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CONSTRAINTS, CHALLENGES, AND OPPORTUNITIES FOR DIGITAL BUSINESS IN RURAL AND TOWNSHIP ECONOMY

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ABSTRACT

Background: The digital economy is expanding at an unprecedented pace worldwide, transforming industries and creating new business models. However, the adoption of digital technologies and digital business models in rural and township areas in developing countries faces numerous constraints given their contextual nuances.
Purpose: This study examined the constraints, challenges and opportunities for digital business in the rural, and township economy in South Africa.
Design/methodology/approach: The study employed a mixed-methods approach incorporating questionnaires and focused group discussions. The study area was two villages in Limpopo and two townships in Gauteng.
Findings/Result: The study findings indicate that challenges and constraints that hinder the successful adoption and implementation of digital business in South Africa were: limited access to internet connectivity, inadequate digital infrastructure, limited digital literacy and skills, insufficient financial resources for investment in digital technologies, restricted access to affordable logistics and delivery services, concerns regarding trust and security in online transactions, competition with traditional businesses, limited access to funding for entrepreneurs, and cultural and language diversity barriers.
Conclusion: Considering these findings, the research presents a set of recommendations to address these constraints and maximize the opportunities offered by digital businesses in rural and township areas contributing to the broader development goals of the nation.
Originality/value (State of the art): This study offers original insights into the specific constraints, challenges, and opportunities for digital business in South Africa's rural and township economies. Employing a mixed-methods approach, highlights the unique contextual factors affecting digital adoption, providing valuable recommendations to enhance digital business integration and contribute to broader national development goals, particularly in underrepresented areas.

Keywords: digital business, digital literacy, e-commerce, internet connectivity, rural economy, township economy

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INTRODUCTION

The adoption of digital technologies has transformed the business landscape globally, bringing new opportunities and challenges for businesses across various industries. The advancement of digital technologies has enabled businesses to reach new markets, reduce costs, and enhance their competitiveness. According to Mtapuri, (2020). The adoption of digital technologies in South Africa has been slower than in other parts of the world, with the digital divide between urban and rural areas exacerbating economic inequalities. Bodibe (2021), on his part, cited that the adoption of digital technologies has been more prevalent in urban areas, where access to digital infrastructure and skills is more prevalent. As a result, this study aims to explore the constraints, challenges and opportunities for digital business in the rural and township economy in South Africa.

On the positive side, digital technologies can bring new economic opportunities to rural and township economies, including access to new markets, increased efficiency and productivity, and job creation (Mafini & Dlodlo, 2020). Digital technologies can help to overcome traditional barriers to economic growth in rural and township economies, such as geographic isolation and limited access to resources (Mangena, 2019). However, there are also significant challenges and constraints to digital business adoption in these areas. One of the most significant challenges is limited access to infrastructure, including electricity, telecommunications, and broadband (Mtapuri, 2020). Additionally, low levels of education and limited digital literacy may impede digital business adoption in rural and township economies, as many business owners may lack the necessary skills to use digital technologies effectively (Mangena, 2019). Moreover, there are significant financial constraints to digital business adoption in rural and township economies, including limited access to financing and high costs associated with digital technology implementation (Bodibe, 2021). Cultural factors, such as a preference for traditional business models, may also pose challenges to digital business adoption (Nkosi, 2020).

The COVID-19 pandemic has further highlighted the importance of digital technologies for businesses. On the positive side, digital technologies have enabled businesses to adapt to the pandemic's disruptions, such as remote working, e-commerce, and digital communication. According to (Mtapuri, 2020), the pandemic has also accelerated the adoption of digital technologies among businesses, particularly in urban areas, as businesses seek to remain competitive and adapt to changing market demands. However, the pandemic's severe effects on the rural and township economies have exacerbated already-existing economic disparities and widened the digital gap. The pandemic has highlighted the need for increased investment in digital infrastructure and digital skills development in rural and township economies to enable businesses to remain competitive and adapt to the new business landscape (Nkosi, 2020).

Therefore, this study seeks to investigate the constraints, challenges, and opportunities for digital business in the rural and township economy of South Africa. Specifically, this research aims to investigate the digital business industry, which encompasses digital platforms and e-commerce, including platform business and online stores, without delving into any specific business entities. This study examined the impact of digital technologies on businesses South Africa. The findings of the research will contribute to the development of targeted policies and programs that promote the growth and sustainability of digital businesses in rural and township economies, promoting economic development and inclusive growth in South Africa. Furthermore, the study provides information to mount framework and regulations to address constraints and challenges frustrating digital business in the rural and township economies of South Africa. The study findings also provide motivation to speculators of digital business to venture into this business space.

Empirically, empirical review conducted in this study focuses on studies carried out in United States (US), Europe, Asia and Africa. In the US, the digital divide has been a prominent challenge in rural areas. Studies such as Johnson et al. (2019) and Smith and Smith (2018) emphasize the limited access to high-speed internet, hindering the adoption of digital technologies by businesses in rural regions. Additionally, regulatory complexities and infrastructural deficiencies have been identified as significant constraints (Brown, 2017). Opportunities, however, have emerged. Research by Parker et al. (2020) highlights government initiatives, like the Rural Digital Opportunity Fund, aimed at improving digital infrastructure in rural areas, thereby creating a more conducive environment for digital businesses to thrive in the US.

In Europe, the challenges faced by rural and township economies in adopting digital technologies are complex. Studies such as Andersen and Kraemer (2019) and Bakhshi et al. (2018) highlight issues related to digital literacy, with small businesses struggling to adapt to rapidly changing technological landscapes. Furthermore, stringent regulatory frameworks and limited access to venture capital have been cited as constraints (Baptista and Karaoğlan, 2019). Despite these challenges, opportunities are emerging. Research by European Commission (2019) emphasizes the role of regional development funds in supporting digitalization efforts in rural areas, with programs like the European Regional Development Fund providing financial support for digital infrastructure projects.

The challenges faced by rural and township economies in adopting digital business models in Asia are deeply intertwined with socio-economic factors. Studies by Kim and Shin (2019) and Zhen and Jeppesen (2020) underscore the importance of cultural barriers and the lack of digital skills as significant constraints in Asia. Moreover, issues related to digital security and privacy concerns have been identified (Kshetri, 2017). Opportunities in Asia include government-led initiatives to bridge the digital divide. For instance, initiatives like India's Digital India campaign have made significant strides in improving digital infrastructure and accessibility in rural areas (Choudhary, 2018). Several studies have been conducted on digital business in rural and township economies in Africa. For instance, a study by Afrifa and Osei-Bryson (2017) has identified issues of trust and security in digital transactions. Opportunities in Ghana and Nigeria center around mobile technology. Research by Donou-Adonsou and Tamru (2019) showcases the transformative potential of mobile banking and e-commerce, offering new avenues for digital business growth in these economies. Studies by Agyapong et al. (2019) and Oyelaran-Oyeyinka (2018) highlight issues related to unreliable electricity supply, limited access to financing, and infrastructural deficits as major constraints.

Theoretically, one important theory that aligns well with this study is the Diffusion of Innovations (DOI) theory that was espoused by Everett Rogers (Rogers, 2003). This theory delves into how, why, and at what pace new ideas and technologies spread through cultures. Specifically, the Diffusion of Innovations Theory outlines the journey of an innovation as it is communicated through various channels over time within a social system. It emphasizes the roles of innovation, communication channels, time, and the social system in spreading new ideas and technologies within a business environment or economy. It further assumes that limited access to internet connectivity. For DOI, this can be a major barrier in the knowledge stage, where businesses struggle to learn about new digital technologies due to insufficient infrastructure.

Similarly, DOI believes that infrastructural limitations could also impact the implementation stage, where businesses may want to adopt digital technologies but lack the necessary resources. This coupled with digital literacy gaps affects the persuasion and implementation stages of the adoption of new digital technologies. Hence, without adequate understanding and skills, businesses cannot be convinced of the benefits, nor can they effectively implement new technologies.

Trust and security concerns are, for DOI, considered issues that affect the decision and confirmation stages of digital technologies in businesses. If businesses do not trust digital systems, they are less likely to decide to adopt them, and even if they do, they may not fully commit without robust security measures in place. Finally, DOI assumes that expanding broadband infrastructure is crucial for the knowledge and implementation stages, ensuring that businesses have the connectivity needed to access and use digital technologies. Tailored digital literacy programs could also help in the persuasion and implementation stages, enabling businesses to understand and adopt new technologies. Implementing cybersecurity protocols and transparent payment systems can enhance trust, affecting the decision and confirmation stages. Collaborative efforts among stakeholders usually help to facilitate the diffusion process by leveraging different communication channels and resources.

Aligning with existing studies and extant literature, this theory has shown that the challenges of digital business especially in rural and township economy are not unique to South Africa but are experienced globally. This, therefore, highlights the universality of the diffusion process and the need for context-specific strategies to address local barriers and leverage opportunities. To address these challenges, DOI supports the need for a holistic approach involving multiple stakeholders that emphasizes the importance of addressing the identified challenges through targeted interventions in order to foster the successful diffusion of digital innovations.

METHODS

This study used a comprehensive mixed-method approach to examine the constraints, challenges, and opportunities faced by entrepreneurs and businesses operating in South Africa's rural and township economies. The methods involved the use of both quantitative and qualitative techniques, executed in a specific order to ensure thorough and inclusive data collection.

First, the data collection instruments were developed, consisting of both open-ended questions and Likert-scale items. These instruments were pretested to ensure clarity and reliability. The pretest helped identify any issues with the questionnaire, and necessary amendments were made before the full-scale data collection began. The study used Cronbach's Alpha to measure the internal consistency of the survey instrument, ensuring that the questions were reliable. A score of 0.6 or higher was considered acceptable, as per Nachmias and Nachmias (2007) and Malhotra (1996).

The study began by conducting online and paper-based surveys. The online surveys were shared through social media channels to reach a broader audience, while paper-based surveys were distributed to those in rural and township areas who lacked internet access. This dual approach ensured inclusivity, allowing individuals from diverse socioeconomic backgrounds to participate. The surveys collected demographic data, as well as information on business challenges and opportunities, using a mix of closed-ended and Likert-scale questions to generate quantitative data.

Focus group discussions (FGDs) were conducted with participants from both literate and illiterate groups. These discussions allowed for the exploration of more complex topics that could not be captured through surveys alone. FGDs were particularly important for participants who had low or no education, as they could express their views more comfortably in a group setting. The interactive nature of FGDs enabled the identification of common themes and nuanced insights into the digital business environment in rural and township settings. Study Areas and Participants The study focused on two townships (Tembisa and Alexandra) in Gauteng Province and two villages (Nwamitwa and Xihoko) in Limpopo Province. These areas were chosen for their typical representation of South African townships and rural communities, ensuring that the findings could be generalized to similar regions. Participants were selected using stratified random sampling to ensure that a diverse range of business owners and stakeholders were included. The study also defined an inclusion criterion based on age, targeting economically active individuals aged 18 years and older.

The collected survey data were analyzed using descriptive statistics, including frequencies, percentages, and means. This provided an overview of the constraints and opportunities reported by the participants. Focus group discussions were transcribed and analyzed thematically, with key themes identified to reinforce relationships between study variables.

By employing a mixed-methods approach, the study was able to capture both quantitative and qualitative data, offering a well-rounded understanding of the challenges and opportunities facing digital businesses in South Africa's rural and township economies. The combination of online surveys, paper-based surveys, and focus group discussions ensured that the study included participants from various educational and economic backgrounds, providing a comprehensive view of the digital business landscape in these areas.

RESULTS

Reliability Test

Cronbach alpha score was 0.8 which indicate a high level of internal consistency reliability of the instrument. The rest of the results is discussed in the following subsections.

Constraints and Challenges

Limited Access to Internet Connectivity

Over 60% of respondents reported inadequate and unreliable internet connectivity as a significant hindrance to conducting digital business operations. This constraint directly impacts their ability to engage in online transactions, market their products, and access crucial information. From the focus group session, the participates had also pointed current loads adding challenges have also exacerbated the in-township areas whereby when lights are off the criminal elements have taken an opportunity to destroy and vandalize limited infrastructure they had.

Resistance to Adoption of Technology

A lower proportion of the feedback received displayed resistance to adopting digital technologies none factor as far as rural and township. The segment emanated from rural and township population which was found to be not keen in using these technologies has been the elderly population segment. For instance, around 63% of the people over the age of 54 have no knowledge of the digital platforms and have not engaged one before (Figure 1).

Lack of Digital Infrastructure

Approximately 26% of respondents cited a lack of essential digital infrastructure (such as computers, laptops, and smartphones) as a notable constraint to embrace digital technology. This shortage limits their capacity to engage in e-commerce and utilize digital tools effectively. From the focus group discussions, the participants have highlighted that poverty and unemployment in these areas are chief contributors for the lack of digital tools. With high levels of unemployment, more special youth unemployment these communities have young people to don't have access to smart phone. For those who have smart phone, they do not have money to buy data.

Limited Digital Literacy and Skills

The study revealed a critical gap in digital literacy and skills among people in rural and township areas. Around 80% of participants expressed a need for training and capacity-building programs to enhance their ability in utilizing digital platforms and tools.

The Figure 2 further highlights that the level of education in the communities also plays a critical role in the challenges and constraints for digital businesses in the rural and township areas. The respondent who indicated that they no idea online platforms and have never used them are people with less high school or less level of education.

Insufficient Financial Resources for Digital Technologies

Nearly 81% of respondents reported financial constraints in acquiring and maintaining digital technologies. This challenge poses a substantial barrier to adopting e-commerce solutions, digital marketing, and other technology-driven business practices only to for the ordinary citizens in those communities but also for the enterprise that seeks to do business in those communities. Among other factors and pre-requisites for the functional rural and township economy the research participants recommended that financial assistance below considered as indicated on Figure 3.

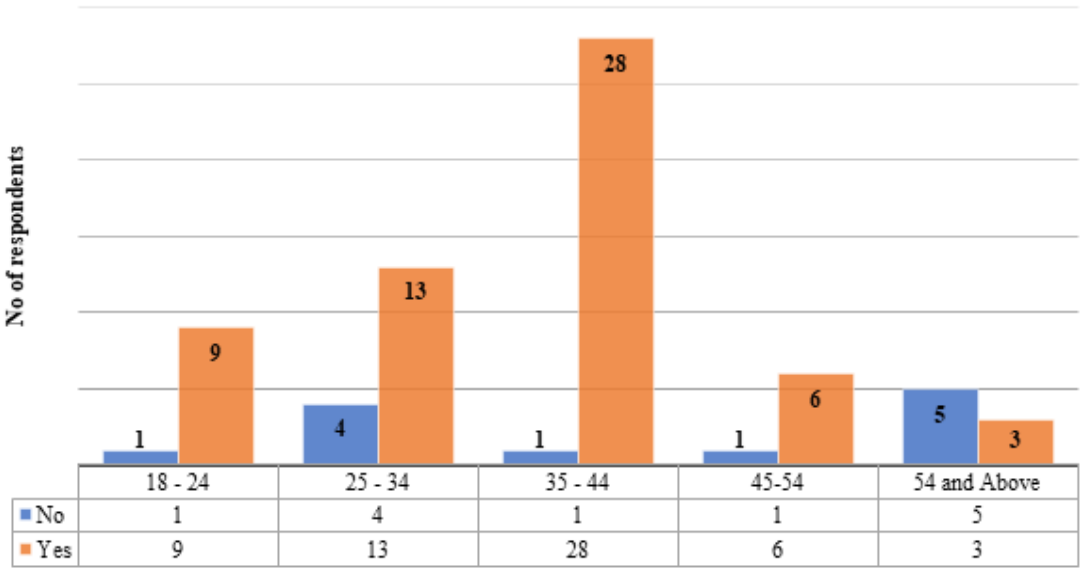
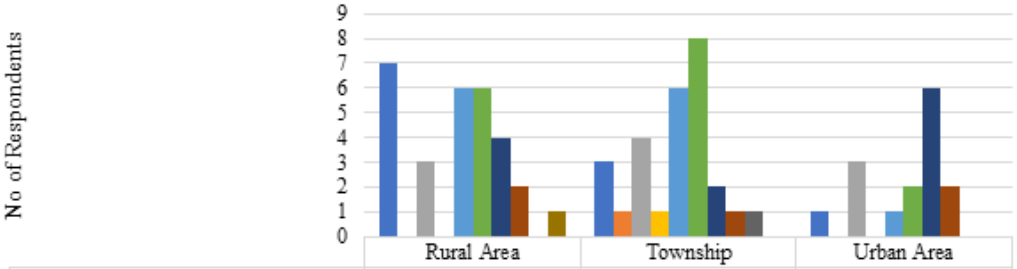


Figure 1. Adoption sample (Responses by Age)



	Rural Area	Township	Urban Area
No - High School or Less	7	3	1
No - Honors Degree or Post Graduate Diploma.		1	
Yes - Bachelor's Degree	3	4	3
Yes - Certificate in law		1	
Yes - Diploma	6	6	1
Yes - High School or Less	6	8	2
Yes - Honors Degree or Post Graduate Diploma.	4	2	6
Yes - Master's Degree	2	1	2
Yes - Supply chain certificate		1	
Yes - (blank)	1		

Figure 2. Digital awareness by level of education by area

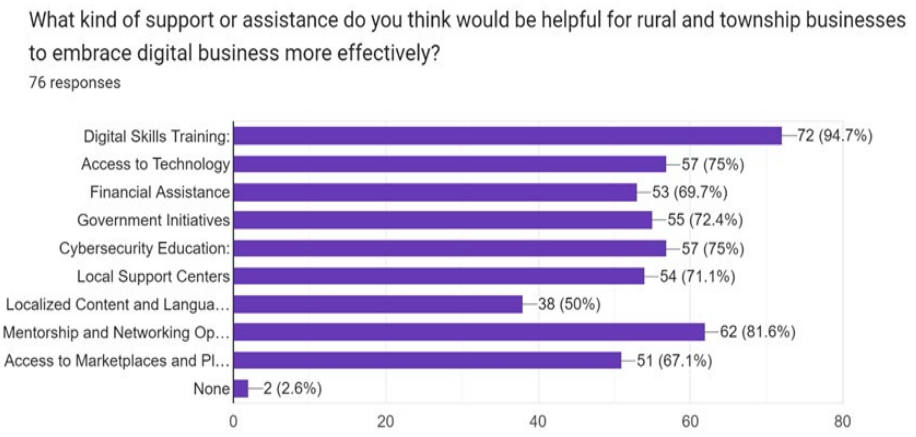


Figure 3. Drivers of digital adoption

Limited Availability of Affordable Logistics and Delivery Services

A significant number of businesses faced difficulties in securing reliable and cost-effective logistics and delivery services tailor made for rural and township areas. This limitation hampers their ability to reach wider markets and fill online orders efficiently. Street address is a challenge for some of the townships or certain segments on of the township. Example. There are certain areas of the Alexander township like Eastbank, Riverpark and Tsutsumani which are address mapping is still intact, however, the curtails areas with too many sharks, i.e., Setswetla and other section at the heart of the township which are very difficult to for the delivery vehicle to service. The same applies to some rural communities, whereby the house address are not present and thereby makes it difficult for the delivery service to be afforded at a door step level. The focus group has also highlighted the security risks associated with last mile delivery in such areas. Delivery vehicles delivering high value items in these areas have to escort vehicle running behind for security reasons. This therefore results in high cost of servicing this area.

Lack of Trust and Security Concerns in Online Transactions

Trust and security concerns emerged as major obstacles to engaging in online transactions. Approximately 88% of respondents expressed apprehensions regarding online payment systems, data privacy, and cyber threats. These concerns cut across all age groups, location and

levels of education. On focus groups the teams have highlighted that they fear exacerbated by the incident like one's Facebook being hacked and used solicit funds from unsuspecting friends and family. They view is that if this can happen, with an ordinary social media it's would be even more risky on the digital platforms like online stores.

Competition with Traditional Businesses

Most businesses faced stiff competition from traditional brick-and-mortar establishments. This competition arises from the established customer base, brand loyalty, and community trust associated with conventional businesses. The local business owners have long standing relationships with the community members in the areas in which they operate. This then makes it difficult for new and untested businesses to establish itself in such environment. The above-mentioned arrangements include among other things the credit arrangements the traditional business might be offering their customers. Example of would a family that has an arrangement to buy bread on credit from the beginning of the month to the end and then make one payment at the end of the month. It is difficult to for form business to break such well-established business ties. It is therefore impossible for Digital business to completely replace the brick n mortar business in the rural and township area as these businesses have entrenched themselves in relationship and networks within these communities. Therefore, means that brick n mortar and digital businesses will co-exist for in these communities.

Access to Funding for Entrepreneurs

Access to funding and capital emerged as a pivotal factor influencing the adoption of digital technologies. A substantial number of entrepreneurs and aspiring entrepreneurs highlighted the need for financial support to invest in digital infrastructure and expand their online presence.

Cultural and Language Diversity/Barriers

Cultural diversity and language barriers were identified as significant challenges in catering to a diverse customer base. Businesses encountered difficulties in effectively communicating their products and services to customers from varied linguistic and cultural backgrounds.

Potential opportunities Digital Business Can bring to the rural and township economy in South Africa Inclusive Growth and Shared Prosperity

With 86% of the respondent the result of this study highlights that digital business landscape in rural and township areas exhibits significant potential for fostering inclusive growth and shared prosperity. They believe that through the integration of digital technologies, previously marginalized communities can gain access to economic opportunities. The focus groups have also highlighted that's the digital business can help to reduce income disparities and an overall improvement in the standard of living.

Poverty Reduction

The findings of this study highlight that digital business initiatives have can play a pivotal role in alleviating poverty in these regions. 84 % of the research respondents have indicated that they believe that the adoption of digital technologies and digital business in the rural and township area can yield positive results in the drive to reduce poverty levels in their communities. The discussions in the focus groups with the Alexandra also highlighted a critical point sighting that by facilitating micro-entrepreneurship and providing platforms for local artisans and service providers, digital platforms can empower individuals to generate sustainable incomes. This has translated into a tangible reduction in poverty levels.

Job Creation

The research confirmed that the adoption of digital business models can resulted in a notable increase in employment opportunities within rural and township economies. Focus group discussion have also highlighted that Small and medium-sized enterprises (SMEs) leveraging digital platforms have emerged as significant employers, absorbing a substantial portion of the local workforce in the communities. The gave example with internet café that have been established in their communities. These establishments have employed one or two young people in the neighbourhood. It is then a general believe among the resident that with proper support and funding from both government and private sector the digital economy can yield positive results are the rural and township economies as far as bob creation is concerned. The growth of e-commerce, in particular, has been a driving force behind this trend.

Efficiency

Approximately 74% of research participants are of the view that digital business has potential to introduced efficiencies in various sectors within these economies. In the focus group discussion, the participants highlighted that through streamlined processes, reduced transaction costs, and improved supply chain management, businesses in rural and township areas have witnessed enhanced productivity and profitability. This efficiency gain has contributed to the overall economic development of these regions. The rural and township economies have been bearing the brunt of the inefficient supply chain for the longest which resulted higher price. The rural and township population at time has to commute to the city or town in order to get discounted price on bulk buys.

Access to Global Markets

The study revealed that digital platforms can served as channels for rural and township businesses to access global markets. In recent years E-commerce platforms and online marketplaces such Takealot have facilitated trade beyond local boundaries, enabling businesses to reach a broader customer base. This global reach has not only expanded revenue streams but has also exposed local enterprises to international best practices. The desire of the rural and township community is not only to gain access to the global market in respect buying product from the global markets but also for them to expose and sell the product produced in the areas to the global market. The South African rural and township communities have a lot to showcase to the global communities, ranging from the likes of busy corner which is a tourist destination who tourist visit to enjoy the African food.

Skills Development

The research result indicate that the digital business initiatives have a potential to cultivate skill development within these communities with over 90% of the participants. The research found that training programs and workshops focused on digital literacy and entrepreneurship have empowered individuals to acquire relevant skills. This has not only enhanced employability but has also encouraged the emergence of a more dynamic and adaptable workforce. The availability of computers centres and internet cafés in villages and township has been reported as instrumental requirement in skill development for young people in those segments as majority of the residents cannot afford to buy personal computers or buy data. The access to such technology enables the community to self-develop without any formal training.

Access to Information and Education

The focus group discussion emphasizes how digital technology highlighted enabled the university student from their communities to continue with the studies in the midst of covid 19 pandemic while physical classes were on hold. That was complemented by research result which indicated that over 93% of the respondent believe that digital technologies can be very instrumental in granting rural and township communities to information and to education.

Online education and E-learning has been rated fourth by the respondents in the research as indicated on the results (Figure 4). The participants believe the Covid 19 has forced everyone to test significance of the integration of digital technologies to improve access to information and education in rural and township areas. The improvement of internet connectivity and the availability of online educational resources have democratized knowledge. This has led to an upskilling of the local populace, enabling them to participate more actively in the digital economy.

Remote Work and Freelancing

The Figure 5 provides the view of how the survey respondents felt they could contribute to job creation in their communities. The results portray remote working as one of the potential top contributors in job creation. This therefore would mean that village people could work for company in the city or an overseas company without having to relocate.

For some focus group participants in rural Limpopo, it was for the first time in 2020 during the Covid 19 pandemic that they heard about remote work when they saw they children and neighbours coming back from Gauteng highlighting that they are working from home. They thereto believe that with future improvements on the digital state of the communities and digital training for the young generation would reduce the need for young people to commute from village in search for greener pastures in the city. The above was confirmed by over 85% of the research respondents who indicate

that they believe enable remote working and freelancing in their communities. It is believed digital economy can enable individuals in rural and township areas to engage in remote work and freelancing opportunities. This newfound flexibility allows for a better work-life balance and expands income-generating avenues. Over the years south Africans from villages across the country have been commuting to cities more specially to Gauteng and Cape Town in search for greener pastures.

Community Engagement and Social Impact

Research result show that over 82% of respondents have indicated social media platforms can facilitate increased community engagement and social impact initiatives (Figure 6). The participants believe that social media channels and online forums serve as platforms for community building, knowledge sharing, and collaborative projects aimed at addressing local challenges. The 82% penetration and awareness level highlight that groundwork in terms have been basic use of the technology. Therefore, since the level of penetration is high, we now have responsibility to productive and safe of technology.

The elderly population believes that that social media platforms can be used to do better things than what the current generation is use it. With high number of social media user in both rural and township like Tembisa and Alexandra some sections are now making WhatsApp groups to communicate matter that affects their community such as issues of security and crime in their areas. The Figure 7 paints a picture that social medial is generally well adopted and leading digital platform in the rural and townships setting:

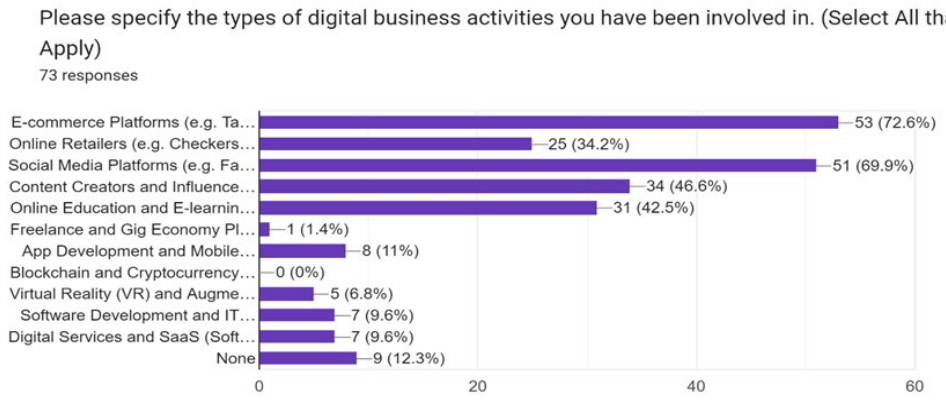


Figure 4. Digital business activities

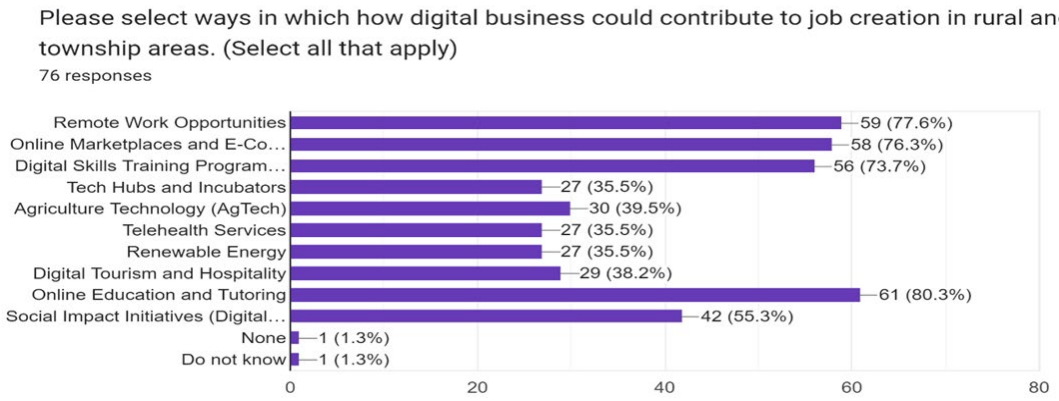


Figure 5. Recommendations

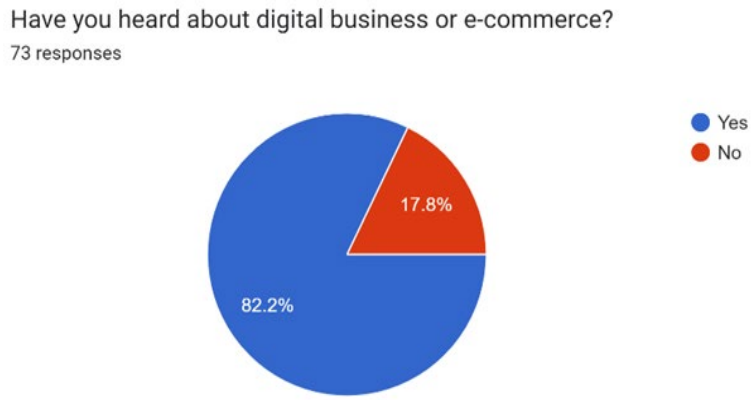


Figure 6. Rate of adoption

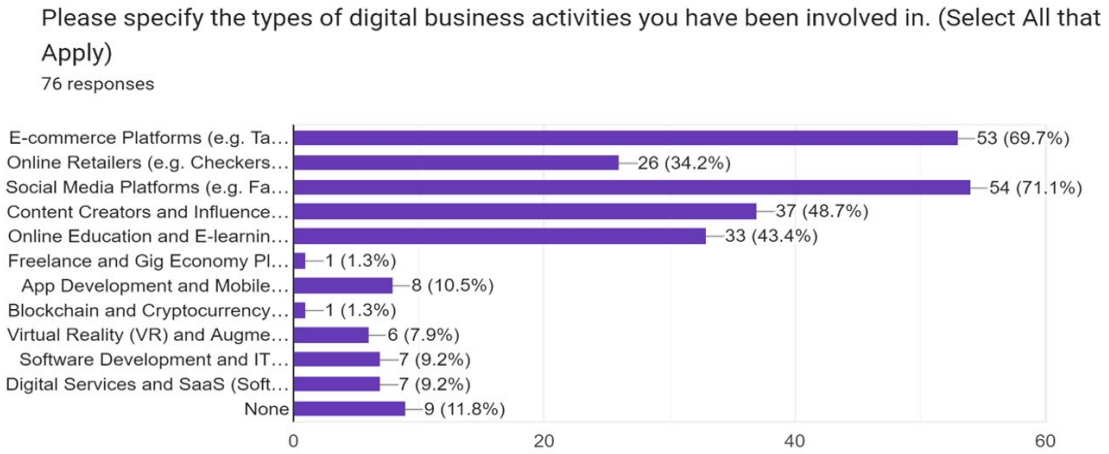


Figure 7. Rate of adoption

Managerial Implication

The findings of this study offer valuable guidance for managers in South Africa's rural and township economies looking to embrace digital transformation. To thrive in the digital landscape, businesses need to focus on improving digital literacy and skills within their teams, ensuring that employees are well-equipped to navigate new technologies. Building trust in online transactions through strong cybersecurity measures is also essential. Collaborating with logistics providers can enhance service delivery, while tapping into global markets via digital platforms can unlock new revenue opportunities. Managers equally need to actively engage with government efforts to improve digital infrastructure and seek out potential subsidies, ensuring their businesses can grow sustainably and remain competitive in these evolving markets.

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

This study highlights the challenges businesses in South Africa's rural and township economies face in adopting digital technologies, similar to those in other regions globally. Key barriers include limited internet access, digital literacy gaps, and concerns over trust and security in online transactions. These issues are not unique to South Africa, as studies in Ghana, Nigeria, Europe, and other climes. To address these constraints, expanding broadband infrastructure, implementing digital literacy programs, and establishing trust through cybersecurity measures are essential. Partnerships between digital platforms and logistics providers can also improve service availability and affordability. While digitalization offers immense potential for economic growth and inclusion, local contexts must be considered to ensure effective implementation. By overcoming these challenges, rural and township

businesses can tap into the global markets, fostering economic diversification and poverty alleviation. These findings emphasize the need for coordinated efforts from government, private sectors, and communities to fully realize the benefits of digital business.

Recommendations

Based on the research findings, the following are recommended actions and strategies to address the constraints, and challenges, and leverage the opportunities for digital business in the rural and township economy in South Africa: These recommendations can be adopted by both the government and private sector in form big corporate and even small business that seeks to invest in the development of the South African economy through digital technology-driven business strategy.

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