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**The Influence of Innovation on the Performance of Small and Medium Manufacturing Enterprises in Tanzania**

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**ABSTRACT**

This study examines the role of innovation in enhancing the performance of manufacturing SMEs in Tanzania, focusing on the influence of product and process innovation on market innovation and overall firm performance. As innovation becomes crucial for competitiveness, particularly in resource-constrained developing economies, this research positions it as an essential element for SMEs to adapt, differentiate, and thrive in dynamic markets. Using Partial Least Squares Structural Equation Modeling (PLS-SEM) on survey data from 277 SME owners and managers, the study reveals that both product and process innovation significantly boost market innovation, which in turn positively impacts firm performance. These findings suggest that market innovation enhances a firm's adaptability, customer engagement, and competitive edge. The study offers empirical insights into the role of multidimensional innovation in supporting SME growth within a developing economy, emphasizing that incremental changes alone may not sustain a competitive advantage. The results underscore the importance of strategic investment in innovation capabilities across product, process, and market domains. For policymakers and SME support institutions, the study calls for initiatives that improve access to resources, training, and technology to facilitate innovation. By highlighting the link between innovation and firm performance, this research reinforces innovation as a cornerstone for sustainable SME growth, demonstrating that a comprehensive innovation strategy enables SMEs to overcome market challenges, deliver value, and achieve long-term success.

**Keywords:** SME; Innovation; firm performance; Tanzania.

## **INTRODUCTION**

Literature recognizes small and medium-sized enterprises (SMEs) as one of the major sources of income, innovation, and job creation in most economies. In emerging economies, for example, SMEs account for about 90 percent of the private sector, more than 40 percent and 50 percent of GDP, and all jobs in developing countries (Runde *et al.*, 2021). In countries like Tanzania and Zimbabwe, the contribution of SMEs to both GDP and total employment exceeds 50 percent, representing a key driver of economic growth (Mabenge *et al.*, 2022). These significant contributions are often made by SMEs that engage in innovation activities. Innovation is defined as a process of transforming ideas into something new or improved and related to products/services, or ways of doing things (processes), forms of organization, and markets. According to Beckeman *et al.* (2013), innovation is something new or different from the existing ones. Organizations embrace innovations to excel in constantly changing business environments (Yeh-Yun Lin & Yi-Ching Chen, 2007; Rosenbusch *et al.*, 2011).

The related literature identifies several benefits of innovations accruing to innovative firms, namely enhancement of competitive advantage, productivity growth, and employment growth (Idris *et al.*, 2017; Alkhateeb & Abdalla, 2021; Mabenge *et al.*, 2022). Bakar and Ahmad (2010) argue that, as far as innovation performance is concerned, firms with efficient utilization of resources are more likely to innovate. Michalakopoulou *et al.* (2022) note that large firms are more likely than small firms to innovate because they control substantial stocks of resources and that the richness of resources raises their capacity to innovate. However, SMEs experience limited internal resources and capability to cope with external unfavorable changes; such conditions make them less likely to innovate and survive (Jabbouri and Farooq, 2021; Julienti Abu Bakar and Ahmad, 2010). In face of these challenges, the government of Tanzania has formulated different national development policies, such as the SMEs Policy (2003) and the integrated industrial development strategy (2011-2025), to promote SME performance through innovation. As a result, a considerable number of SMEs can innovate and grow (Al-Ansari *et al.*, 2013; Msuya *et al.*, 2017).

Innovation is defined as a process of transforming ideas into something new or improved, including products, services, or ways of doing things with the aim of sustaining firms' performance (Baregheh *et al.*, 2009; Baregheh *et al.*, 2012b). Innovation is classified into major categories such as product innovation, process innovation, and marketing innovation (OECD/Eurostat, 2005; Yeh-Yun Lin & Yi-Ching Chen, 2007; Karabulut, 2015; Rajapathirana & Hui, 2018). Product innovation includes changes in organizational products/service offerings that entail the creation and development of new or improved products and services or improvements in existing products (Oke *et al.*, 2007; Capitanio *et al.*, 2010; Taneja *et al.*, 2016). While process innovation represents both minor and radical changes in processing and delivery methods and supporting activities, marketing innovation is concerned with the implementation of new marketing methods with the aim of driving demand through the creation of product awareness and penetration of new markets (Madrid-Guijarro *et al.*, 2009; Capitanio *et al.*, 2010). Therefore, innovation is regarded as a performance driver whereby different types of innovation have a positive impact on firm performance.

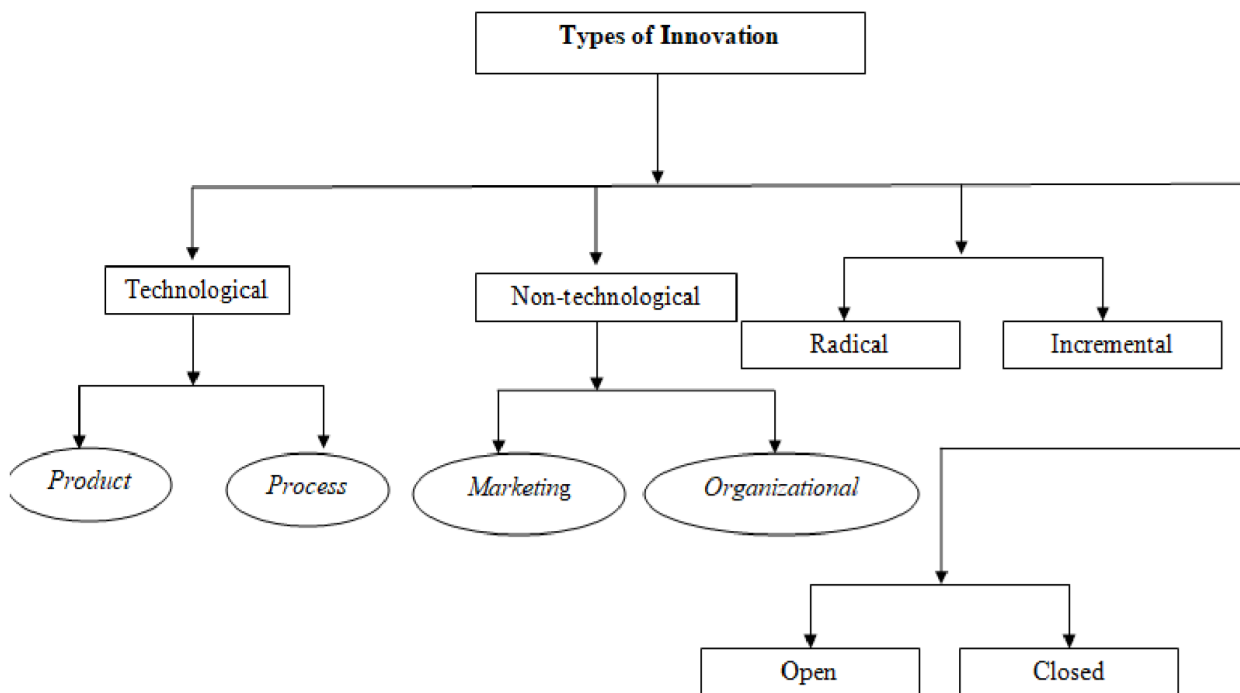
While the relationship between innovation and business performance has been widely examined (Nguyeni *et al.*, 2017; Idris *et al.*, 2017; Alkhateeb & Abdalla, 2021), few studies have specifically explored the interplay of different innovation dimensions on SME performance within Tanzania's context (Chege *et al.*, 2020; Msuya *et al.*, 2017). Much of the existing literature focuses primarily on the impact of product and process

innovation on business outcomes, with relatively limited attention to the role of market innovation (Hu et al., 2020; Sethibe & Steyn, 2016). Emerging research, however, suggests that market innovation may play a crucial mediating role, offering a more comprehensive view of its influence on performance (Saunila, 2020; Siriram, 2022; Wijayanto & Sanaji, 2021).

This study addresses these gaps by developing a model to analyze the relationships between various innovation types—product, process, and market—and their effects on firm performance in Tanzanian manufacturing SMEs. Using survey data and Partial Least Squares Structural Equation Modeling (PLS-SEM), the study provides an integrated analysis of technological and market innovation’s impact on performance, offering new insights into the pathways linking innovation strategies and enhanced firm outcomes. This contribution enriches the literature on SME performance and innovation, highlighting the essential role of market innovation as a mediator in driving business success. The remaining part of the paper proceeds as follows: literature review and hypotheses development, methods and findings, discussions and conclusion, and finally limitations and future research.

### TYPES OF INNOVATION

Innovation plays a crucial role in driving the performance of small and medium-sized enterprises (SMEs) in Tanzania’s manufacturing sector. Different classifications of innovation emphasize how distinct types of innovation can enhance competitiveness and operational efficiency in SMEs. According to the Oslo Manual (2005), innovation is categorized into technological (product and process) and non-technological (marketing and organizational) innovations. Other scholars have also presented alternative classifications, such as product, process, and service innovations (Henao-García & Cardona Montoya, 2023); technological, administrative, and marketing innovations (Olughor, 2014); and radical and incremental innovations (Coccia, 2017).



**Figure 1.1: Classification of Innovation**

### **1. Product Innovation**

Product innovation refers to the introduction of entirely new or significantly improved goods or services (Edquist, et al., 2001). This may involve launching an innovative product or making substantial improvements to existing products. For manufacturing SMEs, product innovation is often driven by customer feedback, technological advancements, and market demands, leading to better alignment with customer expectations and enhanced product offerings. Examples include introducing new materials, advanced technical features, or upgraded software components to existing products. In Tanzanian SMEs, product innovation is visible to customers, promoting brand recognition and loyalty.

### **2. Process Innovation**

Process innovation involves developing new or significantly improved methods of production or delivery (Edquist, et al., 2001). This type of innovation emphasizes improving efficiency, reducing production costs, and enhancing product quality by implementing advanced techniques, equipment, or software. For instance, incorporating automation in production lines or adopting computer-assisted design for product development exemplifies process innovation. Process innovations can help Tanzanian SMEs remain competitive by lowering costs and enhancing productivity, with further examples like GPS tracking for logistics and advanced ICT systems.

### **3. Marketing Innovation**

Marketing innovation focuses on implementing novel marketing techniques or substantial changes in product design, placement, pricing, or promotion (Edquist, et al., 2001). For SMEs, effective marketing innovation could involve redesigning packaging to attract new customers or launching innovative campaigns. The primary goal is to connect with customers in new ways, addressing market needs and improving sales. Given the dynamic business environment, Tanzanian SMEs benefit from adopting unique marketing strategies that are not widely implemented by competitors, thereby strengthening their market position.

### **4. Organizational Innovation**

Organizational, or administrative, innovation involves adopting new or significantly improved management practices, work processes, or operational structures (Damanpour & Gopalakrishnan, 1998). This type of innovation often results in enhanced knowledge utilization, operational efficiency, and workforce productivity. For Tanzanian SMEs, organizational innovation could involve adopting new management approaches or technologies that streamline internal processes, fostering a culture of continuous improvement and increasing employee satisfaction. Organizational innovation also broadens capabilities, potentially leading to improved business performance.

### **5. Radical Innovation**

Radical innovation, or breakthrough innovation, encompasses major shifts or the creation of entirely new approaches that are transformative within the firm. Characterized by significant uncertainty and high risk, radical innovation often requires rethinking organizational structures and practices (Damanpour & Gopalakrishnan, 1998). For Tanzanian SMEs, radical innovation could involve pioneering products or processes, enabling firms to capture new market segments. This high-reward strategy allows firms to gain a competitive edge, especially in industries where being the first to market is advantageous.

## **6. Incremental Innovation**

Incremental innovation, also known as continuous or cumulative innovation, involves a series of smaller improvements that cumulatively enhance performance and efficiency. This form of innovation refines existing products, processes, or technologies, helping firms increase output while reducing production costs. For Tanzanian SMEs, incremental innovations can improve existing products without the risk associated with radical changes, such as updating existing manufacturing processes or enhancing product features to meet evolving customer preferences.

## **7. Technological Innovation**

Technological innovation encompasses applying science or engineering to develop new products or production processes. By leveraging technological advancements, SMEs in Tanzania can introduce new products or improve existing ones to achieve competitive advantage. According to OECD classification, both product and process innovations fall under this category, as they involve adopting new technologies to enhance outputs (Bassanini, et al., 2000).

## **8. Non-Technological Innovation**

Non-technological innovation, in contrast, includes innovations that do not require technological inputs, such as marketing and organizational innovations. Non-technological innovations are essential for Tanzanian SMEs looking to enhance operational efficiency and customer engagement without heavy investment in technological upgrades.

## **9. Closed Innovation**

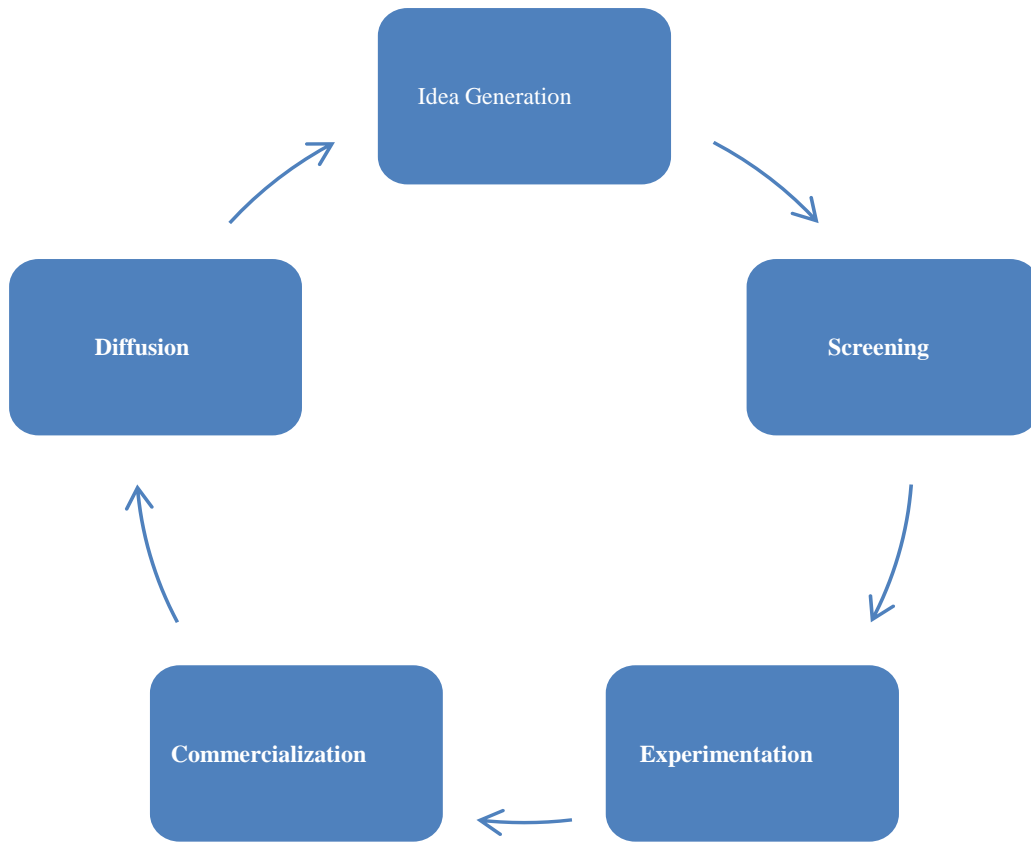
Closed innovation is an approach where firms rely solely on internal resources to develop innovations. Ideas and inventions are generated within the organization, and intellectual property remains strictly controlled. This method enables Tanzanian SMEs to maintain proprietary knowledge, though it may limit external collaboration and adaptability.

## **10. Open Innovation**

Open innovation, popularized by Chesbrough (2017), involves combining internal and external ideas to drive product development. This collaborative approach allows Tanzanian SMEs to leverage external expertise, such as R&D partnerships and networking, creating a more flexible innovation process responsive to market and environmental feedback. Examples of open innovation could include collaboration with external designers, innovators, and academic institutions to address specific industry challenges.

In understanding and implementing these various types of innovation can significantly impact the performance of Tanzanian manufacturing SMEs. By aligning innovation strategies with business objectives, SMEs can enhance efficiency, increase market share, and improve customer satisfaction, leading to sustained business growth and competitiveness in the rapidly evolving manufacturing landscape.

## PHASES OF THE INNOVATION PROCESS



**Figure 1.2: Phases of the Innovation Process**

### **Idea Generation**

The innovation process begins with seeking out innovative potentials and identifying promising ideas. These ideas might stem from unmet customer needs, new technological solutions, or emerging market opportunities. Companies aim to gather a wide range of ideas by attending workshops, trade fairs, and holding learning sessions for employees, encouraging creativity and new perspectives (Ferrari, et al., 2009).

### **Screening**

Once ideas are collected, they undergo a screening process to evaluate their potential benefits and feasibility. This stage involves assessing each idea, discussing its viability, and testing it to identify the most promising options. The goal is to focus resources on the ideas that show the greatest potential for success.

### **Experimentation**

The experimentation phase is vital for assessing the feasibility and sustainability of chosen ideas. During this phase, companies introduce the innovation to a small customer segment to gauge reactions and gather feedback, which helps refine the concept. Senior managers and leaders are instrumental in overseeing this process, providing direction, and determining whether the idea is ready for broader implementation.

## **Commercialization**

At this stage, the innovation is introduced to the market, reaching all proposed customers. This phase involves ensuring that the innovation effectively addresses customer needs and provides a solution to their problems. An invention becomes a true innovation once it is commercialized and accessible to customers.

## **Implementation**

In the final stage of the innovation process, the organization establishes the structures, maintenance, and resources required to produce and sustain the innovation. This phase integrates the innovation into the company's operations, ensuring it can be consistently delivered and managed over time.

## **THEORIES OF INNOVATION**

### **Classical Growth Theory**

Classical growth theory, developed by economists like Adam Smith, David Ricardo, Karl Marx, and Robert Malthus, emphasizes that technological progress and capital accumulation drive economic growth (Kurz, 2010). Key to this theory is the idea that the division of labor enhances productivity, as workers can focus on specific areas of production, leading to inventions and economic progress. This theory primarily sees innovation as tied to technological advancement, which depends on capital accumulation (Kaldor, 1961).

### **Neo-Classical Growth Theory**

In the late 1950s and 1960s, Robert Solow and J.E. Meade introduced neo-classical growth theory, which recognizes innovation as crucial to economic growth (Hagemann & Seiter, 2003). Here, labor and capital are the main factors of production, and technological progress is seen as essential for sustained growth. The theory suggests that technological progress occurs independently of economic forces (exogenously), although the endogenous growth model later modified this, proposing that technological advances result from internal economic factors within the system.

### **Endogenous Growth Theory**

Endogenous growth theory argues that a country's economic growth is determined by internal factors such as investments in human capital, knowledge, and innovation (Howitt, 2010). This model holds that growth can continue indefinitely through existing technologies and education investments, emphasizing that economic growth stems from within the system rather than from external sources.

### **Exogenous Growth Theory**

In contrast, exogenous growth theory suggests that economic growth is driven by factors outside the economy (Aghion, et al., 1998). This theory assumes that external elements beyond the immediate control of an economy or organization play a primary role in determining growth.

### **Schumpeterian Growth Theory**

Joseph Schumpeter highlighted innovation as a vital source of economic growth, introducing the concept of "creative destruction," which views technological change as both an opportunity and a disruptive force (Jackson, 2021). Schumpeter expanded the idea of innovation beyond technology to include knowledge, resources, processes, and markets. He argued that businesses introduce new products or technologies to capture temporary monopoly profits, although these innovations are eventually imitated by

competitors. Schumpeter initially posited that smaller firms were more innovative but later revised this to suggest that larger firms with organized R&D resources had a greater capacity for innovation (Jackson, 2021).

### **System Theory of Innovation**

System theory of innovation builds on evolutionary theory by incorporating the roles of institutions and economic growth. This theory emerged to address Schumpeter's omission of nonmarket institutions in innovation (Jackson, 2021). System theory emphasizes that innovation arises from complex interactions among various actors, including technical institutions, universities, governments, and research organizations. These external organizations contribute to the collaborative innovation process.

### **Generation Theory of Innovation**

Developed by economist Roy Rothwell, generation theory of innovation presents a historical perspective on industrial innovation management from the 1950s to the 1990s. Rothwell (1992) identified five distinct phases:

- **First Generation (1950s-1960s):** Known as the "technology push" era, this phase focused on scientific breakthroughs and R&D investments as primary innovation drivers.
- **Second Generation (Mid-1960s-Early 1970s):** Referred to as the "market pull" era, where firms emphasized meeting customer needs in response to market demand and competition.
- **Third Generation (Mid-1970s-Mid-1980s):** This "coupling model" phase viewed innovation as a result of both market needs and technological opportunities, combining technology push and market pull forces.
- **Fourth Generation (Early 1980s):** During this phase, firms recognized core competencies as sources of competitive advantage and sought strategic alliances and globalization opportunities.
- **Fifth Generation (1990s Onwards):** Marked by collaboration and networking, this phase emphasized partnerships with external actors to reduce development costs and time. Vertical linkages with customers and suppliers and horizontal linkages with competitors and other institutions became crucial in the "integration and networking" era.

## **LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT**

Innovation is widely recognized as a key driver of industrial transformation and competitive differentiation, particularly for small and medium-sized enterprises (SMEs). However, SMEs in developing countries, such as Tanzania, often operate in challenging business environments characterized by high competition, stringent entry barriers, and significant demand uncertainties (Abbey & Adu-Danso, 2022; Alawamleh et al., 2022). These environments demand an adaptive approach to innovation that allows SMEs to overcome resource limitations and respond effectively to shifting market demands. Elpisah (2023) underscore the critical role of SMEs in generating employment, promoting equitable income distribution, and driving economic growth. Although these positive impacts sometimes give rise to market imperfections and institutional barriers, SMEs continue to play a pivotal role in economic development through job creation, entrepreneurship, innovation, and industrial transformation.

For SMEs, innovation encompasses activities such as developing new products, exploring new markets, or optimizing internal processes to enhance efficiency and respond to customer needs (Li and Li, 2017; Topić et al, 2023). Product and process innovation have been particularly instrumental in enabling SMEs to improve operational efficiency



and create unique value propositions, especially when aligned with market trends (Kotler & Keller, 2016). Market innovation acts as a mediating factor, ensuring that product and process innovations are tailored to meet market demands, which can significantly enhance SME performance by capturing emerging opportunities and differentiating from competitors (Slater & Narver, 1994).

The cooperation between SMEs and multinational enterprises (MNEs) also offers new dimensions to innovation. Chowdhury (2020) identifies unique advantages that MNEs bring to the table, such as sustainable differentiation, knowledge transfer, and the internalization of intangible assets. These capabilities are essential in cross-organizational partnerships, where SMEs benefit from co-innovation opportunities. According to Prashantham and Birkinshaw (2019), such cooperation allows SMEs to leverage MNE resources, fostering a collaborative approach that enhances SMEs' innovation capacities and helps them maintain a sustainable competitive edge. This collaboration is particularly valuable in areas like supply chain innovation and market expansion, which enable SMEs to exploit both local and international market opportunities.

New Product Development (NPD) is another critical area within innovation literature, as it involves activities that lead to a stream of market-ready offerings (Wheelwright & Clark, 1992). NPD, as defined by Dodgson (2021), spans activities that bring new products—whether new to the world or new to the organization—into the market. This process requires a well-coordinated approach to efficiently develop and launch products with short time-to-market cycles and minimal costs. However, Dodgson also notes that not all new products represent true innovations; products that are repositioned rather than fundamentally redesigned are examples of developments that may lack the novelty associated with high-impact innovation. For SMEs, the NPD process often encounters challenges due to limited resources, making it difficult to recruit skilled technical staff and secure funding (Mu et al., 2007).

Another pertinent concept is that of Key Success Factors (KSFs), as articulated by Grunert & Ellegaard (1992). They propose that success is not a one-size-fits-all phenomenon; each business must identify its unique success factors in alignment with its environment. For SMEs, identifying KSFs—such as technology, market insight, commercial viability, and managerial competence—is crucial for driving effective new product development and sustaining competitive advantage. These KSFs provide a framework for decision-makers to refine their innovation strategies and achieve long-term growth.

Overall, the literature indicates that innovation for SMEs, particularly in developing economies, is multifaceted and influenced by various internal and external factors. SMEs can drive substantial growth and performance by adopting a holistic approach to innovation that incorporates product, process, and market perspectives. The insights provided in this review suggest that a strategic emphasis on these dimensions can enable Tanzanian manufacturing SMEs to overcome market challenges, achieve differentiation, and enhance their competitive positioning in both local and global markets.

## **Hypotheses Development**

### **Product Innovation and Market Innovation**

Waliuddin and Umar (2021) explored the influence of entrepreneurial orientation and customer orientation on marketing performance, with a focus on product innovation. Their findings highlight that both entrepreneurial and customer orientations have a significant and positive impact on marketing success. Moreover, product innovation was found to mediate the relationship between customer orientation and entrepreneurial orientation, further enhancing marketing effectiveness.

Bustami, Malik, and Inuzula (2021) examined the effects of market orientation and product innovation on the sales performance of home industries in the Keripik Bireuen

District. Their research, which employed a quantitative approach with descriptive and verifiable methodologies, found that both market orientation and product innovation positively influenced sales performance. These effects were observed to be both direct and indirect, underlining the importance of these factors in improving business outcomes in the home product sector.

In a study by Utami, Mulyono, and Furkan (2022), the researchers investigated the impact of product innovation and market orientation on marketing effectiveness, emphasizing the role of creativity in moderating these effects. The results indicated that product innovation had a strong, positive effect on marketing success, while market orientation, though positively associated with marketing effectiveness, did not show a statistically significant impact. This suggests that while product innovation plays a more critical role in driving marketing success, market orientation still contributes, albeit to a lesser extent. It is therefore hypothesized that:

*H1: Product innovation has a positive effect on market innovation*

### **Process innovation and Market Innovation**

The study conducted by Oduro (2019) examined the impact of various types of innovations on the performance of SMEs in the Cape Coast Metropolis of Ghana. The results of the study indicate that the introduction of process innovation has a positive influence on the overall performance of SMEs. However, it is noteworthy that the impact of organisational innovation was found to be more significant in terms of effect size. Therefore, unlike this study, the mediation effect of market innovation was not considered.

The study conducted by Osei *et al.* (2016) examined the various factors that contribute to the growth of SMEs as well as process innovation within the context of Ghana. The results of the study indicate that the implementation of an improved distribution strategy has a positive effect on the expansion of SMEs through the reduction of operational expenses and the enhancement of customer satisfaction. Subsequently, the implementation of an enhanced procedural approach ensued, resulting in a notable enhancement in productivity in terms of both quality and quantity. However, it did not yield a substantial reduction in production costs. On the contrary, the implementation of a novel process strategy led to a rise in production; however, it adversely affected the expansion of SMEs owing to the elevated costs associated with production. Contrary to this study, market innovation was treated as another type of innovation and not a mediating variable of the relationship.

Chege, Wang, and Suntu (2020) investigated the relationship between technological advancements and commercial performance in the context of Kenya. The study examined the impact of entrepreneur innovativeness on the association between innovation and company performance within the context of Kenya. The results indicate that the implementation of innovative technological business processes has a positive impact on performance. However, the study did not focus on the mediating effect of market innovation.

*H2: Process innovation has a positive effect on market innovation*

### **Market innovation and Firm Performance**

The study by Maldonado *et al.* (2018) examined the impact of technology capabilities on the quality of SMEs within the context of Mexico's expanding economy and regional development. The research findings indicate that the development of marketing strategies has a notable and favorable influence on the financial performance of SMEs in Mexico.

On the other hand, Yelmi, Yahaya, and Muhammad (2021) conducted an evaluation of the performance of SMEs in Nigeria, with a specific focus on the impact of marketing innovation. The relationship between the independent and dependent variables was assessed through regression analysis to determine the direction, and correlation analysis to determine the magnitude of the association. The results of the study indicate that the implementation of marketing innovation had a substantial and positive effect on the performance of SMEs in Nigeria.

The study conducted by Sanjeevan (2017) examined the impact of marketing innovation on the performance of SMEs in Oluyole Local Government, Ibadan, Nigeria. This study primarily examines the dependent variables associated with business performance, specifically profitability, market share, return on investment, and expansion. The study revealed that product, place, price, packaging, and after-sales service are all highly significant indicators of business performance, both independently and when considered together. Nevertheless, the research indicates that marketing innovation does not significantly contribute to the improvement of firm performance.

*H3: Market innovation has a positive effect on firm performance*

## METHODS AND DATA

### Measurement of Constructs

The measurement scales of the constructs were adopted from the literature as indicated in Table 1 below:

**Table 1: Measurement Scales of Constructs**

Construct	Item	Source
Product innovation	New product	Wang (2016) and Prajogo and Sohal (2006)
	Product cost reduction	
	Product Quality Improvement	
	Product Design	
Process innovation	New production techniques	Gikonyo <i>et al.</i> (2017) Gupta (2013)
	New distribution techniques	
	New production equipment	
	New marketing techniques	
Market innovation	Digital Marketing	Porter (1990), Adams, Freitas and Fontana (2019)
	Packaging	
	Promotion	
	Advertisement	
SME Performance	Sales level	Fakoki and Machirori (2013), Amoah-Mensah (2013), Machirori (2012)
	Profitability	
	Market Share	
	Capital	
	Number of Employees	

### Sample and data

The study used survey data collected from 277 owners/managers of SMEs through self-administered questionnaires. The sample of manufacturing SMEs was drawn from Temeke District in Dar es Salaam, based on the Temeke District Council Report of 2022, which indicated a total of 897 registered manufacturing SMEs. The sample size of 277 SMEs was determined using Yamane's (1967) sample size formula. Before the actual

data collection, a pilot study was conducted to assess the suitability of the survey tool. A total of 30 respondents participated in the pre-test, in line with the recommendation of Perneger et al. (2015). Data analysis was performed using Partial Least Squares Structural Equation Modeling (PLS-SEM) with SmartPLS version 4.0.

## FINDINGS

### *Descriptive Characteristics of the Sample*

The descriptive characteristics of the sample are summarized as follows. In terms of **firm age**, the majority of the responding SMEs (44.6%) were established for 7 years or more, while 29.7% were between 4 and 6 years old, 14.2% were between 1 and 3 years old, and 11.5% were less than one year old. Regarding **firm size**, measured by capital investment in machinery, the largest group of respondents (34.5%) had investments between TZS 200 million and 800 million, followed by 31.1% with investments above TZS 800 million, and 26.6% with investments ranging from TZS 5 million to 200 million. A smaller proportion, 7.8%, had investments of up to TZS 5 million. In terms of **employee size**, the majority (52.4%) employed between 5 and 49 employees, 30.7% employed between 1 and 4 employees, and 16.9% had between 50 and 99 employees. These results provide a comprehensive overview of the demographic and operational characteristics of the SMEs surveyed.

**Table 2: Descriptive Characteristics of the Sample**

Variables	Category	Frequency	Percent
Firm Age	Less than a Year	32	11.5
	1 – 3 Years	39	14.2
	4 – 6 Years	82	29.7
	7 Years and Above	124	44.6
Firm Size (TZS)	Up to TZS 5mil	22	07.8
	5 – 200 million shillings	74	26.6
	200 – 800 million shillings	96	34.5
	Above 800 million shillings	87	31.1
Number of Employees	1 – 4 Employees	85	30.7
	5 – 49 Employees	145	52.4
	50 – 99 Employees	47	16.9

### **Measurement Model Assessment**

The measurement of the constructs was assessed for reliability and validity. Reliability was evaluated through internal consistency and factor loadings, while validity was assessed via convergent and discriminant validity. The results in Table 3 indicate that the factor loadings for all items were within the recommended threshold of 0.70, except for MKT4, PERF5, PRCS4, and PRD4, as suggested by Hair et al. (2019) for item reliability. These four items were retained, with the exception of PERF5, which had a factor loading below 0.4 (Wende & Will, 2005) and was therefore dropped from further analysis.

To evaluate internal consistency, Cronbach’s alpha (CA), Rho\_A, and composite reliability (CR) were used. The results showed values above 0.70 for all constructs, indicating acceptable reliability (Hair et al., 2019). Convergent validity was assessed using the composite reliability (CR) and Average Variance Extracted (AVE). The results

revealed that the AVE for each construct exceeded the threshold of 0.5, which is the lower limit for acceptable convergent validity (Fornell & Larcker, 1981). Discriminant validity was assessed using the Fornell-Larcker criterion, which compares the squared inter-correlation (SICs) of a construct with other latent constructs and its AVE. The results in Table 5 show that the AVE values for all constructs exceeded the SICs, confirming discriminant validity (Hair et al., 2019).

**Table 3: Internal Consistency and Convergent Validity**

Construct	Indicator	Loading	CA	Rho_A	AVE
MKT			0.777	0.801	0.601
	MKT1	0.756			
	MKT2	0.838			
	MKT3	0.842			
	MKT4	0.647			
PERF	PERF1	0.874	0.825	0.843	0.665
	PERF2	0.633			
	PERF3	0.907			
	PERF4	0.812			
PRCS	PRCS1	0.880	0.825	0.843	0.664
	PRCS2	0.920			
	PRCS3	0.782			
	PRCS4	0.652			
PRD	PRD1	0.819	0.726	0.762	0.547
	PRD2	0.791			
	PRD3	0.772			
	PRD4	0.545			

**Note:** MKT = Market innovation; PERF = Firm performance; PRCS = Process innovation; PRD = Product innovation

**Table 5: Assessment of Discriminant Validity**

	MKT	PERF	PRCS	PRD
MKT	<b>0.775<sup>a</sup></b>			
PERF	0.600	<b>0.815<sup>a</sup></b>		
PRCS	0.697	0.717	<b>0.814<sup>a</sup></b>	
PRD	0.764	0.546	0.621	<b>0.739<sup>a</sup></b>

**Note:** <sup>a</sup>Fornell-Larcker ( $\sqrt{\text{AVE}}$ )

MKT = Market innovation; PERF = Firm performance; PRCS = Process innovation; PRD = Product innovation

### Structural Equation Model Assessment and hypotheses testing

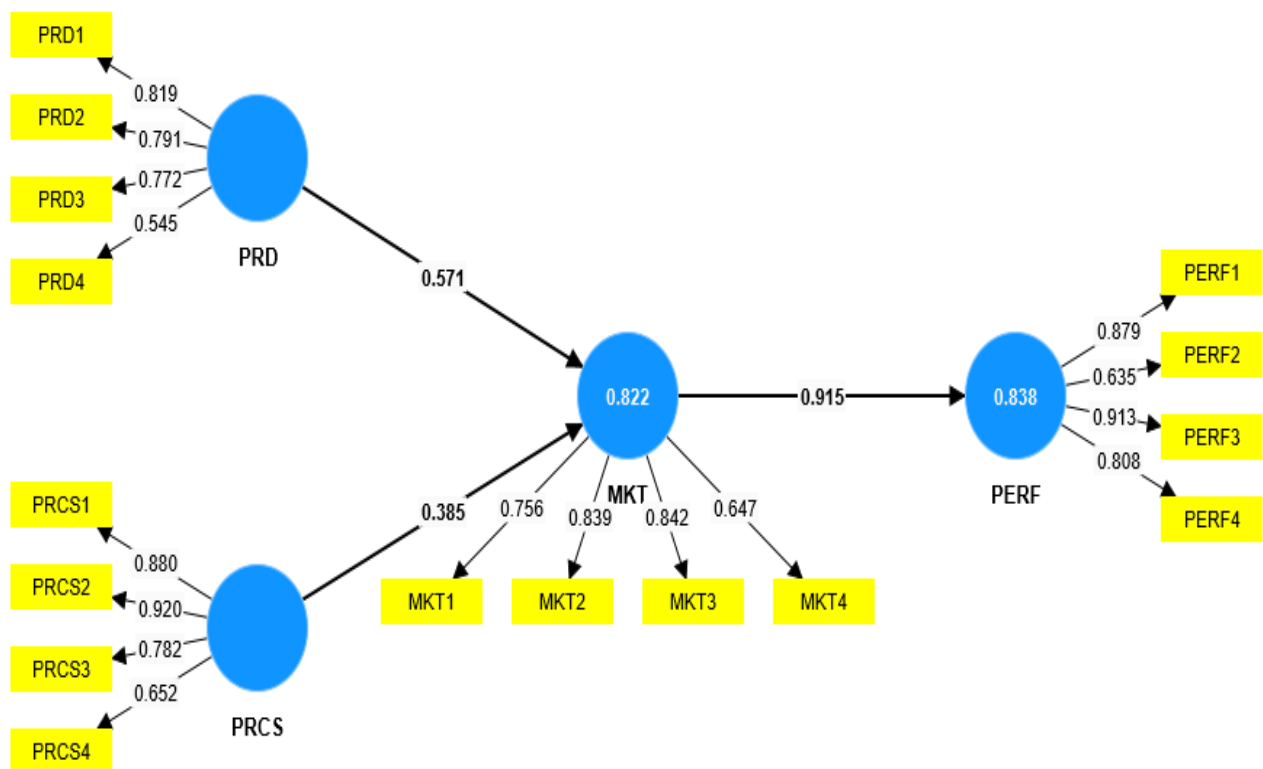
The present study employed PLS-SEM to test the structural associations among latent constructs as presented in the model (Figure 1). The structural model assessment was done by examining the path estimates, VIF values (for assessment of collinearity issues) and coefficients of determination of dependent latent constructs (i.e.  $R^2$ ) (Hair et al., 2019). The computed VIF values were lower than the upper threshold of 5, indicating absence of collinearity issues.

The results presented in Table 4 and Figure 1 support  $H_1$  ( $\beta = 0.571, p < 0.01$ ) and  $H_2$  ( $\beta = 0.385, p < 0.01$ ) and confirmed a positive relationship between product innovation, process innovation and market innovation. Similarly, the findings provide evidence to support hypothesis  $H_3$  that indicates a positive relationship between market innovation and firm performance ( $\beta = 0.915; p < 0.01$ ). In addition, the  $R^2$  is 0.82 and 0.84 for market innovation and firm performance respectively, indicating satisfactory predictive power for the dependent latent constructs (Henseler *et al.*, 2009; Lee *et al.*, 2016).

**Table 6: Estimates of Structural Model**

Direct effect	Path Coefficient
PRD → MKT (H1)	0.571**
PRCS → MKT (H2)	0.385**
MKT → PERF (H3)	0.915**

Note: Significance (two tailed test): \*\*Significant at  $p \leq 0.01$ ; \*significant at  $p \leq 0.05$



**Figure 1: Structural model**

### DISCUSSION OF FINDINGS

The objective of this study was to explore the relationships between various types of innovation and firm performance, particularly in the context of manufacturing SMEs in Temeke District, Tanzania. The study focused on examining how product innovation and process innovation influence market innovation and how market innovation, in turn, impacts firm performance—an area that has been underexplored in prior research. Survey data collected from SMEs in the district revealed that both product innovation ( $H_1$ ) and process innovation ( $H_2$ ) are significant determinants of market innovation. Moreover, the findings demonstrate a positive relationship between market innovation and firm performance ( $H_3$ )

The significant effect of product innovation on market innovation aligns with previous research, such as Nguyen and Nguyen (2020), which suggested that product innovation positively influences market innovation by improving corporate efficiency. Additionally, Obunike and Udu (2018) found a strong link between product-oriented innovativeness and improvements in sales and employment through marketing activities. This suggests that the introduction of new products and services likely improves the performance of SMEs in terms of market innovation.

Regarding the effect of process innovation, the study found a positive relationship between process innovation and market innovation. This finding supports Yezersky's (1988) research, which concluded that the introduction of innovative processes within a business yields favorable outcomes. Other studies, such as those by Chege, Wang, and Suntu (2020) and Mugogo (2020), have also shown a connection between process innovation and market innovation. Process innovation enhances efficiency, reduces costs, and improves the quality of goods and services, enabling firms to better meet customer demands and quickly adapt to market changes (Shaukat et al., 2013).

Lastly, the study provides empirical evidence of the positive role of market innovation in improving firm performance. This finding is consistent with Nyachwaya (2017), who found that market innovation, such as improving product reliability, diversifying offerings, and increasing revenue, positively impacted SME performance. The results suggest that introducing novel market ideas can substantially improve firm performance, including profitability, revenues, and operational efficiency (Yelmi et al., 2021).

The theoretical implication of this study is significant, as it provides empirical evidence confirming the relationships among innovation dimensions in the context of Tanzania, an area that has been relatively underexplored. The positive relationship between product and process innovation, and market innovation, highlights that these initial innovation dimensions are crucial for driving market innovation in manufacturing SMEs. The study further supports the idea that product and process innovations serve as essential catalysts for market innovation, keeping markets vibrant, competitive, and responsive to consumer needs.

Unlike previous studies that mainly focused on examining the direct impact of product and process innovation on firm performance, this study has introduced market innovation as a mediating factor, demonstrating its strong linkage to firm performance. The findings emphasize that product and process innovations are essential in driving market innovation, which is key to improving firm performance.

In practical terms, the study suggests that SMEs should prioritize investing in product and process innovations to enhance their capabilities and performance, ultimately ensuring their survival and competitiveness. Managers are advised to allocate adequate resources to market innovation activities to foster greater business performance.

## **CONCLUSION**

This study examined the relationships between different types of innovation and firm performance within Tanzanian manufacturing SMEs. The findings revealed that both product and process innovation had a significant and positive impact on market innovation. This suggests that firms that prioritize product and process innovation are better equipped to lead their industries, attract a diverse range of customers, and foster long-term growth. By excelling in these areas, companies gain a competitive advantage, set new industry standards, and prompt the widespread adoption of innovative practices. As a result, the market becomes more dynamic and competitive, creating an environment where continuous improvement and adaptation are essential.

Moreover, market innovation plays a crucial role in enhancing the performance of SMEs by driving growth, increasing competitiveness, and fostering customer loyalty. Through the adoption of innovative marketing strategies and continuous adaptation to market trends, SMEs can differentiate themselves, tap into niche markets, and better meet customer needs. This customer-centric approach not only helps attract new clientele but also strengthens relationships with existing customers, leading to sustained business growth. Additionally, market innovation encourages SMEs to remain agile and responsive to changes, enhancing their resilience in dynamic environments. Ultimately, market innovation provides SMEs with the necessary tools to achieve long-term success and maintain a competitive edge in the marketplace.

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