5th African International Conference on Industrial Engineering and Operations Management, Johannesburg/Pretoria, South Africa, April 23 - 25, 2024
Publisher: IEOM Society International, USA
Published: April 23, 2024 DOI: 10.46254/AF05.20240181

Implications of Informality on Acquisition of 4IR Technological Innovations in the Metal Fabrication Industry: A Literature Review

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Abstract

As enterprises now operate in the Fourth Industrial Revolution (4IR), the metal fabrication industry is undergoing tremendous technological trends with very detrimental impacts if not adopted. The purpose of this research is to explore the implications of informality on technological innovations adoption and new policy directives for formalization of metal fabrication micro-enterprises in Zimbabwe. Enterprises that are unregistered and unregulated but not illegal are omnipresent and constitute a large part of the economy in developing countries. Informality is a perennial phenomenon with extensive ramifications on enterprises. How informality impairs the propensity of unregistered enterprises to embrace technological innovations ushered by 4IR is identified as a research gap. In pursuit of this investigation, an in-depth review of theoretical and empirical studies was conducted. The primary data sources were electronic databases: Google Scholar, Science Direct, Scopus, and EBSCO. The articles reviewed focused on the effects of informality on numerous organizational phenomena. The findings shed light on the potential impacts of informality on the acquisition of 4IR technological innovations. The study offers insights into new policy directions for addressing informality by the National Governments can take to address informality.

Keywords:
informality, Industry 4.0, technological innovation, technopreneurial orientation, policy directives.

Introduction

Informalization of enterprises is a global phenomenon however is high in developing countries (Matsongoni & Mutambara, 2021). Notwithstanding its observed benefits such as the provision of employment opportunities, it is argued to be an undesirable economic phenomenon. Informalisation creates informal enterprises which as a consequence build what is called the informal industry. Existing literature is not very clear on whether informalisation has been a feature of the industry since its inception or is a phenomenon that emerged later during industrial development owing to socio-economic, legal, political, and technological factors over the centuries. The informal industry is believed to have been in existence since prehistoric times operating alongside the formal economy (Ram, et al., 2017). However, the notion of informal industry was first presented by Hart in 1972 (Benson, 2014) and in 1973 according to Ram et al. (2017).

The informal industry has played a substantial role in the metal fabrication sector in developing countries. However, despite the implementation of numerous efforts by national governments to address informality, the informal industry continues to grow and flourish at an alarming rate (Ndiweni et al., 2021; Watanga & Shilongo, 2021). Intensification of informality has been observed over the past three decades and its rate of growth has tripled if not quadrupled during the past two decades (Matsongoni & Mutambara, 2021). There has been a proliferation of informal micro-enterprises in the fabrication industry in Zimbabwe. Industry has been with the human race since prehistoric times however its notable development is associated with the Industrial Revolution which began in the 1750s in Great Britain (Mohajan, 2019). Since then the industry has been undergoing a revolution with identifiable phases popularly labelled as first (I1.0), second (I2.0), third (I3.0) and fourth (I4.0) (Grumpose, 2021). Industrial revolutions refer to the transformation from old practices of powering and managing of "workplace" into new and sophisticated structures that meet the goals of modern development to serve better the needs of society.

As enterprises now operate in the fourth industrial revolution (4IR), the metal fabrication industry is undergoing tremendous technological trends with very detrimental impacts if not adopted. Although the term 'industry' is now elusive because of new dimensions attached to its meaning, it has been associated with manufacturing involving the application of complex and sophisticated methods of producing economic goods and services. This study is a narrative review which is aimed at identifying and summarizing what has been previously published on the informality of enterprises, avoiding duplications, and seeking new study areas not yet addressed. Industry 4.0 (I4.0) technologies could enhance the performance of micro-metal fabrication enterprises, but research on the implications of informality on the acquisition of I4.0 concerning production resources and operational performance, competitiveness and financial performance is scanty. While informal fabrication micro-enterprises are regional and continental phenomena in this paper the researcher focuses on Zimbabwe's informal metal fabrication industry.

The paper seeks to answer the following research questions:

1. What is informality in the metal fabrication industry?
2. What are the implications of 4IR technological innovations on the informal sector in the metal fabrication industry?
3. How can the informal sector acquire 4IR technological innovations?

The paper is divided into 6 key sections. The first section details the literature guided by the major themes of the study. This section is followed by a discussion of the methodology that was used to gather data representing section 2. Section 3 details the findings and discussions. This is followed by section 4 which details. Section 5 deals with data analysis. The paper ends with section 6 which deals with the conclusions and provides the orientation of future research.

2. Literature Review

*2.*1 Informality in the metal fabrication industry

Informality is considered an elusive concept with no clear-cut definition that is universally acceptable (Ulyssea, 2020). The legalistic definition defines informal firms and workers as those operating at the margins of the relevant laws and regulations (Perry et al. 2007). The informal sector consists of all unincorporated private enterprises owned by individuals or households engaged in the sale and production of goods and services operated on a proprietary or partnership basis (Polese, 2021). Just like conglomerates and other notable corporates the acquisition of 4IR Technological Innovations in the Metal Fabrication Industry has been a mirage. According to Kanbur (2021) the concept of 'informality' was coined in 1971 in Ghana with the idea of 'informal income opportunities' (Hart, 1971) and in Kenya with the notion of multi-criteria conceptualisation of the informal sector by the International Labour Organization (ILO) report of the World Employment Programme (WEP) (1972). Informality as a term has different meanings to different people, but usually denoting bad things such as unprotected workers, unfair competition, evasion of regulation, underpayment or non-payment of taxes and criminality. Some researchers (Ram, Edwards, Jones & Valera, 2017; Medina et al. 2017) hold that informality is an undesirable multidimensional phenomenon that manifests in many forms: enterprise informality, activity informality, goods or service informality, and labour informality. Nnamdi, Gbadamosi, and Rwelamila (2021), view informality as a liability. Enterprise informality refers to

entrepreneurial agents while activity informality refers to activities that fall outside the ambit of laws and regulations (Ram, Edwards, Jones & Valera (2017). Informality in this research designates enterprises that are not allowed to conduct business because they are not registered (Cling, Razafindrako & Reubaud 2015).

Bu and Cuervo-Cazurra (2020) state that formal firms can legally enter into contracts and defend them, in contrast, informal firms are not legal persons their unregistered status limits their ability to establish and maintain formal contractual relationships. Grâu-panţureac (2022) mentions business or commercial contracts can only be entered into between legal entities and are fundamental to the success and growth of a business. Contracts play an essential role in regulating the purchase and maintenance of adopted digital technologies, as well as in the relationships between craftsman companies, suppliers of goods and services and their customers (Turban et al., 2019). In a recent study Alla (2023) established that business contracts which are only entered into by official enterprises have a positive impact on adoption of I4.0 technologies. Several past studies (Bird & Wennberg 2016; Cowling, Liu, & Zhang 2016; Atherton, 2012) on the relationship between financing and entrepreneurial activities reveal that informality undermines the entrepreneurial capacity of enterprises. Given that informality characterizes micro-enterprises in the metal fabrication industry it might mean that these enterprises may not be able to acquire I4.0 technological innovations.

2.2 Implications of 4IR technological innovations on the informal sector in the metal fabrication industry

The Metal fabrication industry in Africa emerged during the colonial era, primarily focused on servicing the mining and agricultural sectors (Ocheri et al.2017; Mlambo 2017; Mlambo, Pangeti & Phimister 1995). A variety of causes are contributing to the industry's rapid growth. According to UN-Habitat (2021), growing urbanization in most African countries has increased the demand for metal-fabricated items for buildings such as houses, agricultural equipment and implements as well as other construction activities. Africa's burgeoning industrial sector is fueling the growth of the metal fabrication industry due to rising demand for metal components and fabricated machinery, especially for the farming sector (African Development Bank, 2020). Additionally, the introduction of industrial policies in several nations, as well as the provision of incentives to stimulate investment in the metal fabrication industry (UNIDO, 2020), have all contributed to the industry's growth. The industry stands as a vital contributor to various sectors of the economy. However, like any other industry, it faces its fair share of challenges one of which is the proliferation of informal micro-enterprises that are contributing to the supply of metal-fabricated products. The emergence of Small and Medium-Sized Enterprises (SMEs) following the collapse of the formal fabrication industry which was precipitated by ESAP (World Bank 2020) has catalyzed the growth of the informal metal fabrication industry in many developing countries in Africa. Numerous informal SMEs entered the metal fabrication market, to cater to the localized needs and contribute to job creation for the survival of thousands of the employees who lost their job (World Bank 2020).

Informal entrepreneurship and the informal industry are not new phenomena in developing countries (International Labour Organization 2023; Karki, Xheneti & Maden 2021). Even though the informal industry has been in existence alongside the formal economy since prehistoric times informality is a problem and its address is still a work in progress in many developing countries (ILO 2023; Laing et al. 2022; Karki, Xheneti & Maden 2021; Omri 2020). While the informal metal fabrication industry has the potential to enormously contribute to economic growth and development, several scholars and authorities (ILO 2023; Laing et al. 2022; Loayza 2018) contend that informality is a potential drag on economic growth and development and a corrosive force to the integrity of national economies. The digital transformation towards Industry (I4.0) has become imperative for micro-enterprises, as it makes them more flexible, agile and responsive to customers. Enterprises face increasing challenges in the current digital era, such as market volatility and shorter product life cycles due to rapidly changing digital needs, new requirements of buyers and consumers and the pressing need to manufacture smarter and more innovative products (Khin & Kee 2021).
Khin and Kee (2021) despite the numerous benefits offered by the acquisition of I4.0 technologies and its growing importance to all enterprises including informal ones the need to embrace I4.0 to transform their operations is indisputable. Many factors should be considered however, it is still unknown what implications informality has

towards the embracing of I4.0 technological innovations by informal micro-enterprises. This raises our major research question: What are the implications of informality I4.0? Understanding the implications of informality on the acquisition of I4.0 technologies is crucial as it might help informal micro-enterprises in the metal fabrication industry to make the right decision to formalize because they will be more encouraged to adopt I4.0 if they are well-convinced of the implications of informality. Given the research question, this study was conducted with the first objective of ascertaining conditions underlying the acquisition of I4.0 technologies and in which policymakers can encourage formalization among micro-enterprises to enable them to acquire I4.0 technological innovations. The objectives were achieved through a literature review approach.

Farazi (2014) informality can generate inefficiencies in the production process since firms, to avoid detection limit their size to below optimal efficiency scale. According to Nnamdi, Gbadamosi and Rwelamila (2021), firms in the informal sector identify lack of access to finance as the biggest obstacle they face. Businesses in the informal sector face several challenges that can negatively impact their operations and growth (Nguyen & Nguyen 2021; Farazi, 2014; Cheng & Degryse 2010). Nguyen and Nguyen (2021) point out that it has been recognized that lack of access to external finance undermines operations, performance and growth. Farazi (2014), states that these challenges can be related to infrastructure such as power, land and water, property rights, legal protection, and corruption. Beck et al., (2015) explain that inaccessibility to finance induces credit constraints for both the initial investment of microenterprises and their subsequent expansion. In concurrence Farazi (2014), argues that lack of access external finance constrains access to credit and the acquisition of new technologies. In previous studies, external finance usually takes the form of bank and government loans (Du & Mickiewicz 2016; Ayyagari, Demirgüç-Kunt, & Maksimovic 2010). Du and Mickiewicz (2016), expose that, unregistered businesses cannot access government loans for capitalization purposes. Informality is seen as a deterrent to the acquisition of capital resources.

While the impacts of informality on unregistered businesses are well understood, we know relatively little about the implications of informality on the acquisition of new technologies. Specifically, the implication of informality on acquisition I4.0 technological innovations in the metal fabrication industry remains largely unknown. Literature provides some evidence about informality as a barrier to numerous things needed by unregistered micro-enterprises. Previous studies have shown that informality precludes unregistered businesses from entering into technology-based contracts (Porter & Heppelmann 2014), accessing finance and capital from formal institutions like banks and government (Du and Mickiewicz 2016; Ayyagari et al. 2010; Elston & Audretsch 2010) and credit arrangements (Beck et al., 2015). Bashir et al. (2020)'s study found that informality impairs enterprises' capacity for entrepreneurial activities. Prior studies (Atherton, 2012; Bird & Wennberg, 2016; Cowling, Liu, & Zhang, 2016) established that informality is a deterrent to the capacity for entrepreneurship. However, these studies have yet not been clear on the implications of informality on the acquisition of I4.0 technologies and policy directions governments should take. Manyati & Mutsau (2019) expose that informal enterprises have managed to develop agricultural technologies. They indicate that informal enterprises were able to secure technologies from Chinese companies however they did not disclose how informal enterprises developed technologies and whether the technologies were i4.0 technologies. The study reveals that despite informality the enterprises developed technologies. However past research can acquire I4.0 technological innovations

2.3 How can the informal sector acquire 4IR technological innovations?

New prospects for the growth and development of emerging economies will arise from the emergence of the Fourth Industrial Revolution (4IR), also known as Industry 4.0, in emerging technologies (Nyagadza et al 2022). This is consistent with the opinions of Alqam & Saqib (2020), who claim that emerging and developing nations have a special chance to thrive and reach a higher degree of prosperity thanks to the Fourth Industrial Revolution (4IR). The convergence of manufacturing small firms in the SME 4.0 hub will further boost efficiency, profitability, resource optimization, and faster product delivery, even while big organizations may incur job losses. To take use of the 4IR opportunity to spur innovation in manufacturing, SMEs can quickly expedite the business decision-making process and readily modify their operating model (Alqam & Saqib, 2020). One of the most important things that has to be done if the region wants to avoid losing out on the benefits of 4IR because of the perceived risk that comes with informality among SME enterprises is the formalization of SMEs. The shift from conventional SMEs to industry 4.0-driven SMEs is expected to facilitate the automation and digitization of public administration processes and procedures, including tariffs. This shift may also curtail the practice of public officials engaging in rent-seeking

activities (Menon & Fink, 2019). To improve productivity, trade capacity, and innovation, small and medium-sized businesses must have a strong legal, regulatory, and operational framework that specifically targets technologies of the fourth industrial revolution (Mabotja, 2018). Most significantly, the government must address regulations about financial assistance for SME 4.0 procurement through finance and development institutions; if at all feasible, tax incentives should be implemented throughout the transition.

The adoption of smart manufacturing by the SMEs will improve production efficiency and customer specification, and mass production by the SMEs will reposition the sector for better contribution to economic growth (Kamaruzaman, 2020). Informal micro-enterprises cannot enter into technology-based contracts which clarify the terms and responsibilities of all parties involved, ensuring that the adopted technologies align with the company's strategic objectives (Porter & Heppelmann 2014). Contracts for digital technologies also encompass marketing technologies, such as customer relationship management systems, marketing automation platforms, and e-commerce solutions. These contracts define the scope, data privacy, and security requirements thereby contributing to the company's overall marketing strategy (Lamberton & Stephen 2016; Li & Kannan 2014). In the context of industry 4.0 technologies the Internet of Things (IoT), robotics, and additive manufacturing, can revolutionize production processes and supply chain management. Contracts for these technologies help to establish the framework for their successful integration and adoption, addressing intellectual property, data ownership, and other critical issues (Lu, 2017; Lasi et al. 2014). Acquisition of I4.0 technologies is an essential means by which enterprises add to their technical capabilities and products, enhance their market power, and achieve strategic renewal (Graebner, Eisenhardt & Roundy 2010).

Businesses face multiple growth constraints in developing countries one of which include the lack of access to finance and capital (Nguyen & Nguyen, 2021; Du & Mickiewicz, 2016; Yazdanfar & Abbasian, 2013). Formal sources include capital from institutions, such as banks and credit unions, or from government or nongovernmental (NGOs) organizations, such as the post office, whereas informal sources include capital from supplier credit, customer prepayments, personal savings, or gifts from family or friends. Informal finance has emerged as a popular source of finance in many emerging economies (Wu, Si & Wu, X, 2016; Bruton, Khavul & Chavez 2011). The informal sector is usually the sector that is more constrained with issues related to having access to finance (Bashir et al, 2020). Financing constraints for small firms, especially in less developed countries is a handicap (Beck, Lu & Yang, 2015). The potential for acquisition of I4.0 technologies is challenging, particularly for micro enterprises (SMEs), as it requires significant investments in these technologies. Bashir et al. (2020) and Farazi (2014) explain that informal firms may also find it difficult to access finance through conventional sources, which can result in sub-optimal levels of investment in physical capital, research, technology and innovation and training programs for improving skills of their employees.

Methods

The study attempts to decipher the phenomenon of the informality of business and its implications on the Acquisition of IR4.0 Technological Innovations in the Metal Fabrication Industry. A literature search was performed for the present study on the lines of searches for the informality of enterprises. The criteria for selecting the existing research on the topic included cited research studies on informality, costs, and consequences of informality on businesses and the economy. Most recent research studies used in this literature review were available on Google Scholar, EBSCO, and Proquest and were selected for review if they were on informal entrepreneurship, informal or unregistered businesses, informality costs, and consequences. The review focused on articles from several journals namely the Journal of Small Business Management, Taylor & Francis Journals, Vol. 57, Journal of African Business vol. 22, Journal of Management Innovations (YOJMI), Vol. 1, Strategic Entrepreneurship Journal vol.10. The exclusion criteria were articles for which full text was not available, were not in English.

The READ methodology, which is a methodical process for gathering documents and analyzing data, was used in the research (Dalglish, Khalid, and McMahon 2020; Berner-Rodoreda 2018). The procedures include preparing the necessary materials, extracting data, analyzing data, and finally distilling conclusions.

3.1 Ready Material

The researchers were able to take notes from several sites that they thought offered helpful information about 4IR and informatization. What the researchers intended to learn and how this would help answer the research question(s) were

important factors to take into account before starting this procedure. The majority of the content used came from well-vetted papers and reliable internet sources.

3.2 Extracting Data

The data extraction process constituted the second phase. The researcher recognized that document analyses are mostly close reading tasks. As a result, every document—including the appendices—was carefully studied from beginning to end. Although this might seem laborious, it yielded a wealth of useful information. To address the three research topics the study set out to address, specific data was retrieved. Informalization and the adoption of 4IR are ongoing processes that involve creating concepts and working conceptions.

3.3 Analysing the data

Similar to all other forms of qualitative research, emergent design characterizes the iterative nature of data collection and analysis, whereby evolving conclusions continuously affect decisions about when, how, and what to gather and analyze (Creswell, 2013). The researchers analysed the data, developed preliminary hypotheses, and changed the document selection criteria during the data extraction step. The primary themes of the study served as a guide for the analysis.

3.4 Distilling the Findings

The fourth and last stage of the literature review was distilling the results. The researchers realized that data saturation had been reached and were entirely happy with the document's completeness. They tried to use the third circumstance as justification for concluding your document assessment because they were sufficiently certain that all research inquiries had been addressed.

Discussion and implication

As previously said, the main gist of the study was to address three important aspects. The first aspect dealt with comprehending informality in the metalworking sector. Understanding how 4IR technology advancements might affect the unorganized sector of the metal production industry was the subject of the second topic of study. How 4IR technological advancements can be acquired by the informal sector was the subject of the previous section. This is supported by several scholars who suggest that the informal sector provides several opportunities for economic growth just like conglomerates (Ram, Edwards, Jones & Valera 2017; Medina et al. 2017). Interestingly it is perceived that in both industrialized and emerging nations, the concept of informality seems to be a major problem (Ulyssea, 2020; Perry, 2007; Polese 2021). This is largely because the bulk of the players in the space seem to disorganize hence making their recognition and contribution marginal. There has been a serious call from the different governments and captains of industry to make sure that the informal sector is encouraged to formalize business so that they gain access to loans. The researchers concur with the view of Kanbur (2021) who reiterates that the informal sector fails to acquire the needed technology due to a lack of proper financial structures to support the technological adoption within the metal fabrication industry. This is inline with the views of Petersen et-al (2016) whose study of 30 Cape Town informal economy metal workers proved they are affective in generating employment, income and skill but suffer from not having proper infrastructure such as the adoption of 4IR technology.

Findings reveal that when a corporation or worker operates beyond the bounds of applicable laws and regulations, it is referred to as informal in both situations and instances (Atherton 2012; Bird & Wennberg 2016; Cowling, Liu, & Zhang 2016). These comprise all unincorporated private businesses owned by people or families that are involved in the production and sale of goods and services under partnership or proprietary arrangements. Being family-owned an unregulated study by Du and Mickiewicz (2016); Ayyagari et al. (2010); Elston & Audretsch (2010), and (Beck et al., 2015) revealed that the way they operate may be difficult to ensure the full adoption of 4IR technology. Interestingly some studies have exposed that informality is not a limitation to the full adoption of 4IR technology (Nyagadza et al., 2022; Alqam & Saqib 2020; Menon & Frank. 2019). from these studies, the challenge with most scholars is to think that being in the informal sector means a lack of cash to adopt 4IR technologies. However, the reality is that some players in the informal sector are making a killing having been fully automated (Nyagadza et al. 2022).

The results showed that informality continues to be a major barrier to the complete adoption of 4IR because of a variety of issues, including a lack of funding, a low degree of innovation acceptance and adoption, and a lack of awareness and desire to collaborate with corporations for value addition. Despite these challenges, informal finance has emerged as a popular source of finance in many emerging economies (Wu, Si & Wu, X, 2016 Bruton, Khavul &

Chavez, 2011). This on its own should then motivate governments and corporations to resource the informal sector and encourage the sector to adopt the 4IR technology and enhance productivity through improving business processes within the metal fabrication industry. It appears there is a great opportunity that the player in the informal sector can be encouraged to seize with proper support. Considering this properly guided informal sector players can perform wonders and contribute significantly towards exports and improve the GDP of nations. This is equally the situation in Namibia which according to an Lazarous (2023) as quoted by the Namibian Radio, the informal sector contributed 56% of the labour force and 24% to the GDP and credit was extended to the metal scap industry as well. This reveals that with the adoption of 4IR technology wonders can be performed by the sector.

A review of related literature on the informality of enterprises and technological adoption was conducted. This review informed this study on what previous studies have investigated and the gaps in our knowledge in the field of acquisition of 4IR technological innovations, providing the rationale for this research (International Labour Organization, 2023; Karki, Xheneti & Maden 2021). Although there appears to be considerable research done on the factors influencing informality, there is little literature on its implications on the adoption of 4IR technological innovations. Many of the studies on the informality of enterprises focus on factors influencing and intensification of informality, its benefits, and limitations it was important to investigate the implications of informality on the acquisition of 4IR technological innovations, and what policy interventions can be implemented to encourage mainstreaming of these enterprises into the formal industry to enable them to adopt technological innovations of 4IR (Nguyen & Nguyen 2021; Du & Mickiewicz, 2016; Nyagadza etal. 2022; Alqam & Saqid 2020; Menon & Fink. 2019). In Zimbabwe an empirical study was conducted by Mujeyi et al. (2015) involving 602 randomly selected informal metal industry across 15 clusters. The study focus was on the technology they produce not what they use to produce. This was taregeted to the agriculture sector where the low income eaners are clustered opting cheap technology. Thus with the adoption of 4IR technology the target market may be both domestic and international.

Prior studies on formality established that informality deters enterprises from accessing finance which causes a lack of other resources. Limited financial resource base which is a feature of most informal enterprises means that the enterprise cannot acquire material resources, modern machinery, and equipment (Nguyen & Nguyen 2021; Du & Mickiewicz, 2016; Yazdanfar & Abbasian 2013). It also means the enterprise cannot invest in research and development, training, and development of employees to upgrade their skills and knowledge. The acquisition of 4IR technological innovations requires as a precondition skilled and knowledgeable worker. Informality generates the inability to absorb external knowledge. More general studies on the informality of enterprises found that informality negatively undermines the ability of enterprises to grow and expand. Technological innovation may indeed be an essential aspect of transitions toward sustainability. An empirtical study by Uzhenyu (2015) pointed out the need for formalization of the metal fabrication industry as a way of attracting funding form fianciers. Similar sentiments were raised by the Banker's Association of Zimbabwe (2020). Similarly, Maposa (2022) raised similar inclusion issues and challenged the Government of Zimbabwe and other stakeholders like the Zimbabwe Revenue Authorities to offer tax incentives for the SMEs to breath and presumably think along lines of formalization. Manayati and Mutsau (2019)'s study focused on views of micro entrepreneurs in formalizing their business 70% objected to the idea citing punitive laws in place, other stakeholder pointed out to the benefits the micro-entrepreneurs can benefit such finical inclusion to adopt 4IR technologies.

Conclusion

The study found that informality is growing in the metal fabrication sector, particularly in developing nations. It seems that attempts are being made to guarantee that it fully embraces and obtains the IR4.0 Technological Innovations. Nonetheless, based on the results and conversations, several obstacles jeopardize the likelihood of guaranteeing a complete purchase. Informal sector participants lack the necessary appetite and support to properly embrace technology. One of the most prominent constraints is the insufficient funding to conduct comprehensive studies or purchase necessary materials. This is mostly due to the difficulties experienced by industry giants, who should logically collaborate with the SMEs' mainly disorganized participants. Failure to obtain loans from banks and other finance houses, where the firm is considered unstructured with little to no security, exacerbates informality even further. It's interesting to note that informalization will persist because corporations are continuing to let go of employees as they struggle with profitability and are trying to streamline their manufacturing process. The key finding of this study is that as more corporations implement IR4.0, their operational efficiency increases, their production costs decrease, and more employees are let go to work in the unorganized sector.

A straightforward conclusion about the impact of informality on the adoption of IR4.0 is reached through the evaluation and analysis of the aforementioned research. Xu et al. (2018) assert that while knowledge plays a significant role in the revolution, their research shows that capital and machinery are the key drivers of the industrial era and that people are still vital but replaceable. This suggests that as IR4.0 develops, there may be ongoing layoffs of employees. It is imperative to emphasize that the capacity for innovation possessed by unregistered entrepreneurs and the overall performance of their firms are essential components for the sector's eventual influence. Therefore, innovation development and implementation skills are becoming more and more crucial for the informal SME sector's competitiveness (profitability and productivity) and long-term growth. This is true for almost every industry, and the metal fabrication industry is no exception.

More significantly, the industry's innovation plays a key role in assuring increased cost-effectiveness as well as the development and delivery of novel goods that satisfy consumer demands. As an alternative, innovation assists a company in strengthening its core strengths in several ways that enable it to outperform its non-innovating competitor and become speedier, more flexible, adaptive, and able to handle market challenges. The consequences of informality on the acquisition of I4.0 technological advancements have received less attention than the concerning features of the informal industry, which have been extensively studied. The acquisition of I4.0 technologies is significantly impacted by informality. Globally, metal fabrication productivity and efficiency are rising as a result of automation and digital technology advancements. Furthermore, workforce skill development investments are producing a better-skilled workforce for the metal manufacturing sector (World Bank, 2020). Modernization of technology is essential since it lets SMEs realize their full potential. The acquisition of Industry 4.0 and technological upgrading are essential for microenterprises to remain sustainable.

The final research topic, which examined what the industry can do to obtain the IR4.0, is interesting. It seems from the conversation that unofficial metal fabrication players could be able to obtain and use IR4.0 technologies. This is mainly because, as suggested by Alqam & Saqib (2020), they may quickly expedite business decision-making and readily modify their operating model to take advantage of the 4IR opportunity to promote innovation in manufacturing. It is acknowledged that the change will undoubtedly encourage the digitalization and automation of processes and procedures. To improve productivity, trade capacity, and innovation, small and medium-sized businesses must have a strong legal, regulatory, and operational framework that specifically targets technologies of the fourth industrial revolution (Mabotja 2018). Most notably, the government must address regulations about financial assistance for SME 4.0 procurement through finance and development institutions; tax incentives must be implemented during the transition if at all feasible. Small and medium-sized enterprises (SMEs) can enhance their production efficiency and meet customer demands by implementing smart manufacturing.

This can be achieved through bald statements by the government backed by action such as producing a Statutory Instrument giving a clear reasonable window period for taxation. Additionally, mass production by SMEs can realign the industry and improve its ability to contribute to economic growth (Kamaruzaman 2020). Considering this, it is imperative that all participants in the unofficial sector prosper and at the very least legalize their businesses to guarantee complete government support. Equally important is for the government through the responsible ministries like the ministry of Small Medium Enterprises Development, Information Communication and Technology among others to organize symposiums and expos as a way of attracting partners for SME players. The is need for a massive promotion and encourage micro entrepreneurs' participation in programs like Agricultural Show and Mine Entra Expo where they will create business opportunities and appreciate new technologies. To harness and quicken the adoption process ZIMRA may allow the importation of 4IR equipment duty free to enable quick adoption and provide law handouts for micro entrepreneurs. This may boost their confidence. Lastly Private Public Sector Partnerships can also help. This is through the collaboration of micro entrepreneur players with conglomerates and parastatals through the support systems within the value chain.

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