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Fourth (4th) Industrial Revolution In Enhancing Local Economic Development In South African Local Government: E-Governance Effects And Deliverance

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Abstract
This study examines the efficacy of the 4th industrial revolution in enhancing local economic development strategy in South African local government. The study argues that 4IR offers South African local governments many opportunities to improve their local economic development policies. Local governments can stimulate economic growth, increase public services, improve the quality of life for their inhabitants, and inspire innovation by utilising digital technology and supporting skills development. The study relies heavily on secondary data, wherein existing literature and journals will be used to supplement the argument. The study advocates for qualitative research methodology. This study found differences in access to 4IR benefits because many rural and underserved metropolitan regions lack the infrastructure for high-speed internet and contemporary communication technology. Additionally, local governments sometimes have tight budgets, which makes it challenging to invest in the infrastructure and technology required for 4IR. The study recommends that improvements in infrastructure, economic diversification, skill development, public service delivery, and inclusive growth are some of the major dimensions that can be used to assess how well the 4IR is enhancing LED strategies in South African local governments. The study further contributes to the wider debate on democratization, particularly the transformation of public institutions and service delivery.

Keywords: Industrial revolution, Local economic development, Local government, Development, Service delivery

Introduction

According to the Local Government Sector Education and Training Authority (LGSETA) (2020), there is government and political support for the advancement of 4IR technology in all facets of South Africa. A number of declarations, laws, and regulations make this clear. The significance of the 4IR in their sectoral and intergovernmental activity has been discussed in important national government papers. Furthermore, LGSETA (2020) confirms that the NDP views ICT as the foundation of a vibrant, inclusive, and successful knowledge economy, where ICTs are employed to boost economic competitiveness, create jobs for young people, and facilitate a higher standard of living. It acknowledged that for South Africa to properly engage in the Fourth Industrial Revolution, gaining a digital advantage is essential.

According to Sikhakhane, David, and Van Wyk (2023), South Africa is coping with the triple issues of poverty, economic inequality, and unemployment as a result of the COVID-19 epidemic. This is despite the economy's unanticipated deindustrialisation. Furthermore, Sikhakhane et al. (2023) contend that before the pandemic, Africa was already concerned about the 4IR impact and the potential for robot technology to replace human labor. In South Africa, there are increasing calls for the government to take action to protect workers from automation and to encourage employment. According to Thani (2020), one way to view the 4IR is as a means of assisting South Africa in resolving its issues with service delivery while increasing its relevance and competitiveness on a global scale. To improve LED and service delivery, South Africa has launched some e-government projects. Furthermore, Thani (2020) asserts that clear and intentional government tactics are necessary for LED and transparent governance.

For local governments to create feasible LED strategies and address the global 4IRs, collaboration with communities and other stakeholders is essential. In recap, by providing cutting-edge instruments and encouraging economic dynamism, the Fourth Industrial Revolution offers a potent platform for improving local economic development. Strategic integration of 4IR can support local communities in achieving resilience, sustainable growth, and enhanced quality of life. However, to guarantee that the advantages are shared fairly and in line with regional interests, thorough planning, human capital investment, and inclusive policies are necessary.

Theoretical Framework

A theory of technology was adopted in this paper. According to Kumar (2023), technology has evolved beyond its initial use as a simple tool to become a dynamic, all-pervasive force that affects almost every area of our lives. Technology has already impacted every aspect of life, from how people communicate and obtain information to how governments and corporations function. Technology has a significant impact on how human civilizations change economically and socially (Berg et al., 2019; Moehrle & Caferoglu, 2019). According to Coccia (2019), technology is a fundamental aspect of human nature and humanity. According to Hickman (2001, 40–41), technology is also a collection of methods, an investigation of methods, instruments, and artifacts, where methods are customary and conventional approaches to problems. As seen by the rise in social media, the

use of smartphones, and the introduction of innovative technologies like artificial intelligence and the Internet of Things, Kumar (2023) suggested that the rapidly changing technological landscape is changing the human experience. Technological developments in diagnostics, patient treatment, and medical research have the dual benefits of improving results and expanding access to healthcare. By transforming conventional educational paradigms, the use of digital technology and online learning platforms has created new opportunities for information transfer and skill development. Additionally, technology has played a critical role in fostering global connectivity by facilitating cross-border cooperation and real-time communication.

For this paper, technology theory helps in understanding the emergence, diffusion, and effects of technical breakthroughs on society and the economy. This is vital in the 4IR, where technology is advancing at a rapid pace and includes robotics, blockchain, IoT, and artificial intelligence. As these technologies develop, local economies face both new possibilities and difficulties. Policymakers and researchers may create policies that use these technologies to support local economic growth by having a better understanding of the dynamics of technological change. The 4IR highlights how crucial it is to embrace cutting-edge technologies to stay competitive. When local economies successfully incorporate these technologies, they can boost investment, develop new sectors, and increase productivity. Technology-theoretic research can examine how local governments and businesses can use 4IR technologies to boost productivity, innovate, and create high-value jobs that will promote economic development.

Method

This paper adopted a qualitative research strategy wherein data was collected through government documents, journals, books and other literature to supplement the inherent argument. Document analysis is a systematic procedure for reviewing or evaluating printed and electronic (computer-based and Internet-transmitted) documents. Like other analytical methods in qualitative research, document analysis requires that data be examined and interpreted to elicit meaning, gain understanding, and develop empirical knowledge (Corbin & Strauss, 2008).

Results

The results of this study are drawn from the conceptual framework regards 4IR, which is a collective digital technology, that blurs the lines between the digital, physical, and biological realms. The combination of advanced technology that integrates human and machine intelligence in industrial processes to create high-agility value chains constitutes 4IR as denoted by Schumacher, Erol, and Sihn (2019). In contrast to previous technological revolutions, 4IR integrates and reconfigures hardware, software, and communication in new ways, as emphasised within digital transformation. As with its predecessors, the 4IR has a significant impact and enormous economic potential due to its rapid development (Schafer, 2018). Technology advancements are becoming more widely accessible, which is speeding up 4IR improvements.

Enhancement of the Fourth Industrial Revolution (4IR) in implementing Local Economic Development (LED)

The World Economic Forum (2018) predicts that 4IR will radically change government, business, and society. The 4IR's implementation may benefit the South African government and businesses by creating millions of good jobs, increasing operational effectiveness, and improving customer and citizen outcomes. Therefore, the 4IR may have a big impact on many different areas by boosting growth, creating new market opportunities, and enhancing human-machine relations. However, because of the advancement of new technologies, the 4IR has several benefits, such as improved decision-making, greater productivity, increased competitiveness, decreased employment in risky situations, and improved worker safety. Incorporating 4IR technology into LED strategy can help local economies become more robust, competitive, and flexible so they can prosper in a world that is changing quickly.

4IR technologies, including blockchain, big data, artificial intelligence (AI), the Internet of Things (IoT), and 3D printing, can improve LED by encouraging local entrepreneurship by supporting local manufacturers and artisans in their more efficient production of items. Good governance and openness are required, and blockchain technology must be able to facilitate safe transactions, increase public service transparency, and streamline local government operations. Furthermore, analysing community requirements, allocating resources optimal

Fostering 4IR in local government context in South Africa to enhance Local Economic Development strategy

South Africa has a significant push for citizen participation, engagement, and openness in its local government institutions, as advocated by Mawela et al. (2017). To overcome some of the current developmental obstacles, this is an area where e-government platforms can be integrated and is therefore a crucial conduit for 4IR advancement. Mawela et al. (2017: 149) assert that municipalities play a significant role in expediting e-government initiatives for all stakeholders, including enterprises, local communities, non-governmental groups, and conventional leadership structures. For the purpose of achieving local government objectives, it thus supports a cultural ethos and a methodical governance process. It can assist the Indian model of the bottom-up top-down approach and the integration of diverse settings in ways that are based on values, making governance more approachable and engaging (LGSETA, 2020: 4).

4IR is expected to give South Africa the chance to more effectively maximize socioeconomic development. The main areas of importance in local government will be the development of strategies and policies, the involvement of citizens, and the emphasis on service delivery. Additionally, its human resources, risk, change, and organizational culture will all be crucial factors to take into account while integrating 4IR (LGSETA, 2020: 5). Practically speaking, local government plays a significant role in promoting sustainable development goals, and e-government integration is essential to accomplishing this. Additionally, it stated that several job functions, like accounting, administration, ballot counting, internal audits, and others, are expected to

become increasingly automated. These positions include adding more experts in digital transformation, business development and facilitation, process automation, and digital security monitoring (LGSETA, 2020: 4).

The Fourth Industrial (4IR) and Local Economic Development (LED) services in Local Government: Nexus

Thani (2020); Matthews and Landsberg (2022) claim that a study of the 4IR in the context of changing public sector management paradigms is crucial. According to this study, public sector management has been the subject of intense scrutiny in the last 30 years of democracy. Due to the need to move away from traditional administration and toward more creative approaches to managing the provision of public sector services, digital transformation is key. In the age of globalization, there are significant obstacles to overcome for the public sector to fulfill its mandates for citizen involvement and delivery in a more inventive, competitive, and flexible manner. Beyond the conventional administration paradigm, the public management paradigm developed in response to inquiries about how governments could better meet the increasingly discriminatory needs of their constituents. Additionally, it contributed to the development of a more outcomes-based approach to service delivery. Better community-centered public-private partnerships (PPPs), increased employment possibilities, and improved economic growth can all result from well-thought-out and executed LED programs. The 4IR, on the other hand, is presented as a revolution that drastically alters both economic output and people's lives. The 4IR, encourages digital connectedness, which includes "available technology that allows people who have access to the Internet to connect with organizations in real-time." Even in rural places, organizations can maintain connections with people and spread information.

Both urban and rural areas stand to gain from these developments. Most developing nations ought to take advantage of this chance to improve LED. However, for this kind of development to take place, sub-Saharan African nations must be guided by carefully thought-out policy frameworks. Future employment will undoubtedly undergo significant changes as a result of the 4IR. Therefore, to prepare the next generation positive stance are to be determined. As was already established, current developmental problems, particularly in Africa, seriously impede the 4IR revolution. The biggest problem facing South Africa is the absence of "adequate viable resources," which includes both digital illiteracy and a lack of infrastructure and digital technologies. When digital solutions are used, this leads to inequality because it increases the skills gap by excluding the illiterate (Olaitan *et al.,* 2021: 2). However, South Africa is also assessing its preparedness for 4IR integration by posing the question of whether developmental realities and frameworks are examined and incorporated. This makes it clear that one of the biggest demands is for the "socio-institutional component of the 4IR" to invest in skills upliftment and a "telecommunications infrastructure" that facilitates openness and transparency.

In linking 4IR and LED it is vital to ensure that the South African Local government leverages new technologies to promote economic growth, create jobs, and improve service delivery at the local level requires connecting the Fourth Industrial Revolution (4IR) to Local Economic Development (LED) policies. The 4IR, which is defined by the combination of technologies like automation, big data, the Internet of Things (IoT), and artificial intelligence (AI), provides fresh approaches to the conventional problems that local economies and communities face. Upskilling and reskilling the local workers to prepare them for employment in 4IR-related businesses should be a key component of LED plans. This involves providing instruction in high-demand fields like cybersecurity, robotics, coding, and data analytics. To create and execute a curriculum that gives students 4IR skills, local governments can work with academic institutions, technical institutes, and business partners. Local economies can become more competitive and technologically adaptable by matching educational programs with market demands. Cloud computing, artificial intelligence, and automation are examples of 4IR technologies that local governments can assist SMEs in integrating and gaining access to to improve their competitiveness and efficiency. For instance, offering training courses or cash rewards to companies that want to automate their processes.

The paving of Local Economic Development (LED) strategy through e-government-drive

According to Mbatha (2019), a Presidential Commission on 4IR was formed in South Africa in 2019 in recognition of the importance and pressing need to incorporate 4IR into the country's public service strategy and objectives. E-government initiatives must be viewed as crucial platforms that facilitate the provision of public sector services. Mbatha (2019: 4-5) further stated that, e-government is basically a collection of several public sector technology platforms used to establish and maintain governmental institutions. Additionally, these arrangements allow for the efficient, effective, and accessible delivery of services (Bwalya, 2018: 5). The provision of regular government information and transactions through electronic channels is known as e-government (Marche & McNiven in Mawela, 2015: 20).

Adding to this, e-government focuses on how information and communication technologies (ICTs) may assist in decision-making and policy-making processes. Mawela (2015:20) delves deeper into the connection between e-government and e-government platforms. It's critical to realize that without flexible governance, e-government platforms may lose their effectiveness. Governance is basically the ability of human societies to perceive, adjust, and react quickly and sustainably to changes in their surroundings by combining agile and lean capabilities with governance capabilities. This allows them to provide value to their core business more quickly, better, and more affordably (De Oliveira et al., 2014: 134). Furthermore, it is believed that there is still a lack of knowledge integration across disciplines in literature theory and in the definition of e-government, which is restricting perspectives on the integrated public sector functioning, as stated by De Oliveira *et al.* (2014: 134). Establishing the prerequisites for creating a "systems architecture to ensure the efficient delivery of government services with transparency, reliability, and accountability" is also essential, as supported by Bwalya (2018: 240). By using digital governance tools and platforms to improve public service delivery, stimulate economic growth, and advance inclusivity, e-government-driven projects can pave the way for a Local Economic Development (LED) plan. Effective LED requires transparency, efficiency, and citizen engagement, all of which are accelerated by e-government.

The effects of Fourth Industrial Revolution (4IR) on South African Local Government

The definition of the 4IR is a combination of digital technology that blurs the boundaries between the physical, biological, and digital domains. Schumacher, Erol, and Sihn (2019) define 4IR as a set of cutting-edge technologies that create high-agility value chains by combining human and machine intelligence in manufacturing processes. In contrast to earlier technological revolutions, 4IR is distinguished by the creative integration and reconfiguration of hardware, software, and communication (Lavopa & Delera, 2021). With an exponential growth rate and a diffusion rate "much faster and more widely than in previous ones," the 4IR is at the pinnacle of the three main industrial revolutions that preceded it (Schwab, 2017). Railroads and the mechanisation of production processes characterised the first industrial revolution in the 18th century; mass production and the widespread use of electricity characterized the second industrial revolution; and technological advancements in the 1960s characterized the third industrial revolution, which saw the automation of production processes (UNIDO, 2020). Local governments in South Africa have a chance to modernize their operations and promote inclusive growth as a result of the 4IR. But tackling the digital gap, encouraging innovation, and making sure that technological improvements benefit all residents equally are necessary for success.

Discussion

4IR has the potential to have a major impact on LED in the context of South African municipal government, especially through e-governance, as discovered and unpacked by this paper. The use of digital technologies by local governments to enhance citizen involvement, transparency, and service delivery is known as e-governance. E-governance reduces bureaucratic inefficiencies by enabling local governments to digitize and streamline procedures. For instance, online platforms for municipal services like licensing, permits, and billing facilitate access for both individuals and enterprises, increasing local economic activity and productivity. Additionally, digital platforms enhance the management of public utilities, such as water and power, which results in improved resource allocation and cost savings for local governments. By e-governance solutions, local governments can increase operational openness**.** Public access to information and decision-making procedures encourages increased accountability, which lessens financial mismanagement and corruption. Building trust between the local government and its constituents is facilitated by the real-time data on government spending, procurement, and project status that digital platforms may offer.

Through the provision of internet services, education, and entrepreneurial possibilities to underserved communities, 4IR technologies can contribute to the closing of the digital divide and promote more equitable economic growth. E-governance tools that offer localised information and services in multiple languages can help ensure that all citizens, regardless of their socioeconomic background, benefit from digital innovations. Speedier feedback loops and more inclusive decision-making are made possible using digital platforms for communication between residents and local governments. Through online discussions, electronic voting, and platforms that let individuals report problems to municipalities directly, citizens can take part in local governance. Citizens become more involved and knowledgeable as a result, which promotes involvement in regional economic projects. The fourth industrial revolution is therefore important in enhancing the local economic development in South African local government to improve the general welfare of the communities.

Conclusion and Recommendation

In South Africa's local government sector, e-governance is greatly boosting local economic development as a result of the Fourth Industrial Revolution. It has enormous potential for better service delivery, transparency, and citizen engagement, but to reach its full potential, issues like the digital divide and infrastructure constraints must be resolved. Local government e-governance's future rests on ongoing innovation, capacity building, and universal access to digital tools. The following are recommendations of the study.

- To improve data analysis and service delivery, the report suggests integrating artificial intelligence (AI). This would enable predictive analytics, which will assist local governments in addressing problems before they become emergencies.
- The implementation of mobile payment systems is recommended in the paper because it makes it simpler to collect municipal taxes and levies, enhances income streams, and lowers non-payment problems.

Adding to this, e-government focuses on how information and communication technologies (ICTs) may assist in decision-making and policy-making processes

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