The Nexus between Digital Transformation and Operational Efficiency in Emerging Economies: A Case Study of SheCanCode – Rwanda

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Abstract

The adoption of digital technologies has become a strategic imperative for businesses seeking not only to survive but to thrive in an environment characterized by rapid technological advancements and heightened global competition. Digital transformation has become a must-have for all businesses as an essential strategy not just to benefit from the opportunities it presents but also to stay relevant. This paper was able to consider the intricate relationship between digital transformation and operational efficiency within the context of a Rwandan-based organization, SheCanCode, a non-profit organization working to bridge the digital skills gap among women by empowering them to enter and remain in the tech industry. With a desktop literature review and a case study, this paper showed the level of awareness, adaptation, and operational effects from digital transformation within SheCanCode Rwanda, where the main focus was on its initiatives and their implications on operational efficiency. Through qualitative and quantitative inquiry, insights were gathered from 8 participants, 4 being top management, revealing a shift towards digitalization for the past 3+ years, particularly catalyzed by the COVID-19 pandemic. The paper identified that 75% of SheCanCode-Rwanda participants believe that digital transformation has a positive impact on their operational efficiency. at the level of 75%. However, based on the fact that the integration level is at 3.8 out 5, the management has committed itself to continue improve digital technologies into the operational processes, strategic partnerships, and continuous monitoring and evaluation strategies to enhance adaptability and resilience in the face of challenges.

Keywords: Digital Transformation, Operational Efficiency, Emerging Economies and Organizational Adaptation

INTRODUCTION

The 21st century is characterized by rapid technological advancement and the all-encompassing influence of digitalization across industries and organizations globally are obligated to adjust and adapt digital transformation in order to uphold competitiveness and maintain operational excellence. The requirement for digital transformation was once again intensified by the COVID-19 pandemic due to the disruption of the customary state of affairs. The disruption came in effect due to the implementation of extreme social confinement measures, including social distancing and the temporary shutdown of public spaces, by numerous governments, Rwanda included (Contreras,n.d). Rwanda, with its ambitious Vision 2050 development agenda, has positioned itself as a regional hub for technological innovation and economic growth (The World Bank,2020). As a result, organizations in the country are striving to align with this vision and the ever-changing business landscape.

The aim of this paper is to investigate the relationship between digital transformation and operational efficiency in emerging economies with a focus on SheCanCode-Rwanda. The paper sought to understand how digital transformation influences operational efficiency within the context of Rwanda's development agenda. By conducting a case study on SheCanCode-Rwanda, the paper aimed to shed light on how digital transformation can act as a catalyst for operational efficiency, impacting the cost structures of organizations in Rwanda. This paper intends to contribute to academic discussions on leveraging digital transformation for enhanced operational efficiency but also inform policymakers, business owners, and other stakeholders about the potential challenges and recommendations relevant to this context.

LITERATURE REVIEW

Inferred by multiple instances, digital transformation is a common focus for organizations in various industries,

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including the education industry, due to the availability of digital technologies and the potential benefits they offer. Jaumotte, Oikonomou, Pizzinelli, and Tavares article highlights that digitalization has not been in high use in contact-intensive sectors, such as education, and that small organizations were lagging behind compared to larger counterparts across many countries such as Sweden and Greece. It; however, added that there was a higher digitalization levels, during the pandemic, in various sectors which reduced labor productivity losses that would have otherwise been unavoidable due to lockdowns, through remote work and online operations (2023). Furthermore, the Perception Point Inc report explored several successful cases that demonstrate the positive effects of digital transformation, where Target introduced an online ordering and digital marketing tool that led to increased stock prices and revenue, and it highlighted the case of Honeywell's reduction of operating regions and implementation of IoT connected devices which led to revenue growth. Lastly, it spotlighted Home Depot's enhanced ecommerce experience and cost savings through predictive analytics (2024). One would see that all organizations are from advanced economies only. Also, on the global perspective, Kaggwa, Akinwolemiwa, Dawodu, Uwaoma, Akindote, and Eloghosa (2023) study explored the transformative impact of digital technologies on national economies and highlights how they drive innovation, enhance productivity, and foster sustainable development across various industries. While this study focuses on the transformative impact of digital technologies on national economies, there is a lack of detailed examination on the challenges faced by SMEs from emerging economies in adopting digital technologies.

Muridzi G. paper discusses the adoption of the IoT by small and medium enterprises (SMEs) in emerging economies and reveals the challenges such as lack of strategic implementation frameworks that hinder widespread adoption (2024). While the paper acknowledges the opportunities and challenges of digital transformation in terms of IoT, there is a need for a more comprehensive exploration of how digital transformation specifically impacts operational efficiency within the context of emerging economies. Westerman & McAfee paper spotlights the transformative potential of digital technologies in enhancing operational processes across divers industries and it provides a framework that underscores the potential of digital transformation in developing economies (2014). It is true that the idea of embracing digital technologies would potentially allow organizations to leapfrog traditional constraints, leading to enhanced efficiency. However, little is discussed on specific insights of the nexus between digital transformation and operational efficiency for organizations in African countries like Rwanda. While existing papers are useful in understanding a broader context, it lacks empirical evidence specific to Rwanda; hence, the need for localized case studies. The work by Bihkongnyuy (2023) provides insights into the challenges and successes of digital transformation initiatives in African organizations. However, a specific focus on the relationship between digital transformation and operational efficiency, particularly within

the context of Rwanda is not extensively covered in the existing literature. The study by World Economic Forum (2022) and Twinoburyo, Munu, and Vlaminck (2022) talks about Rwanda's forward-looking digital policies and mapping of its e-governance initiatives that have served as major drivers of Rwanda's economic transformation; they do not delve into the specific outcomes and challenges faced by organizations in operational efficiency through digital transformation. It is evident that research that tackles the relationship between digital transformation and operational efficiency in developing countries remains scarce.

METHODOLOGY

This paper used a desktop literature review and a case study methodology to examine the research gap concerning the connection, opportunities, and challenges associated with digital transformation and operational efficiency within developing nations, particularly in the African context. Out of 15 articles reviewed, only three merely scratched this relationship directly. This approach facilitated the acquisition of qualitative data which was combined with a case study of SheCanCode - Rwanda, an EdTech organization empowering young Rwandan women with coding skills. A questionnaire-Google Form survey was used to compile qualitative and quantitative insights from the case study.

For keywords selection, digital transformation, operational efficiency, emerging economies, and africa were used.

FINDINGS AND DISCUSSIONS

1. SheCanCode in a nutshell

SheCanCode provides training to young Rwandan women 18-25 years with skills to code, build web design, and applications. The organization believes that education, training, and campaigns are crucial to bridging the gap between men and women in using, learning, and accessing technology. SheCanCode has different programs, notably coding programs through 4-month boot camps, the academy for women tech and entrepreneurship, and the SheCanCode outreaches in high schools. All these programs are Kigali-based except the outreach campaigns that are across the country. The focus for this paper has been the 4-month boot camp coding program, whereby the participants attend classes in cohorts and develop designs for local businesses, and create a path for securing a job. The organization took this challenge because of the identified gap in digital and technology literacy between women and men. This is supported by research which shows that women are still behind in 3 dimensions of technology. According to United Nations Women Africa (2022), 48% of women in Rwanda aged 15-49 years own a telephone, which is less compared to 62 percent of men in the same age group. Additionally, VVOB, a non-profit organization helping the government to revolutionize education, reports that 66% of male students attend STEM courses in upper secondary school while only 51% of female students choose STEM programs at the same level. Also, in tertiary education, 51% of male students choose STEM fields while women who enroll in STEM programs make up only 32% (2022). Below the management structure and what has been achieved so far.

No of Employees by Gender		Over 6 Years		No of Management	Respondents No
		No of Cohorts	No Graduates	Male	3	4
Male	5			Female	1	4
Female	6	9	350	Total	4	8

2. Findings and Discussions

From the data collected, it is clear that SheCanCode-Rwanda has made significant strides in digital transformation, like many other Rwandan organizations, shifting to online learning during the COVID-19 pandemic, necessitating an adoption to new platforms for skill development. One of the top management participants' direct words

"*At Shecancode we have adopted different digital changes, which started in 2020 when COVID-19 pandemic started. We were obliged to move our learning programs to online as in person activities had stopped during Lockdown. That means we had to learn and adopt online learning tools that can still help our students to access coding skills. The second digital change we went through was to adopt the platforms that provide coding skills and subscribe so that our students can access them. This was a shift where for students to gain skills, a teacher in the physical room was not the only option. Instead it was a mix of physical lectures and online tech platforms. This helped the students to gain skills from diverse sources across the world.*"

This transition enabled the organization to continue its operations, thereby ensuring business continuity. The organization's awareness of digital transformation is currently high (**rated at 4 out of 5**), with substantial integration of digital technologies into their operational processes. Here is a snippet of other aspects quantified on average from the 8 respondents.

On Scale of 1 - 5, SheCanCode Rwanda representatives (8) were asked to quantify their position on the following questions	1 - being the lowest rating, 5 being the highest rating (Average)
To what extent is your organization aware of the concept of digital transformation?	4
How would you rate the level of digital adoption within your organization?	3.3
How involved are you in the digital transformation initiatives of the company?	3.6
To what extent has your organization integrated digital technologies into its operational processes?	3.8

Operational efficiency Key performance indicators (KPIs) like staffing, finance, and stakeholders engagements have evolved post-digital transformation implementation; leading to both opportunities and opportunities. For instance, it led to cost savings which enhanced students' experience and alumni engagement. According to the program manager, "*The digital transformation has compelled certain key performance indicators (KPIs) to undergo modification. Take, for instance, the aspect of Staffing, whereby employees are no longer obligated to physically report to the office; instead, they operate remotely. This shift resulted in reduced expenses pertaining to items such as Internet usage and electricity consumption within the office premises which allowed us to increase the number of students we could take per cohort. However, this change has also brought about a decrease in the personal interactions and experiences of both students and facilitators, particularly when urgent support is required. Also, the hybrid work environment limited our work productivity due to unstable internet at home for both students and staff. Nevertheless, it has enabled students to expand their learning resources, as they now have access to various new platforms. From a financial perspective, certain operational costs have been eliminated, such as transportation, meals, workplace Internet usage, and electricity. On the front of Alumni engagement, the digital transformation has been advantageous, as it allows individuals to access opportunities without the need to physically attend networking events. Although such events still exist, online platforms can now be utilized to explore and seize these opportunities.*" This shows that while remote work reduced operational costs, it also posed some challenges such as personal interactions and experiences as well as budget constraints. The next step on the agenda is to boost staff productivity and program quality through international affiliations and technological systems.

Despite the challenges, 75 % of the participants expressed that the implementation of the digital transformation initiatives has brought about a beneficial influence on the daily operation post-pandemic mainly due to the fact that a hybrid policy was established enabling the option to work from home and in the office.

Digital Transformation Initiatives Positive Effects on Day to Day Operations
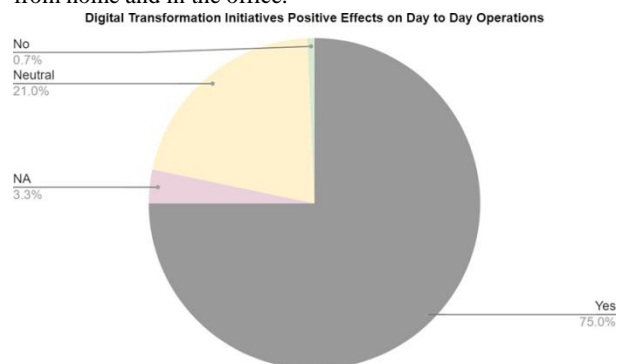
RECOMMENDATION

It has become evident that the intersection of technology and organizational effectiveness has become a focal point for businesses and institutions worldwide. As highlighted by the SheCanCode - Rwanda case study, the impact of digital transformation initiatives on operational processes is profound. Based on the findings and insights from the case of SheCanCode - Rwanda, where digital transformation strategies have been implemented to enhance organizational efficiency, it is evident that leveraging digital tools and

platforms can significantly optimize outcomes.

Below are recommendations derived from the SheCanCode case study, which can be extrapolated to broader contexts to guide organizations in enhancing their digital journey and operational efficiency:

- **Provide Ongoing Digital Skills Training:** Organizations should prioritize continuous training programs for staff to empower them in effectively utilizing digital tools. Though it can be easier to focus on specific platforms, it is important that the training should cover a wide range of platforms and tools (within scope) to enhance adaptability and efficiency across various digital processes and technologies. This is crucial because, for example, the SheCanCode-Rwanda management's opinion on how employees have embraced the new digital tools and processes is at a rating of 3 out of 5 (on average).

- **Enhance Student Support Mechanisms:** This one is very specific for organizations that are in education/vocational training because they should embrace online and hybrid learning by developing or improving strategies that facilitate online tutoring, mentoring, and peer-to-peer collaborations. This approach will not only improve learners' interactions and experiences in their academic journey but also enhance alumni engagement and success rate which in turn will optimize learning outcomes and students satisfaction.

- **Forge Strategic Partnerships:** Depending on organizations future ambitions, they should establish partnerships with both local and international organizations that offer relevant resources/skill sets and platforms that they are in need of. By diversifying partnerships through strategic collaborations, organizations can enhance their program(s) quality and improve operational efficiency. Creating strategic partnerships will lead to innovation, knowledge exchange, and program effectiveness.

- **Promote Digital Inclusivity:** As organizations work on improving hybrid/remote working environments, they should strive to ensure equitable access to digital resources where opportunities and resources for all are available. Strategies such as designing platforms that are accessible to individuals with disabilities and adhere to web accessibility standards. Also, they should develop mobile-friendly resources optimized for low-resource settings to enhance accessibility, especially in areas with limited internet connectivity. By promoting digital inclusivity, organizations can reach a broader audience and create a more inclusive work environment.

- **Monitor and Evaluate Performance Metrics:** Organizations should put in place systems and processes that ensure continuous monitoring and evaluation of key performance metrics related to digital transformation initiatives. Analyzing their KPIs data will allow organizations to identify areas of improvements and make informed, data-driven decisions that can catalyze operational efficiency and overall effectiveness. Developing the habit of regular performance evaluation will ensure alignments with organizational goals and facilitate continuous improvement.

CONCLUSION

SheCanCode-Rwanda has made significant strides in digital transformation and it has positively impacted their operational efficiency at the level of 75%. The organization and many others like it continue their efforts to navigate the complexities of adapting to a rapidly evolving digital landscape, the need for continuous training, strategic partnerships, and monitoring and evaluation. However, based on the integration level (3.8 out 5) of digital technologies into the operational processes and the management commitment to continuous improvement, it is clear that they will be able to enhance adaptability and resilience in the face of challenges.

Undoubtedly, organizations should strive to create space for continual improvements of their processes and digital transformation initiatives by gaining insights from all involved stakeholders and leveraging the feedback to enhance operational efficiency.

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