

# RESILIENCE STRATEGIES FOR SMALL BUSINESS IN INDUSTRY 5.0

**Edited by** Timilehin Olasoji Olubiyi,  
Olumide Babatope Longe, K. Suppiah Susela Devi  
and Mudita Sinha

CONTEMPORARY ISSUES IN  
ENTREPRENEURSHIP RESEARCH

**VOLUME 21**

# RESILIENCE STRATEGIES FOR SMALL BUSINESS IN INDUSTRY 5.0

As Industry 5.0 redefines the relationship between humans and machines, moving beyond automation to embrace personalisation, sustainability, and collaboration, this book – *Resilience Strategies for Small Business in Industry 5.0* – offers a clear, actionable roadmap for small businesses seeking not only to survive but to thrive in Industry 5.0. It is a timely and insightful contribution to the evolving discourse on the future of entrepreneurship in an age of intelligent industry transformation. The authors deftly explore how small enterprises can build adaptive capacity, leverage digital–human synergies, and integrate ethical and sustainable practices into their business models. Drawing from interdisciplinary research and practical case studies, this book equips business leaders, policymakers, and scholars with tools to navigate disruption and foster long-term resilience. I therefore endorse this book for anyone invested in the future of small business whether as a practitioner, academic, or policymaker. *Resilience Strategies for Small Business in Industry 5.0* is not just a manual for survival; it is a manifesto for inclusive and intelligent growth in the next industrial age.

—**Dr Vijay Prakash Gupta, Associate Professor and PhD Coordinator,  
Institute of Business Management-GLA University Mathura, India**

*Resilience Strategies for Small Business in Industry 5.0* is a timely and insightful contribution to the evolving landscape of business innovation and sustainability. This book skilfully addresses the pressing need for small enterprises to adapt, thrive, and lead in an era defined by human-centric technology and intelligent collaboration. The editorial team has demonstrated remarkable dedication and vision in curating a volume that is both academically rigorous and practically relevant. Their collective expertise, drawn from diverse professional and cultural backgrounds, has enriched the content, making it globally relevant and locally impactful. Equally commendable is the diversity of the chapter contributors, each bringing unique perspectives, experiences, and solutions that reflect the real-world challenges faced by small businesses today. Their contributions ensure that the strategies presented are not only theoretically sound but also grounded in practice. This book is more than a scholarly resource; it is a strategic guide that will empower small business owners, policymakers, and industry leaders to build resilient systems capable of withstanding and growing through the disruptions of the Industry 5.0 era. I wholeheartedly endorse *Resilience Strategies for Small Business in Industry 5.0* as a valuable and necessary addition to the library of anyone invested in the future of small enterprise resilience and innovation.

**Professor Popoola and Sunday Olanrewaju, Department of Library, Archival  
and Information Studies, University of Ibadan, Ibadan, Nigeria**

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CONTEMPORARY ISSUES IN ENTREPRENEURSHIP  
RESEARCH VOLUME 21

# RESILIENCE STRATEGIES FOR SMALL BUSINESS IN INDUSTRY 5.0

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# CONTENTS

<i>About the Editors</i>	<i>ix</i>
<i>About the Contributors</i>	<i>xi</i>
<i>Foreword</i>	<i>xix</i>
<b>Chapter 1 Fostering Artificial Intelligence in Small Businesses in Sub-Saharan Africa</b> <i>Timilehin Olasoji Olubiyi</i>	<i>1</i>
<b>Chapter 2 Sustainability Through Green Entrepreneurial Orientation (GEO)</b> <i>Indranil Mutsuddi and Sulagna Das</i>	<i>17</i>
<b>Chapter 3 Resilience Strategies and Sustainability in Business</b> <i>Godwin Ayodeji Nwogu</i>	<i>37</i>
<b>Chapter 4 Quantum-inspired Strategies and Business Resilience in Industry 5.0: A Study of Small Businesses</b> <i>Saladi Jaswanth Seshasai, R. Vijay Raja and G. Kumar</i>	<i>53</i>
<b>Chapter 5 The Effect of Digital Transformation Capability on Business Model Innovation in Industry 5.0: Evidence from Vietnamese Small and Medium Enterprises</b> <i>Tang My Sang</i>	<i>69</i>
<b>Chapter 6 Digital Marketing Strategy for SMEs in India and South East Asian countries in Industry 5.0: A Literature Review</b> <i>Sabita Bhagabati</i>	<i>89</i>
<b>Chapter 7 Cyberloafing and the Future of Business Productivity in Developing Economies: Insights From India</b> <i>Divya, Timilehin Olasoji Olubiyi and Mahabir Narwal</i>	<i>105</i>

<b>Chapter 8 Sustainable Growth in SMEs With Generative AI: Reaping Rewards, Tackling Challenges, With Human Insights</b> <i>Umme Ara and Shivani Pandey</i>	125
<b>Chapter 9 Resilience: Future Trends and Challenges in Small and Medium Enterprises</b> <i>Mohit Sharma, Rishi Chaudhry, Raj Kumar, Nitika Malik and Kuldeep Chaudhary</i>	147
<b>Chapter 10 Impact of Information and Communication Technology on E-business of Small- and Medium-Scale Enterprises in Nigeria</b> <i>Mary Agamalaḡiya, Kelvin Inobemhe and Tsegyu Santas</i>	165
<b>Chapter 11 Prioritisation of Human Resource Strategies in the Digital Transformation Process of SMEs</b> <i>Tuḡçe ŐimŐek and Ahmet Bahadır ŐimŐek</i>	181
<b>Chapter 12 Disruptive Technology and Performance of Manufacturing SMEs as Moderated by Technological Innovation in South-West Nigeria</b> <i>Olamide Titilayo Ayodeji, Timilehin Olasoji Olubiyi, Titilayo Doris Ibikunle, Israel Olabode Aroge and Abiodun Richard Obisanya</i>	203
<b>Chapter 13 Strengthening Legal Frameworks for Small Businesses Integrating Artificial Intelligence in Consumer Products: Navigating Nigerian Regulations in the Era of Industry 5.0</b> <i>Rosetta Okiemute Isiavwe, Mary-Ann Onoshioke Ajayi, Folajimi Olayiwola Jegelola and Olayiwola Owoade Oladele</i>	223
<b>Chapter 14 E-commerce in Industry 5.0: Insights Into Consumer Purchasing Preferences and Behavior</b> <i>Richard Fedorko and Őtefan Král'</i>	241
<b>Chapter 15 Talent Management Practices and Product Differentiation as Resilience Strategies in Africa</b> <i>Solomon Olusegun Adeoye and Johnson Ashiemamho Egwakhe</i>	257

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# FOREWORD

In a period characterised by swift technology progress, societal transformations, and environmental issues, small businesses encounter distinct opportunities and significant problems. Industry 5.0, defined by the amalgamation of human intellect with sophisticated technology like artificial intelligence, robotics, and the Internet of Things, is revolutionising the domains of business, production, and service provision. This transition, although it offers enhanced efficiency and creativity, also poses issues such as disruption, unpredictability, and the necessity for swift reaction. In this situation, resilience is essential for the survival and growth of small businesses. The book *Resilience Strategies for Small Business in Industry 5.0* serves as a pertinent and essential resource for entrepreneurs, business executives, scholars, and regulators. This book offers a comprehensive analysis of how small businesses may not only endure but also prosper under disruptive challenges. By meticulously examining modern scholarly contributions, it provides readers with the skills, frameworks, and insights essential for cultivating resilience in a progressively intricate and rapid business landscape. The editors of this collection have utilised a multidisciplinary approach to create a comprehensive perspective on resilience. The book transcends academic principles, providing practical techniques that small businesses may use to enhance their operational and strategic frameworks. This includes adjusting to technological progress, nurturing a culture of innovation, constructing flexible organisational frameworks, and promoting sustainable practices capable of enduring external disruptions.

The book's primary contribution is its emphasis on the human aspect of resilience. In Industry 5.0, the integration of human qualities with technology is essential for sustaining a competitive advantage. Resilient businesses will be those that empower their personnel, cultivate skills, and uphold a flexible and adaptive organisational mentality. The amalgamation of human-centred techniques with advanced technical innovations creates a dynamic foundation for enduring success in an increasingly automated environment. Furthermore, this book recognises the essential function of leadership in fostering resilience. Leaders in the Industry 5.0 era must adeptly manage technological transformation while motivating their people to adopt innovation, oversee change, and cooperate across several fields. The authors provide pragmatic advice on cultivating resilient leadership that promotes a growth-oriented, future-ready mentality in small businesses. This book is a crucial read for anybody seeking to comprehend how tiny businesses might utilise resilience techniques to navigate the changing obstacles and prospects of Industry 5.0. This guide is essential for entrepreneurs seeking to establish their firms for sustained success in a progressively digital and linked environment. As we enter this new industrial revolution, the ideas inside these pages will assist small companies in not only surviving but flourishing among

the significant transformations influencing our global economy. I thank the contributors for their insightful contribution to this significant issue and for offering a thorough and practical resource for small business executives addressing the intricacies of Industry 5.0.

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# CHAPTER 1

## FOSTERING ARTIFICIAL INTELLIGENCE IN SMALL BUSINESSES IN SUB-SAHARAN AFRICA

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### ABSTRACT

*In the present era, there are numerous consumer data sources, particularly through web services and terminals such as point of sales to better understand customers. More so, it has become challenging to gather and evaluate this vast amount of data manually. This chapter highlights the role of artificial intelligence (AI) in improving relationships with customers and explores the techniques used to analyze customers' data in order to predict their demands and reach their satisfaction. The objective of this study was to empirically test the effect of AI on customer satisfaction of selected family-owned businesses listed in Nigeria, the most populous and one of the biggest economies in Africa. This implies that AI is a significant predictor of customer satisfaction. The study suggests that companies should employ AI solutions to improve operational efficiency. Through the implementation of AI, companies can optimize their operations, decrease expenses, and enhance their ability to adapt to market fluctuations and client needs.*

**Keywords:** Business intelligence; business performance; customer retention; family businesses; Nigeria

**JEL Classifications:** L25; M10; O55; L10; O30; D63; L24

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## INTRODUCTION

AI has become an increasingly important tool for businesses of all sizes in today's rapidly evolving business landscape. AI technologies have the potential to improve efficiency, accuracy, and innovation in a variety of industries, including healthcare (e.g., [Rajpurkar et al., 2022](#)), automotive (e.g., [Grigorescu et al., 2020](#)), and small business (e.g., [Bunte et al., 2021](#); [Schönberger, 2023](#)). AI is becoming increasingly important for small businesses as it offers numerous benefits that can help them to compete with larger organizations ([Olubiya, 2022a](#); [Sinha & Sathiyarayanan, 2024](#)). The term "artificial intelligence" is not generally defined due to its various manifestations and applications ([Bunte et al., 2021](#); [Meub & Proeger, 2022](#)). Despite the wide availability of AI technologies and their impressive performance potential, small- and medium-sized enterprises (SMEs) often struggle to take full advantage of them ([Brodny & Tutak, 2022](#)). Hence, the necessity for AI systems emerges to facilitate the comprehension of the corporate data ([Ibrahim & Handayani, 2022](#); [Schönberger, 2023](#)). Compared to large companies, small businesses have numerous advantages. Numerous benefits were highlighted by [Schumacher \(1973\)](#), including their competitive structure, increased efficiency, ease of adapting to new needs and technologies, less repetitive work positions, and more resilience to economic downturns. Additionally, [Şentürk and Keskin \(2010\)](#) noted their increased decision-making agility. Because of this, small business owners that rely on a team of specialists may not be able to hire workers with the same degree of expertise or productivity as they could if they used the new AI tools. AI can open up new opportunities for small businesses to develop smart and creative goods and services, as well as new organizational structures and economic models ([Gu et al., 2019](#)). These small businesses' ability to use technology, particularly AI, to effectively and efficiently adapt to the complicated dynamics of the global market will determine whether they succeed or survive.

While big businesses across a range of industries have already made great strides in deploying AI applications, SMEs confront special difficulties that frequently impede their adoption of AI solutions, particularly limited financial and human resources. SMEs sometimes have tight operating margins and restricted access to funding, which makes it challenging for them to purchase the pricey technologies needed for digital transformation ([Alwaely et al., 2024](#); [Schönberger, 2023](#)). These data are then analyzed and converted into valuable insights, which assist managers and owners in making informed decisions to enhance business performance and achieve the necessary goals for business success. The demand for AI arose throughout the later years of the 20th century, and it has since become a crucial component of decision-making procedures ([Triono & Jaya, 2021](#)). Organizations are increasingly adopting AI to attract consumers and achieve a competitive advantage but less is seen in Africa particularly in Nigeria the largest consumer country on the continent. It becomes even more important for family-owned businesses which are continually faced with immense pressure to retain existing customers and attract more customers for survival. AI can enhance the company's comprehension of its customers, leading to improved customer relationships. This includes expediting the conversion of potential clients into actual clients, decreasing customer attrition, and increasing sales to existing

customers. Consequently, these efforts will boost sales and revenue for the company (Habul & Pilav-Velic, 2010). This chapter will explore the methodologies employed by AI in enhancing customer relationships. However, before delving into these strategies, it will provide an explanation of the AI system idea and the specific functions of each component. Considering the use of AI as a research context, several researchers (Alwaely et al., 2024; Bach et al., 2018; Bunte et al., 2021; Chen & Lin, 2021; Chen & Prentice, 2024; Chen et al., 2022; Olubiyi, 2022a; Schönberger, 2023; Yang, 2023; Yiu et al., 2021). Adejoh and Hadiza (2015), Nebo et al. (2015), Ghasemaghaei and Calic (2020), Hadhoud and Salameh (2020), Marchalina and Ahmad (2017), and Olubiyi (2022a) have investigated the impact of technology on performance and have concluded that it enhances customer satisfaction in organizations. However, these studies were undertaken in industries other than the small business industry in developing economies. Therefore, the researcher is compelled to take a fresh look at the issues in the context of emerging economies, specifically Nigeria. SMEs play a crucial role in the global economy, yet they often face significant challenges in implementing cutting-edge technologies such as AI due to limited resources and expertise. As a result, the goal of this chapter is to fill the gap in Nigeria, the most populous and the largest economy in Africa. This study aims to analyze the function of AI in customer satisfaction and emphasize the need of utilizing intelligent technologies in the rapidly expanding small businesses that are family owned. Therefore, the objective of this study is to identify the impact of AI on customer satisfaction of selected family-owned businesses in Nigeria.

## LITERATURE REVIEW

### *Artificial Intelligence*

AI is defined as the application of advanced analytics and logic-based techniques, including machine learning, to interpret events, support and automate decisions, and perform actions (Schönberger, 2023; Ukhalkar et al., 2020). AI involves the collection of data from many sources in the business environment and within the business itself. There is also a wide range of anticipated advantages to AI integration. The main advantages were determined to be cost savings, enhanced decision-making, automation of company processes, higher productivity and efficiency, and personalized offerings and services (Williady & Ban, 2023). This includes accelerating the conversion of potential clients into actual customers, reducing customer attrition, and increasing sales to existing customers. Ultimately, these efforts will result in increased sales and revenue for the company (Habul & Pilav-Velic, 2010).

The objective is to facilitate the process of making improved decisions by enhancing both their ease and speed (Triono & Jaya, 2021). The volume of business data is growing at an exponential rate. In the era of intense information competition, it is imperative for individuals to possess the ability to make more efficient and effective decisions. AI involves acquiring accurate and relevant data, harnessing its potential, and effectively communicating its worth (Hadhoud &

Salameh, 2020). AI refers to the process of acquiring accurate information and providing it to the appropriate user in a timely manner, in order to enhance the decision-making process (Ibrahim & Handayani, 2022). AI encompasses the various processes, operations, strategies, technologies, and tools required to transform data into information, information into knowledge, and knowledge into plans that facilitate productive business actions (Sinha & Sathiya Narayanan, 2024). The AI umbrella encompasses data warehousing, business analytics, and knowledge management (Triono & Jaya, 2021).

### *Customer Satisfaction*

Customer satisfaction is considered a crucial factor in customer retention, loyalty, and positive word of mouth (Al-Balushi et al., 2020; Oliver, 1980). In the consumer goods industry, customers who are very satisfied with the retail products and services are likely to remain with the family-owned businesses, recommend it to others, or make future purchases (Al-Mawali et al., 2021; Al-Rousan & Al-Shishani, 2021). Implementing AI tools, data analysis and reporting, business process integration, and continuous improvement and innovation are crucial for achieving long-term business success and also prevent environmental issues in the consumer goods industry. These factors serve as catalysts that can propel the organization toward its desired position (Al-Rousan & Al-Shishani, 2021). By utilizing these business intelligence skills, firms may obtain significant insights into consumer preferences, habits, and changing demands. This information can lead to opportunities such as personalized product offerings, improved operational efficiency, and, most importantly, enhanced customer satisfaction. Developing a highly effective AI implementation can enhance customer satisfaction by enabling retailers to consistently deliver superior services and surpass customer expectations through personalized service offerings, prompt issue resolution, and effective collaboration among various departments (Al-Balushi et al., 2020; Al-Mawali et al., 2021). Conversely, customers who are extremely satisfied will dedicate more time to a company, enhance their loyalty, and generate new customers through repeat purchases. As a result, they will endorse the startup's products and services through positive word of mouth, ultimately leading to improved marketing effectiveness, customer acquisition, and retention.

### *Theoretical Review*

#### *The Resource-Based View (RBV)*

The RBV theory, which was formulated in the strategic management literature, posits that a firm's unique combination of internal resources, including its advantages, is the main determinant of the firm's profitability and competitive advantage. In addition to the RBV, physical assets encompass other resources, including technology, infrastructure, intangible assets such as brand recognition and intellectual property, and organizational capabilities consisting of knowledge and skills (Asiaei et al., 2021). Based on the resource-based concept, this hypothesis suggests that companies with valuable, rare, inimitable, and non-substitutable (VRIN) resources are more likely to outperform their competitors

(Bhandari & Alonge, 2020). Considering the field of study, the application of business intelligence may be seen as a tool for enterprises to effectively utilize their internal resources. Marketers can use this tool to enhance their marketing efficiency (Yiu et al., 2020). Without utilizing tools and processes to enhance customer data and track market trends and consumer behavior, enterprises will experience the negative impact of inefficient marketing, resulting in enhanced marketing effectiveness. Adopting AI also enhances organizational competencies such as experience in data analysis and agility in decision-making. It enables the company to promptly respond to external situations and intensify competition with other entities (Medeiros & Maçada, 2022). RBV theory asserts that a firm's sustained competitive advantage should be based on its possession and effective exploitation of resources that are highly valued, rare, difficult to imitate, and not easily replaceable (Gupta et al., 2020). Upon closer examination of the consumer goods industry, it becomes evident that AI has emerged as the primary factor that sets organizations apart. By utilizing state-of-the-art analytical tools, businesses are able to make astute marketing decisions, hence enhancing their ability to compete with their competitors (Al-Rousan & Al-Shishani, 2021; Rasheed & Rashid, 2023). Within the Nigerian consumer goods industry, the use of AI applications can significantly enhance marketing effectiveness. Companies can leverage these applications to gain a deeper understanding of their customer base, identify emerging trends, and tailor their offerings and marketing campaigns accordingly to meet customer requirements (Bharadiya, 2023).

### *Empirical Review*

#### *Relationship Between AI and Customer Satisfaction*

A vast array of theoretical and technological advancements serves as the foundation for the study of AI in SMEs. The different aspects of AI, current trends in the area, and its growing importance in the business sector, especially in SMEs, are first explored in order to better comprehend the strategy, methodology, and findings of this research. AI has the potential to fundamentally alter the marketplace and transform how companies engage with their customers (Bock et al., 2020; McLean & Osei-Frimpong, 2019). Researchers in the scientific field have explored various topics related to AI (Schönberger, 2023). Some of these include the critical success factors for implementing AI, the impact of AI on decision-making processes, the role of AI in enhancing organizational agility and competitiveness, and the challenges associated with implementing AI (Paradza & Daramola, 2021). The study conducted by Al-Rousan and Al-Shishani (2021) provides a comprehensive insight into the historical progression of AI and its extensive effects on enterprises. In contrast, other studies (Kumar et al., 2023) provide insights into the key aspects that lead to the success of AI through AI programs. Tseng et al. (2020) provide a comprehensive and specialized resource on AI that is specifically designed for both academics and professionals. Bharadiya (2023) argued that it is crucial to build complete models for AI and analytics. These models should encompass the link between the aforementioned activities and the overall objectives of the company. These studies together contribute to

the exploration of how AI is utilized to enhance decision-making and customer satisfaction through data analysis, to improve organizational performance, and provide a competitive advantage. The research on consumer satisfaction has been a subject of study in academia and industry for many years. Scientists have mostly concentrated on identifying the immediate factors and results of consumer satisfaction (Massaro & Secinaro, 2021). Also, researchers have examined AI and customer satisfaction from various perspectives, including the evaluation and categorization of metrics (Pandey et al., 2020), the influence of AI on customer satisfaction and company performance, but not on consumer goods industry in developing economies (Tarsakoo & Charoensukmongkol, 2020). Consequently, this study sought to bridge the gap and hypothesized thus:

$H_{0j}$ : There is no significant effect of AI on customer satisfaction of selected family-owned businesses in Nigeria.

*Conceptual Model*

The model (Fig. 1.1) sheds light on AI measured by usage of data quality, interactivity, and security on customer satisfaction which is the research framework. The independent and dependent variables for this research are AI (X) on customer satisfaction (Y), respectively.

*Model Specification*

The model sheds light on the effect of AI on customer satisfaction which is the research framework. Given, the mathematical derivative function which gives the value of the slope at any value ( $x-x_n$ ) since intuition explains that as  $\Delta x \rightarrow 0$ , then  $\Delta y \rightarrow 0$ . This can be deduced mathematically since a firm’s customer satisfaction is a function of AI

$$y = f(x_1 - x_n).$$

Hypothesis:

$$Y = P_0 + P_1x_1 + P_2x_2 + P_3x_3 + P_4x_4 \qquad \text{Regression equation (1)}$$

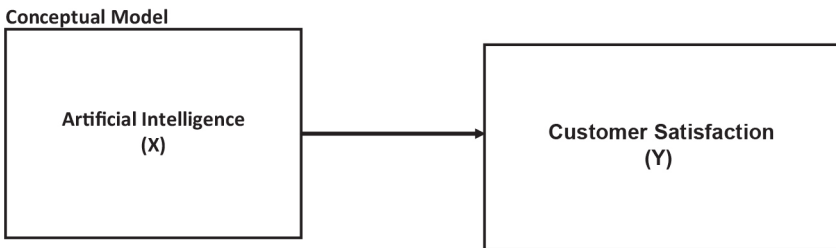


Fig. 1.1. Author’s Conceptual Model (2024).

## METHODOLOGY

The research context of this study is the small business sector and the present investigation is limited to family-owned businesses in Lagos State, Nigeria. For this quantitative study, a cross-sectional survey research design was adopted and the justification for adopting the survey is due to its usefulness in assessing the thoughts, opinions, and feelings of different groups of individuals and allowing them to give more valid and honest feedback on the area of study. This chapter relied on the prior study methodology of [Arokodare and Olubiya \(2023\)](#), [Makinde et al. \(2023\)](#), [Olowoporoku and Olubiya \(2023\)](#), [Olubiya \(2019, 2022a, 2022b, 2023a, 2023b\)](#), [Adeoye et al. \(2023\)](#), [Olubiya et al. \(2023\)](#), [Olubiya and Akpa \(2023\)](#), [Adeyemi and Olubiya \(2024\)](#), [Olubiya, Lawal, et al. \(2022\)](#), and [Omoyele et al. \(2023\)](#) with cross-sectional survey and a population of family businesses consisting of owners/managers of selected businesses SMEs in Lagos State, Nigeria. The companies are registered with the Small and Medium Enterprises Development Agency of Nigeria (SMEDAN) in Lagos State, Nigeria, in order to determine whether there is a correlation between knowledge management techniques and sustainable business success.

This study focuses on family enterprises and family-owned SMEs where a single family holds more than 50% of the shares. The research population consisted of SMEs owned and operated by families in selected local government areas of Lagos State. This study evaluated five local government areas: Oshodi Apapa, Ibeju-Lekki, Ikeja, Lagos Island, and Lagos Mainland. Members of the SMEDAN are highly concentrated in these regions, hence the choice to focus on them. Lagos State is selected due to its reputation as Nigeria's commercial hub. As of 2020, 11,663 SMEs were registered with SMEDAN in Lagos State, including 11,044 small businesses and 619 medium-sized businesses. According to [Olubiya \(2019\)](#), the following criteria must be met for a business to be included in the study: (a) a family must own it; (b) it must be owned by a family and operated by a family member; (c) it must be legally registered with the Corporate Affairs Commission (CAC); (d) it must employ between 10 and 50 workers; and (e) it must have existed for more than 10 years. [Table 1.1](#) provides an overview of how the sample size is distributed across the selected strata using a simple random sampling technique.

According to a SMEDAN report, 11,663 family-owned SMEs are in operation, which may have decreased or increased due to the recent economic recession and pandemic outbreak. Due to time and cost constraints, it would be practically impossible to study all 11,663 populations. Therefore, a sample is analyzed.

**Table 1.1.** List of Family Businesses By Divisions in Lagos States, Nigeria.

Small Business Sector	Ikorodu	Badagry	Ikeja	Lagos Island	Epe	Total
Manufacturing	5	2	50	40	4	101
Real estate	20	12	30	60	10	132
Agriculture	8	5	–	–	10	23
Service	17	10	110	100	10	247
Total	50	29	190	200	34	503

Source: Researcher's computation (2024).

The sample size for this study was calculated using Yamane's (1967) formula for sample determination from a finite population. Utilizing Yamane's (1967) sampling formula, a representative sample from the general population was determined. This formula selects a sample  $n$  from a population  $N$ , assuming a sampling error of 5%. The researcher used a 5% level of significance to determine the sample size; the sample size was calculated using the following formula:

$$n = \frac{N}{1 + N(e)^2}$$

where

$n$  = desired sample size

$N$  = population of the study

$e$  = level of significance/tolerable error margin at 5%

1 = constant

$$n = \frac{11,663}{1 + 11,663 (0.05)^2}$$

$$n = \frac{11,663}{1 + 11,663 (0.0025)}$$

$$n = \frac{11,663}{1 + 29.1575}$$

$$n = \frac{11,663}{30.1575} = 386.73$$

$$n = 387$$

According to Israel and Glenn (1992), for the probability of non-response, 30% of the sample should be added to the original sample size to account for the non-response rate. In light of this, a 30% non-response rate allowance (116) was added, bringing the total sample size for the study to 503 SMEs operating in Lagos State. A stratified sampling technique was used to provide a representative sample of the identifiable groups, namely the local government areas in Lagos State and the responding small- and medium-sized businesses. The justification for using stratified sampling in this research is that it makes the sample from the population more manageable and inexpensive by grouping it into strata. It typically improves the accuracy of estimates for the entire population.

#### *Data Analysis*

The researcher provided respondents with 503 copies of the questionnaire; 469 copies of the questionnaire were deemed useful for the study after data coding and verification. This represented a response rate of 93.2%, and 34 copies of the