

ELEMENTS FOR A COMPETITIVE BUSINESS ENVIRONMENT IN THE CONTEXT OF THE FOURTH INDUSTRIAL REVOLUTION: AN OVERVIEW OF THE SOUTH AFRICAN ENVIRONMENT

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ABSTRACT

Problem statement: *As a result of disruptive technologies associated with the Fourth Industrial Revolution (4IR), business models are transforming and industry best practices are being recon-figured, leading to multiple speculations about future models and factors for business survival, competitiveness and sustainability. Disruptions in traditional business suggest that new competencies and operational demands are now required*

Study aim: *The study aims to explore elements for developing a competitive business environment in the context of the 4IR and new business models for competitiveness and survival of business in the South African context.*

Method: *The study is qualitative in nature and data was collected following a document analysis technique. Official documents reporting on competitiveness were selected and reviewed. These documents included the Global Competitiveness Report and State of the South African Nation addresses.*

Results: *The study found that the South African business environment is characterised by remarkable socio-economic inequalities. Rural areas and provinces remain marginalized.*

Adoption of technology should be seen as central to improve the competitiveness of businesses and reduce socio-economic inequalities.

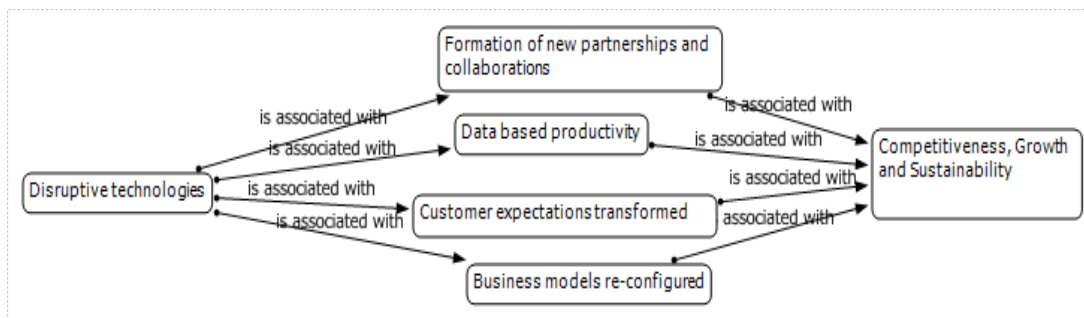
Significance of the study: *The study is expected to boost businesses and entrepreneurship in various industries and sectors and informs entrepreneurs on the role of technology in enhancing competitive advantage and survival in the 4IR. It will inform policy makers on relevant policies to implement to support small businesses.*

Keywords: Technology, Competitiveness, Fourth Industrial Revolution, Inequality, Economic Development.

INTRODUCTION

The Fourth Industrial Revolution has led to disruption of societies and communities (Schwab, 2018). Writing for the World Economic Forum in the Global Competitiveness Report, Schwab (2019) noted that through a multi-dimensional approach to the use of technologies, societies and nations can foster shared prosperity which is a key attribute in development.. This study focuses on the essential elements for competitiveness in the context of disruptive technologies which are associated with the Fourth Industrial Revolution (4IR) and how they attend to key societal issues for development. The 4IR is expected to offer both business

opportunities on one side and threats or disruptions on the other side (World Economic Forum [WEF], 2019). New business models have started to emerge and customer expectations are changing (Schwab, 2016). In addition, new ways of attending to pertinent societal issues have emerged. In addition, existing industries are being modified while new sectors are sprouting. This study seeks to explore the elements for business competitiveness in light of disruptions due to the 4IR that are expected to affect various societal spheres including business, politics, culture and social networks. Speculations about future models and factors for business survival, competitiveness and sustainability make this study essential. Furthermore, disruptions in traditional business models within sectors and industries manifest in high failure rate (Mupani & Chipunza, 2019) of businesses as they fail to respond to changes and achieve new operational efficiencies in the context of the 4IR (Mhlanga, 2018). Statistics South Africa [SSA] (2016) reported a sixty two percent (62%) failure rate for small businesses within the first year of business while the failure rate over five (5) years was reported to be eighty seven percent (87%). To explore the phenomenon, this study seek to identify elements for business competitiveness that are needed to facilitate the re-modelling of the business model in the South African context. The study is based on the premise proposed by Schwab (2016) that the 4IR has affected competitiveness, survival and sustainability in four (4) basic ways, namely: transformation of models of business operation, shifting customer expectations, and data based productivity and formation of new partnerships and collaborations. Following the above, the study is conceptualized as shown in Figure 1.



Source: Author's construction

FIGURE 1
CONCEPTUALISATION OF THE STUDY

LITERATURE REVIEW

With the increase in competition, new innovative business models such as digital service platforms have been experienced. Operators with disruptive technology application tendencies have increased the cost of entry for new businesses. This problem is of greater magnitude when consideration recent economic literature which have warned about the progression of the world economic order to the fourth industrial revolution which involves widespread application of robotics and automation, artificial intelligence, nanotechnology and adaptive or convergence technologies. Furthermore, technologies such as artificial intelligence and robotics may destroy or disrupt many jobs in the services sector and in labour-intensive industries (Schwab, 2018). It has also been noted that the fourth industrial revolution is also associated with mass personalisation, enabled by social technologies and better data processing capabilities. Schwab

(2018) commented that these advances have a direct bearing on both big and small firms, as a result, fundamental shifts in production processes are a necessity. Given these trends, this study is premised on the idea that adoption of timely technology and adoption of relevant competencies is central to both the survival and competitiveness of both business and non-business organisations.

The Fourth Industrial Revolution and Elements of Competitiveness

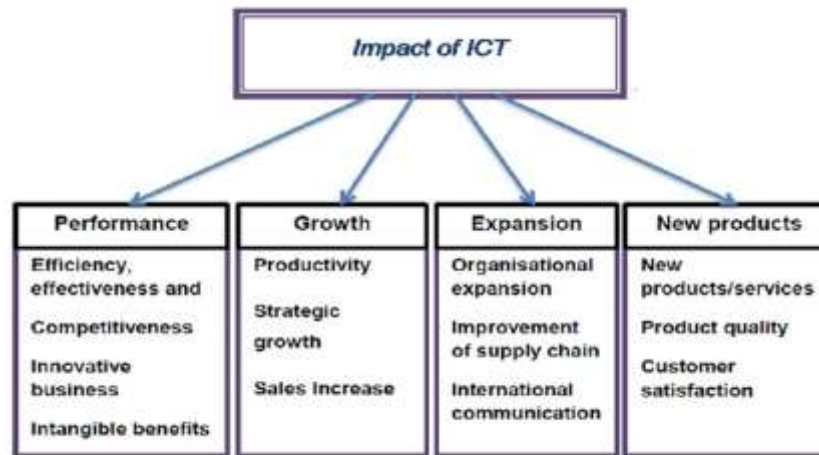
The 4IR has been associated with several technologies that have disrupted business models and have changed traditional standards of industry competitiveness (Berg, et al., 2018). Major disruptive technologies associated with the 4IR include artificial technology, robotics, 3D printing, digital work platforms and new computing technologies (Cunningham, 2018). Remodeling business models may involve the adoption of 4IR technologies and the perfection of related competencies. Lai (2017) commented that there are several technology adoption theories that can be considered. Afolayan (2014) posit that Schumpeter's (1947) seminal paper, established the origins of innovation adoption and Technology studies.

The 4IR is based on technologies, convergences and production changes (Cunningham, 2018). Since the period of the first industrial revolution (1760–1840), technologies have continued to be at the centre of industrial revolutions. The third industrial revolution, in particular, started in the early 1980s and was characterised by significant use of electronics, information technology, and automated production. Historically, the industries used to be characterised by oligopoly competition structures with the few industry players following an in-service business model. With the increase in competition, new innovative business models such as digital service platforms have been experienced. Operators with disruptive technology application tendencies have increased the cost of entry for new restaurants. This problem is of greater magnitude when considering recent economic literature which has warned about the progression of the world economic order to the 4IR which involves highly pronounced use of robots and automated systems in addition to artificial intelligence and nanotechnology. The 4IR has also been reported to be characterised by significant application of adaptive and convergence technologies. Moreover the adoption of artificial intelligence and robotics is expected to eliminate and reconfigure many occupations in the services industry and in industries that make wide use of labour (Schwab, 2018). Schwab (2018) commented that these developments are likely to affect all firms irrespective of size, as a result, fundamental shifts in production processes are a necessity.

Technology adoption is an area of study that has attracted the interest of many recognised scholars. These theories include: (1) Rogers's (1995) theory of Diffusion of Innovations (DIT), (2) the Theory of Reasonable Action (TRA) proposed by Fishbein and Ajzen (1975), (3) Theory of Planned Behavior (TPB) which is found in the work of Ajzen (1985), (4) Decomposed Theory of Planned Behaviour (Taylor and Todd, 1995), (5) Technology Acceptance Model (TAM) (Davis, Bagozzi and Warshaw, 1989), (6) Technology Acceptance Model 2 (TAM2) which was proposed by Venkatesh and Davis (2000) and (6) Technology Acceptance Model 3 (TAM3) from Venkatesh and Bala (2008). While these theories can be used to explain how businesses can adopt technology, empirical studies are not conclusive on which theories can be suitable for application in a general way. The TAM has gained much popularity, acceptance and implementation. It postulates two precise beliefs: perceived ease of use and perceived usefulness. The model is well referred to and a realistic approach for predicting user acceptance of information systems, since it has provided valued research results over a period of time.

Essence of Digital Based Business Competencies

Consoli, 2012 cited in Afolayan (2014:38) provided some key impacts of technology on businesses as shown in Figure 2.



Source: Adopted from Consoli, 2012 cited in Afolayan (2014:38)

FIGURE 2
IMPACT OF DISRUPTIVE TECHNOLOGIES ON BUSINESS

Mhlanga (2015) conducted an online survey on customer preferences that lead to profitability, sustainability and competitiveness in the fast food restaurant sector and classified these into: (1) the nature of the food and beverages, (2) ambience, (2) quality of service and the overall experience of the customer at the restaurant. Even though the actual role of technology is not fully stressed, It can be argued that the adoption of technology can increase the quality of the factors. In line with Mhlanga (2015), some studies have found that certain tabletop innovation based technology are likely to boost sales by 2.91% on average and reduce service delivery complains by 9.74%, this was noted to increases the sales per minute or sales turnover by an estimated 10.77%. In addition to these observations, Lai (2017) conducted a literature review technology adoption and noted that technology has the capacity for providing your models of conducting businesses and provides ways to ensure business survival. The role of various technologies to businesses is also provided in Zabeen et al. (2016) who provided categories of technologies that can be used by businesses and how they benefit operations. These technologies and benefits are classified into three groups, namely: (1) business to business (2) business to customer, customer to business and business to internal. When these are analysed, one can argue that there is a business case for technological adoption. It appears that the case for technology is significant entrepreneurs can choose to use technology as a way of dealing with competition. Nkosana et al. (2016) noted that successful businesses use technology and also that entrepreneurs who use technology in their operations are successful. Some researchers have observed that technology promotes the collection and analysis of information. Business operators should be advised to take note of clients' comments and analyse on a continuous basis the expectations and perceptions of clients using data analysis technology to ensure long term sustainability (Mhlanga, 2015).

METHODOLOGY

A thematic document analysis was conducted to establish the determinants of business competitiveness in South Africa in the context of the Fourth Industrial Revolution (4IR). Bowen (2009:27) describes document analysis as a systematic procedure for reviewing documents. Scholars argue that documents serve various important functions in research, these include: providing context; tracking change and development and also complementing other categories of data. In this study, documents were used to track changes and development in local government competitiveness policy within the context of the 4IR over the last three years in South Africa.

Document Inclusion and Exclusion Criteria

Scott cited in McNeill and Chapman (2005:156) identified four criteria for selecting documents as evidence, these are: authenticity, credibility, representativeness and meaning. The documents which were deemed useful in this study were selected from internationally recognised publications whose authenticity, credibility, representativeness and meaning are not in objection. Firstly, the Global competitiveness Report 2019 and other key related publications on the 4IR were reviewed to provide key criteria for term competitiveness in the 4IR. An authority based citation technique was used to identify relevant documents for reviewing competitiveness. These Key elements of competitiveness were then reviewed in the General Household survey (GHS) report of 2018. This was done to report on the state of the major competitiveness report in local communities in 2018. This was then followed by a study of how South Africa's state of the Nation Addresses (SONA) reports from 2017 to 2020 addresses these issues. The findings were then considered to identify essential elements for competitiveness in the South African scenario.

RESULTS AND DISCUSSION

Essential elements for business competitiveness from were analysed from relevant documents and the results are shown in Table 1.

Document	Concepts of competitiveness in the 4IR
The Global Competitiveness Report 2019 (Schwab, 2019)	12 pillars of competitiveness: (Institutions; Infrastructure; ICT adoption; Macroeconomic stability; Health; Skills; Product market; Labour market; Financial system; Market size; Business dynamism; and Innovation capability).
Industry 4.0 Developments towards the Fourth Industrial Revolution (Kumar, Zindani & Davim, 2019)	Smart operations; digitalisation; cloud manufacturing; intelligent manufacturing and internet of things (IoT) enabled manufacturing; information and communication technology (ICT) and big data analytics
Shaping the Future of the Fourth Industrial Revolution (Schwab & Davis, 2018)	Adopting a technological systems for wellbeing mind-set; technological empowerment; human based technological designs and the use of technology in ways that respect societal values
The Fourth Industrial Revolution (Schwab, 2016)	E-governance; greater transparency; accountability and engagement between the government and its citizens; enabled citizens; new ways to voice opinions, coordinate efforts and possibly circumvent government supervision; transformed, much leaner and more efficient power groups;

	an environment of new and competing power structures; essential public functions, social communication and personal information migration to digital platforms; governments in collaboration with business and civil society; need to create the rules, checks and balances to maintain justice, competitiveness, fairness, inclusive intellectual property, safety and reliability.
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Progress in Realising Competitiveness

The elements shown in Table 1 were then considered with particularity to the South African context by reviewing The General Household Survey Report and State of the Nation addresses by the South African president. The study used purposive sampling to select relevant concept that describe the state of the business environment in relation to the competitiveness criteria identified earlier. The findings are shown in Table 2.

Document	State of technological competitiveness
General Household Survey,	While developments have been registered to ensure access to internet in local governments some provinces remain marginalised. Access to the Internet using all available means was highest in Gauteng (74,6%), Western Cape (72,4%) and Mpumalanga (70,2%), and lowest in Limpopo (46,2%) and Eastern Cape (55,3%). Access to the Internet at home was highest among households in Western Cape (25,8%) and Gauteng (16,7%), and lowest in Limpopo (1,7%) and North West (3,0%). Nationally, Internet access using mobile devices (60,1%) was much more common than access at home (10,4%), at work (16,2%) and elsewhere (10,1%). Although the use of mobile Internet access devices in rural areas (45,0%) still lags behind its use in metros (67,5%) and urban areas (63,7%), it is much more common in rural areas than any of the alternative methods. The major observation is that of wide inequalities among the nine local governments. Local governments with major cities and metropolitan cities remain better than rural local governments.
The South Africa State of the Nation Addresses (2017; 2018; 2019 and 2020)	Vision for an egalitarian society that is free from poverty and inequalities. Acceleration of policies that encourage the accessibility and provision of technology among citizens. Vision to build a society defined by decency and integrity that does not tolerate the plunder of public resources or the theft by corporate criminals of the hard-earned savings of ordinary people. Establishment of a Digital Industrial Revolution Commission, which will include the private sector and civil society, to ensure that that country is in a position to seize the opportunities and manage the challenges of rapid advances in information and communication technology. Drive towards the digital industrial revolution. Policies to improve networks. Stabilisation of vital institution. Emphasise on the principles of Batho Pele.

The results suggest there authorities in South Africa appreciate the essential role of technology in developing a competitive business environment within the context of the 4IR. It has been noted that the 4IR is based on technologies that are expected to touch across all elements of life. Essential arguments posit that technology has the capacity to develop societies and solve popular societal problems such as inequalities and other social vices such as crime, corruption and marginalisation of disadvantaged groups. The observation is that the use of various technologies can help increase citizen participation, inter social class dialogue, accountability and strengthening social checks and balances. It has also been noted that technology has the capacity to create platforms that can empower citizens through effective and

widespread information dissemination. These key capabilities of technology has made it a key issue for consideration in the South African context which is characterised by inequalities, corruption, ineffective business practices and human capital inadequacies. The study has established that South Africa remains unequal along many dimensions. In the geographical perspective, rural areas remain broadly lagging on key 4IR technology diffusion while the urban and metropolitan areas have registered notable achievements.

CONCLUSION

This study has considered the elements for a competitive business environment in the context of the 4IR in South Africa. The documents reviewed in this study have indicated that the use of relevant technologies to eliminate socio-economic challenges and marginalisation is important. It has been found that the South African government has achieved notable progress in establishing policies and practices that promote adoption of 4IR related competencies. However, these attempts remain unequal with rural areas and provinces lagging behind in competitiveness. The equalisation of the technological environment remains critical for business. Key issues such as the use of technologies to empower and increase economic participation of all societal groups remain vital.

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