The Role of Knowledge Management Applications in Reflecting the Digital Transformation Era: A Case of Tanzania Bureau of Standards

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ABSTRACT
This study explores the role of digital transformation in Knowledge Management (KM). This study aims to address this empirical gap by examining the employees' level of awareness of KM systems, the usefulness of KM applications, and the impact of digital technology in KM. Data was collected through semi-structured interviews and questionnaires. The collected data was systematically organized, coded, recorded, and analysed. The Statistical Package for Social Sciences (SPSS) was used to analyse quantitative data while content analysis was used to analyze qualitative data. This study found the majority (42, 58%) of employees were aware of the KM system with little utilization of the KM platform due to minimal understanding of interaction with the system. Also, the system is not sufficient to support employees' activities based on their duties and responsibilities. This study concludes that there is low transformation of modern technology in the public sectors in Tanzania. It recommends increasing training and adopting a new knowledge-based system, as well as policy formulation. This study contributes to a body of knowledge through integrating digital procedures in the knowledge management industry.

Keywords: Knowledge Organisation, Knowledge-based systems, Digital revolution, Information Management, Tanzania Public Sectors

1. INTRODUCTION

Digital transformation is inevitable for the modern firm, whether public or private, because of the strength and high speed brought by digitalisation in operational activities, whereby many organizations have not been able to adapt it yet (Omotayo & Babalola, 2016). One of the major reasons for this situation in an organization is the lack of knowledge or skilled staff, and how they can cope with this gradual change.
An organization needs to boost performance through innovation by developing organizational models based on knowledge management and value creation. Public sectors face different challenges and characteristics related to the public good, with a variety of consequences for accountability and responsibility to stakeholders. Information technologies and systems provide better services with an economy of resources, enhancing the efficiency and effectiveness of public services (Islam et al., 2020). Knowledge and technology are essential assets for this ongoing improvement process and the development of a new service approach.

Nowadays, the growth of organizational change is accelerated through digital transformation, the essence that governments look at knowledge management practices to foresee social needs or upgrade service provision effectively (Farooq, 2019). On that notion, knowledge management has a benefit in digital governance such as advancement in the quality of government service, enhancement of government competence and the upgrade of healthy government development.

Knowledge management become a forerunner due to the need for public and private organizations to perform in advance and effective use of their knowledge. Adejumo (2023) state that knowledge management may potentially offer a competitive advantage and enable building up of knowledge-intensive

economies. Therefore, knowledge management is very crucial in the context of the public sector. Onifade and Akinwade (2019) asset that, the public sector is influenced by an upgrade need for: performance standards, measurement, competition, monitoring, flexibility, customer focus and control. According to García-Piqueres et al., (2019) knowledge management has the necessity to greatly encourage and improve public sector renewal processes. Within the public sector, knowledge management is the strongest facilitator in the current push for maximum efficiency in all areas.

Technology plays a crucial role in KM. The advances in Information and Communication Technology (ICT), the internet revolution and the move toward information and knowledge society have emphasized the importance of knowledge and the need for KM. Furthermore, Information Technology (IT) has enhanced the ability to store, access, manipulate and use of information in a variety of ways (Etemadi, 2019; Farnese et al., 2019; Sotery & Munisi, 2022). It is greatly used in work operations and improves communication between people. Collaborative applications such as e-mail, calendaring, scheduling, databases and threaded discussion promote knowledge sharing and transfer.
Charles and Nawe (2017) assert that KM tools need to go beyond information management activities and focus on tools that will enable human communication and collaboration. This is because information management tools are concerned with the management of knowledge including tools for capturing, indexing, retrieving, and manipulating information whereas KM technologies go beyond information management tools to include technologies designed to facilitate the management of other types of knowledge, such as tacit knowledge. Yeboah (2023) clarify that these technologies require human interactions at all levels and their main objective is to facilitate communication, collaboration and interaction.

1.1 Objectives of the Study

Therefore, this study sought to:

i) assess employees' level of awareness of KM systems in the public sector.
ii) examine the usefulness of KM application in the public sector.
iii) assess the impact of digital technology in KM in the public sector.

2. LITERATURE REVIEW

2.1 Employee's Awareness of Knowledge Management Systems

Adopting information technology is crucial to organization because it affects work performance, organizational culture and organizational development (García-Piqueres et al., 2019). Apart from technological infrastructure in the organization, the Knowledge Management System (KMS) attempts to support learning while creating, sharing and transferring knowledge across organization. In South Korea, Adejumo (2023) noted that many Korean companies have tried to motivate their employee to utilize KMS through means such as reward, based on their level of generating and sharing knowledge or developing best practices and supporting employee consistent learning. Study of Waititu and Barker (2023) in Kenya articulate that most of employees lacked the requisite knowledge, skills and attitude for adopting KMS and emphasized the need for training prior to the implementation process and an organizational environment that is conducive for attitude modification in the use of existing KMS. Generally, this asserts that there is little awareness among employee of KMS due to the lack of KMS adoption in their organizations.

2.2 Useful is Knowledge Management Applications

Lubua's (2022) study on the uses of knowledge management systems in the African context a case of Tanzania confirmed that knowledge management systems owned by the organization do not meet minimum technical criteria. Furthermore, there were challenges in how to deal with technology. Tilahun (2023) studies on the application and challenges of knowledge management systems assert that there is confusion in conceptualizing knowledge management systems in the institution. The institution has applied knowledge management systems, mostly in document management and database management. Getting

employees to buy and update knowledge immediately is the most common challenge in the knowledge management system. This shows that KMS are not highly applied in most public sectors which fosters the implication of this study.

2.3 Impact of Digital Technology on Knowledge Management

Digital technology has altered how businesses organise and distribute knowledge. According to Tilahun (2023) the use of knowledge management systems (KMS) in institutions such as St. Mary's University has increased access to organisational knowledge, improved decision-making, and streamlined academic and administrative operations. However, issues such as low ICT skills and insufficient infrastructure continue to impede complete implementation. Similarly, Waititu and Barker (2023) highlight the importance of online internal communication platforms in encouraging knowledge exchange among employees. Their findings show that digital platforms boost not only collaboration but also information retention and accessibility. Yeboah (2023) emphasises the role of technology in knowledge management, stating that digital tools assist in capturing both explicit and tacit information, allowing organisations to innovate and adapt in fast-changing settings. These findings highlight the importance of digital technology in improving knowledge management methods, particularly in dynamic organisational settings.

3. METHODOLOGY

The study employed a case study research design to gain in depth information on the role of digital transformation in knowledge management in the public sector in Tanzania. A mixed-methods design was used to gain a comprehensive understanding of the role of knowledge management applications by integrating both quantitative data and qualitative insight (Creswell & Creswell, 2018). The quantitative methods were meant to collect questions on the efficiency of the KM system in selected public sectors in Tanzania, whereas the qualitative methods supplemented the quantitative methods (Rosalia, 2022). The study was conducted in the Dar es Salaam Region at the Tanzania Bureau of Standards (TBS). TBS is responsible for monitoring and evaluating the standard of manufactured, imported and exported products all over the country. The sample size was constructed from the Sample size determination Table using Krejcie & Morgan's 1970 to get the actual number of staff who participated in this study (Abdul, 2021) were 76 respondents were selected to participate in this study. A purposive sampling technique was used to select 6 respondents, who are public relations officers (who represent the Director General), Standard Development Directors, Quality Management Directors, Compliance and Enforcement Directors, Testing and Metrology Service Director, and Administration and Human Resource Management Director. Convenience sampling was adopted to select 70 staff members respectively from their directorate due to their readiness and availability (Bondmass, 2021).

Quantitative data were collected through structured questionnaires from selected participants where the researcher distributed the questionnaire to them physically at different times and routines. The questionnaire was pre-tested to 7 staff at National Social Security Fund located in Dar es Salaam because it has some similar characteristics of knowledge management tools and applications to those that were sampled for actual data collection. The pre-testing enabled crucial corrections to be made to ensure the accuracy of the data collection instruments. A semi-structured interview was used to collect qualitative data from six participants selected based on their knowledge and experience. An interview guide was complemented by a notebook and recorded audio for capturing data. Moreover, questionnaires were used to collect quantitative data and were analysed through SPSS and MS Excel, and descriptively (percentage and frequency) to describe the characteristics of respondents. Qualitative data was subjected to content analysis by transcribing, coding based on the questions, noting common themes, theme review, redefining and reporting respondents' views on awareness, and impact of technology in KM.

4. FINDINGS

A total of 76 responses were collected, and all the 72 responses were valid. Most of the questions were designed as multiple-choice questions, and therefore, the answers were mostly nominal. In addition, seven

semi-structured interviews were conducted with six staff members from TBS directories. The findings are presented based on the themes of the research questions namely: employees' level of awareness of KM systems; usefulness of KM applications/platforms in public sectors; and impact of digital technology in KM in the public sector.

4.1 Demographic Information of Respondents

Demographic information of respondents shows specialists were 21 (29%), trainees 13 (18%), Office workers 12 (16%), Managers 14 (19%) and others 12 (16%). The findings revealed that among staff position categories the majority were specialists. The education level of employees showed respondents who had a certificate level 15 (20%), Diploma 11 (15%), bachelor's degree 32 (44%), master's degree 13 (18%) and PhD level 1 (1%). This asserts that education level among staff the majority are bachelor's degree holders. On the age of the respondents, the result shows 25-35 years were 38 (52%), 36-45 years were 19 (26%), 46- 55 years were 9 (12%) and 55 years above were 6 (8%). This revealed that many employees were below 35 years old. Also, the Gender of participants were male 39 (54%) and female 33 (45%). Lastly, the result identifies the working experience of employees where below 1 year were 2 (2%), 1-5 years were 19 (26%), 5-10 years were 40 (55%), 10-15 years were 9 (12%), and more than 15years were 2 (2%). This clarifies that many staff have working experience of 1-5 years.

Table 1: Socio-demographics of Respondents (N=72)

Demographics	Frequency
Position	
Specialist	21 (29%)
Trainee	13 (18%)
Office worker	12 (16%)
Others	12 (16%)
Education level	
Certificate	15 (20%)
Diploma	11 (15%)
Bachelor's degree	32 (44%)
Master's degree	13 (18%)
PhD	1 (1%)
Age	
25-35 years	38 (52%)
36-45 years	19 (26%)
46-55 years	9 (12%)
55 and above	6 (8%)
Gender	
Male	39 (54%)
Female	33 (45%)
Working experience	
< 1 years	2 (2%)
1-5 years	19 (26%)
5-10 years	40 (55%)
10-15 years	9 (12%)
>15 years	2 (2%)

Source: *Field Data, 2024*

4.2 Employees' Level of Awareness of Knowledge Management Systems

Staff were asked to identify the level of awareness on the knowledge-based system used in an organization to manage information flow which supports day-to-day activity. The finding revealed that 42 (58%) of employees were aware and 30 (42%) of the staff were not aware. Figure 1 below presents the results on employee awareness respectively.

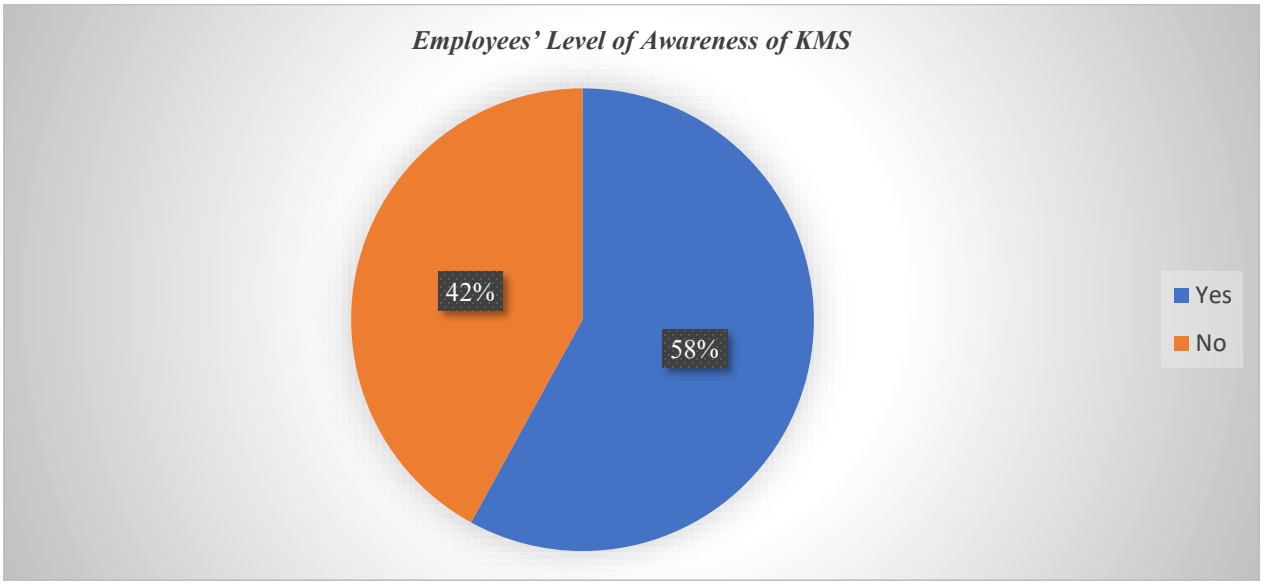

Figure 1: *Employee awareness of the KM system. (N=72) (Source: Field Data, 2024)*

4.3 Usefulness of Knowledge Management Applications/Platforms in Public Sectors

The respondent was further asked to rate the efficiency of the KM application/ platform available in their organisation through essential features and characteristics as identified below in Table 2. The five-point Likert scale was provided to gather data on the efficiency and usefulness of the KM applications. The results indicate that 28 (38.8%) of staff agreed with high speed of the system, 33 (45.8%) disagreed of the system on ease of data migration, 40 (55.5%) strongly agreed on the accurate information available on the system, 20 (27.7%) were neutral on the user-friendly interface of the system, 45 (62.5%) were strongly agree on the update and add new content of the system, 30 (41.6%) were agree on file editing history of the system, 20 (27.7%) were strongly agree and 20 (27.7%) were disagree on access management of the KM platform, 30 (41.6%) were neutral on content editing capability of the system, 40 (55%) were disagree on a feedback loop of the system, and 12 (25%) were agreed on help option (question and answer) of the KM applications.

Table 2: Efficiency of the KM application/platforms in an organisation (N=72)

Features	***Strong Agree***	***Agree***	***Neutral***	***Disagree***	***Strong Disagree***
High speed	9 (12.5%)	28 (38.8%)	10 (13.8%)	12 (16.6%)	13 (18%)
Ease of Data	4 (5.5%)	6 (8.3%)	9 (12.5%)	33 (45.8%)	20 (27.7%)
Accuracy of information	40 (55.5%)	7 (9.5%)	1 (1.3%)	9 (12.5%)	15 (20.8%)
User-friendly	14 (19%)	11 (15%)	20 (27.7%)	15 (20.8%)	12 (16.6%)
Update and add new content	45 (62.5%)	20 (27.7%)	2 (2.7%)	3 (4%)	2 (2.7%)
File edit history	5 (6.9%)	30 (41.6%)	13 (18%)	15 (20.8%)	9 (12.5%)
Access management	20 (27.7%)	15 (20.8%)	7 (9.5%)	20 (27.7%)	10 (13.8%)

Content editing capabilities	16 (22%)	17 (23.6%)	30 (41.6%)	6 (8%)	3 (4%)
Feedback loop	5 (6.9%)	3 (4%)	7 (9.7%)	40 (55%)	17 (23.6)
Question and answer section	17 (23.6)	18 (25%)	10 (13%)	15 (20.8%)	12 (16.6%)

*(**Source:** Field Data, 2024)*

4.4 Impact of digital technology in KM in the Public Sector

The respondent was asked to rate the significant impact of digital technology on KM practices in their organization. The five points of the Likert scale were used to rate the feedback and the results indicate that collaboration and communication are most often practised 45 (62.5%), High productivity is rarely indicated 25 (34.7%), Reduced information loss was often practised 32 (44%), Better decision & problem solving was rarely practised 20 (27.7%), Innovation and sharing were most often practised 30 (41.6%), Customer experiences were rarely practised 31 (43%), Centralized knowledge base were most often practiced 27 (37.5%), and Ongoing learning & development were most often 42 (58.3%).

Table 3: Impact of digital technology in KM in the public sector (N=72)

Impact of digital technology on KM in the public sector (%)					
Collaboration and communication	62.5	12.5	1.3	11	12.5
High productivity	18	9.7	8.3	34.7	29
Reduce information loss	25	44	1.3	26	2.7
Better decision-making and problem-solving	20	23.6	13.8	27.7	13.8
Innovation and sharing	41.6	8.3	12.5	23.6	13.8
Customers experiences	5.5	11	15	43	25
Centralized knowledge base	37.5	22	26	9.7	4
Ongoing learning and development	58.3	4	16.6	12.5	8.3

(Source: Field Data, 2024)

5. DISCUSSION OF THE FINDINGS

As shown in Table 1, most of the respondent more than half were aged below 35 years, and more men (54 per cent) than women (45 per cent) responded. Many respondents were young professionals who had work experience of less than 10 years and worked in different departments in the organization. Almost one-over-three respondents hold first-degree qualifications followed by a certificate level specialised in their position. This suggests that young professionals with limited work experience, most of whom hold degree qualifications, are more actively involved in knowledge management practices than older, more experienced employees.

5.1 Employees' level of awareness of KM systems

The respondents identified an awareness level of knowledge of management systems used in an organisation. As shown in Figure 01 above, more than half indicate that they are aware of the available system. This is also evidenced by interview findings where one of the respondents noted:

> *"KM system is highly known by those young staff, who are capable of dealing with digital devices nowadays".* Staff 01 (2024)

This clarifies that most young professionals in the organisation are much more aware and engaged in utilisation compared to other employees. Therefore, many young employees hold bachelor's degrees in

education experience which reflects the awareness of KM systems in public sectors. This highlighted also on the study Zahidul Islam et al., (2020) in which the young generation in the public sector contributes to the revolution and initiatives on the use of technology in knowledge management because they are greatly aware of modern technological devices.

5.2 Usefulness of KM Applications/Platforms in Public Sectors

Respondents were asked to rate the most useful feature that the KM platform provides to simplify organisational activities. This is important because the best system is the one which offers many features to enable multipurpose performance. As shown in Table 2, the majority of staff more than half accept that the KM system enables updating and adding new content, and getting accurate information (55-65 per cent) followed by other staff who do not accept that the KM system offers them feedback loop, ease of data migration (55 per cent) and remain few staff were neutral on the ability of KM system on content editing capability, user-friendly interface. This is also evidenced by one of the staff who noted:

> *"To me KM platforms do not operate better in all aspects because there are some delays due to some issues like internet, technical help and skills to use them" (*Staff 02, 2024).

Where another staff noted that: *The system is complicated due to the number of features available, which consumes time and effort (*Staff 03, 2024). This is also highlighted in the study of Farooq (2019); and Onifade & Akinwade (2019) in which the KM system should be upgraded in a level that it will be suitable and friendly to users to support work performance. This indicates that most of the staff are not competent in using KM systems, moreover the organisation should upgrade the system to add value to efficiency and easy access. The system should support work operations in each feature effectively and on time.

5.3 Impact of digital technology in KM in the Public Sector

Staff were asked to rate the impact brought by digital technology on KM activities. This was effective in investigating how digital transformation brought changes in KM initiatives and success. This study sought that many staff point out collaboration & communication, ongoing learning & development for more than half per cent as the most impact brought by digital technology in KM practices, then followed with a minimal of one over three points out that it reduces information loss. The remaining staff identify with high productivity, better decision-making & problem solving, customer experience and central knowledge base as rarely affecting the KM practices in an organization. This was clarified by one of the staff who noted:

> "*Digital transformation has resulted in notable changes in KM practices, but our organization lacks modern tools to support proper KM practices".* Staff 04 (2024).

Staff 05 submitted that:

> *"Our Organization lack a central pool for managing their knowledge where each department can be integrated so that we can share knowledge".*

This articulates that digital technology is very crucial in KM practices but implementation of modern mechanisms to foster high impact was not achieved in public sectors. This is also sought in the study of Waititu and Barker (2023); Yeboah (2023) who have pointed out that a knowledge management system plays a crucial role in optimizing cooperation between departments and implementing collaborative and cross-organizational learning processes. This indicates that the public sector is supposed to develop a central knowledge pool which will encourage ongoing learning, collaboration, good decision-making, innovation and solving different problems for the development of the organization.

5. CONCLUSION AND RECOMMENDATIONS

This study investigated the role of digital transformation on knowledge management in Tanzania's public sector, despite the initiatives of embedding digital technology in knowledge management, this study concludes that there is low transformation of modern technology in public sectors in Tanzania. There also KMS are necessary in each public sector for highly managing and application of knowledge, information

as well as essential procedures to achieve a certain activity. Digital transformation also can have a crucial impact as this study identifies, easy and simplification of operation, employee sharing and the ability to secure vital information within an organization.

Based on the findings above, it is recommended that:

i) The government regulate on proper implementation of knowledge management systems in their agency including the Tanzania Bureau of Standard (TBS)
ii) Public sectors like TBS should conduct regular training and workshops among employees to make them aware of knowledge management practices as well as modern platforms, tools and tools responsible for the management of knowledge in an organization.
iii) The ICT department within the public sector should ensure the systems are sufficient for users and technical support such as updating them to facilitate the system to become active and perform all required activities successfully.
iv) All staff in the public sector are supposed to become ready to interact with modern technology, especially on knowledge management platforms, tools and devices to participate effectively in the creation, storage, sharing and utilization of knowledge regardless of age, education level, position and working experience.

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