ATTITUDE OF MICRO-ENTREPRENEURS TOWARDS ADOPTABILITY OF SIMULATION FOR OPTIMAL INVENTORY MANAGEMENT DECISIONS IN NIGERIA: EMPIRICAL EVIDENCE FROM LAGOS STATE

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Abstract

This paper examined the attitude of different categories of micro-entrepreneurs towards adoptability of simulation process for optimal inventory management decisions in Nigeria with empirical evidence from Lagos State. This was undertaken to determine the willingness, readiness, and ability of selected micro-entrepreneurs in Lagos to adopt the simulation process as an alternative optimization tool towards attaining optimality in inventory management. In accomplishing the objective of the study, the quantitative descriptive survey research design was adopted and data were collected using structured questionnaire which was administered to randomly selected micro-entrepreneurs in Lagos State. The responses from the questionnaire administered were analyzed using both deductive and inductive statistical tools which included custom frequency table, Pearson Chi-square test, Fisher's exact test and Kruskal-Wallis test with the aid of SPSS. The result of the investigation shows that 84.79% of the respondents were willing and ready to adopt simulation process for optimal inventory management decisions if they are given necessary training on how it works; and that, there is no statistically significant difference in the attitude of different categories of micro-entrepreneurs with respect to the subject of investigation in the study area. As such, a synergetic partnership among all stakeholders responsible for promoting, supporting and driving the operations of micro-entrepreneurs in Nigeria is recommended towards training programmes for possible adoption of the alternative inventory management optimization approach within the micro-enterprise ecosystem.

Key Words: Attitude, Inventory Management, Micro-Entrepreneurs, Optimal Decisions, Simulation.

1.0 Introduction

Every business operator which does not exclude micro-entrepreneurs is constantly faced with management decision problems relating to inventory management which is an important integral part of the determining factors for business survival, continuity, growth and profitability as ongoing concern. Business enterprises are designed to fulfill specific goals and objectives, and in an effort to do so, decisions are taken and resources are allocated in a suitable manner. Consequently, the enterprise manager as an entrepreneur becomes a decision-maker being the one who has the original business idea and tries to make a difference by creating value for the market.

An enterprise manager in the words of Fourie (2007) is someone who acts with ambition that exceeds what can be supported by the resources under his or her authority, in a persistent pursuit of an opportunity. According to Acha and Nduaguibe (2012), due to the fact that most decisions are taken to secure the survival, stability, continuity, and

growth of business and operating performance, the decision-making process of entrepreneurs is not always activated when an enterprise sees a crisis.

Inventory management optimization is a serious management decision problem for most businesses especially micro-enterprises, because one of the essential elements for an enterprise's success is efficient inventory flow management (Daniel & Assefa, 2018). In other words, an inefficiently managed inventory will lead to an irreversible loss for any enterprise operating in a highly competitive business environment. To maintain a balance between inventory supply and demand is the fundamental difficulty of inventory management. An enterprise would ideally like to have adequate inventory to meet client needs without losing sales due to stock-outs of inventory. However, due to the inventory carrying cost, the business does not want to keep too much inventory on hand. As such, the ultimate objective of inventory management according to Coyle, Bardi, and Langley (2003) is to hold or carry enough but not too many inventories perpetually, which is all about inventory management optimization.

Businesses, especially micro-enterprises, must significantly increase performance, reduce costs in their supply chains, and offer effective customer service to assure customer satisfaction in order to succeed in today's aggressive business environment. This can only be attained through competent inventory management with the use of well-established optimization tools such as simulation. Achieving optimal inventory management will ensure large sales turnover and profit as well as retention of current and potential customers. As a result, to minimize operating expenses and losses while maximizing profit, the level of inventory should be balanced at every stage of business operations. It should not be either too high or too low (Hugo, Fettermann, Tortorella, & Testoni, 2016). This according to Ballou (2000) is the lifeblood and the heart of any enterprise and has attracted scholars from the global business world.

The simulation approach to inventory management yields optimal result and does not involve esoteric computational injunctions when capered with the traditional inventory models. However, it is not a popular technique within the micro-enterprise ecosystem. As such, before the introduction of a relatively new approach for inventory management optimization like simulation process as an alternative to the traditional method within the micro-enterprise ecosystem, it is expedient to understand the behavioural attitude of different categories of operators in that ecosystem. Hence, the need to investigate the attitude of micro-entrepreneurs towards adoptability of simulation process for optimal inventory management decisions. This is primarily to establish their willingness, readiness and ability to adopt a seemingly new approach to inventory management. This therefore, has necessitated this research work to investigate the attitude of micro-entrepreneurs towards adoptability of simulation process for optimal inventory management decisions in Lagos, Nigeria.

Objectives and Hypothesis Development

The basic objective of the empirical study is to determine the attitude of different categories of micro-entrepreneurs towards adoptability of simulation process for optimal inventory management decisions. The predictor variable for the study is the attitude of micro-entrepreneurs measured in terms of willingness, readiness and ability for adoption; while the dependent variable is adoption of simulation process for inventory management for the purpose of optimization.

The tentative answer to the research question of what kind of attitude do different categories of micro-entrepreneurs exhibit towards adoptability of simulation process for optimal inventory management decisions is presented in the hypothesis of the study as stated below in the null form.

H_0: There is no significant difference in the attitude of different categories of micro-entrepreneurs towards adoptability of simulation process for optimal inventory management decisions.

2.0 Literature Review

2.1 General Overview of Micro-Enterprises

Since the early 1970s, there has been a rising understanding of the significance of small businesses for economic development. They are viewed as the catalysts for job creation, eradicating poverty, and promoting equality. Following the finding of extensive entrepreneurial activity in both developed and developing nations, the 1980s witnessed an escalation of this interest and a corresponding expansion of policy into the area of micro-enterprises (Gomez, 2008).The concept of micro-enterprise has been recognized and generally described since the 1990's as a very small business that is owned and managed by poor individuals or a group of poor people (Midgley, 2008).However, depending on a country's level of development, policy objectives, and administration, a micro-enterprise can be described in a variety of ways going by World Bank. Individuals may own or run micro-enterprises, and frequently their families are also engaged. Alternatively, they might be owned and run jointly by groups of individuals. Furthermore, the numbers of participants are typically low, and some experts contend that for a business to be considered a micro enterprise, no more than five individuals are required (Jurik, 2005). SMEDAN-NBS (2017) defined micro-enterprises as those businesses with a staff of no more than 10 people and total assets of less than ten million naira (excluding land and buildings). It's crucial to understand that micro enterprises are, by definition, distinct from regular small-scale enterprises, which are defined as businesses with total assets (excluding land and buildings) above ten million naira but below one hundred million naira and a workforce totaling over ten but under 49 employees. Thus, there is a growing understanding of the necessity for micro-level strategies that address the unique issues faced by small-scale entrepreneurship and are consistent with the overall goals of industrial and macro-economic policy. In the current context of globalization, emerging nations must immediately make sure they have a critical mass of local middle-market businesses that are capable of competing internationally and gaining access to global production chains.

Importance of Micro-enterprises

The importance of micro-enterprises is conceived in terms of the beneficial issues related to micro-enterprises. A World Bank study points out the following as the benefits of micro-enterprises.

i. Increasing national product and aggregate output
ii. Enabling the efficient use of capital and labour
iii. Initiating and utilizing indigenous resources
iv. Bringing a regional balance
v. Improving the quality of life and distribution of income

However, Fate Foundation (2019) considered the importance of micro-enterprises according to the categorization below.

Importance to the Economy

i. Higher employment offerings

ii. Increased domestic resources
iii. Global competitiveness
iv. Innovation and industry development
v. Human capital development
vi. Growth in investor confidence
vii. Growth in entrepreneurship

Importance to Business

i. Higher productivity
ii. Increased profit and market share
iii. Durability and longevity
iv. Innovation
v. Greater capacity
vi. Higher industry influence
vii. Attractive investor returns

Importance to Employees and Community

i. Enhanced ambition
ii. Personal and professional development
iii. Better network
iv. Greater societal impact
v. Perks
vi. Improved quality of life

2.2 Overview of Inventory Management

Inventory management has been viewed by different scholars in diverse ways. Miller (2010) asserts that inventory management encompasses all measures used to guarantee that customers have access to the goods or services they require. In order to satisfy organizational and marketing

requirements for making the product available to clients, it coordinates the operations of purchasing, production, and distribution. The amount and location of stored products are the main concerns of inventory management. Inventory management, according to Eneje, Nweze, and Udeh (2012), is the process of transferring in-process inventory around the company as well as delivering raw materials and supplies to the point of production. According to Panigrahi (2013), inventory refers to the stockpile of the goods a company is selling as well as the many parts that go into making those goods. Gerald (2006) describes inventory management systems as procedures for controlling inventories to satisfy customer demands while preserving the lowest feasible investment cost.

In order to safeguard the regular and planned flow of production against the unforeseen disruption of running out of supplies, inventory management is necessary at several points across a facility or at numerous locations of a supply network. The management of the lead time for replenishment, the replenishment of goods, returns and defective goods, demand forecasting, carrying costs of inventory, asset management, physical inventory, available physical space, demand forecasting, inventory valuation, inventory visibility, future inventory price forecasting, and quality management are also included in the scope of inventory management. To achieve an appropriate inventory level, which is a continuous process as the business requires a shift and responds to the external environment, it is possible to balance these criteria (Ogbo *et al*, 2014).

Classification of Inventories

Inventory types, according to Pandey (2007), include finished goods, work-in-progress, and raw materials;

a. Raw Material Inventory

An unprocessed natural substance used in production is what is meant by raw material inventory. Raw materials are described as direct materials that are waiting to be used in the manufacturing process. One industry's finished products could serve as another industry's raw materials. Raw materials are these fundamental inputs that are transformed into finished goods during the manufacturing process, according to Pandey (2007). This often consists of the basic material required to produce or build a finished good. All products that a business purchases for processing are included in this. For instance, a confectionary company's raw materials inventory can include flour, yeast, eggs, and other ingredients.

b. Work-In-Progress Inventory

Work-in-progress inventories cover materials and partially finished products that are in the middle of the manufacturing process. In other words, it is any materials that have undergone some processing but have not yet taken the form of final commodities. Inventories of products in process are another name for this. The plant needs to complete this level of raw material inventory before moving on to the next stage of processing. These are materials that have only partially undergone processing Pandey (2007).

A work-in-progress is an item that is still being worked on but is still unfinished. It also describes objects that are almost finished but aren't quite ready for sale. Additionally, it describes the stock of all materials whose processing has started but has not yet been

finished. Between raw materials and completed goods, these materials are typically encountered. Work-in-progress was described by Pandey (2007) is partially finished products and component subassemblies between manufacturing steps.

c. **Finished Goods Inventory**
These are the goods that are finished and offered for consumer purchase. Products that are finished and prepared for sale are referred to as finished goods, according to Pandey (2007). While the stock of finished goods is necessary for efficient marketing operations, the stock of raw materials and work-in-progress facilitates production. These could be the quantity of finished goods in the warehouse or stock of goods awaiting shipping. Coordination between the organization's production and sales sections is necessary to manage stock.

The Reasons for Holding Inventory

In order to avoid having its operations cut short, a company would keep more inventory than is currently required. Some of the reasons for keeping inventories according to Kuku (2004) are:

a. **Demand:** When a retailer has the goods his customers need in stock and ready to go, he may continue to operate. If not, the store will need to place a backorder for the item. Instead of waiting to let the original customer fill demand later if the consumer can obtain the items from another source, they may opt to do so through back-order. Hence, when products go out of stock, a sale may be lost forever in some cases.

b. **Running Operations:** To produce a product, a producer must have certain procured items such as subassemblies or raw materials components. When a producer is out of just one thing, finishing the creation of finished items can be avoided. Additionally, inventory between subsequent dependent processes helps to break the activities' dependence on one another. A work centre frequently needs pieces to work on from the prior operation. If a work centre stops producing, the other centres will close due to a lack of demand. If a stock of work-in-progress inventory is preserved between each work centre, each machine can continue to function for a finite amount of time, hopefully until operations resume at the original centre.
c. **Lead Time:** Lead time is the amount of time that passes between the time an order is placed and the moment the ordered items are actually received, whether it is a manufacturing order sent to the factory floor or a purchase order. The client company must maintain an inventory of necessary commodities if an internal department or plant, an external supplier, or both, are unable to meet demand for the required items. The longer the lead time, the greater the amount of inventory the company must maintain.
d. **Hedge:** Inventory can also be utilized as a protection against inflation and price hikes. Salesmen frequently phone buying agents before a price rise takes effect. This allows the buyer the ability to buy materials beyond what they currently require at a price that is less expensive than it would be if they waited until the price increase had already taken place.
e. **Quantity Discount:** Large-scale purchases frequently result in price breaks for the businesses. Additionally, this typically causes the inventory to be greater than what is currently required to meet demand. However, if the discount is adequate to cover the

additional holding costs incurred as a result of the surplus inventory, then the decision to purchase in bulk is reasonable.

2.3 Inventory Management Decisions

The process of decision-making in managing inventories for optimality requires the identification and analysis of alternatives as well as the choice of the alternative that offers the greatest outcome. One of the methods that can help managers of business enterprises in arriving at the relatively best decision alternative which will subsequently depict optimization in this study is the Operations Research technique. Operations research optimization methods aid business decision-makers in achieving efficiency, boosting productivity, and improving overall corporate performance (Idolor, 2012). In recent years, there has been considerable curiosity in the application of operations research optimization techniques in business enterprises all over the world but the situation according to Ogbo, Onekanma, and Wilfred (2014) is more critical in developing countries such as Nigeria, where the real-world application of operations research optimization techniques in business enterprises, particularly micro-enterprises is still very low. Many operations research optimization tools that are available for all levels of enterprise managers which are well-accepted by both research and practice communities include simulation, linear and nonlinear programming, queuing theory, and stochastic modelling amongst others. All these techniques have to do with the allocation of scarce resources among alternative uses and are designed to help entrepreneurs in planning and decision-making relative to enterprise resources management.

2.4 Entrepreneurial Attitude

Attitude has been conceptualized as the degree to which a person has a progressive or undesirable appraisal of an idea, object, person or situation. It is related to thoughts, feelings, as well as to emotions and could be divided into two namely, affective and instrumental attitudes. Affective attitude on one hand has to do with whether a person perceives the object of the attitude to be enjoyable or not. In

other words, it is an emotional reaction or feeling of the person towards the object of the attitude such as like or dislike. Instrumental attitude on the other hand, relates to whether the object of the attitude is beneficial or harmful. And basically, instrumental attitudes are those that provide the individual with more rewards than punishments. Attitude is a suitable and effectual way of elucidating regular patterns in behaviour meaning that someone's attitude toward something can be seen from how he speaks, and responds to the object of the attitude.

Entrepreneurial attitude is all about how a prospective entrepreneur feels and thinks about entrepreneurship. An essential factor in the impression of desirability that influences entrepreneurial intention is one's attitude toward entrepreneurship. Entrepreneurial attitude often succeeds to summarize, explain and predict the behaviour of a prospective entrepreneur. A person's attitude, according to Unal and Işeri (2012), is the state of emotional and mental readiness that is established by experiences and has a directive or dynamic influence on how they behave toward all objects and circumstances. As such, an entrepreneur's general tendency to act in a specific instance based on his beliefs about possible outcomes of the context can be described as his attitude

towards the phenomenon. An entrepreneur will therefore have a favourable attitude toward the adoption of such a notion if they have a strong belief that it will lead to positively valued outcomes.

Importance of Attitude in Enterprises

Attitude is an important factor in an enterprise as a workplace because of its resultant implications on all stakeholders of the enterprise. Healthy attitudes toward an organization are particularly essential because they foster productive interpersonal ties among the workforce. Along with their co-workers and managers, they get along well with and love serving the clients. Naturally, customers would want to deal with people who are motivated by positivity. The right workplace attitude will make every work teams look for the solution to issues rather than complaining and whining about challenges encountered. An entrepreneur who builds an all-round positive or healthy attitude in managing his enterprise operations is expected to enjoy the following dividends.

i. Positive attitude reflection among workforce teams
ii. Better teamwork and collaboration achieved
iii. Less stress and conflict in the workplace
iv. Higher productivity
v. Better customer relationship
vi. Improved quality of goods and services delivery
vii. Greater Profitability
viii. Less absenteeism and turnover in the workforce
ix. Increased customer loyalty
x. Overall performance optimization

2.5 Overview of Simulation Model

Simulation is a very powerful operations research optimization tool if understood and used appropriately. Simulation according to Adedayo, Ojo, and Obamiro (2010), is an investigational method that may be applied when choice issues involve complicated variables among their decision variables, such as controlled and uncontrollable random events. Unlike a model which gives a representation of

reality, simulation imitates reality. A practical example of the simulation situation occurs when children and other fun-seekers get pleasure for themselves at simulated environments such as amusement parks, and planetarium shows where a boat, train rides, etc. are done to imitate a real life experience.

Simulation has been defined by Ekpudu (2007) as a model used in Operations Research (OR) to imitate the essential features, processes, and behavioural patterns of a system so that one could predict the system with a reasonable degree of certainty. Using current information technology and computer software, simulation is a numerical approach of experimentation used to assess the dynamic behaviour of a management system (Adedayo *et al*, 2010). For instance, while making administrative decisions, mathematical models may be built and then utilized to evaluate the outcomes of decisions before putting them into action. Simulation experiments provide results that

provide approximate approximations of the real systems being simulated. The simulation approach is widely used in a variety of fields, including management sciences, computer science, engineering, and mathematics.

In contrast to analytical modelling approaches, where an attempt is made to find the ideal solution in order to get descriptive information through experimentation, operational knowledge on the behaviour of a system that assists through decision-making is obtained in simulation. A simulation model is often the sum of several basic models that represent the interactions between system variables and components. As a result, a model may be divided into a number of straightforward yet connected models that can be used to forecast how a system would behave under different circumstances.

Techniques for determining a potential optimal solution to a decision problem by analyzing different recommended alternatives and then comparing outcomes have been developed through model creation through the use of computers for simulation. The common slogan is **"when all else fails simulate"**. Simulation models are used when there are inadequate data to observe the actual systems and also when it is impossible to observe the reality using the active system.

Types of Simulation

Simulation can be classified into different types, depending on the angle at which one is focusing on it. Categorization can be done with respect to time horizon, randomness or non-randomness, the dynamics of the situation, etc. However, it shall for the purpose of this study be categorized with respect to practical situations as well as the theoretical aspect into the physical simulation, computer simulation, deterministic simulation, stochastic simulation, discrete simulation, continuous simulation, and dynamic simulation.

1. Physical Simulation

Physical simulation involves the use of iconic models in which the model has physical similarities with the real system being imitated. Examples under this category include:

a. Simulation of the motion of aircraft in various scenarios. Aeronautical engineers may examine performance that can occur in real-life scenarios by testing various plane models in wind tunnels.
b. The ground flight simulator simulates some of the flying circumstances that airline pilots could encounter when they start flying actual airplanes.
c. Before astronauts make their first actual space mission, the conditions in space are investigated and replicated using flight stimulators.
d. Historical events simulation with the use of museum items.

e. A typical instance of a simulation is a kid's game like monopoly. Also, youngsters are exposed to a simulation of reality while they ride at amusement parks utilizing the many amusing devices.

f. There are further simulation models for different transportation systems, urban corporate planning, simulation models for water resources, etc.

2. Computer Simulation

This is used when the analytical solution to a problem is difficult or practically not possible to formulate. What may take many years to assess is done in a short while with the use of a computer. Also, a situation that is complex can effectively be modelled using computer simulation packages that can be installed on a personal computer. They can build complex models, generate random variables from many distributions and bring out detailed output. Some of the packages can enable the user to observe the simulations as they occur. The excel software is a modern spreadsheet that can be used to build and analyze simple simulations.

3. Deterministic Simulation

This is the type of simulation in which certainty is involved. It has been extensively used in management decision-making where uncertainty is eliminated. Deterministic simulation models are often referred to as "what if" models. They have applications in manufacturing process analysis. An example is when a company simulates the flow of materials through various stages of manufacturing thereby revealing quality control problems in the manufacturing process. Other examples include planning simulation models, econometric models for predicting economic conditions, financial models showing postulated relationships for system growth and shares, and transportation and assignment models.

4. Stochastic Simulation

This type of simulation brings some probability elements into the structure. Uncertainty occurs in everyday life and there is a need to take the randomness into account in this model. In this type of simulation, probability estimates are associated with the models. Examples are probabilistic inventory models, probabilistic decision models, probabilistic queuing models, etc. Almost all the problems faced in a real-life situation are probabilistic in nature and such models make use of Risk analysis.

5. Discrete Simulation

This model occurs if there is a block of time changes in which changes occur with respect to the time order sequence. Thus the value of the variable involved changes discretely with respect to time. Discrete simulations are useful in operations research topics like inventory control, production scheduling, and personnel planning among others.

6. Continuous Simulation

This kind of model is such that the system changes constantly in relation to time. There is no instance on the model at which nothing is changing. It finds application more in econometrics where economic models are used for economic forecasting and also in world energy planning models.

7. Dynamic Simulation

Most of the simulation models we construct to analyze real-world situations are dynamic in nature since change is usually experienced over a period of time. The continuous economic models used to predict economic conditions are dynamic in nature.

Advantages of Simulation

There are various advantages associated with the use of simulation which includes but are not restricted to the following

a. It allows us to imitate and experiment with reality without modifying or negatively influencing the system.
b. On occasions, in combat, an adversary's defeat might lead to technological improvements. The enemy's strategy can be effectively planned for by simulating such anticipated adjustments.
c. A firm may fail as a result of a commodity price fluctuation, particularly an unjustified increase. In order to prevent such detrimental consequences on the firm, simulation techniques can be utilized to replicate the business environment.
d. Computer simulation may be used to replicate the existing state of the actual world and to examine the impact of significant changes that might take place if the system is changed. When existing analytical methods are insufficient to understand a problem, we can use simulation to analyze complicated systems without changing the system.
e. In a simulation, the problem is thoroughly analyzed to generate needed data. This thorough analysis can detect some problems or obscure interrelationships in the system.
f. Since a simulation model can be regarded as a component of a simple set of models which denote specific interrelationships among systems the components, it can be built gradually irrespective of how complex the problem is. Thus, one does not need to start with a complex model.
g. It serves as a useful tool for managers and staff members to learn, especially in light of the widespread usage of management games in business schools.

3.0 Methodology

This study adopted the quantitative descriptive survey research design in which a structured closed-ended questionnaire was used for the gathering of primary data. The study, targeted the population of micro-enterprise owner operators (micro-entrepreneurs) domiciled at various locations across Lagos as an attempt to assess their attitude toward adoptability of simulation process for optimal inventory management decisions within the micro-enterprise ecosystem in Lagos State and invariably Nigeria at large towards greater economic sustainability and nation-building. The respondents were micro-entrepreneurs who were micro-enterprise owners. They were randomly selected from different locations across Lagos State to respond to the research instrument. The population of this study consisted of 3,329,156 micro-entrepreneurs in Lagos. These were considered as the owner managers of the 3,329,156 micro-enterprises in Lagos State as captured by SMEDAN-NBS (2017) in the MSMEs national survey report.

The study adopted both stratified and random sampling techniques for sample selection. The basis for using the stratified sampling approach was based on a general categorization of micro-enterprise into two operational categories namely primary and secondary sectors. The random sampling was then applied within each of the sectors. The process of selection required that the sector category was identified before the random selection was done by assigned research assistants to each sector. The selected respondents were owner operators of micro-enterprises in Lagos State and the size of the sample was determined based on the formula provided by Slovin in Serakan (1992) with known confidence and risk levels.

A confidence limit of 97% which implied 3% significant level was adopted to arrive at 1100 sample size.
758 respondents were from the primary sector, while 342 were from the secondary sector.

The researcher adopted both deductive and inductive statistics in analyzing the collected data for the study. The deductive statistics was applied through the use of a custom frequency distribution table as appropriate for the basic objective of the study. Inductive statistics were used extensively to test the hypothesis of the study to ascertain the relationship of the predictor variables with the dependent variable using the general-purpose Statistical Package for the Social Sciences (SPSS). Specifically, the Pearson Chi-square test, Fisher's exact test, and Kruskal-Wallis test were used to test the hypothesis.

Lagos State was considered appropriate for this study considering the concentration of businesses that are situated in Lagos State relative to other parts of the country. Oluwole (2021) asserted that Lagos is the largest economic hub in West Africa and the fourth largest and wealthiest economy in Africa where over 60 percent of Nigeria's industrial investments are located. This assertion is affirmed by the SMEDAN-NBS (2017& 2021) report on MSMEs survey where it was stated that Lagos State had the highest number of enterprises across all categories covered in the country.

4.0 Results and Discussion

Attitude of different categories of micro-entrepreneurs toward adoptability of simulation process for optimal inventory management decisions

Table 4.1captured the data collected on the attitudes of micro-entrepreneurs studied towards adoptability of simulation process for optimal inventory management decisions using willingness, readiness, and ability to adopt simulation process as proxies. Of the respondents in the primary sector, 676 representing 89.18% indicated a willingness to adopt simulation process for inventory management while 82 (10.82%) were not willing. 732 (96.57%) showed readiness to adopt simulation process for inventory management but 26 (3.43%) were not ready. 492 (64.91%) believed they possess the ability to adopt simulation process for inventory management while 35 (35.09%) felt they did not have the ability for the adoption of simulation process for inventory management. As for the respondents from the secondary sector, 321 representing 93.86% indicated a willingness adoption of simulation process for inventory management while 21 (6.14%) were not willing. 335 (97.95%) showed readiness for adoption of simulation process for inventory management but 7 (2.05%) were not ready. 242 (70.76%) believed they possess the ability to adopt

simulation process for inventory management while 100 (29.24%) felt they did not have the ability for adoption of simulation process for inventory management. Overall, 933 on the average out of a total of 1100 respondents covered which represented 84.79% gave positive responses while 167 (15.21%) gave negative responses with respect to willingness, readiness, and ability to adopt simulation process for optimal inventory management decisions. This result implied that if appropriate training on the use of simulation process for inventory management is readily made available, an average micro-entrepreneur in the study area is willing, ready, and can adopt simulation process for inventory management optimization which will in turn further boost economic growth, development, and sustainability.

Table 4.1: Deductive Statistics on Micro-Entrepreneurs' Attitude

Variables	Options	Primary sector	Secondary sector	Total
Willingness	Yes	676	321	997
	No	82	21	103
	Total	**758**	**342**	**1100**
Readiness	Yes	732	335	1067
	No	26	7	33
	Total	**758**	**342**	**1100**
Ability	Yes	492	242	734
	No	266	100	366
	Total	**758**	**342**	**1100**

Source: Researcher's Field Study, SPSS Output (2022)

4.2 Test of Hypothesis

H_0: There is no significant difference in the attitude of different categories of micro-entrepreneurs towards adoptability of simulation process for optimal inventory management decisions

Pearson Chi-square test, Fisher's exact test, and Kruskal-Wallis test were conducted to test H_0 on micro-entrepreneurs' attitude towards adoptability of simulation process for optimal inventory management decisions. The result of Pearson Chi-square test in table 5.2 [Willingness: $\chi^2(2, N = 1100) = 6.075$, $P = 0.14 > 0.05$; Readiness: $\chi^2(2, N = 1100) = 1.550$, $P = 0.213 > 0.05$; Ability: $\chi^2(2, N = 1100) = 3.636$, $P = 0.057 > 0.05$;] showed that the difference in the micro entrepreneurs' attitude towards adoptability of simulation process for optimal inventory management decisions is not statistically significant. Likewise, the result of Fisher's Exact test (two-sided) as captured in table 4.2also showed a statistically insignificant difference in the attitude of different categories of micro-entrepreneurs towards adoptability of simulation process for inventory management optimization, (Willingness: $p = 0.14 > 0.05$; Readiness: $p = 0.255 > 0.05$; Ability: $p = 0.062 > 0.05$). However, as contained in table 4.2, the result of Fisher's Exact test (one-sided) statistically

showed a partly significant difference (Willingness: $p = 0.008 < 0.05$; Ability: $p = 0.032 < 0.05$) and a partly insignificant difference (Readiness: $p = 0.145 > 0.05$).From the Kruskal-Wallis H test result in table 4.3 [$H(1) = 3.176$; $p = 0.075 > 0.05$], there is statistical evidence that there is no significant difference in the attitude of different categories of micro-entrepreneurs studied towards adoptability of simulation process for optimal inventory management decisions.

Overall, therefore, the researcher failed to reject the null hypothesis (H_0) based on the three different test results presented in table 4.2, and table 4.3 that were largely in conformity statistically (with p values > 0.05). It was, therefore, concluded that there is no significant difference in the attitude of different categories of micro-entrepreneurs towards adoptability of simulation process for optimal inventory management decisions in the study area

Table 4.2: Chi-Square and Fisher's Exact Test on Micro-Entrepreneurs' Attitude

Variables	Pearson Chi-square	Asymptotic Significance (2-sided)	Fisher's Exact test Sig. (2 sided)	Fisher's Exact test Sig. (1 sided)
Willingness	6.076[a]	0.14	0.14	0.008
Readiness	1.550[a]	.213	.255	.145
Ability	3.636[a]	.057	0.062	0.032

Source: Researcher's Field Study, SPSS Output (2022)

Table 4.3: Kruskal-Wallis H Test on Micro-Entrepreneurs' Attitude

Ranks	Sector	N	Mean Rank
	Secondary sector	342	554.00
WRA	Primary sector	758	548.92
	Total	1100	

Test Statistics[a,b]	
	WRA
Kruskal-Wallis H	3.176
Df	1
Asymp. Sig.	.075

Source: Researcher's Field Study, SPSS Output (2022)

5.0 Conclusion and Recommendation

Given the various findings of this research on the attitude of selected micro-entrepreneurs towards adoptability of simulation process for optimal inventory management decisions in Lagos, Nigeria, the study concluded that the predictor variable was significant to the dependent variable that was studied in the study area. This position implied that the extent of adoption and usage of simulation process for optimal inventory management decisions among micro-entrepreneurs is a function of their attitude. Also, the various analyses and tests performed clearly showed that the situation was not significantly different across the two basic categories considered in the study.

Specifically considering the predictor variables proxies (willingness, readiness and ability), the study concluded that majority of the micro-entrepreneurs in the study area indicated willingness and readiness to adopt the process based on their positive attitude towards the adoption of the

simulation process as an alternative approach to inventory management which they conceived will yield greater effectiveness and efficiency for improved business performance.

Going by the findings of this study as presented earlier, the following recommendations have been made by the researcher towards introducing and promoting the adoption of simulation process as an operations research optimization technique for inventory management decisions among micro-entrepreneurs in the study area and Nigeria at large.

1. In order to boost entrepreneurs 'proficiency on the use of simulation process towards its adoption for inventory management optimal decisions in the micro-enterprise ecosystem, operations research societies and micro-enterprises government accredited regulatory agencies in Nigeria, should collaborate with various existing micro and small enterprise associations to practically begin intensive training on how to use simulation process and other operations research decision optimization techniques for inventory management decisions through seminars and workshops for micro-entrepreneurs across all sectors.

2. Because of the significant contribution of micro-enterprises to economic growth and sustainability through improved GDP as reported in the study, government authorities at all levels should incorporate training on general entrepreneurial resources management optimization into their various initiatives aimed at supporting and promoting micro, small, and medium enterprises generally in the country.

3. More proactive empirical researches focused on micro-enterprises resources management and optimization techniques should be motivated by all stakeholders inclusive of government authorities, accredited regulatory agencies, operations research practitioners and societies by way of making research funding available to prospective researchers.

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