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The Effect of Individual Entrepreneurial Orientation and the Fourth Industrial Revolution 4.0 On Women Business Venturing Survival in Nigeria

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Abstract

The study on Women Business Ventures (WBV) has become necessary because of their contribution to socio-economic and technological development. However, WBV has not been successful as that of their male counterparts. Individual Entrepreneurial Orientation of the women could increase WBV survivability. Thus, this study suggests a new perspective for thinking about the survivability of WBV by laying emphasis on the direct effects of Individual Entrepreneurial Orientation and Fourth Industrial Revolution which aids WBV to attain efficiency in production levels at low costs of production. By exploiting recent global trends in which borders are not a challenge to markets. Therefore, the objective of this study is to assess women individual entrepreneurial orientation and fourth industrial revolution towards the survivability of WBV in Nigeria. An individual entrepreneurial orientation and practices are required from the women entrepreneurs and their employees. Individual Entrepreneurial Orientation influences survivability of WBV through the recognition, harnessing of innovativeness, proactiveness and aggressiveness. This includes applying creativity and developing innovation, which is a significant business development exercise.

Keywords: Nigeria, Survivability, Women Business Ventures, Giessen Amsterdam Model, Ir4.0

Introduction

The focus of our study is on the effects of individual entrepreneurial orientation and industrial revolution 4.0 on the women business venturing survival. Recently, numerous scholars have argued that there is an urgent need to develop studies to explicate the effects of IEO (Santos, Marques, & Ferreira, 2020; Sutanto, Kelana, & Simatupang, 2023). In response to the call of these scholars, the goal of this study is to provide perspectives on WBVS by assessing the effects of IEO and IR 4.0 using the Giessen Amsterdam Model. This paper is structured as follows. First, we explain the basic framework of Giessen Amsterdam business model and how managers can adapt this framework to achieve survivability. Second, we evaluate relevant

dimensions of WBVS and the effect of these dimensions on sustainable business practices. We conclude the paper by discussing the various WBVS dimensions used in the Giessen Amsterdam Model framework.

The Concept of Survivability

According to Silalahi et al. (2023); (Soto-Simeone, Sirén, & Antretter, 2020) business venture survivability is determined by the first year of operation, the availability of the business venture's future blueprints, and the diversification of the product/service scope. According to social scientists and management specialists, the following are the major technological advancements highlighted in literature: sophisticated machinery and equipment, gadgets, the merging of many technologies, and gadgets as innovation-supporting instruments. Taking into account the elements of technological innovation Diaconu (2011), Online marketing, computerised records, and social networking can all be categorised as part of the present technological innovation because they are the foundation of technology and have an impact on how quickly businesses grow with the support of new or enhanced procedures and goods (Kaur, Kedia, & Rasiah, 2023).

A general word used to describe business performance, regardless of financial or non-financial measurement, is "business venture survivability." Financial measurement has been emphasised in previous research as the key to evaluating the success of businesses. However, this judgement is seen as skewed by academics who believe that non-financial metrics are also important to consider when determining the success of a commercial initiative. Additionally, the financial performance and product market performance of business ventures are two key aspects that are often accepted (Adam & Alarifi, 2021; Bian, Teppratuangtip, & Siraphatthada, 2023).

Giessen Amsterdam Business Model

One of the most used methods for evaluating the success of businesses is the Giessen-Amsterdam model. The model was taken from Rauche & Freese 2007 and modified. It is an interdisciplinary model of entrepreneurial success. It covers the majority of topics that have been researched in entrepreneurship. Although these interactions have been extensively explored, there are no clear direct links between personality, human capital, or environment and achievement since the model is so closely interwoven. Success cannot be imminent without taking action or putting it into practice, thus this is plausible. The goals and tactics are primarily determined by the actions. The means by which all entrepreneurial success is attained or not are strategies and tactics of action. Goal orientation is the foundation for all plans and methods (Rauch & Frese, 2000; Yap, Keling, & Ho, 2023).

Additionally, given a certain environment, both goals and solutions have a propensity to be misunderstood. Therefore, past successes and failures influence how goals and techniques are modified in case they turn out to be incorrect, ineffective, or inappropriate for a certain context. Entrepreneurs who have goals, elaborated strategy, and concepts for sustaining their businesses make up the market. Because of this, strategies and tactical actions are required to moderate all of the influencing variables determining achievement, including self-efficacy, human capital, and environment (Feng, Ahmad, & Zheng, 2023; Rauch & Frese, 2000).

The Giessen-Amsterdam model can essentially be applied at different levels of analysis, including the organizational level and the personal level of the business venture owner. In the sphere of entrepreneurship, the function is different with regard to the level of

analysis question since the size of the company venture tells which level is the one that fits (Klein & Sorra, 1996; Klofsten et al., 2019; Laachach & Ettahri, 2023). The organizational level determines the appropriate analytical level of variables for success in a large organization. Different perspectives on how to enhance business performance for success may exist among business venture owners.

The major participant is the business venture's owner. The business owner has a stronger hold and more control over the policies, cultures, and actions of the company when there are fewer employees than in larger enterprises. The variables at the individual and organizational levels differ from one another. In larger enterprises, the variables are larger; in small businesses, the variables are smaller. As a result, success in business ventures may be studied on an individual basis using the personality, human capital, goals, tactics, and environment of the individual's business venture (Rauch & Frese, 2000; Schermerhorn & Bachrach, 2023). Small and medium-sized businesses place more focus on the level of analysis that needs to be determined empirically. Determining the extent of information from the business venture owner is a critical factor in success prediction.

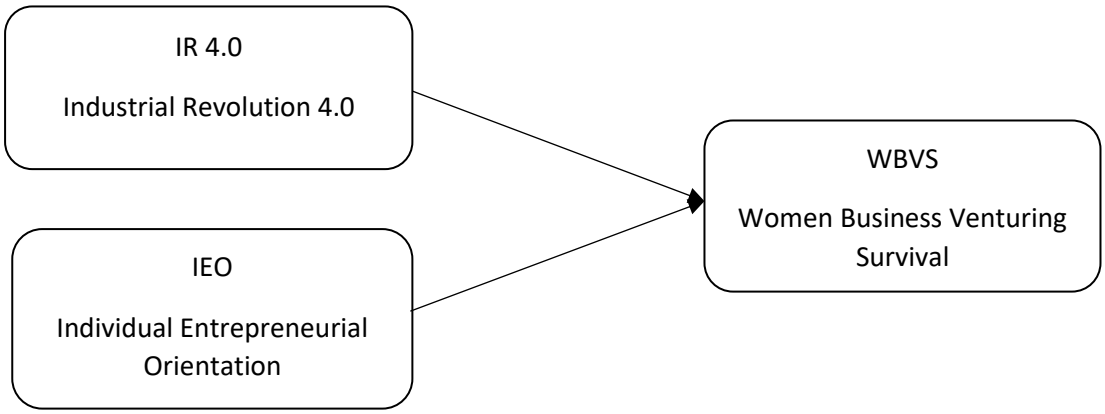


Figure1. Conceptual model
Source: Rauche&Frese 2007

Women Business Venturing Survival

Business survival is the ability of the woman entrepreneur to manage and attain success in business in the continuation of business activities despite a lot of internal and external challenges whereas failure means stoppage of business operations (Sanders, 2023; Tidd & Bessant, 2020; Ucbasaran, Shepherd, Lockett, & Lyon, 2013). Many studies have been conducted to comprehend WBVS. Several researchers connected WBVS with elements such as individual, institutional and environmental (Ghouse, Durrah, & McElwee, 2021; Heinemann, Mussel, & Schäpers, 2022; Nwokoro & Etukakpan, 2023).

Rauch and Frese (2007) argued that achieving business success from the psychological perspective of a woman entrepreneur is more effective and one of the vital components of WBVS. The study posited that efficiency in individual personal attributes for instance self-efficacy, human capital abilities like competency and strategies like entrepreneurial orientation resultant effect is success in business. Researchers such as Makandwa, de Klerk, and Saayman (2022) explained further about WBVS stating that experience in management, industry, economic circumstances and skills in planning are very vital factors for WBVS.

There have been recent investigations by researchers on the effect of EO in WBVS. In a research conducted by Corrêa, Queiroz, Cruz, and Shigaki (2022) the author emphasized the

key role that EO executes in the survival of a WBV. Dimensions such as inventiveness, proactivity and ability to take risk have a positive influence on WBVS. Most recently, Boers and Henschel (2021) reiterated that the emphasis in a family business is on the significance of non-financial performance goals as drivers of their EO, their social obligation as a family business, their embeddedness in local communities, and the significance of being valued by society.

Individual Entrepreneurial Orientation

The methods, frameworks, and behaviours of commercial endeavours that are characterised by inventiveness, proactivity, and risk-taking are referred to as EO (Covin, Green, & Slevin, 2006; Ovoke-Odiete & Kifordu, 2023). EO is a set of managerial decision-making processes that managers use to conduct business in an entrepreneurial manner. This viewpoint was developed through the work of (Covin et al., 2006); which focuses on the senior managers' activities to appropriately articulate the strategic goal and competitive plans that align with an entrepreneurial approach. Additionally, EO outlines the business venture priorities with regard to locating and taking advantage of market possibilities. EO may be a useful indicator of the organisational and structural framework of a business endeavour.

The ideal way to increase the success of commercial ventures using knowledge-based resources is to focus on using such resources to make unique discoveries by taking advantage of new opportunities (Wales, Kraus, Filser, Stöckmann, & Covin, 2021).According to Danny Miller, three characteristics of EO include innovation, proactiveness, and risk-taking. In his seminal work, he also added that an entrepreneurial company is one that engages in product-market innovation, welcomes hazardous endeavours, and is at the forefront of developing proactive ideas far in advance of its rivals. EO processes lay the groundwork for managers to adhere to, enabling business endeavours to be more advanced than their competitors (Al-Awlaqi, Aamer, & Habtoor, 2021; More & Rakibe, 2023).

The Fourth Industrial Revolution (4.0)

The industrial revolution has been observed throughout many years in several industries, particularly manufacturing. According to (Cameron & Green, 2019) it has been a scaled revolution with numerous upgrades in new technologies. The first Industrial Revolution, which began in the early 1800s, witnessed the transition from manual production methods to machine production powered by steam and water engines. Electricity, assembly lines, and mass production were features of the Second Industrial Revolution in industry. The capabilities of computers and digital automation were implemented in manufacturing during the third wave, sometimes known as the "Digital Revolution." Basic improvements in the economy, workplace, and skill development will result from IR4.0 (Suhairi, Franadita, Sari, & Husni, 2023).

The foundation of the fourth industrial revolution, or IR4.0, is digitalization and the value chain's inclusion (Jovanovski, Seykova, Boshnyaku, & Fischer, 2019; Rasiah, Kamaruddin, & Low, 2023). According to Nagy, Oláh, Erdei, Máté, and Popp (2018); (Wang, 2023), the new era of industrial computerization has already begun, and businesses are embracing this idea by investing more money in the hardware and operational solutions that enable their processes, machines, personnel, and even the goods themselves. This makes it possible to merge these into a single, integrated network for data gathering, analysis, review and evaluation of its development, and performance improvement in general. The goal of implementing IR4.0 in actuality is to improve corporate competitiveness (Mathew, 2023);

Vrchota, Volek, and Novotná (2019), along with the interconnection and linkage in between emanating and foremost technologies in the value chain. The major components that will change enterprises across a range of industries include services, automation, robots, artificial intelligence, the Internet of Things (IoT), and related manufacturing (Jan et al., 2023; Sima, Gheorghe, Subić, & Nancu, 2020). The enterprise can attain high level of entrepreneurial orientation and efficiency if it smoothly adjusts to IR 4.0.

Internet of Things (IoT), cyber-physical system (CPS), information and communications technology (ICT), enterprise architecture (EA), and enterprise integration (EI) are the factors Maresova et al. (2018); (Vyas, Paul, Marthande, Agarwal, & Yadav, 2023) highlighted as being important to Industry 4.0. The definition of "internet of things" (IoT) can be considered the primary enabler of IR4.0 by enabling unrestricted access to the internet via smart technology that independently manage themselves (Bradu et al., 2022; Qin, Liu, & Grosvenor, 2016). Industry 4.0 will have a big impact on the entire value chain and define the new advantageous processes in terms of business models, production technologies, job creation, work organisation, and workflows. Currently, a variety of computing tools can be used to gather, process, and complete enormous amounts of data and information every day. Currently, the necessary technology (such as Big Data) is accessible to finish these analysis jobs (Lutfi et al., 2023; Mulyadi, Huda, & Gusmian, 2022; Witkowski, 2017).

Relationship between Individual Entrepreneurial Orientation and Women Business Venturing (WBV) Survivability

Past studies by Poi (2021) examined the relationship between entrepreneurial risk-taking and performance of women entrepreneurs in Rivers State. The study collected data from 329 women entrepreneurs through a survey and random sampling. The results show that there is a significant effect between entrepreneurial risk-taking and performance of women entrepreneurs in Rivers State. Entrepreneurial risk-taking improves the performance of women entrepreneurs in Rivers State considering the positive role it plays on household sustenance and job creation. The study suggests that women entrepreneurs should embrace an entrepreneurial risk-taking mindset ability for the effective management of risk to attain entrepreneurial success.

The investigation made by (Susanto et al., 2021) intends to revisit the impact of SMEs' entrepreneurial orientation (EO) on businesses' COVID-19 performance. By examining the mediating and moderating effects of marketing expertise and social media use, respectively. A systematic questionnaire was used to collect the data, and the SME's owner served as the study's unit of analysis. Using structural equation modelling with partial least squares, the data were analysed. The study's findings indicate that an EO has a large and beneficial impact on SME's performance, but that this impact is conditional on the use of social media and marketing skills.

The analysis of prior research on a project that was performed by Wahab (2021) on the success of Muslim SME's in relation to the EO aspects of innovation, risk, and proactiveness produced the following results. Data from 122 business initiatives were gathered for the survey-style investigation (operating above 3 years). Simple random sampling was used to make the selection among 2286 Muslim SMEs in Malaysia. The results showed that proactive elements and innovation have a big impact on Muslim SME success.

H1: Individual Entrepreneurial Orientation has a significant impact on women business venturing (WBV) survivability

Relationship between 4th Industrial Revolution and Women Business Venturing (WBV) Survivability

The relationship between a business and its consumer is strengthened in the digital age based on IR4.0. It will be simple for them to communicate with one another and access the goods or services through the web platform. The ancillary components of service and e-customer happiness may be inextricably linked through website quality and associated problems (Laureti, Piccarozzi, & Aquilani, 2018; Opuni, 2023). Big data is appropriate for massive volumes of data that can't be obtained with standard database software for data collection, archival, management and analysis. The broad application of cyber-physical systems in the manufacturing industry serves as further evidence. Big Data technologies are rapidly being viewed as a tool for businesses to streamline their production process management (Deepa et al., 2022; Raj, Kumar, & Shah, 2023). It has been observed that businesses using big data have a better understanding of both market and client needs. When taking into account digitization and its overall effects on the data that has been gathered by the businesses, these components can deliver more functionality, integration, and transparency as well as larger informational volumes about the needs of its customers and the precise procedures needed to fully meet those needs (Turi, Khwaja, Tariq, & Hameed, 2023).

Additionally, IR4.0 offers particular new value-creating business sectors that are essential to its future, like product design and development and data security (Ghadge, Kara, Moradlou, & Goswami, 2020; Leang & Rasiah, 2023; Nagy et al., 2018). IR4.0 involves its employees, suppliers, manufacturers, logistics service providers, and local cyber-physical systems as well as business operations. The lack of skilled people is one of the first serious factors identified by the early adopters of IR4.0 (Bali, Bhatnagar, Aggarwal, Bali, & Diván, 2021). Other studies looked at improved internal processes for businesses, capital investments to replace workers, the effects of high unemployment rates, and globalisation (Bahri & Min, 2023; Soto-Acosta, 2020).The most important advancement of the digital era and its online metamorphosis is thought to be IR4.0. It has the ability to alter the structure and dynamics of a range of enterprises through greater automation, cyber-physical systems, big data analytics, sensor networks, iCloud computing, artificial intelligence, and the Internet of Things (Bin Che Hasni, 2023; Tyagi & Abraham, 2020). The industrial revolution's phases are shown in the following figure:

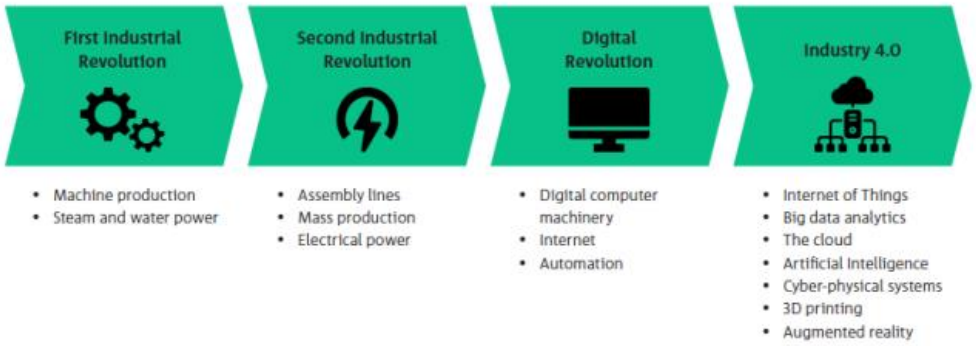


Figure 2. Stages of the industrial revolution
Source: Cameron et al., 2019

Understanding how the various aspects of the fourth industrial revolution might profit from the advantages brought about by digitization is crucial since the fourth industrial revolution has a substantial impact on the entire organisation (Shahzad et al., 2023; Sima et

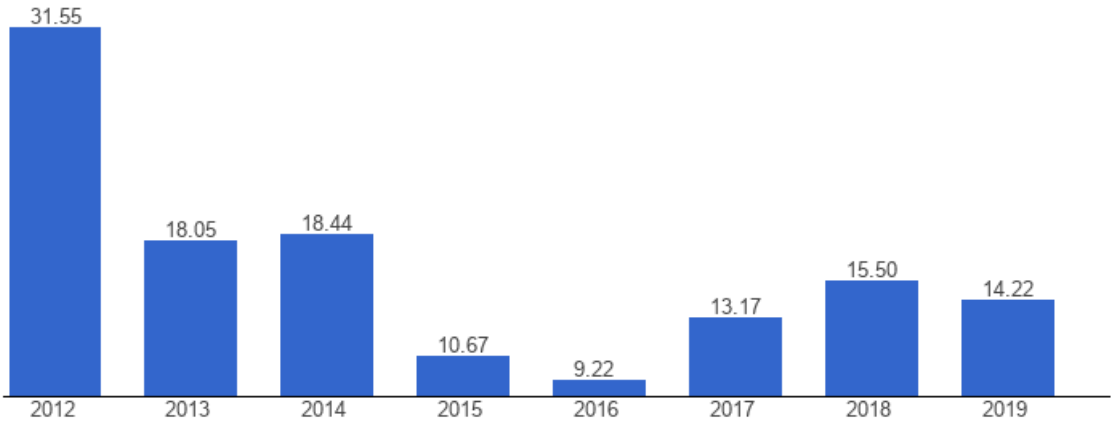
al., 2020). Businesses can integrate improvements into their digital businesses, due to the IR4.0 revolution, the age of artificial intelligence, and the Internet of Things, business and marketing solutions, as well as the overall digital management strategy (IoT). It will provide a solution to draw in the targeted clientele and achieve its goals. IR4.0 will present a variety of chances for enhancing its technological level, production volume, and competitiveness against competitors. It will also create enticing and viable investment prospects in the digital technology, Internet of Things, etc. sectors. These are the main advantages and chances that Nigerian enterprises have (Adebiyi et al., 2023; Vermesan & Friess, 2022).

Additional thought is given to how the fourth industrial revolution will affect business relationships and how it will affect an organization's internal business sectors. Analysing the connection between suppliers and customers at the supply chain level is initially necessary (Freije, de la Calle, & Ugarte, 2022). There is a noticeable impact on the Nigerian economy right now, as its businesses are not keeping up with the regional economic growth of the rest of the world. A reduction in production and company value, a conspicuous surplus of unskilled workers, unskilled and low-skilled workers, untrained and retrained labourers, a regression in technological capabilities would surely result from this. If businesses utilise the advantages, keep up with technical changes, and create products that are in line with market wants, they will expand swiftly. In contrast, if there is inadequate understanding and keeping up with new modern technology, businesses will have to downscale, confront a limited market share, and possibly disappear from the market (Gambo & Musonda, 2021; Monye et al., 2023).

The contribution of women business ventures to Nigerian Economy in the IR4.0

Industry 4.0 "assists WBVs in reducing operating and product costs so that profit and productivity are raised, which in turn leads to GDP growth," (de Souza Sant'Anna, Diniz, de Carvalho Neto, Santos, & Lima-Souza, 2022). Nigeria is currently undergoing a process of industrialisation, modernization, and deeper economic integration processes as a result of its involvement in numerous free trade agreements (FTAs) and the dynamic creation of key policies that Muhamad, Mohamad, and Nor (2023) states will give it access to cutting-edge IR4.0 technological advancements. Ebekozien et al. (2022) claim that Industry 4.0 is impacting Nigeria's sustainable development in a variety of ways, and the Nigerian government is working to foster supportive environments and incentives for Industry 4.0. This can benefit Nigeria by helping to promote and improve its industrial processes, modernise them, and raise their beneficial contributions to the nation's economic growth. It can also help the Nigerian economy in general to effectively engage in the global value chain.

Enhancing corporate governance is a crucial issue that contributes to the continued existence and future development of Nigerian firms in this era of IR4.0 by embracing positive and contemporary technological advancements (Latif & Saari, 2023). Nigeria's economy has seen tremendous change over a long period of time, as shown in the image below. According to the following numbers, there has been a significant growth in the levels of contributions to the Nigerian economy.

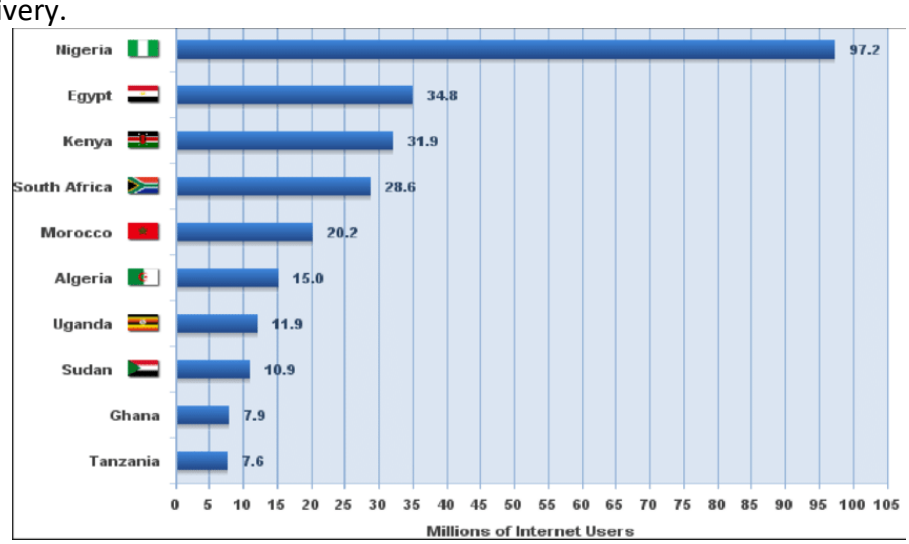


Source: (The Global Economy.com 2022)
Figure 3. Nigeria Exports and percentage of GDP

H2: Industrial Revolution 4.0 has a significant impact on women business venturing (WBV) Survivability

The Importance of IR4.0 on Women Business Ventures in Nigeria

The digital age has demonstrated its part as acting a vital role in the Nigerian economy. Nigerian businesses will profit if they implement the new technology as part of the IR4.0 revolution, which is characterised by technological advancement. The information included below will provide several aspects for the broad viewpoints on the state of the economy in Nigeria and Nigerian businesses. As a result, internet usage has increased widespread in Nigeria, depending on IR4.0's development. It is of benefit for the government, corporations, and citizens to utilise the internet of things in their general daily routines. According to Shava (2022), Nigerian businesses will need to build their operations around digital platforms in order to give their target clients conveniences and advantages for improved efficiency in service delivery.



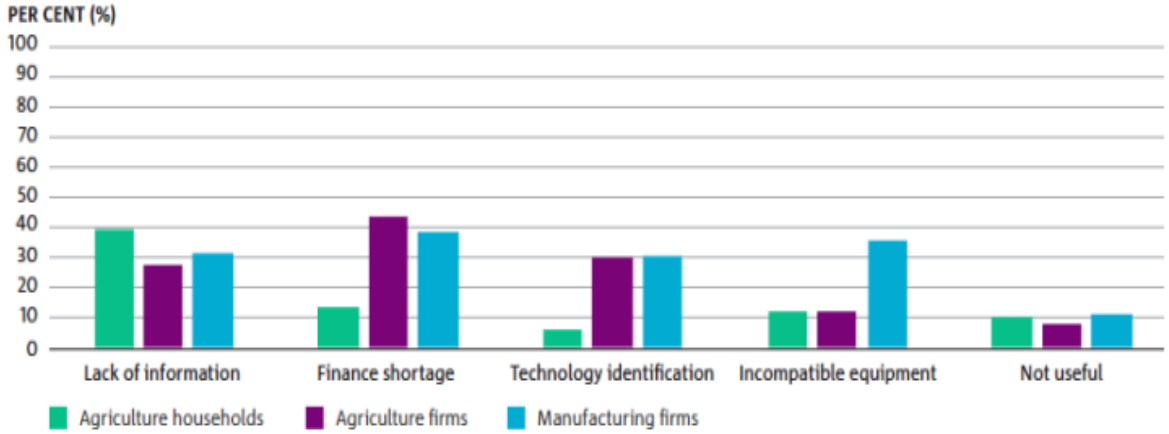
Source: (Effiong., 2017)

Figure 4. Population using the Internet (%) by country, 2017

According to data from Figure 3, Nigeria had the highest percentage of its population utilising the Internet when compared to numerous other nations, including Egypt, Kenya, and South Africa. The proportion of persons in Nigeria as users of the Internet has risen to over 97% in 2017.

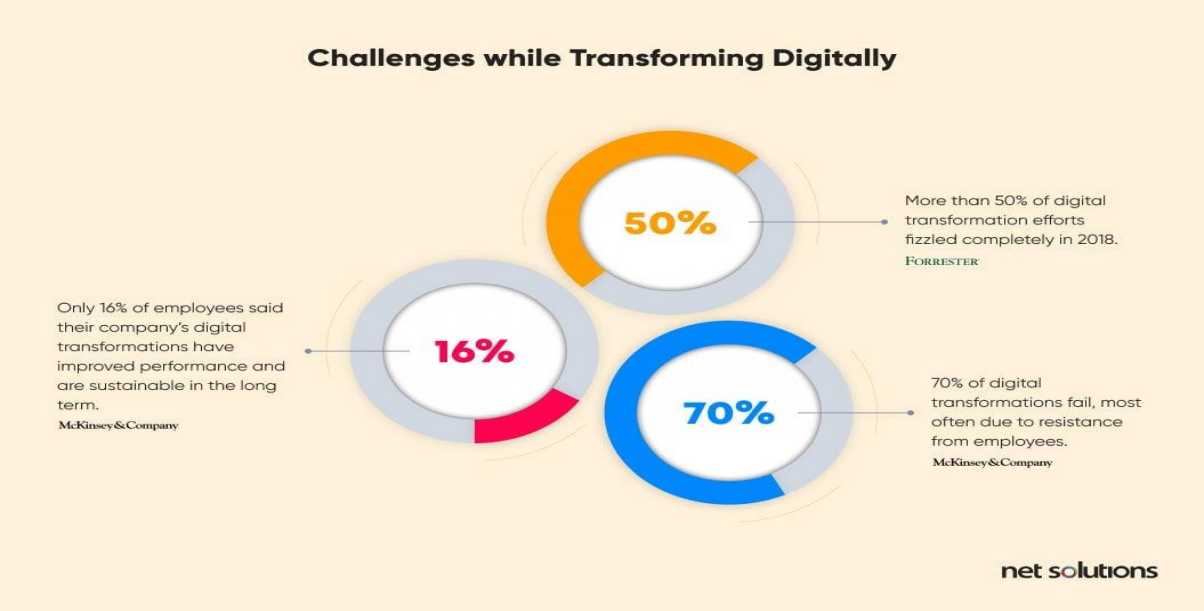
Source: (Nguyen., 2022)
Figure 5. Reasons why enterprises should adopt digital technologies (Nguyen., 2022)

According to the statistics in Figure 4, a business venture employs digital technology primarily for the following reasons: to boost output, reduce input costs, improve management, raise equipment efficiency, reduce risk, and benefit the environment. Humans will therefore profit if they incorporate it into their daily lives in the digital age.



Source: (Bimer et al., 2021)
Figure 6. Challenges to digitalization in Nigerian agriculture and manufacturing firms (Bimer et al., 2021)

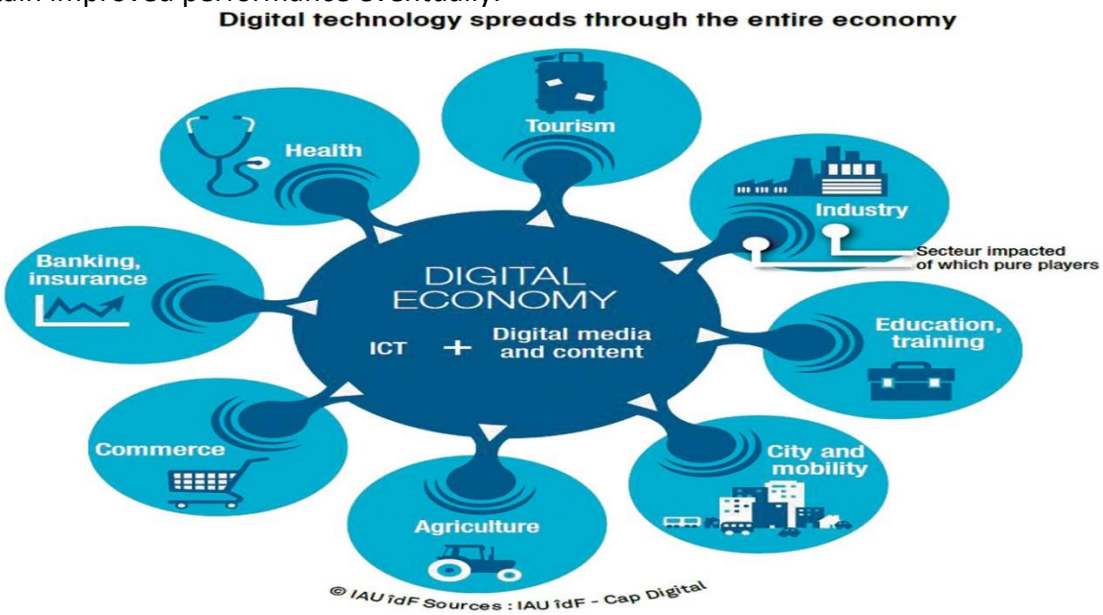
There are numerous substantial obstacles to digitization in Nigerian businesses, as shown in Figure 5. Lack of knowledge, financial constraints, technological identification, incompatible apparatus, and useless data are all present.



Source: (Akash Lomas 2021)

Figure 7. Top challenges businesses face while transforming to digitalization

More than 50% of digitalization efforts could not be sustained in 2018. As a result of resistance from workers 70% digital transformations failed. A meagre 16% were able to sustain improved performance eventually.



Source: IAU

Figure 8. Digitalization spreads through the whole economy

Nigeria has developed an image as one of Africa's media marketplaces with the greatest rate of growth in recent years. There is a demand for fresh publications, including periodicals, radio and television shows, music, movies, and more recently digital media of all kinds has grown over the past several decades as a result of country's vast population, which the World Bank estimates to be approximately 170 million. The economy of the digital age is

constantly changing. Modern digital innovations, particularly those using wireless networks, mobile devices, location technology (like GPS), embedded sensors, and real-time analytics, are now driving this trend after being initially driven by the increased usage of personal computers, business computing tools, and internet access (Tella, Okojie, Abdullahi, & Ajani, 2022).

Key advantages of IR4.0 on Women Business Ventures in Nigeria

Hassoun et al. (2022) asserts that IR4.0 makes a substantial contribution to technology advancements that will affect and have a significant impact on many nations, governments, enterprises, and people worldwide and bring about fundamental changes to the way we live, work, and produce. Systematically establishing a new network and operations for economies based on high-tech applications, Internet of Things, artificial intelligence, smart robotics, blockchain, cloud computing, etc. With the start of the global implementation of IR4.0, Nigerian businesses may now quickly access modern technology, base their corporate administration on the internet, and easily communicate information (Islam, Hossain, Pullen, & Rahman, 2023).

Second, IR4.0 describes a world of computers, automation, and people working together in entirely new ways. Computer systems are networked with robots and other equipment. Process systems learn and control machinery using digital learning algorithms, requiring little to no human input. This is why IR4.0 is frequently referred to as the "smart factory" (Ahmad, Hamid, Wei, Rahman, & Nawi, 2023). With the help of IR4.0, the Nigerian economy will be better able to be synchronized in the global value chain, giving Nigeria the chance to speed up the industrialization and modernization process and favourably impact growth (Oosthuizen, 2022).

Thirdly, IR4.0 helps businesses achieve faster and more accuracy in production, a reduction in the need for human labour, greater data collecting, and quicker decision-making. The machines must be able to communicate data to the central system and retrieve data from external sources in order to offer enough data for IR4.0 to manage production. IR4.0 will ensure that it offers a range of advantages to raise its technological level, increase production capacity, increase competitiveness versus competitors, and create appealing and possible investment prospects in the fields of digital technology, the Internet, and biotechnology. These are the basic advantages and chances that Nigerian business ventures can take advantage of (Peerally, Santiago, De Fuentes, & Moghavvemi, 2022).

Fourthly, the advancement of state-of-the-art current communication and information facilities, consisting of cyber-physical systems, data centres, and cloud computing, assists the businesses in timely observation and evasion of complexities with products imperfection as well as the improvement of productivity and quality. The businesses can access and examine the data to get the pertinent facts that will help them run their operations and manufacture more profitably (Shaturaev, 2022).

The Setbacks of IR4.0 on Women Business Ventures in Nigeria

Malomane, Musonda, and Okoro (2022) asserts that IR4.0 has its own setbacks for emerging nations like Nigeria. Not keeping up with trends, losing the advantage of cheap labour, an ever-widening technology gap, misinformation due to the gap in proper information dissemination causing further social divide, etc. are a few of the issues in the spotlight. They must be capable of adapting to change, being driven to do so, and coming up with the best plans for the future growth of the economy's sectors, services, and industries.

In addition to IR4.0's technological benefits, its drawbacks must also be taken into account. Business ventures "must adapt and actively adjust their business operations, efficiency in capabilities, and constantly apply technology," (Khalil, Khawaja, & Sarfraz, 2022). Business ventures are being cautious; they are hesitant to expand investment, hesitant to upgrade technology, hesitant to invest in high-quality staff, and hesitant to change their operational strategy. Long-term effects include decreased competitive advantages over competitors, greater costs, inconsistent product quality, and the loss of talent.

In accordance with the works of Kumar (2023) the multinational organisations that have embraced modern technologies and are currently expanding into Nigeria provide greater challenges to the Nigerian businesses and increase competition. Nigerian businesses that do not stay in line with regional or global economic growth will undoubtedly have unfavourable consequences, such as a drop in their total productivity and efficiency. One of the biggest issues is a shortage of knowledgeable workers, an obstacle so many businesses face as they embrace and use IR4.0. Pató, Kovács, and Abonyi (2022) states that "the labour force's abilities and competency need to be constantly improved when they are a part of an Industry 4.0 process." Traditional low-wage workers who are unable to reskill or upskill themselves also create a new set of challenges for society and the government because they may cause social unrest and political instability.

Obstacles and problems with security concerning how data may be safely transmitted between systems is really vital considering how pervasive data is today. Data purity refers to factors such as whether or not the data has been altered to be false, whether or not the data volume is too huge, how to process and store the data, how to collect data from locations without an internet connection, etc. Businesses need to ponder upon these concerns because they are the underlying issues affecting the businesses (Nyagadza, Pashapa, Chare, Mazuruse, & Hove, 2022).

The empirical study's methodology

Secondary data will be used to assess the synthesized information in this empirical study (Cameron et al., 2019). In order to compile the data that will be needed to support this investigation, this approach also incorporates content from other sources. This study aims to provide an overview of the challenges by utilizing secondary data and prior research.

A scoping review will produce an overview and a summary of recent research on IR4.0 in business and economics. From the data analysis and the synthesis information, it is clear that the latter will be used in the application of the analysis to present the actual situation and offer suggestions to policymakers and Nigerian business ventures.

The entire image of Nigeria's society and economy will be analysed based on prior research and secondary sources. Utilizing secondary data, it has been possible to assess the impact of IR4.0 on businesses and find pertinent solutions that can help them improve their strategy for changing with the market.

Conclusions

Every industry in Nigeria is being profoundly impacted by the IR4.0, which is developing at an ascending momentum across all fields. Undoubtedly, applying its advanced technology and automation in productivity phases is perceived to be the best option of businesses implementing the IR4.0. Automation in manufacturing is an explosive and robust development, and the IR4.0 technology platform has given Nigerian businesses numerous opportunities to communicate with one another and take part in the global supply chain.

From the market structure to the modes of production, consumption, and management, IR4.0 will bring about extensive change.

This is a chance for Nigeria to increase worker productivity, boost the competitiveness of conventional industries, and gain access to global markets via digital/internet platforms, which will enable businesses grow quickly and sustainably. Nigerian organisations must creatively formulate overall strategies, taking into account their management capabilities, technology, and new procedures for accessing and evaluating databases. For them to take advantage of the chances, survive, and develop. Sustainably in the long run, they must keep up with and conserve the present mode of the IR4.0.

To fulfil the needs of IT human resources, it is crucial to imbibe the culture of continuity coupled with standardized training and expertise as a result of improved efficiency in information technology brought about by the development of the IR4.0. To quickly update the most recent information and skills for students and employees, there should be a collaborative effort for the improvement of IT industry skills and knowledge with Nigerian businesses and institutions.

Recommendations

Nigerian businesses must adopt the idea of the digital era as the essential standard for establishing their enterprises in the IR4.0 revolution. Numerous business models constructed on new technology have undergone continuous reconditioning, utilising artificial intelligence (AI), the internet of things (IoT), big data, blockchain, etc. as part of their principle management to facilitate change and adopt new corporate administration procedures, which slowly but surely increase competitiveness, get rid of rivals, and reach higher levels in the market. As recommendations to the Nigerian business ventures engaged in IR4.0, the ascertained important solutions are listed below.

First and foremost, Nigerian businesses are required to imbibe new managerial technicalities. Due to the new technology, Nigerian businesses must create new strategic plans, use new management techniques that are better suited to generating value through their quality, and be based on the most recent technological advancements in management, operations, and the manufacturing industry. Nigerian businesses must apply their science and technology. New digital software and procedures for administrating, coordinating, managing, and information dissemination can be implemented by the company.

Second, a fully equipped firm that makes use of contemporary gear and uses managed process equipment that is currently technologically advanced and enables the digital transition. The important elements in the process of converting enterprises, assisting businesses to "survive" in the digital era, are gadgetry, the newest appliances handled by currently "state of the art" technology. The adoption of new technology has allowed for increased flexibility in corporate operations, a reduction in the reliance on human resources, and significant cost and producing time savings.

There are also brand-new, creative varieties of robots that can communicate with people. Coupled with other upcoming technologies, this new technology will enhance human activity components, particularly enlightenment, and provide people access to whole new computer models. To seal the vacuum between physical engineering and computer science, automation learning, and artificial intelligence, new talents are therefore needed. Nigerian businesses need to create appropriate scientific and technology plans that take into account increasing the productivity of their workforce as well as build and offer cutting-edge scientific and technological foundations. In order to retain their competitiveness with the newest

technology and to optimise their entire company management, operational, and production divisions, Nigerian firms must emphasise research in these areas. The innovations and adjustments that have been adopted will improve the product quality even more, giving it a competitive advantage in both the present and the future markets.

Thirdly, IR4.0 development for Nigerian businesses is made possible by training a qualified, skilled work force in modern digital technology. Education and training in the era of IR4.0 demand that the worker fulfil high standards in positions that computers cannot take over by having the appropriate credentials, talents, foreign languages, etc. The team will be developed and supported by a proper higher education strategy in accordance with the needs of the company. For businesses, human resources play a central role in making the digital world and era more easily implementable. Funding trainings for individuals is not a non-profit endeavour. If a business is to be regarded as flourishing, it must keep a workforce that is appropriately skilled and technologically savvy, utilise its machinery and equipment to its fullest potential, embrace new management techniques, and garner the rewards of success and technology.

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