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Digital Transformation Frames in the National ICT and Digitalization Policy of Malawi

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Abstract:

African governments are prioritising digital transformation in their public technology policies to support socio-economic development. Digital transformation needs to be meaningful to policy stakeholders so that their actions and practices can lead to change, adaptation and value creation. This study analysed how digital transformation is framed in the national ICT and digitalization. The case of Malawi was analysed as an example of an African country that recently revised its national ICT policy to incorporate digitalization. The policy documents (e.g. draft and final version of policy) were analysed using content analysis. The findings showed that policy declarations framed digital transformation around digital infrastructure, digital skills, governance and regulations. These were perceived to be issued that could address challenges that were not addressed in previous policies and could support the country's national development agenda. The study offers insights into areas that require attention in the national ICT and digitalization policy (e.g. advanced digital skills development, professional ethics practices and law reforms for cybersecurity) to effectively support and achieve digital transformation. The study contributes towards digital transformation literature in the context of developing countries.

Keywords:

Digital Transformation, Policy Frames, Digitalization, Digital Policy, Malawi

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Introduction

Digital transformation has attracted the attention of business leaders, government officials, development agencies, academics, donors, legislators and policymakers (Begazo, Blimpo & Dutz, 2023; Heeks, Ezeomah, Iazzolino, Krishnan, Pritchard, Keken & Zhou, 2023; Imran, Shahzad, Butt & Kantola, 2021). These groups view digital transformation from different standpoints and define the term differently. For instance, “digital transformation is concerned with the changes digital technologies that can bring about in a business company’s model, products or organisation structures” (Nadkarni & Prugl, 2020: 331). Gong and Ribiere (2021:10) define digital transformation as “fundamental change process enabled by digital technologies that aim to bring radical improvement and innovation to an entity (organisation, business network, industry or society) to create value for its stakeholders by strategically leveraging its key resources and capabilities”. In another definition, Vial (2019:1) describe digital transformation as “a process that aims to improve an entity by triggering significant changes to its properties through combinations of information, computing, communication, and connectivity technologies". From these few definitions, it is confirmed that there is no single definition of digital transformation. Each group of digital transformation stakeholders uses a definition meaningful to their context (Imran, Shahzad, Butt, & Kantola, 2021; Saeedikiya, Salunke & Kowalkiewicz, 2025; Schot & Steinmueller, 2016). Hence, digital transformation can relate to change because of advances in digital technologies that affect individuals, organisations and society (van Veldhoven & Vanthienen, 2022).

The current study focuses on the nation ICT policy and digitalization of Malawi. In 2021, the government of Malawi developed the new public digital policy. The government departed used the policy labs approach that was different from conventional way of public policy cycle (see Makoza, 2017; Makoza, 2021). The policy lab approach attracted diverse stakeholders who attempted to advance their interests in the policy objectives and implementation strategies (Lewis, 2021; Makoza, 2023). The study supports the notion that frames are important when developing a public policy because they inform key policy ideas and intentions of policy stakeholders (Chong & Druckman, 2007; Drucker, 2017). Despite the significance of understanding frames in a policy (Schot & Steinmueller, 2016; Schot & Steinmueller, 2018), there are few studies that have analysed digital transformation frames in the national ICT policy and digitalization of Malawi. This study attempts to address this knowledge gap so that policy implementers may know the inspirations of the stakeholders and effectively manage their interests to achieve the policy goals. The study responds to the call for more research on digital transformation in the context of developing countries (see Ndemo & Weiss, 2017; Marino-Romero & Folgado-Fernández, 2024). It is perceived that digital transformation can support alleviation of poverty and support economic growth through job creation, improved access to markets, effective public services delivery and financial inclusion (Bhorat, Signe, Asmal, Monnakgotla & Rooney, 2023; Graham, Hjorth & Lehdonvirta, 2017).

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From the discussion above, the study was guided by the research question: How is digital transformation framed in the national ICT and digitalization policy of Malawi? To answer this question, the concept of frame was used in the study (De Bruycker, 2017; Entman, 1993). The concept has multiple dimensions (e.g. description, interpretation, moral and action) and can be used to understand policy text and ideas; and the possibilities of wider implication of digital policy in society (Chong & Druckman, 2007; van Veldhoven & Vanthienen, 2022).

Literature Review

Defining Digital Transformation

Digital transformation has attracted the attention of governments, development agencies, private organisations and communities. Digital transformation is progressing because of the advances in digital technologies including artificial intelligence, robotics, communication systems, internet of things, cloud computing, three dimensions printing etc. (Gong & Ribiere, 2021; van Veldhoven & Vanthienen, 2022). Other authors have noted that the concept of digital transformation can be coined into three areas of digital technology: digital data, digitization and digitalization (Schallmo & Williams, 2018). In summary, data in analogue format can be converted into bits and bytes which are easy to access, store and transmit. The process of converting analogue data into digital format (bits and bytes) is digitization. Adoption and use of digital technologies at a large scale is called digitalization (Schallmo & Williams, 2018). The process is happening in organisations and society where manual systems are being replaced with digital systems to achieve efficiency, effectiveness, cost saving and improve productivity (Gong & Ribiere, 2021; van Veldhoven & Vanthienen, 2022).

Other authors have cautioned the strong emphasis on technology when thinking about digital transformation (Leal-Rodriguez, Sanchis-Pedregosa, Moreno-Moreno & Leal-Millan, 2023; Tabrizi, Lam, Girard & Irvin, 2019). Instead, digital transformation should be about people. Other scholars highlight the multiple dimensions of digital transformation to include business, society, culture and digital technologies (Leal-Rodriguez, Sanchis-Pedregosa, Moreno-Moreno & Leal-Millan, 2023; van Veldhoven & Vanthienen, 2022). Figure 1 summarises the dimensions of digital transformation.

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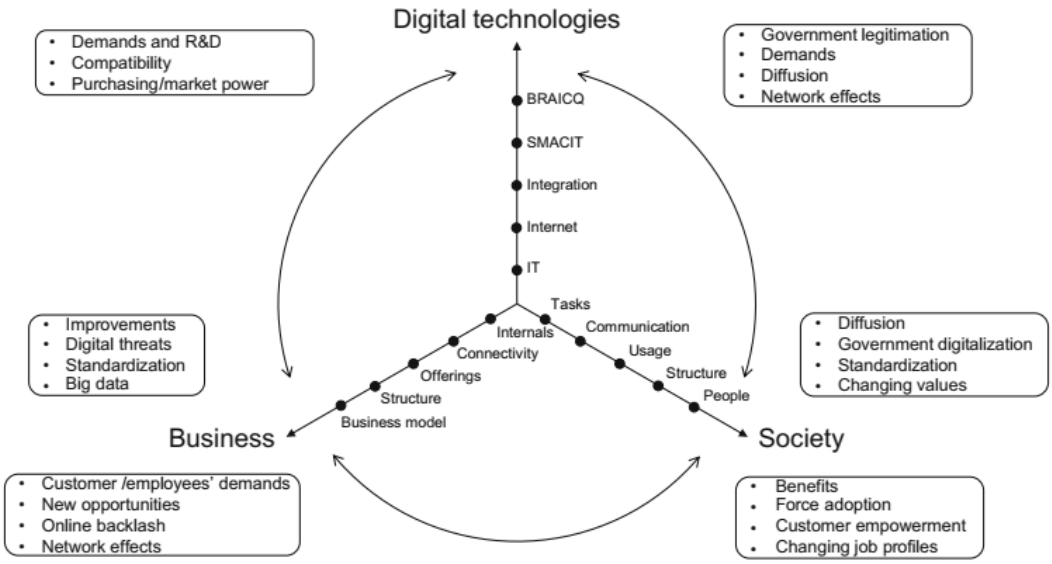

Figure 1: Interaction bases digital transformation framework (van Veldhoven & Vanthienen, 2022)

Krauss, Jones, Kailer, Weinmann, Chapparo-Banegas and Roig-Tierno (2021) suggested two dimensions of digital transformation: business processes and organisations. Business process dimensions relate to products, sales, business model, customers, technology, communications etc. Organisation dimensions include innovation, structures, resources, value creation, leadership etc. (Krauss, Jones, Kailer, et al., 2021). In their study on digital transformation in organisations, Imran, Shahzad, Butt and Kantola (2021) outlined several factors that are necessary for digital transformation, and they include leadership, culture and structure. The study also highlights the meanings assigned to digital transformation including experimentation, cultural change, operational efficiency, flexibility, opportunity, customers centricity and transparency. From these few examples, digital transformation can be viewed from many perspectives and each study focuses on different components in line with the context and objectives of the study. The current study will attempt to view digital transformation using the three dimensions of business, society, and digital technology (van Veldhoven & Vanthienen, 2022) because they provide a holistic view of digital transformation. The three dimensions of digital transformation are approached with caution and with an open mind (recognising there are other dimensions to digital transformation).

Digital Transformation Opportunities and Challenges

There are both opportunities and challenges of digital transformation in relation to national development in the context of developing countries (Begazo, Blimpo & Dutz, 2023; Heeks, Ezeomah, Iazzolino, Krishnan, Pritchard, Keken & Zhou, 2023). Digital transformation can support the automation of manual systems to improve operations of businesses and public services. Organisations and government

agencies can offer innovative services online using platforms and mobile technologies to reach out to customers or citizens. Digital services can be offered 24 hours and 7 days thereby reaching customers or citizens any time (Mergel, Edelmann & Haug, 2019). Organisations may come up with new business models, processes and value chains to improve their products and services (Schallmo & Williams, 2018). Such changes may lead to job creation where some segments of communities may participate in employment and reduce vulnerabilities (Ngene, Pinet & Maclay, 2021). Further, digital platforms are also creating work opportunities and skills development in the context of African countries. For instance, the youth may work in e-hailing, online grocery shopping delivery services, business process outsourcing and gig-work to improve their livelihoods (Graham, Hjorth & Lehdonvirta, 2017; Ngene, Pinet & Maclay, 2021). Digital transformation is also supporting organisations in the adoption of advanced digital technologies e.g. artificial intelligence to support business processes, reporting, decision-making to achieve efficiency and deliver better products and services. The use of advanced digital technologies is generating gains to both organisations and economic sectors and supporting sustainable economic growth (Feliciano-Cestero, Ameen, Katabe, Paul & Signoret, 2023; Ndemo & Weiss, 2017). For instance, use of platforms in the financial sector may improve financial inclusion of communities (Kelikume, 2021; Menza, Jerene, Oumer, 2024). Use of platforms in governments to support public services access can improve transparency and accountability (Chizoba & Onuora, 2025; Mergel, Edelmann & Haug, 2019; Shenkoya, 2023).

There are also challenges that are related to digital transformation in developing countries' context. Some of the challenges include the high cost of digital technology devices, internet cost, lack of digital skills, cybersecurity concerns, limited regulations to support data protection and fair use of data (Feliciano-Cestero, Ameen, Katabe, Paul & Signoret, 2023; Maglaras, Kantzavelou & Ferrag, 2021). Not all countries in Africa have invested in high internet connectivity infrastructure such as undersea cable connections, satellite internet connection and fibre connections. There is a scarcity of digital skills for both end-users in using advanced technologies and lack of experts in developing and supporting application for advanced technologies (Bhorat, Signe, Asmal, Monnakgotla, & Rooney, 2023; Makoza, 2022). Developing countries are prioritising digital transformation so that they can benefit from digital technologies despite the challenges. While studies have highlighted issues related to digital technologies and business context issues, policy issues have not been studied in detail (Heeks, Ezeomah, Lazzolino, Krishnan, Pritchard, Keken, & Zhou, 2023; Mettler, Miscione, Jacobs & Guenduez, 2024). The study seeks to address this knowledge gap.

Context of Malawi: Digital Transformation

Malawi is located in Southern Africa with a population of 21.1 million people (World Bank, 2024). The country is classified as the least developed countries because of low general productivity score of US$,

life expectancy of 63 years at birth and 13 years of schooling years (UNDP, 2025). The country faces challenges in the digital landscape related to limited infrastructure investment for rural and remote areas, lack of digital skills, high cost of internet services, inadequate legal frameworks for cybersecurity and consumer protection (Chirwa, 2022; Kainja, 2023; Makoza, 2023). Network readiness index scores of Malawi are considered to summarise the level of adoption and use of digital technologies in relation to the country competitiveness as it navigates through digital transformation. The technology score is 16.12, people score is 24.86, governance score is 38.35 and impact score is 37.92 (NRI, 2023).

Digital technology access and adoption is still in the early stages of development due to lack of financial resources, donor dependency, limited knowledge and expertise on digital technologies and strategies guiding development of digital technologies (Makoza & Chigona, 2016; Makoza, 2019). To address some of these issues, the government of Malawi initiated the development of national ICT and Digitalization of 2021 (Makoza, 2023). The policy aims to facilitate and guide the integration of digital technologies in socio-economic development programs. The policy was developed using policy lab where about 130 stakeholders participated in the development of the policy. The policy lab approach is perceived to be more human centered through co-define, co-create and co-produce solutions that meet the needs of citizens and produce value (Lewis, 2021). Previous national ICT policy (2013 to 2016) and related policies documents (e.g. Vision 2020, Vision 2063, Malawi Growth and Development Strategy III etc.) were reviewed to identify gaps and propose new policy thematic areas and an implementation plan. The national ICT and Digitalization of 2021 covers the period 2022 to 2027. The policy provides guidelines for digital technology infrastructure investments, governance, ICT in government for public service delivery, human capital development, cyber security resilience, among others (Makoza, 2023).

Theoretical Background to the Study

The study used the concept of frame (De Bruycker, 2017; Entman, 1993) as the social construction of meaning presented as stories or narratives or statements that represent problems that are presented in policies to be addressed through policy programs, processes and politics (De Bruycker, 2017). In other words, “to frame is to select some aspect of perceived reality and make them more salient in communicating text, in such a way to promote a particular problem definition, causal interpretation, moral evaluation and/or treatment recommendation for the item described" (Entman, 1993:52). Frames related to policy debates are discussed among stakeholders having different opinions on a policy issue (Chong & Druckman, 2007; Goffman, 1974). The study will operationalize frames using the terms suggested in Etman’s definition. The key concepts are problem description, causal interpretation, moral evaluation and treatment recommendation in consideration of wider implications of digital technologies use in society (e.g. individuals, organisations and communities) (Schallmo & Williams, 2018). These are summarised as follows:

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- **Problem description**: defining the problem and scope of the problem that policy responses will address (De Bruycker, 2017). The problem should be clear in addressing the most challenging and divisive issue. A multiple perspective of the problem is important in establishing the policy issue. Each stakeholder frames the policy issue in representing their interests, capabilities, values and position within the social structures (Head, 2019). The study will attempt to understand the problems that policy declarations on digital transformation will address.
- **Causal interpretation**: Political, historical, social and cultural factors influence the way frames are developed and presented. Interpretation of frames may consider the factors that influence the position of policy stakeholders on how they frame policy issues. The causal interpretation of frames may consider the contextual conditions and contingencies under which frames are developed and presented (Entman, 1993). The study will consider the contextual conditions that influenced the development and presentation of frames on digital transformation in the policy document.
- **Moral evaluation**: frames may represent the values, duties and responsibilities that policy stakeholders hold on a particular policy issue (Entman, 1993). Further, policy actors may make decisions and take actions from the frames presented in a policy. Hence, it is important to understand the virtues and moral character of stakeholders that frame policy issues. Moral evaluation of frames in this study will consider whether frames related to digital transformation in the policy respect the dignity of policy stakeholders and beneficiaries. Further, moral evaluation may also assess if the frames may cause injury, harm or marginalisation to the policy stakeholders. Frames related to digital transformation should promote benefits of digital technologies to policy beneficiaries equally and justly; and frames should promote accountability and transparency (Shenkoya, 2023).
- **Treatment recommendation**: These are the strategies and interventions that are taken to address the identified policy problems. These include policy decisions and actions in policy processes and programs related to digital transformation. The study will attempt to establish alignment of assumptions and values in frames, if proposed solution provides mutual benefits, consider cultural sensitivity, power balance and collaborations among the policy stakeholders (Entman, 1993).

Method and Data

The study used qualitative research approach understand how digital transformation is framed in the national ICT and digital of Malawi. Qualitative research approach (Maxwell, 2020) was considered appropriate given that policy stakeholders' views and opinions can be subjective, and they can use

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different frames to describe policy problems and solutions that represent their interests (Head, 2019; Lewis, 2021). A country case study of Malawi was chosen because the country prioritised the formulation and implementation of digital technologies policy despite other pressing issues such as food security, public health investments and public services delivery. The case study approach was useful to gather in depth understanding of a real-world situation where problems can be understood, and useful knowledge can be generated to inform practices of policy implementation agencies (Sutherland, 2016).

Data for the study was secondary data sourced from the Ministry of Digitalization and Communication. The data was purposefully selected where only data that was relevant to the study was selected (Maxwell, 2020). A copy of Malawi ICT and Digitalization policy roadmap draft (#D1) and final version of national ICT and digitalization policy (#D2) were selected. The document was stored in electronic format and analysed using qualitative data analysis software (QDA Miner). The process for data analysis followed content analysis (Elo & Kyngas, 2008). The data was read to be familiar with the context and sections of the policy document. The document was re-read and noting important content that was relevant to the study. Words, phrases, sentences and paragraphs were assigned to codes. The codes were grouped into categories. The categories were further grouped into themes. The process was repeated to refine the categories and themes (Elo & Kyngas, 2008). A report was produced at the end to answer the research question guiding the study.

Summary of Findings

Emerging Themes in the Policy Documents

The main objective of the national ICT and digitalization policy was to “to contribute to the socioeconomic development of the country through enhanced provision of integrated, inclusive and dynamic digital systems and services.” (#D2). The policy further addressed eight priority areas to meet the policy objective and these were: ICT infrastructure development, universal access to ICT and digital services, governance in ICT development, human capital development, digital government, ICT legal and regulatory environment, research innovation and development and cybersecurity resilience. Figure 2 summarises the four digital transformation themes in relation to the eight priority areas the Malawi ICT and digitalization policy.

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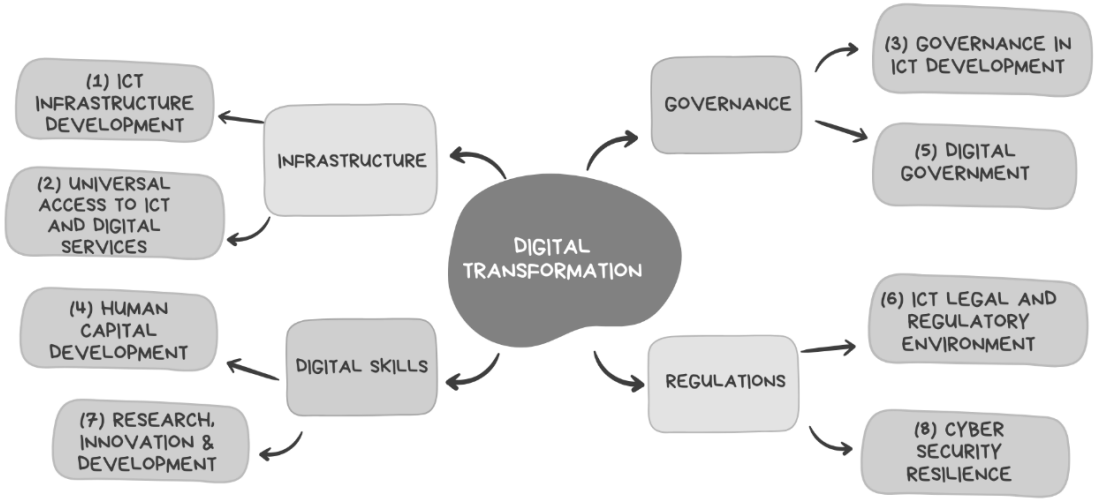

Figure 2: Summary of thematic areas and policy priority areas

As can be seen in Figure 2, four themes were identified related to digital transformation in the national ICT policy and digitalization of Malawi. These were digital infrastructure, governance, digital skills and regulations.

Summary of Digital Transformation Frames

The national ICT policy and digitalization policy presented transformation as a means for achieving benefits of digital technologies to the country: "… the policy will enable Malawi achieve digital transformation and some of the benefits will include: Improved public service delivery through digitalization of Government administrative processes; job creation through local production of ICT-based products and services; economic growth as a result of ICT innovations, digital financial inclusion and new business opportunities…" (#D2). It was perceived that the benefits of digital transformation may be achieved through development of digital infrastructure development, digital skills, improving governance and regulations.

Digital infrastructure were resources that facilitate adoption, appropriation and use of digital technologies among individuals, organisations and communities. Malawi as a developing country has limited investment in infrastructure that supported the operations on digital technologies. While the ICT investments where implemented, there was limited concentration of investment in rural areas as highlighted in the statement: "… there is great disparity in ICT infrastructure investment across the country. A greater portion of rural areas still have limited access to digital technology and services." (#1).

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One of the causes of disparities between urban and rural ICT investment was that ICT companies considered rural areas not profitable because there few customers and limited demand for ICT services. Hence, ICT investments concentrated in urban centres. Another challenge was lack of electricity to support the use of ICT devices. Electricity was not present in the rural and remote areas of the country. The government recognised the challenges of ICT infrastructure that was causing digital divide. ICT investment programs were introduced including public free Wi-Fi program (targeting public markets, airports, libraries and schools) and connect a school program (targeting schools in constituencies). Table 1 summarises the digital transformation frames and the dimensions in identified in the Malawi ICT and Digitalization policy.

Digitalization frames	**Problem description**	**Causal interpretation**	**Moral evaluation**	**Treatment**
Digital infrastructure	Lack of digital infrastructure	Digital divide between urban and rural areas	Access to digital technology for all, Inclusion and social justice	Investment projects e.g. Digital Malawi, Public free Wi-Fi, Connect a school project
Digital skills	Low digital skills affecting uptake of digital technologies	Education programs do not include technology programs	Digital inclusion program, Internet as basic right	Training programs, Professional development in public organisations
Governance	Lack of transparency and accountability	Poor working conditions and lack of professionalism	Corrupt free society	Proactive ethical culture
Regulations	Cybersecurity risks and lack of enforce of standards	Outdated laws and inability to cope with technology changes	Compliance and acceptable use of technology	Legal frameworks

Table 1: Summary of digital transformation frames

Digital skills were knowledge and capabilities of individuals to use digital technology effectively in their activities and improve their lives. Despite having public ICT facilities (e.g. telecentres in some of the urban and rural centres across the country), the use of ICTs services was still limited. The situation was attributed to digital illiteracy: “However, uptake and utilization of ICT and digital services is hindered by

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low basic literacy, caused by high early school dropout; low digital skills competencies; and lack of deliberate policy to promote digital skills for the population" (#D1). "Digital skills shortage limit the ability of individuals, businesses, and public agencies to capitalize on the benefits of digital transformation" (#D2). Another cause of digital illiteracy was lack of basic education due to dropout. This meant that people who could not read and write were not able to use the ICT facilities and services effectively. This affected their ability to reap the benefits of using digital technologies to improve their lives.

Governance were processes and procedures that were followed by individuals and organisations when appropriating and using digital technologies to promote transparency and accountability. Governance was crucial to ensure that there was no misuse of digital technologies, moral hazards and promoted fair use of technology in organizations and communities. However, the policy highlighted inadequate governance in the following statement: "There are a number of gaps in the governance for ICT that need to be addressed such as the lack of ICT sectoral policy harmonization, …. lack of Government guidance on connectivity infrastructure, and lack of standards and expertise in data" (#D1). From the statement, the key focus was on governance related infrastructure and data. Another area was ICT systems: "Weak Governance in the digital space has resulted in disjointed and segregated ICT systems in the country" (#D1). This may mean that since digital transformation was the early stages of development, the key focus of the policy was on availability of infrastructure and other issues related to governance of advanced technology were not yet prioritised. For instance, the use of advanced technologies in public organisations e.g., artificial intelligence, robotics, data analytics, internet of things and cloud computing.

Regulations were directives that were issued by authorities to individuals and organisations to support compliance with laws that supported and protected organisations and individuals when using digital technologies. The rise in use of digital technologies had also seen increase in cybersecurity issues that were affecting users and organisations as highlighted in the following statement: "… there are some challenges relating to the legal and regulatory environment hindering people's enjoyment of this right, which include: Lack of a comprehensive standalone Cyber Crime Act for cross border standardization of data and mutual legal assistance in cyber-crimes with other countries,…" (#D1).

While the country had Electronic Transactions Management and Cyber Security Act of 2016, there were lapses in regulations of new issues that had emerged and rendered the Act ineffective to deal with the complexity of the emerging issues and the development of digital transformation. Some of the examples of the emerging issues were: "… inadequate frameworks for critical information infrastructure (CII) holders, inadequate identification, management, ownership and protection of the critical sites, inadequate coordination on international cyber security issues …" (#D1). It was also interesting to note the acknowledgement of international collaboration in addressing cyber security because the country did not have adequate professionals in both public and private sector that could support to address

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cyber security problems. The intended collaboration would fill the skills gap and provide opportunities for learning.

Discussion of Research Findings

This paper sets out to analyse how digital transformation was framed in the national ICT and digitalization policy. The findings reveal that digital transformation was framed around digital infrastructure, digital skills, governance and regulations. Digital infrastructure was related to ICT development to support universal access to ICT and digital services. Digital skills associated with capacity development for supporting research and innovation for digital technologies solutions. Governance was linked to promoting transparency and accountability in delivery of public services in government departments. Regulations were based on ICT legal frameworks to support a safe environment for using digital technologies. The findings in the study were related to the dimensions of digital transformation suggested in previous studies (Krauss, Jones, Kailer, et al., 2021; van Veldhoven & Vanthienen, 2022). It was interesting that the dimensions of the frames had both technology (e.g. digital infrastructure and regulations frames) and human aspects (e.g. digital skills and governance frames). This may mean that right balance was necessary for digital transformation to be effective in addressing policy problems in the policy (Tabrizi, Lam, Girard & Irvin, 2019; Zimmer, Jarvelainen, Stahl & Mueller, 2023). The four areas of frames that emerged in the study are discussed in detail in the subsequent paragraphs.

Consisted with other studies (Gong & Ribiere, 2021; van Veldhoven & Vanthienen, 2022; Vial, 2021; Schallmo & Williams, 2018), the findings of the study showed that digital infrastructure frames were proposed around physical, organisational, facilities and processes that could be introduced because of digital technologies. The proposed digital infrastructure frames addressed the challenges of inclusion and access to digital technologies services. There were also areas that could be improved for digital infrastructure frames. Digital infrastructure investments could also integrate transparency and accountability. The government implementation agencies may introduce communication strategies to inform the policy stakeholders on how the tax funded or donor funds were used in the policy programs for digitalization.

The findings showed that digital skills were also a crucial factor in digitalization. The education system in Malawi had not yet incorporated digital technologies in the education programs. This may explain why the country had low score on network readiness index (NRI, 2023). Other studies highlight similar concerns for lack of digital skills in the country (Kainja, 2023; Makoza, 2022; Rui, 2024). The digital skills frames highlighted the need for improving digital skills for both users and professionals. The contribution of the study is that digital skills development as part of digital transformation may also address issues related to responsible use of technology, understanding of cultural values of users and promoting

training programs that were relevant for upskilling rather than deskilling. For example, digital skills training that will empower citizens to create innovations that can address their problems in communities and avoid training programs that promote the use of digital technology as passive consumers without any personal or community transformation.

The findings revealed that governance was framed around legal framework gaps. The aims of the governance frames were to enhance accountability and transparency in policy programs and processes. This finding was similar to studies that suggest governance as one of the factors that is significant in digital transformation (Jewer & van Der Meulen, 2022; Shenkoya, 2023). The study extends this debate to highlight contextual issues of governance in digital transformation of Malawi. Governance frames may also extend to oversight where the adopted processes, procedures and regulations for digital transformation could be monitored, reviewed to ensure that compliance and due diligence were followed and corrective action to be taken. Monitoring performance and compliance may be implemented in processes and procedures for digital transformation programs to detect early any form of unprofessionalism in the government implementation agencies.

The findings showed risks of cybersecurity and lack of standards, particularly those that emerged from legal frameworks. Similar studies have stressed that cybersecurity is important in digital transformation to guarantee safety of users and infrastructure (Feliciano-Cestero, Ameen, Katabe, Paul & Signoret, 2023; Maglaras, Kantzavelou & Ferrag, 2021). While frames on regulations addressed pertinent issues to ensure that digital transformation created a safe environment for individuals, businesses and communities when using digital technologies, the study shed light on some of the legislations that required laws reforms (e.g. Electronic Transactions Management and Cyber Security Act of 2016). The reforms were necessary to ensure that emerging technologies threats and risk were minimized (Maglaras, Kantzavelou & Ferrag, 2021).

The discussion above confirms the scope of the national ICT and digitalization policy matched with some of the interaction bases digital transformation frameworks (e.g., van Veldhoven & Vanthienen, 2022). The key areas of technologies, society and business were relevant to the context of national ICT policy and digitalization of Malawi. The study also showed that there were frames that were missing, especially in national ICT and digitalization policy that could address the complexities that emerge when appropriating and using technology in organisations and society e.g., cultural values of users and communities, law reforms, measures of transparency and accountability. The current study offers useful insights that can be explored further. In relation to framing digital infrastructure, further studies may look at how the different interests and values of marginalized groups of stakeholders are articulated in the policy. For instance, women, the youth, and people with special needs. Another fruitful area for future research is the framing of digital skills. Developing countries are always on the receiving end of

technology value chain, it would be interesting to note how far digital policies go in supporting to support capacity for designing, development and deployment of digital innovations (e.g. skills in designing and manufacturing electronic chips and parts of digital devices, programming applications for advanced technologies such as Artificial Intelligence, language models, robotics, three dimension printing, unmanned aerial vehicles or drones) that reflect the local context conditions of Africa.

The study makes the following recommendations for policymakers:

- Policy labs to include legal experts (e.g., Malawi Law Commission and Malawi Human Rights Commission) and representative from portfolio committees of the national assembly (i.e. to represent the legislators) so that there is buy-in and potential for sharing knowledge and incorporation of legal frameworks in digital transformation policies.
- Policymakers may consider collaborating with Education ministry and institutions to establish strategies for digital skills development for supporting design and creation of innovations (beyond mere use of digital technology) that address the local needs of users, organisations, and communities.
- Policy implementation agencies and regulatory organisations may prioritise awareness programs of cybersecurity. These can be done to inform the public and organisations about data protection and safety standards for digital technologies.
- Government agencies may include training programs for staff on ethical practices and professionalism. Staff who perform their work with integrity and transparency should be recognised and motivated.

Conclusion

In conclusion, the study objective was to outline the digital transformation frames in the national ICT and digitalization policy. The findings showed that digital transformation was framed around infrastructure, digital skills, governance, and regulations. The findings were consistent to the dimensions of digital transformation related to society, business, and technologies (Krauss, Jones, Kailer, et al., 2021; van Veldhoven & Vanthienen, 2022). The key contributions of the study were: missing frames related upskilling, advanced digital skills, law reforms, professional ethical practices, oversight; and monitoring and evaluation of digital transformation policy programs. The study noted areas for further research related to law reforms for supporting cybersecurity in digital transformation and development of advanced digital skills. Recommendations are suggested for policymakers to engage law experts and legislators in policy innovation labs and formulate comprehensive digital skills development strategies together with government education implementation agencies and institutions.

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