



Assessing the Impact of Digital Transformation on Employee Performance in the Public Sector: A Case Study of Zambia's Ministry of Health Headquarters (2017-2022)

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Abstract: Public sectors worldwide have faced a performance crisis, with public employees being stereotyped as lethargic and bureaucratic and public agencies being seen as large, wasteful and inefficient. This has increased the demand for efficiency, leading to the adoption of Digital Transformation (DT) approaches from outside the public sector. DT is considered a path to efficiency, fostering innovation, inclusivity, and sustainable growth. However, human effort and accumulated knowledge drive the use of digital tools for organisations and nations to adapt to change. This paper aims to assess the impact of DT on employee performance in Zambia's Ministry of Health Headquarters by establishing whether key technologies in DT have been implemented at the Ministry, their effect on employee performance and subsequent constraints and challenges. The study used a mixed-method approach; quantitative data were collected from 41 employees using questionnaires and qualitative data were collected from two key informants (managers) using interview guides. Quantitative data were analysed using Statistical Package for Social Sciences (SPSS) software and qualitative data were analysed using content analysis. The study findings revealed that the key technologies were implemented in the Ministry though in phases as the process was still underway. The digital tools implemented positively influenced employee performance in terms of tasks, adaptability and contextual but there were challenges and constraints such as connectivity issues, limited access to digital tools in isolated cases, inadequate resources and training. Hence the recommendation that since digital tools positively impact employee performance, there is need for government to provide the necessary tools, skills, resources, stable connectivity and training of employees in using digital tools.

Keywords: Digital Transformation, Employee, Task Performance, Adaptive Performance, Contextual Performance, Key Technologies.

1. INTRODUCTION

Digital Transformation (DT) is a top priority for many governments due to its potential for increased transparency, faster and more accessible services, reduced corruption, and improved efficiency in the public sector. Porrura et al., (2021), refers to it as a shift in institutional culture and organisational practices that leverages Information Communication Technologies (ICTs) to meet the needs of citizens and businesses efficiently, transparently and securely. From a global perspective since 1960s, scholars of human resource management have argued that, the public sector's image has steadily declined due to a performance crisis. Public employees are stereotyped as lethargic and bureaucratic while public agencies are seen as large, wasteful and inefficient,(Osborne and Gaebler, 1992).The poor performance problem increased the demand for efficiency and consequently, Digital Transformation (DT) approaches outside the public sector which allow for changes in the way public administrations deliver their work is considered the path to efficiency, fostering innovation, inclusivity and sustainable growth. According to Dilmegani et al., (2014), Governments worldwide are convinced that Digital Government is the way forward for operational efficiency and employee performance so as to attain improved services. Further, reports from the European Commission (2017) have revealed that, governments are changing their operations to improve service delivery, efficiency, transparency and citizen satisfaction through the use of digital tools. At continental level, the African Union's "Digital Transformation Strategy for Africa 2020-2030" aims to use DT to drive growth, reduce poverty and inequality and achieve sustainable development goals.

A World Bank report on accelerating DT in Zambia shows that better access to digital technologies can increase private sector productivity and improve public sector efficiency and accountability. To this effect, Zambia's 7th and 8th National Development Plans include several DT strategies and a Government Electronic Act is in place to support digital efforts. DT offers a solution to challenges such as low productivity, socio-economic inequality and low trust in government but whilst this is true, understanding employee performance is essential for organisational success as decisions are based on individual performance (Sonnetage, Volmer & Sychala, 2008) leading to an organisational success. Moreover, whilst DT improves public sector efficiency, it's important to understand how employees perform in transforming the public sector's image as it is human effort and attendant knowledge that promote the use of digital tools to enable organisations and nations to cope with change. The fact that current studies, particularly in the Zambian context, have not adequately incorporated employee related factors, there is need to look at DT and its impact on employee performance. Therefore, the aim of this paper is to assess the impact of DT on employee performance in Zambia's Ministry of Health Headquarters. The paper starts by examining the existing literature on the relationship between Digital Transformation and employee performance, followed by an explanation of the theoretical and conceptual frameworks that guide the research. Next, the research methodology is presented, along with a discussion of DT implementation, its effects on employee performance and subsequent constraints and challenges. The paper concludes with a summary of the findings.

2. LITERATURE REVIEW

A number of scholars have conducted extensive research on the impact of Digital Transformation on organisations' efficiency and effectiveness across the globe. According to the Gartner Survey (2021), which surveyed over 2000 Chief Information Officers (CIOs), there was a growing need for enterprises to embrace business composability in 2022. This means that businesses should focus on creating flexible and adaptable structures that can quickly respond to changing market conditions and customer needs. By doing so, enterprises can improve their overall performance and remain competitive in the rapidly evolving business landscape. In a related study, Yunus and Waidi (2011) believe that acquisition of latest technology will improve operating practices and the quality and quantity of goods and services. Even though there are lessons learnt from the survey, its focus was on business outcomes as opposed to employee performance.

In a study by Srinivas and Werner (2017) on Digital Transformation (DT) and value creation, it was established that DT changes the nature of employment and physical lifestyles. It was observed that DT allows for more flexibility in terms of time and place for work and individuals have greater work participation opportunities. The study further revealed that DT has the potential to bring value for society at large, such as more efficient and effective public administration processes and services. However, Srinivas and Werner argue that DT also presents challenges, such as privacy and data protection. This study is worth noting as it relates to employee performance in correlation with DT though not done in the Zambian context.

The Asian Productivity Organisation (APO) (2021) in its research project to highlight the current state of digital government transformation across public services in APO member countries revealed that the diffusion and adoption of information technology were changing citizens' and businesses' expectations of governments' ability to deliver public services. Governments were moving toward an open, bottom-up, agile, online and integrated operational framework to provide public services more efficiently. The study also presented case studies of successful government-digitalisation initiatives from India, Indonesia, Malaysia, the Republic of Korea, Philippines and Thailand. The case studies present important findings that are of significance to this study with regards government digital transformation. It was revealed that these initiatives have had a positive impact on public service delivery, such as reducing leakages, costs and ensuring timely and transparent service delivery. The study findings are of significance as they spur keen interest for a study to be conducted in the Zambian context in order to understand what impact digital transformation has on employee performance.

Fairoos et al., (2020) conducted a study on best technologies and key success factors in Zimbabwe regarding a review on improving performance through digital transformation. Study findings were that digital transformation can improve employee performance by reducing time spent on manual

processes and increasing collaboration. Success factors are extracted through the application of digital technologies and digital transformation can improve performance in various organisational areas, including employee and financial performance and can benefit different sectors and industries such as healthcare. Study findings are of great relevance and worth noting though not done in the Zambian context.

Trenerry et al., (2021) in a Study on Preparing Workplaces for Digital Transformation distilled the important factors in digital transformation at three levels: individual, group and organisational. Findings are worth noting as they revealed that organisations need to embrace digital technologies and transform in order to remain competitive and survive but employees are a crucial part of the digital transformation process's success. In an International Journal of Data and Network Science (2020), Carla et al., did a study to analyse the impact of digital transformation on the individual job performance of insurance companies in Peru. The study revealed that customer service experience based on digital transformation has a significant influence on the dimensions of task performance and contextual performance as well as a negative implication on the counterproductive behaviour dimension. Findings are significant but further research was recommended on the impact of digital transformation and individual job performance.

A study by Shinta et al., (2020) on Digital Transformation in the Indonesian Banking Industry revealed that companies that implement an integrated digital transformation strategy, enhance the performance and increase the possibility of a sustainable long term business. Similarly, Goswami and Yogesh (2019) examined employee's perception toward digital transformation and how it influences their level of engagement towards the organisation. The findings were that positive perception on digital transformation increases the level of employee's engagement. A related study by Norazlan et al., (2019) in the MJBSE Malaysian Journal of Business and Economics on the Effect of Technological Changes on Employees' Work Performance revealed that technological changes are important in improving performance as well as increasing productivity of the employees. The study concluded that there are dimensions that have strong relationships with work performance. A number of initiatives were cardinal to help employees accept technological changes as well as constant training to ensure every employee is able to utilise the current technologies so as to achieve both individual work performance and organisational success. These studies are worth noting as they show the importance of employee performance in any process of digital transformation.

Chipeta and Ngoyi, (2018) conducted a case study in Zambia on the review of e-government development in Africa. The study revealed that E-government brings out many benefits to support delivery of public services through the use of the internet. They observed that successful adoption of e-government enhances open government data which is an important aspect in promoting transparency, accountability, openness, efficiency and trust in the civil service. This study is worth noting as it brings out the importance of e-government and its attendant benefits. Malamboin 2022 conducted a study to analyse the challenges of Stanbic Bank Zambia's digital innovation services on customer satisfaction. The study concludes that despite challenges that customers had, the majority of respondents were able to access banking services using online banking platforms. The study recommended that to have faster processes in digital banking, there was a need for Stanbic bank to invest more in robust reliable systems to reduce incidents of failed transactions on all digital banking platforms. A notable recommendation though done in the private sector was that there was need for the banks to facilitate ICT skills so that technology could be embraced.

Zambia's Digital Economy Diagnostic Report on Accelerating Digital Transformation in Zambia (2020) is worth noting as it reveals that even though the country had made progress in digital infrastructure, financial services and platforms, there were still gaps in digital skills and entrepreneurship. This implies employee performance plays a crucial part in the digital transformation process. Government digital transformation requires digital specialists to carry it out and civil servants who are capable of properly implementing the new technologies but Porrúa et al., (2021) highlights that their alignment is not automatic and thus it calls for new human capital management policies and processes. Most governments have recognised the need to strengthen civil servants' information and

communication technology (ICT) capacities but they have not examined the relationship between employees' performance and digital transformation in depth. Thus while the study findings are significant to this study, there is limited information on how individual employees are performing in their tasks using digital tools, despite significant academic attention on how digital technology is disrupting job tasks and occupations. This highlights the need for further research to understand the impact of digital technology on employee performance.

3. THEORETICAL FRAMEWORK

The paper is guided by the assumptions of Fountain technology enactment framework, Digital Era Governance approach and Individual Work Performance Questionnaire, (Fountain, 2004, Dunleavy et al., 2006 and Koopmans et al., 2016). The frameworks helped the study to derive elements key to employee performance in a dynamic environment due to digital transformation. Only major technologies were considered which according to Jean (2018) affect employee and organisational performance in the context of digital transformation. Thus; Internet of Things (IoT) which connects physical devices over the internet. Data analytics transforms insights into actions. Cloud computing delivers hosted services over the internet in three categories: Infrastructure as a Service (IaaS), Platform as a Service (PaaS), and Software as a Service (SaaS). Artificial Intelligence (AI) brings human-like capabilities to machines (Ulrike et al., 2018).

The Fountain approach discusses the impact of technologies on organisations through an institutional perspective. The author differentiates between objective and enacted technologies. Objective technology incorporates innovations such as the internet while enacted technology entails the use, design and perception of those technologies by individuals within the organisation. The perception and usage of technology is constrained by institutional arrangements, but enacted technology also influences the organisation. The role of technology therefore differs and is dependent on the organisation and what individuals within the organisation make out of it.

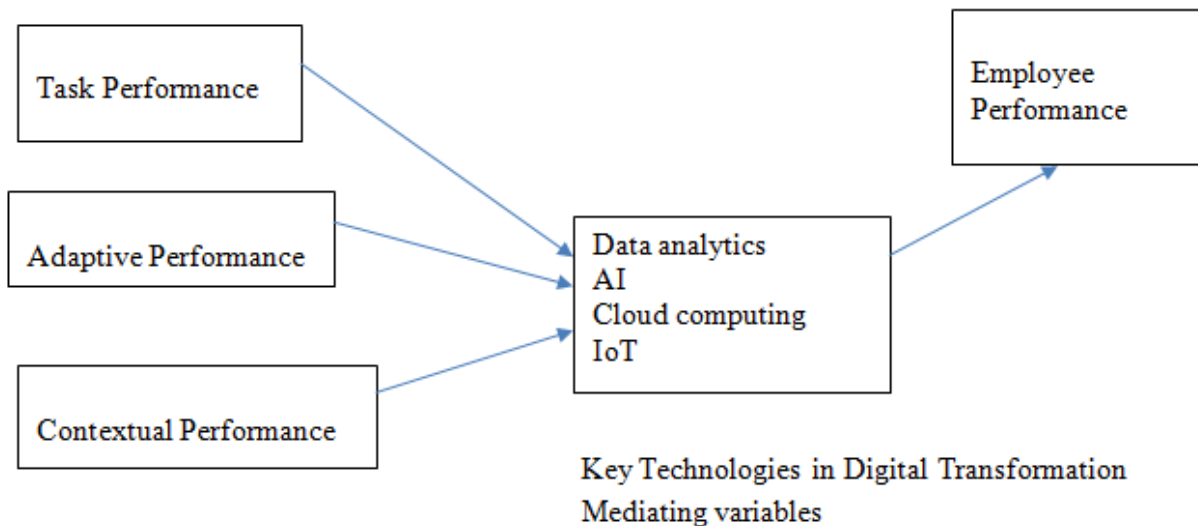
The Digital Era Governance approach is an assumption that under the influence of the new public management paradigm, technological change enables change in public sector organisations in several ways. Technology per se does not change organisations, rather the way organisations work and their use of technologies changes work practices. They take a holistic approach to the study of technological change considering its impact on organisations, cultures, information management and government services.

The Individual Work Performance Questionnaire considers four dimensions of performance: Task, Adaptive, Contextual, and Counterproductive. This study focuses on the first three dimensions in relation to key technologies in Digital Transformation. Task performance refers to the proficiency with which central job tasks are performed, including behaviours that contribute to the production of goods or services. Contextual performance refers to behaviours that support the organization's environment and the social and psychological aspects of work. Adaptive performance refers to an individual employee's ability to adapt and provide necessary support in a changing work environment, such as Digital Transformation. It encompasses flexible work behaviours such as generating new ideas, adjusting goals and plans, learning new tasks and technologies, being flexible and open-minded, understanding other groups or cultures, showing resilience, remaining calm, analysing quickly and acting appropriately.

4. CONCEPTUAL FRAMEWORK

Independent Variables

Dependent Variable



Author's Own: 2023

5. RESEARCH METHODOLOGY

The study was conducted at Ministry of Health Headquarters, Lusaka Province in Zambia. The research is both qualitative and quantitative in nature. Qualitative research aims to gather in-depth information about a topic under investigation, while quantitative research collects numerical data to explain a phenomenon across groups.

The case study strategy was used. This involves a detailed investigation of a particular social unit. The researcher used interview guides and questionnaires to gather data. The study used a combination of closed and open ended questions in order to get a broader view on the subject under assessment. Questionnaires were administered both manually and online to employees whose job descriptions encompass the use of digital tools while interviews were administered manually to two key informants in management. Quantitative data was analysed using the Statistical Package for the Social Sciences (SPSS), generating both descriptive and inferential statistics. Descriptive statistics describe the basic features of the data, while inferential statistics allow for conclusions to be drawn beyond the immediate data. Qualitative data was analysed using content analysis, which involved grouping information into themes.

With regards to research ethics, the researchers sought approval from Mulungushi University and the Public Service Management Division (PSMD) before conducting the study. The PSMD is the governing body for public service in Zambia. Consent was obtained from the respondents and they were assured that their identities would be kept confidential by filling out the questionnaires anonymously, even online. Participants were also given the freedom to withdraw from the study at any time without penalty if they felt uncomfortable with the process.

6. IMPLEMENTATION OF DIGITAL TRANSFORMATION

6.1. Technologies in Place

The study established that the Ministry of Health had embarked on a Digital Transformation (DT) process since 2008 as mentioned by the key informants. With regards to the four key technologies, namely, Artificial Intelligence (AI), Internet of Things (IoT), Cloud Computing, and Data Analytics, all these key technologies have been implemented in phases as the process was ongoing. It was also observed that the ministry had developed data warehouses and increased analytics of data. During the time of the study, the ministry was using machine learning towards the attainment of AI. The ministry had been applying AI concepts on data to improve medical diagnosis, manage healthcare data, track and trace drugs and transform patient experiences. This was aimed at reducing mortality through disease detection and improved patient outcomes.

With regards to Cloud Computing, the Ministry of Health has implemented electronic health record systems through the Zambia National Data Centre. In terms of the Internet of Things (IoT), the ministry has introduced Telemedicine Innovations, which allow patients to reach doctors outside traditional health facilities, thereby reducing costly visits to sit down with providers. Furthermore, through online computer networks, the electronic health record system and logistics system, including lab systems, were connected to transmit data to the national data warehouse for analytics at the program level.

The study revealed that the ministry also had a data analytics process that was regulated under the Data Protection Act (2021), under which the Data Protection Commissioner guided on the effective use and protection of personal data by regulating the collection, use, transmission, and storage of data. Employees operating outside the base could be reached through tools like Google Drive to share documents regardless of their location, as well as through virtual platforms like Microsoft Teams and Skype for Business. The ministry's cloud infrastructure is housed through the Zambia National Data Centre. Devices such as ambulances were connected over the internet.

Further, the study established that the Human Resource Department had implemented an Integrated Human Resource Information System (IHRIS) that was used to collect employee information from physical files. All relevant information on employees was uploaded online and could be accessed by authorised personnel. This initiative had been rolled out to all ministry facilities but was yet to be fully operationalized. Information on employees could be retrieved using internet platforms outside the office base. The study findings on the implementation of key technologies were consistent with Zambia's Digital Economy Diagnostic Report on Accelerating Digital Transformation in Zambia (2020). The report revealed that Zambia had made progress in digital infrastructure, financial services and platforms but there were still gaps in digital skills and entrepreneurship.

According to statistics, majority of respondents indicated that the implementation of the key technologies helped to enhance efficiency and effectiveness in terms of performing their job tasks. The findings were that after the inception of DT, there has been a significant improvement of about 70% in the way meetings were held, information was exchanged and stored, as well as other administrative processes. Other areas include among other issues the accounts section where the use of the Integrated Financial Management Information Systems (IFMIS) platform has enabled the processing of payments and approvals to be done online. IFMIS has enhanced performance and also reduced risks associated with manual tasks. In Human Resources, SMART Zambia has implemented the electronic receipt of pay slips, which has improved the time in which employees receive their pay slips and helped to cut down on operational costs. The Integrated Human Resource Information System (IHRIS), though not yet fully operational, has helped to enhance the storage and retrieval of information.

Study findings reveal some similarities with the findings presented in the case studies of successful government-digitalisation initiatives from India, Indonesia, Malaysia, the Republic of Korea, Philippines and Thailand where it was revealed that the initiatives had a positive impact on public service delivery, such as reducing leakages, costs and ensuring timely and transparent service delivery. In the study of Fairros et al., (2020) in Zimbabwe, it was revealed that digital transformation can improve employee performance by reducing time spent on manual processes and increasing collaboration.

However, the study revealed that there was resistance to the use of digital tools because employees had continued with traditional methods, hence the burden fell on the ICT department. Despite the significant improvement in employee performance, the ministry faced challenges such as inadequate capacity of some employees to utilise some of the digital platforms and internet connectivity issues in some areas. With regards to constraints, the ability to analyse data was restrictive because some employees lacked the drive.

6.2. Task Performance in Relation to Digital Tools

The research findings on Task Performance in Relation to Digital Tools from 41 respondents revealed that majority (95%) of the respondents used digital tools to perform tasks. According to statistics, 82.9% of the respondents indicated that digital tools in place helped them to maintain a high standard

of work in serving the community and to derive satisfaction in nurturing others in the organization. The majority of the respondents indicated that digital tools helped them to carry out their tasks efficiently. However, some respondents pointed out that there was a challenge in the use of digital tools because some employees in workplaces resented the introduction of digital tools. The resentment was, attributed to issues of time and experience with the said tools. There was a general feeling that the level of exposure to the digital tools was not enough and as well as low or little capacity building in the use of the digital tools. Other respondents cited access and equity of distribution of the tools as challenges in using digital tools. They also indicated that computer illiteracy was a barrier to the effective use of the tools.

6.3. Adaptive Performance in Relation to Digital Tools

The research findings on Adaptive Performance in Relation to Digital Tools revealed that out of the 41 participants, 92.7% were able to mobilise collective intelligence for effective teamwork, while 84.5% of the respondents were managing the digital transformation. 82.9% were able to effectively handle teamwork at times in the face of DT. Out of the 41 respondents, 78.0% believed that DT can lead to a visible solution in the organization at times, and 87.8% indicated that they were usually comfortable with job flexibility in the face of DT. Notable challenges cited were that not all people prefer to use digital tools and that digital transformation is not always handled well due to varying levels of capability and ability to learn new skills among organisational staff, as well as a lack of knowledge. Constraints cited were that to use DT, one need to use many dimensions such as data and equipment, among other issues. Thus, with limited exposure to digital tools prior to taking up their respective roles in the organization and limited opportunity to be thoroughly trained in utilizing digital tools, there is a need for more training.

6.4. Contextual Performance in Relation to Digital Tools

The study findings on Contextual Performance in relation to the use of digital tools were that 82.9% of respondents indicated that digital tools usually made it easy for them to extend help to co-workers when asked or needed. They further indicated that digital tools usually made it easy for them to handle extra responsibilities effectively and that it usually helps to extend sympathy and empathy to co-workers when they were in trouble. They also indicated that digital tools helped to enhance group discussions and work meetings.

However, 85.4% indicated that digital tools did not help to maintain good coordination among fellow workers, while 2 out of 41 respondents indicated that sometimes digital tools helped to maintain good coordination among fellow workers. 85.4% mentioned that digital tools usually helped to effectively share knowledge and ideas among team members, while 80.5% of the respondents out of 41 indicated that digital tools usually helped to enhance effective problem solving and decision making. Constraints cited included digital devices not being readily available and sometimes being very expensive to acquire. Challenges mentioned were computer illiteracy in some employees; hence there was a need for training.

7. CONSTRAINTS AND CHALLENGES

The study established several challenges and constraints in the use of digital tools. Some of the challenges include resistance from employees who had continued with traditional methods, inadequate capacity of some employees to utilise some of the digital platforms, internet connectivity issues in some areas and resentment towards the introduction of digital tools in workplaces. Other challenges included access and equity of distribution of the tools, computer illiteracy as a barrier to the effective use of the tools, not all people preferring to use digital tools, and digital devices not being readily available or being very expensive to acquire.

Some of the constraints revealed by the study included the ability to analyse data being restrictive because some employees lacked the drive, a low level of exposure to digital tools and little capacity building in the use of digital tools. It was also observed that there were issues concerning the need to use many dimensions such as data and equipment to use DT; computer illiteracy in some employees; limited exposure to digital tools prior to taking up their respective roles in the organization and limited opportunity to be thoroughly trained in utilising digital tools. These revelations are related to

those in the study done by Srinivas and Werner (2017) which highlighted that while digital transformation (DT) has the potential to bring value to society at large, such as more efficient and effective public administration processes and services, it also presents challenges such as privacy and data protection. Malambo (2022) noted the importance of adequate ICT skills in her study.

8. CONCLUSION

From the findings, it can be concluded that the key technologies in Digital Transformation were put in place in the Ministry though in phases as the process was ongoing. The study further revealed that performance in terms of Tasks, Adaptive and Contextual were positively impacted by the use of digital tools that were in place. However, there were challenges and constraints faced in terms of connectivity, full implementation of necessary digital tools, lack of access to digital tools in isolated areas and inadequate trained human resource in other departments apart from ICT. Hence the recommendations to provide all necessary digital tools, to capacity build all employees in ICT and roll out digital transformation to all health facilities in the country.

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