides easy access for the community. E-Government allows citizens to access various government services online, anytime, and anywhere. This eliminates geographic and time barriers that often hinder access to traditional services. In (Clarke, 2020) through E-Government, the government can provide wider access to public information, budgets, policies, and other important decisions. This increases government transparency and accountability. In addition, this opens opportunities for active community participation in the decision-making process. The use of online platforms for public consultation and providing feedback allows citizens to participate in developing policies.

Online services can reduce bureaucracy and speed up administrative processes. This saves time, costs, and resources, both for governments and citizens. With greater transparency and better data management, the risk of corruption can be reduced. Open information reduces opportunities for harmful corrupt practices. Governments can respond to people's needs more quickly through online services. Online services can be customized according to individual or

Figure 3.
Integration of human resources and technology in innovation and development in public management



Source: Research Data, 2023

group needs, increasing customer satisfaction. Data from online services allows governments to monitor service performance, identify areas of improvement, and measure the impact of policies (Asogwa, 2013). Online services can be used for distance education, health information, and other social services, increasing the access and quality of these services for the community. At the same time, online services have the potential to overcome disparities in access to services that often occur in remote areas or disadvantaged communities.

Changing other aspects, collaboration, and human resource development. Technology integration enables collaboration between various disciplines and work units within the government. Multidisciplinary teams can apply innovative thinking from various fields to design more comprehensive solutions. The government must provide appropriate training to human resources to optimize the use of technology. Digital skills, an understanding of innovation, and knowledge of the latest technologies are required for HR to contribute effectively to innovation.

The implementation of collaboration and human resource capacity building can be realized through more accurate monitoring and evaluation activities. By utilizing technology, performance measurement and evaluation of public service programs can be carried out more precisely and accurately. HR can use real-time data (Yıldırım & Bostancı, 2021) to make better decisions and identify areas that need improvement. Technology enables governments to monitor the implementation of policies, projects, or programs in real time. Data can be obtained from a variety of sources, such as sensors, online surveys, social media platforms, and community reporting apps. This monitoring helps detect problems or successes quickly so that corrective action can be taken earlier. It also allows automatic collection of data from various sources. For example, a centralized database system can integrate data from various government departments or agencies, enabling a more comprehensive analysis.

With data collected digitally (Hujran et al., 2021), governments can apply advanced data analysis, including statistical analysis, predictive analytics, or machine learning, to identify trends, patterns, or potential problems that may not be detected by traditional methods. On the other hand, digital evaluation allows the government to measure the performance of policies, programs, or projects more objectively. The performance indicators that have been set can be tracked continuously, and the results can be compared with the targets that have been set. However, digital monitoring and evaluation strengthen government accountability by providing clear evidence of the achievement or failure of policies or programs (Ospina et al., 2021).

Evaluation results can also be shared with the public, increasing transparency, and strengthening public trust. Digital monitoring allows governments to respond quickly to problems (Deng et al., 2021; Kavanaugh et al., 2011). For example, if data shows that a public service program is not running as expected, corrective or adjustment actions can be taken immediately. Technology enables more efficient delivery of monitoring and evaluation results to stakeholders, including legislatures, communities, and related institutions. The data collected can provide valuable insights for innovation in public management, enabling governments to design more effective policies and programs based on facts and evidence.

The last aspect of this study relates to resistance to change because technology brings a very fast phase of change (Dunleavy et al., 2006). Adaptive HR integration with technology can assist public organizations in dealing with rapid changes and facing evolving challenges. Technology plays an important role in designing and implementing innovations in public management. The use of technology, such as artificial intelligence

(AI) or predictive analytics, can strengthen analytical and forecasting capabilities that support innovation development (Wirtz & Müller, 2019). By combining competent HR expertise with sophisticated technological capabilities, public management can create relevant innovations, respond quickly to environmental changes, and provide better public services to the public.

Change Management in Public Management in a Technology Frame

Public management reflects the process of mobilizing human and non-human resources according to public policy orders. Important issues of public management include privatization as an alternative for the government in providing public services; rationalization and accountability; planning and control; finance and budgeting; and productivity of human resources. In this discussion, the sub-discussion emphasizes human resources to be more productive through the process of internalizing technology.

In general, the principles of public administration also encourage public management to be created effectively. In the context of government as the main organizational setting, to develop human resources with technological adaptation it is necessary to go beyond the existing stages, such as employee examinations, job classification, promotion, and discipline to the retirement process. In Tsisinska & Podolchak (2023), it doesn't stop there, exclusive functions are also considered as the main focus, which includes planning, organizing, staffing, directing, coordinating, reporting, and budgeting.

Not only that, management principles and techniques also contribute to the key development of administrative competencies. At this stage, public management emphasizes that management functions do not need to be taught normatively; management function is also considered something universal. So, the comparative method to see the position of public management lies in inviting the government to abandon the old paradigm as an effort to replace effort with performance results. The classical bureaucracy began to switch to a flexible bureaucracy. In other words, (Addo, 2022) technology is the basis for making changes to public management practices. Furthermore, it can be seen from how to set organizational goals and targets so that measurement results are clear, systematic evaluation, measuring indicators correctly. Where the intended indicators include economic, efficient, and effective.

In König et al. (2022), the essence of public management is about organizational restructuring, budgeting systems, resource management, and program evaluation. The link with the study here is with the new institutional theory, in which human innovation as a resource adapts to accelerated technology. This theory has a conceptual framework in social science that examines the role and impact of institutions (institutions) in shaping behavior, interactions, and structures in society, politics, and the economy. This theory focuses on how institutions affect social processes and how the existence of these institutions can shape individual and group behavior patterns in various contexts.

It can be noted that the concepts involved in change management in this theory are based on three things namely: new institutional economics, new political institutionalism, and new sociological institutionalism. The first point emphasizes the relationship between institutions, regulations, and market structures in the economic context. This theory attempts to understand how existing rules and norms influence economic transactions, contract formation, and resource allocation in various situations, such as free markets and monopolies. Meanwhile, political, and institutional links examine the influence of institutions on political decisions, legislative processes, interactions between political actors, and changes in the political system. This theory explores the role of institutions in shaping power,

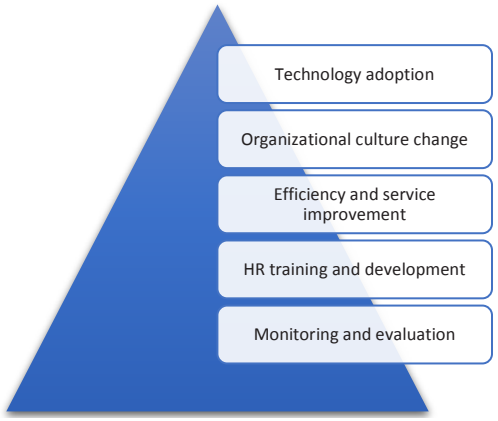
policy formation, and political dynamics. On the other hand, when talking about sociology and institutions, it relates to the role of institutions in shaping social norms, organizational culture, and social change. This theory tries to understand how social institutions, such as family, religion, and educational institutions, shape individual behavior and norms that exist in society.

The main emphasis of public management when associated with changes based on technology first, is the recognition that institutions have a significant role in shaping interactions and behavior in various fields of life. Second, the understanding that institutions can limit or encourage innovation, change, and decision-making. Third, the recognition that institutions are not always rational or efficient, but are sometimes shaped by historical, cultural, and political factors. Finally, attention to concepts such as norms, values, rules, and structures in understanding the role of institutions.

The correlation between change management and public management in a technological framework is an important relationship that influences how governments and public institutions adapt to environmental changes, utilize technology, and provide better services to society. In this context, change management and public management have complementary and supportive roles. Change management is an approach that involves planning, implementing, monitoring, and evaluating managing change within the organization. In public management itself, change can include the adoption of new technology, organizational restructuring, improvement of work processes, or policy changes (Szczepaniuk et al., 2020). Change Management understands that change is a constant and requires a structured approach to manage it successfully.

Meanwhile, public management itself covers various aspects of managing public organizations, including planning, implementation, supervision, decision-making, and service to the community. Public Management is also concerned with managing resources, increasing efficiency, and transparency, and the ultimate goal is providing better services to citizens (Svara & Brunet, 2020). In looking at both when it is related to technology, the striking link lies in the adoption of technology and changes in organizational culture. However, it does not rule out the possibility of the creation of other relationships.

Figure 4.
Change Management in Public Management in a Technology Frame



Source: Research Data 2023

Change Management helps in the adoption of new technologies. Governments need to change to integrate technology into their work processes. Change Management helps design strategies to ensure these changes are accepted by employees and implemented smoothly. In this process, the adoption of technology is necessary to ideally support its effectiveness. Technology adoption is a critical process that involves the acceptance, integration, and utilization of information and communication technology in various operational and strategic aspects of government. The aim is to increase efficiency, transparency, public participation, and services to citizens (Granić, 2022). Technology adoption involves careful planning, selecting the right technology solutions, training human resources, changing organizational culture, and ongoing monitoring.

With the adoption of the right technology, public management can become more responsive, adaptive, and effective in dealing with the demands of modern times and have a significant positive impact on the development of society and public services.

The adoption of new technologies often requires cultural changes within the organization (Martínez-Caro et al., 2020). Change Management helps design an approach that engages employees, explains the benefits of technology, and ensures that organizational values support innovation. Changes in organizational culture in public management are transformations that involve shifting values, norms, attitudes, and ways of thinking and interacting within a government entity or public institution. The goal is to adapt the organization to the changing environment, creating an atmosphere that supports innovation, transparency, and better service to society. This cultural change involves commitment from the leadership, active participation of all members of the organization, effective communication, and efforts to design strategies that unite a common vision and goals. By developing a culture that is open to change and promotes collaboration and continuous learning, public management can respond to change more responsively, achieve continuous innovation, and ensure success in providing quality services to the public.

Technology can improve efficiency in the delivery of public services (Gesk & Leyer, 2022). Change Management ensures that the changes implemented contribute to improving services to the community, by ensuring that work processes are more efficient, and the right technology is used. Improving efficiency and service in public management is an integral effort that aims to maximize results by optimizing the use of existing resources and providing better services to the public. In this context, the government, and public institutions design strategies to eliminate waste, simplify work processes, and apply appropriate technology. By streamlining the bureaucracy, designing more efficient technology systems, and providing training to human resources, public management can better allocate resources, increase responsiveness to change, and provide services that are faster, more accurate, and more relevant to the needs of society (Cordella & Tempini, 2015). This increase in efficiency and service not only improves customer satisfaction but also strengthens the credibility of the government and improves the quality of life of citizens by creating a more effective and competitive environment.

Change Management helps design employee training and development in mastering new technologies (Basu et al., 2023). This is important to ensure that human resources can operate and utilize technology effectively. an important strategy in public management that aims to increase the knowledge, skills, and competence of employees in dealing with demands related to tasks and environmental changes. This involves the provision of relevant training programs, continuing education as well as career coaching. Through HR training and development, governments can strengthen organizational performance, support innovation, increase productivity, and encourage employees to reach their full potential. In addition, investment in HR training also creates a climate that supports continuous learning, strengthens employee loyalty, and enhances organizational competitiveness in the face of the dynamics of ongoing change.

Then it can be said to also monitor the effectiveness of changes in the application of technology. This evaluation ensures that the change objectives were achieved and provides insights for further improvement. Digital monitoring and evaluation in Public Management is an approach that utilizes information technology to monitor and assess the implementation of government policies, programs, or real-time, data-based projects (Nalubega & Uwizeyimana, 2019). By leveraging information systems and data analysis,

monitoring and evaluation enable governments to collect, analyze, and visualize relevant data to measure performance, monitor progress, and detect problems more quickly (Esty & Rushing, 2007). Evaluation results are used to make better decisions, improve work processes, and design improvements based on empirical evidence. This approach not only increases transparency and accountability but also enables the government to respond more appropriately and effectively to changes and societal needs, resulting in policies and services that are more adaptive and meaningful to citizens.

Conclusion

Effective integration between human resources and technology in public management is an important foundation for creating responsive, transparent, and high-quality public services. When competent and trained human resources collaborate with advanced technology, government organizations can be more flexible in dealing with environmental changes, able to maximize the use of resources and adopt innovations in delivering services to the public. This strengthens operational efficiency, improves accountability, and responds to changing societal needs more quickly and accurately. With good integration, public management will be able to play a crucial role in promoting sustainable development, strengthening public trust, and generating significant positive impacts in an ever-evolving society. Managing public management and optimizing public services in accelerating technology includes the use of digital platforms; human adaptation to technology; transparency and participation of the technology community; and data security. Meanwhile, the integration of human resources and technology in innovation and development can be described in the use of technology and data analysis; collaboration, and improvement of human resources; as well as a survival strategy not to change.

Finally, to see the management of change in public management in a technological framework from the aspects of technology adoption, changes in organizational culture, service efficiency and improvement, HR training and development, and monitoring and evaluation. Since this study is limited to exploring and proposing framework integration by reviewing previous studies, we acknowledge the need for further investigation, specifically on empirical research. Future research could examine how algorithmic decision-making in public policy affects human resources manager competencies. These studies could examine how HR managers can use algorithms ethically and transparently. Other research could focus on how cognitive computing can boost public agency employee engagement and sentiment analysis. This study would reveal the skills and knowledge HR professionals need to plan and manage workforces using these technologies. Blockchain technology to secure HR processes, neurotechnology to reduce decision-making biases, and affective computing to analyze citizen feedback may improve public sector HR practices. Future research also could examine public service training with virtual reality simulations. Emerging technologies and public management human resources management can be understood in these research domains. This could improve public service and workforce dynamics.

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