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PRODUCT DELIVERY SYSTEM A PANACEA FOR ORGANISATION OPERATION EFFICIENCY

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Abstract

The study investigated how product delivery systems, serves as effective strategy that enhance operational efficiency within manufacturing firms in Lagos, using Selected manufacturing firms as a study. Among the objectives set out were to find out the criteria and attributes of product delivery systems on the operational efficiency and innovational survival of the manufacturing firms. The research study was developed around the product innovative and dynamic capability innovative theories. The theoretical model of the modernized product delivery techniques were used in developing the hypotheses that were tested at 0.05 significant levels; through the survey of one hundred and seventy - there respondents. Copies of the questionnaire were administered to the respondents sampled. The validity and reliability of the instrument were measured at Cronbach's alpha of 0.63 and alternative form validity of 0.59. The regression analysis clearly shows that Product Delivery System is a strong determinant of Operational Efficiency. With an explanatory power of 46.3% and statistically significant results across all tests, it implies that Lagos manufacturing firms must prioritize the modern techniques and innovation in delivery systems as a critical driver of performance. In conclusiont, the investigation indicates that the product distribution system has the most significant and consistent impact on operational efficiency. This highlights the strategic significance of strengthening delivery speed, dependability, and responsiveness to optimize internal processes, minimize costs, and bolster competitiveness.

Keywords: Product delivery, Operational efficiency, Performance, Manufacturing firms, Lagos

Introduction

A product delivery system can be either a significant obstacle or a boon to operational efficiency depending on its design, development and deployment. Barney, (2019) An efficient system optimizes resources like time, fuel, and cost by streamlining logistics, route optimization, leveraging technology, and a consistent feedback loop. Conversely, the ability to generate new ideas and innovation has become a priority for most organizations. Intense global competition and technological progress have made innovation a source of competitive advantage. Innovation studies have attempted a number of approaches, e.g., levels of innovation in individuals, teams/projects or organizations (Drucker, 2019), or intensity of innovation (Hollenstein, 2016). An ineffectively managed system with outdated practices, inefficient routes, or no performance tracking equals higher costs, delays, and overall inefficiency Aaker, (2020) Product-led design is a groundbreaking approach that allows teams to create excellent user experiences. Through early validation of user experience, cross-functional collaboration, operational zing design at scale, customer-centricity, and agile mindset, teams can deliver products that have a significant effect on customers and business success without incremental cost and time.

Levitt (2020). Product delivery's contribution to profitability is spoken from many points of view, more frequently highlighting the requirement for efficiency, customer satisfaction, and cost control, (Freeman et al 2021). argue that timely and reliable delivery of goods enhances customers' satisfaction, leading to higher retention rates and profitability in the long run. Parasuraman, et al 2018) point out that reliability of delivery is one key dimension of service quality that has direct impacts on customer loyalty and repeat business. For operational Efficiency: Bolden T.A (2015) in Logistics and Supply Chain Management highlights that efficient delivery processes reduce costs, minimize wastage, and maximize supply chain performance as a whole, increasing profitability. Means et al (2020) reveal that lean logistics and reduced lead times can create competitive advantages, which are seen in increased market share and profitability. For effective Cost Management: Fegeeberg J.(2021) in his value chain analysis reveals that simplifying delivery processes reduces the cost of operations, which directly impacts by enhancing profit margins. Oced (2025) reveals the contribution of agile supply chains in responding to market changes with speed, minimizing disruptions, and being cost-effective, hence safeguarding profitability.

Enhanced Market Responsiveness: Ferreira et al (2020) suggests aligning product delivery methods with product demand characteristics to avoid overstocking or stock outs and to maximize revenue while reducing costs. Means, et al (2020) argues that faster delivery can be utilized as a premium differentiator in competitive markets, with companies capable of commanding premium prices.

Product delivery is the process of taking a product from concept to market. It includes everything involved in getting a product to market, from product development to testing and marketing to finally getting the product into the customers' hands. Every stage is necessary to ensure that the product will meet customer specifications and be viable in the market. poor delivery leads to delays, dissatisfied customers, and wasted money. While on the contrary, nailing product delivery means faster time to market, happier customers, and a product that actually delivers on the hype, product delivery helps make your product not just built right but also arrives in the hands of users in the most suitable way possible, A product delivery team's function is to take a product through the development phase to launch in the market. Their job is to ensure the product is built, tested, marketed, and delivered to customers in a way that is smooth and efficient, this team typically includes developers, testers, marketers, product managers, and product delivery managers who all collaborate together to ensure things stay on track, their focus isn't exclusively on building the product but also on ensuring that it is of quality, is released on time, and receives constant feedback from the customers for future development and to adjust performance. The following scenario therefore informed the foundations and objectives of this study as:

(i) to examine the relationship between product delivery system and manufacturing firms' operational effectiveness
(ii) to ascertain the roles of product delivery techniques on organization operation strategies, and
(iii) to show if product innovation enhances performance in manufacturing firms.

The importance of this research, this time, is equally vital as the research will help in bringing out benefits the firms in this industry will accrue. The information collected will subject the companies' management in product delivery, and determine the basic delivery system to implement so as to avoid losses time and other resources. The study will also help in the following ways:

(i) It will help the firms in the industry to compete favorably from their internal ability,
(ii) Customer and other stakeholders will also be greatly benefited from the study, given the reality that it will allow them to make rational choices when it comes to product delivery attributes.
(iii) To the society at large, the studies unveil the useful product delivery among other things of product innovation strategy.
(iv) The studies help the manufacturing sector to realize the problems and opportunities related to the product designing, developing, storing, distributing and delivering,

Product Delivery Criteria for Operational Efficiency

Logistics service provider is instrumental to organizations (Gunasekaran and Sarkis, 2018), as it has the ability to improve organizational competitiveness for enhancing information and materials flows throughout the supply chain (Gunasekaran et al., 2008). Nevertheless, most of the current studies discuss the importance of logistics to traditional brick and mortar firms, while few emphasize their needs in the case of e-commerce (Ramanathan, 2010). E-commerce, especially B2C e-commerce, unlike traditional firms, is characterized by small order sizes, greater order volumes and shipments per day and different distribution systems (Ramanathan, 2010). Hence shipment or delivery forms a mandatory element of e-commerce. Graves (2013) believes the expansion of e-commerce calls for effective selection of 3PL service providers. Therefore, the selection of an appropriate 3PL service provider is a significant process for e-commerce firms. 3PL service provider selection has consistently been on efficiency and price. All prominent Chinese e-commerce firms have signed agreements with several 3PL service providers, and customers can choose a particular 3PL service provider according to their requirements. Wang and Sang (2015) show that efficiency of 3PL service provider is an important consideration factor for e-commerce firms while choosing 3PL service providers. Scholars have highlighted that technological, human and logistical aspects of service quality can have an impact on customer satisfaction and firm competitiveness (Ling et al., 2012). In particular, with the growth in consumer interest towards service quality, customer service and logistics service more and more become crucial. In recent years, customer service quality and logistics service quality have been introduced into the mechanism of consumer feedback. Any enterprise must set up rational and useful standards while selecting a supplier or partner company. Researchers of operation management have stressed more importance on selection and administration of contracts of 3PLs for evolving cooperative supply chain relationships (Sahay and Mohan, 2016). According to Ramanathan (2010), delay or non-delivery of the product, order accuracy and damage to the product significantly increase customer dissatisfaction. Recent modifications in these variables render delivery speed and dependability of 3PL service providers as selection parameters. Esper et al. (2013) considered four related variables of 3PL service providers namely delivery time, product condition, carrier reliability and delivery satisfaction expectations. Other studies consider responsiveness, communication order-handing and distribution (Cho et al., 2008). Recent studies by Tezuka (2011) focused on the specialization of 3PL service provider in scale, know-how, searching capability and/or IT capabilities of 3PL service provider. As enhancement of logistics service provider ability, Buyukozkan et al., (2009) identified a fourth party logistics (4PL) decision model with criteria such as service performance (service cost, service quality, service flexibility, value added service), IT performance (IT

capacity, IT competency, IT flexibility, IT compatibility) and management performance (management competency, management quality, management flexibility, management sustainability). The study of product delivery in IoT era and 4PL with soft infrastructure (IT, Human skill and knowledge), hard infrastructure (Tracing and tracking, high-tech trucks) and flexibility (in hard and soft infrastructure) is at infancy stage. Coltman and Devinney (2013) propose a model with operational capabilities for commoditized and customized services. The operational competencies include customer interaction, cross-functional collaboration, innovative solutions, operations improvement, IT infrastructure and professional delivery.

identify the effect of product delivery and design on the performance of financial in Cooper's (2019) investigation looks at the combination of product innovation approaches and new product delivery performance success for N = 211 Australian firms. Ten different types of approaches were distinguished. Surprisingly, the various approaches had equivalent levels of reported success, implying that firms tailor their product innovation approaches to accommodate market and industry conditions. Overall, though, the best-performing method was discovered to be technical fit, concern for customer requirements, and aggressive marketing. He also supported his views with the following new product delivery techniques

i. **Validating the User Experience Ear**ly: In order to make a product successful, teams must resist the urge of leaping straight into development based on initial concepts. Rather, they should perform ideation exercises, such as storyboarding and mind mapping, to come up with concepts. Through creating low-fidelity prototypes that are basic, product flows can be visualized by teams and early feedback obtained. With refining the design, one can create more advanced prototypes of higher fidelity with animations and micro-interactions. The iterative process enables constructive user feedback that saves time and effort by avoiding what might be incorrect.
ii. **Cross-Functional Collaboration**: Breakthrough design does not happen in a one-person show; it requires cross-team and cross-department collaboration. By including different points of view, like customers, developers, marketing, sales, and executives, teams can get a rounded view of the user requirements and align with the product vision. With this collective effort, the potential corner cases and areas of friction are brought into account, resulting in a refined and user-friendly design. When everyone is on the same page from the start, decision-making is informed by a common empathy for the user, and improved products ship faster.
iii. **Operationalizing Design at Scale:** Design debt can accumulate over time and impede growth if it's not addressed. Design operational maturity is necessary to reduce design debt and accelerate the design process. The use of a design system, as a

source of truth and common design language, can be transformative. A successful design system enhances collaboration among teams, reduces complexity in workflows, and maintains design consistency. The majority of product teams underinvest in design systems, limit their adoption, and minimize their impact. To fully operationalize the design, developers, other stakeholders, and designers need to be considered in order to bring accessibility, version control, and data protection into the design system.

iv. **Customer-Centric Design**: Product-led design has at its center a deep understanding of the customer's problem. Design teams should empathize with users, gain insights, and align on a vision to solve their pain points effectively. By involving customers early in the design process, teams can learn and iterate on their designs to craft incredible experiences. When the entire company is customer-obsessed, empathy guides decisions, and products ultimately really resonate with users.

v. **Agile Thinking in Design:** Gone are those days when decisions about products used to be done with gut instinct alone. Agile thinking in design embraces speed, iteration, and collaboration. With an emphasis on rapid prototyping and regular feedback loops, teams can iterate quickly and adjust designs to address evolving user needs. This Agile mindset fosters a culture of experimentation and learning, and the end product is always highly aligned with user expectations.

Attributes to effective Product delivery System

As last mile delivery is a multi-attribute issue, previous research has been done to examine the weights of the different attributes. These have been done in countries where home delivery is the most common delivery mode but can still inform on what attributes customers base their delivery option decision on. Delivery cost has also been ranked the most important delivery attribute in most research (Nguyen et. al., 2019). In three of these researches the delivery fee added up to more than half the value of the delivery option and was therefore more important than all the other factors combined. Customers therefore accept reduced convenience to the extent that shipping is cheaper or even without a cost. Free shipping is the biggest partworth utility off all levels of attributes in all of these delivery studies, signifying very high consumer importance. For the attribute delivery method Rai. al. (2019) and Gawor & Hoberg (2019) determined that this attribute explained 12.6 % and 10.8 % respectively of choice of delivery option. Nguyen et. al. (2019) enumerated time slot and daytime/evening delivery as separate attributes, summing to 15.4 % of choice of delivery. Moving on to another attribute of the multi-attribute problem, Nguyen et. al. (2019) gauged lead time as representing 11,2 % and 13,7 % respectively of the entire delivery option choice weight. Other two articles by Garver et. al. (2012) and Gawor & Hoberg (2019)

respondents perceived lead time as more important, representing 19,1 % and 24,2 % of attribute importance weight. Reasonably, all of the four studies concluded that on average shorter delivery lead times have greater consumer perceived utility. Other parameters which has been studied in previous last mile delivery research papers are weekend delivery (Nguyen et. al., 2019), different return opportunities (Rai et. al., 2019), and guaranteed delivery and who logistic service provider is being used (Garver et. al., 2012). In being able to receive packages on weekdays and weekends having some importance, this covered 9,3 % of the delivery option choice in Nguyen et. al.'s (2019) research. However, upon examining e-commerce retailers in the Swedish using collection and delivery points (CDPs) pioneer market, scarcely any retailers offered weekend delivery. Different return options had an attribute importance weight of 20.2 % in the research of Rai et. al. (2019), higher than delivery method or delivery lead time. However, this could be a little biased since some levels of returns have a cost that is not normally seen, to which customers are sensitive as reflected by the importance weight of delivery cost. For complete e-commerce vendors in an prevailing market such as Sweden, there will also be returns at CDPs irrespective of the collection and delivery points, (CDPs) delivery alternative and with only 6 % unsatisfied with product return it even suggests low pain point for customers (Postnord, 2020a). In one of Garver et. al. (2012) guaranteed delivery represented 7.7 % of attribute weight and shall be discussed in the lead time paragraph of the literature review. Which logistic service provider to which the product is shipped had the lowest delivery attribute importance weight of just 6.7 % (Garver et. al., 2012). Since they have not been suitable as CDP dominated marketplace attributes or have possessed low weights of importance in previous research, the above four mentioned attributes will not be included in this research paper. Below is the focus on what delivery method, delivery lead time and delivery cost factors consumers gain utility from.

Delivery methods

If presented with an option for delivery choice, the consumer will choose the one that gives them the maximum utility relative to the minimum constraint, i.e., having to stay at home for home delivery or to visit a (Collins, 2015). The CDPs come in two types. There is the employer visit CDP, generally within an outside shop (Tiwapat et. al., 2018). The best prevalent example in the Swedish market is Postnord packages sold in food stores. Another example is the unattended collection and delivery point (CDP) concept, where products are left in storage boxes and the client is given a PIN-code to collect the package (Xu et. al., 2011). In Sweden with a CDP dominant market the latter approach is not favored since only one percent get their end product through this process (Postnord, 2019). Since it is not utilized so much, present CDPs will be addressed by this research paper and when

CDPs are mentioned in this article, it will refer to present ones. Of those previous conjoint analysis experiments, two quantified the consumer value of a level of a collection and delivery point method attribute. In one of them by Rai et. al. (2019), consumer received less value from having the package home-delivered to a CDP than by any other home delivery method, it was still more preferred than an unattended CDP or a store pickup. Gawor & Hoberg (2019) had collection and delivery point or in-store pick up as one of its delivery methods level and this alternative also possessed lower utility than any home delivery alternative. The reason for this lower utility found in CDP attributes is that some consumers only view it as a choice for picking up failed deliveries and needs incentive to use it instead of home delivery (Kedia et. al., 2017). Examining some of the larger European countries, less than 5 % of UK, Italian or German customers utilized collection and delivery points as their initial preference delivery option (Postnord, 2018). According to the Postnord (2019) study, 41 % had no possibility of specifying their location for their collection and delivery point when placing an online order in Sweden, a country with a collection and delivery point dominant market, and instead had it delivered to their default CDP. This default collection and delivery point relies on the postal code of the consumer and most e-commerce stores only provide delivery to this default collection and delivery point location. One of the biggest success stories for collection and delivery points to emerge as a delivery channel that the customers find convenient is the way they are readily accessible by the consumers at or near their doorstep and in Europe alone, 95 % of the population has access to a collection and delivery points within 15 minutes through car or walking (Kedia et. al., 2017). This is supported by findings from Weltevreden (2008) that showed that the more people living within a five-minute walk of a collection and delivery point, the greater the number of parcels where collected from this service point. In a curious twist, the most-used Nordic countries where collection and delivery points have been implemented are quite low-density and still make the most use of collection and delivery points. Another benefit of having the ability to choose and select which collection and delivery point the product is delivered to, is the potential for trip chaining. Here the consumer can pick up parcels while doing something else, i.e., grocery shopping or returning home from office (Weltevreden, 2008; Collins, 2015). Convenience will be gained here for this group of consumers in having a choice to select a collection and delivery point that aligns with the daily commutation. Collection and delivery point product delivery also reduces the vehicle kilometres by e-commerce retailers having the ability to deliver multiple packages to the same endpoint at one time, which results in reduced environmental impact of the last mile delivery (Rai et. al., 2019). Mangiaracina et. al. (2015) also recognizes that collection and delivery points eradicate wasted missed delivery trips when the customer is not at home.

Therefore, individuals with environmental influence being an important weight concern can obtain more utility in collection and delivery point and delivery modes.

Home delivery is considered by others as the most utility delivery mode due to receiving the product at home directly (Campbell and Savelsbergh, 2005). These home deliveries have different levels of service, either being planned to arrive for the whole day, or a in specific time window (Punakivi & Saranen, 2011). A time window is a specific time duration of a few hours when people need to be at home to receive a delivery (Nguyen et. al., 2019). These time slots may be pre-defined times which are specified by the retailers or requested by customers from where it is up to the retailers whether the product will be delivered at that time slot (Bent & Van Hentenryck, 2014). For the Swedish e-retailers involved in this study these time slots are often pre-defined in the evening. Time slots are perceived by consumers as a higher utility product than home deliveries without any time frame as these can lead to fewer missed deliveries (Agatz et. al., 2011). Han et. al. (2017), found that consumers prefer time slots and that consumers will not be very dissatisfied with the delivery arriving early or after the allocated time slot. For the retailers, these time slots of delivery are more difficult for providers to serve with efficiency. Boyer et. al. (2009) concluded that a three-hour window instead of whole day delivery raised last mile transportation expense of the company by nearly 50 %. Time slot provides utility due to reducing unsuccessful deliveries and products delivered while customers are working as the largest reason for unsuccessful deliveries (Rai et. al., 2019). Surprisingly, previous attribute level utility studies have not come to the same conclusion whether home delivery time slot is desirable. Nguyen et. al. (2019) did find out that a two-hour time slot had the highest part-worth utility among consumers. In Rai et. al. (2019) and Gawor & Hoberg (2019) though, subjects were most utile with day long delivery and wanted that over time slots. These findings will have some criticism to be held valid due to contrary findings in some other research studies with focus on time slots such as Han et. al. (2017) and (Agatz et. al., 2011).

Delivery lead times

Delivery lead time means the time from when the customer orders to having the product available for delivery or pickup (Gawor & Hoberg, 2019). Thus, a oneday delivery lead time is the same as a product ordered today being either at home or in a CDP tomorrow. All prior conjoint analysis last mile delivery studies had lead time as an attribute variable of interest. For Swedish consumers, a collection and delivery point preferred delivery country, according to the Postnord (2019) survey, the majority of respondents stated that they wanted to have their delivery within two days' lead time and saw a significant decline in wanting to wait four days or more. Part of the reason for the weight importance of lead

times that there is lies in the fact that the time saved compared to traditional shopping is one of the strongest e-commerce points of shopping (Gupta et. al., 2004). Saving time not having to commute to the physical stores is regarded by Duarte et. al. (2018) defined that receiving your order in time was one of the highest scoring online shopping convenience and usefulness drivers. Order waiting time to be processed and shipped is seen as an offline expense of online shopping (Bednarz and Ponder, 2010).

Gawor and Hoberg (2019) broke down this financial cost and determined each day of slowed delivery was worth, on average, $3.61 for customers. For the publishing sector, Hsiao (2009) estimates this amount to be as low as $0.53 per day, quite a bit lower. The difference is large and a precise lead time value measurement is hard to establish. The $3.61 per day cost seems a bit too high for a customer to pay for a single day less of lead time. A reason why this sum could be so large is that they used expensive electronic equipment in their studies so that the delivery charge would be a lesser portion of the sum.Lead times are typically not insured and shoppers are not reimbursed if the item is delayed longer than the lead time specified when it was bought. It is still important for the stores to offer the product in terms of lead time promised and whether or not the product is received within the stated time frame is an important service quality component of consumer perceived e-commerce utility (Rao et. al., 2011). It has also been found to enhance consumer satisfaction and that on time arrival of a product has an extensive impact on customer retention (Gupta et. al., 2004); Rao et. al., 2011). Subsequent delivery lead time longer than communicated will therefore impact both the consumer valuation of the current order, but also to order again from the ecommerce retailer. With most of the tested e-commerce retailers having set a band of days that the item can be delivered, they have a buffer against an inaccurate lead time. One of the disadvantageous aspects of reduced delivery lead times would be increased environmental impacts due to trucks being dispatched with unfilled cargo capacity, leading to higher aggregate kilometres and CO_2 emissions (Rai et. al., 2019). Environmentally aware consumers can therefore be willing to wait longer for a product if they knew it was delivered more responsibly.

Delivery cost

Online retailers should be a target of learning how shipping price affects consumers' behavior (Lewis, et. al., 2016). Specifically because shipping charges are not integrated into the whole price of a product such as other characteristics but charged along with the payment on the last stage of a purchase (Dinlersoz et. al., 2006).

So, the cost of last mile delivery is clearly apparent to the consumer. According to a study by Rao et. al. (2011) found that shipping price exerted a stronger influence on consumer repeat purchase than distribution quality, i.e., people will come back to e-commerce

merchants who charge less for shipping even though they are not completely satisfied. Lower shipping costs makes consumers happy to change delivery timing and delivery mode in order to realize lower costs, showing the vast usefulness of low shipping costs. For example, IMRG (2018) indicated that the most common explanation for customers choosing CDP delivery was that it was cheaper than home delivery. That was, however, within the UK where CDP is seen as a worse alternative to home delivery. That shipping is free altogether is best used as a marketing tool to bring in new business (Frischmann et. al., 2012). That something is free has been found, in other studies on marketing, to be more attractive to consumers, even compared to very low costs (Shampanier et. al., 201 up7). Having only a flat price no matter the size of the order leads to larger orders, since customers like the shipping to be proportionally smaller than the overall cost (Lewis, 2016). However, it is likely to lead to fewer total consumer orders. The majority of e-commerce websites lack absolute free shipping but rather demands a minimum price value. Evidence by Lewis (2016) has shown that free pricing structure with a limit yields more gross margin and greater average valued order size compared to unconditional free shipping. It also yielded lesser total amount of orders, including new and repeat orders.

Research Methodology

The study used a descriptive research design. The targeted population included selected large manufacturing firms in Lagos Metropolis. The observation unit entailed the managers and those employees in the middle management level, such as supervisors. The collection of the data was done using the questionnaires. The analysis of the data was done using descriptive and multiple regression method.

Population of the Study

The population delineates the scope within which research results are relevant. The study population for this research comprises five hundred and twenty-seven (527) individuals, including selected top, middle, and lower management, customers, employees, and other stakeholders of Unilever Nigeria Plc, Dangote Group, Nigerian Breweries Plc, Nestlé Nigeria Plc, Flour Mills of Nigeria Plc, and Seven-Up Bottling Company Plc, all of whom have engaged with these companies and their products over the past five years at their Lagos offices and locations. Due to the company's intricate structure and the regulations governing its management practices, stakeholders from top to lower management, along with selected customers and employees, will be chosen using a heterogeneous purposive sampling technique across various locations in Lagos.

Sampling Method and Sample Size

Sampling is crucial for picking items from a population to ensure that the chosen sample accurately represents the population. Odugbemi and Oyesiku (2000) define a sample as a subset of the complete population of any category. The study will target management, customers, and staff of the selected manufacturing enterprises as respondents. The sample size was established using Yamane's (1967) sampling model, as referenced in Israel (2013), which is deemed the minimum acceptable threshold for responses to achieve a 95% confidence level with a 5% margin of error. To account for response bias and missing values resulting from inadequate completion by respondents, an additional 30% of the minimum sample size indicated in the formula will be incorporated, as recommended by Israel (2013). Consequently, 68 respondents (30% of 227) were added to the calculated sample size of 227, resulting in a total of 295 questionnaires.

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

Where = Sample Size (unknown)
N = Population (527)
e = the desired level of precision (commonly 0.05 for 95% confidence level)
n = 527

Lets calculate the sample size with a margin of error e = 0.05
n = 527/ 1 + 527 (0.05)2
= 527/ 1 + 527(0.0025)
= 527/ 1 + 1.3175
= 527/2.3175
n = 227.1 approximately 227
n. =. 227 + 68 Approximately 295
Therefore the sample size for this study is two hundred and ninety-five (295) using the total population of five hundred and twenty seven (527).

Hypothesis:

Changes in existing product delivery system will not have influence on organization operational efficiency

Research Findings

The research findings were presented in sections as presented below.

Demographic Characteristics of Respondents

Variable	Category	Frequency	Percent (%)
Sex	Male	161	59
	Female	112	41
Age Group	20–30 yrs	106	38.8
	31–40 yrs	99	36.3
	41 yrs& above	68	24.9
Marital Status	Single	106	38.8
	Married	123	45.1
	Widow	13	4.8
	Widower	14	5.1
	Divorced	17	6.2
Educational Qualification	Polytechnic	105	38.5
	University	138	50.5
	Others	30	11
Years of Working Experience	Less than 1 yr	94	34.4
	2–5 yrs	132	48.4
	6 yrs& above	47	17.2
Years of Patronage	Less than 1 yr	67	24.5
	2–5 yrs	117	42.9
	6 yrs& above	89	32.6

Source: Author's computation. 2025

Table 4.1 revealed that 59% of respondents are male, while 41% are female. Since the manufacturing sector in Lagos metropolis is male-dominated, it suggests that men may play a more significant role in decision-making regarding innovation strategy adoption. However, the increasing participation of women (41%) signals that product innovation strategies should consider gender inclusiveness, especially as female employees and managers can bring diverse perspectives that may enhance creativity and innovation performance.

Most respondents fall within **20–30 years (38.8%)** and**31–40 years (36.3%),** while only 24.9% are 41 years and above. This youthful workforce implies that manufacturing companies in Lagos have a strong base of employees who are energetic, technology-driven, and more likely to embrace product innovation strategies. Younger employees often adapt faster to new production techniques, digital tools, and innovative processes, which directly impacts firm performance positively. The relatively smaller proportion of older employees

suggests a need for mentorship and knowledge transfer to balance creativity with experience.

Large proportions are **married (45.1%),** followed by singles (38.8%), with smaller percentages of widows (4.8%), widowers (5.1%), and divorced individuals (6.2%). Married employees may prioritize stability and long-term benefits, which could influence their receptiveness to structured product innovation strategies that guarantee sustainable firm performance. On the other hand, single respondents who form a significant share may be more flexible and open to risk-taking, which can support the adoption of new product ideas. The diversity in marital status means companies need to design innovation strategies that balance risk with stability to meet the varied expectations of their workforce.

University graduates constitute the majority (50.5%), followed by Polytechnic graduates (38.5%) and others (11%). A highly educated workforce provides a strong intellectual foundation for product innovation. University and Polytechnic graduates bring theoretical knowledge, technical skills, and practical exposure that can enhance innovative product development. This educational mix suggests that Lagos manufacturing firms have the human capacity to implement product innovation strategies effectively, thereby improving performance in terms of competitiveness, quality, and market expansion.

Most respondents have **2–5 years of experience (48.4%)**, followed by less than 1 year (34.4%), while 17.2% have 6 years and above. The dominance of relatively new employees (less than 5 years) indicates a dynamic workforce that is open to new ideas, technologies, and innovation strategies. However, the smaller group of highly experienced workers (17.2%) may pose a challenge in terms of preserving institutional knowledge. This calls for innovation strategies that blend fresh ideas from newer staff with the practical wisdom of experienced employees, thereby boosting overall organizational performance.

The findings show that 42.9% have patronized their companies for **2–5 years,** 32.6% for **6 years and above,** and 24.5% for less than 1 year. A high level of customer loyalty (over 75% with more than 2 years of patronage

Regression Analysis

The section consisted of model fitness, analysis of variance and regression of coefficient. The results presented in Table 4.2 show the model fitness

Table 4.2 Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.680	.463	.461	.682

Source: Author's computation, 2025

Table 4.2 indicates that the correlation coefficient R is .680, demonstrating a strong positive relationship between the Product Delivery System (predictor) and Operational Efficiency (dependent variable). The R Square value of .463 indicates that 46.3% of the variation in operational efficiency is attributable solely to the product delivery system. Adjusted R Square (.461): This marginally modified figure takes into consideration the sample size and predictors; it indicates that the model demonstrates stability, with an explanatory power of 46.1%. Standard Error (.682): This indicates the mean deviation of observed values from their predicted counterparts. A reduced error value signifies an effective model fit. The findings indicate that product delivery systems, integral to the product innovation strategy, have a substantial impact on operational efficiency within the chosen manufacturing firms in Lagos. Almost 50% of the differences in operational performance can be attributed to the efficiency of product delivery. This highlights the critical role of efficient delivery systems in improving competitiveness.

Table 4.3: ANOVA

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	108.310	1	108.310	233.203	.000
Residual	125.865	271	.464		
Total	234.176	272			

Source: Author's computation, 2025

Table 4.3 explained that the F-value (233.203) is very large, indicating that the model is statistically significant. The p-value (.000) is less than 0.05, which confirms that the product delivery system significantly predicts operational efficiency. The regression sum of squares (108.310) is nearly equal to the residual (125.865), which supports the strong explanatory power of the predictor. The ANOVA confirms that the regression model is valid and reliable. It implies that product delivery systems are not just incidentally, but significantly, linked to improvements in operational efficiency. Manufacturing firms in Lagos that adopt innovative and efficient delivery methods are more likely to record higher operational performance.

Correlation Analysis

The correlation results show the association between the variables. The study results of the correlation analysis are summarized in Table 4.3

Table 4.4: Coefficients Table

Variable	B	Std. Error	Beta	T	Sig.
(Constant)	1.677	.154		10.882	.000
Product Delivery System	.590	.039	.680	15.271	.000

Source: Author's computation, 2025

Table 4.4 revealed that constant (B = 1.677): This is the baseline value of operational efficiency when product delivery is zero. It suggests that other factors beyond delivery systems also contribute positively to performance. Product Delivery System (B = .590): For every one-unit increase in the effectiveness of the product delivery system, operational efficiency increases by 0.590 units, holding other factors constant. Standardized Beta (.680): This shows that the product delivery system has a strong standardized effect on operational efficiency's-value (15.271) and Sig.(.000): The predictor is highly significant.

The coefficient analysis demonstrates that product delivery systems exert a strong and positive effect on operational efficiency. This means that improving delivery speed, reliability, and responsiveness can significantly enhance the overall operational performance of manufacturing firms. Firms that invest in innovative delivery systems (logistics optimization, digital tracking, customer-responsive distribution) will achieve greater efficiency, reduce costs, and improve customer satisfaction.

Discussion of Finding

The regression analysis clearly shows that Product Delivery System is a strong determinant of Operational Efficiency. With an explanatory power of 46.3% and statistically significant results across all tests, it implies that Lagos manufacturing firms must prioritize innovation in delivery systems as a critical driver of performance. Efficient product delivery does not only sustain customer loyalty but also boosts internal efficiency and competitive advantage. The study concluded that changes in existing product delivery system influence organizational operational efficiency positively.

Combined Effect of Innovation Components on Organizational Performance. The combined analysis shows that the product delivery system is the most significant driver of the overall product innovation strategy, while augmented packaging, core values, and symbolic features contribute less directly. This supports the resource-based perspective, as outlined by Otalinde et al. (2009) and Roper et al. (2009), which asserts that leveraging unique internal capabilities such as delivery efficiency can create a sustainable competitive advantage. The findings are also in line with Roberts et al (2010), who establish that innovation strategies strongly predict long-term firm performance.

The results suggest that in the Lagos manufacturing context, delivery-based innovations generate the most immediate benefits, primarily through operational efficiency gains, before influencing external outcomes like market growth or customer satisfaction. This observation is consistent with Polder et al. (2019), who argue that process and delivery innovations tend to impact internal performance first. The relatively weak influence of symbolic and augmented features may reflect contextual realities in emerging markets, where affordability, accessibility, and reliability take precedence over brand symbolism—an insight also supported by the Policy Study Institute (2010) and Wasike (2018).

Overall, the findings affirm that product innovation strategy is critical to organizational performance, but its impact is mediated by the type of innovation adopted. For Lagos manufacturing firms, prioritizing delivery efficiency while strategically enhancing packaging, core values, and symbolic features can optimize both internal and external performance outcomes.

Conclusion

This study aimed to investigate the influence of product innovation strategy on organizational performance among selected manufacturing firms in Lagos Metropolis, focusing on product delivery systems, core product values, augmented product packaging, and symbolic attributes. The findings indicate that product innovation strategy is crucial in determining both internal operational efficiency and external market results for manufacturing enterprises, while the degree of influence differs among various innovation components.

The investigation indicates that the product distribution system has the most significant and consistent impact on operational efficiency. This highlights the strategic significance of strengthening delivery speed, dependability, and responsiveness to optimize internal processes, minimize costs, and bolster competitiveness. The importance of delivery-oriented technologies corresponds with the conditions of the Lagos manufacturing sector, where infrastructure obstacles render efficiency in logistics and distribution a competitive imperative.

The findings indicate that enhanced product packaging substantially propels market and revenue expansion, underscoring its dual function as a protective device and an influential marketing instrument. Packaging innovations boost product aesthetics and influence consumer purchasing decisions, ultimately augmenting market penetration. Likewise, fundamental product values have a significant positive impact on market share. This discovery underscores the need of connecting a product's inherent characteristics with customer demands and expectations to maintain loyalty and enhance market presence.

Companies that continuously fulfill their fundamental value offer are more likely to sustain a competitive advantage in their marketplaces.

Recommendations

Based on the findings of this study, several practical recommendations are proposed to guide manufacturing firms in Lagos Metropolis toward achieving higher organizational performance through effective product innovation strategies. These recommendations are designed to address each component of innovation product delivery system, core product values, augmented product packaging, and symbolic features while recognizing their combined effect on performance.

First, manufacturing enterprises must prioritize the ongoing enhancement of their product delivery systems. The research determined that delivery efficiency exerts the greatest impact on operational success. Management ought to allocate resources towards logistical infrastructure, implement sophisticated tracking technology, and establish strategic alliances with dependable transportation service providers. In Lagos, where infrastructural challenges like traffic congestion and insufficient road networks prevail, implementing technology-driven delivery methods can markedly decrease delays and improve customer satisfaction.

Secondly, considering the substantial cumulative impact of the four innovation components on performance, companies should implement a cohesive innovation strategy instead of concentrating on discrete elements. Interdepartmental collaboration among operations, marketing, product development, and customer service may guarantee that innovation initiatives are synchronized, mutually supportive, and strategically balanced. This comprehensive strategy will optimize the synergy of operational efficiency, market expansion, customer contentment, and brand equity.

Finally, Policymakers and industry authorities should establish support mechanisms—such as infrastructural enhancements, tax incentives, and access to innovation funding—to facilitate manufacturing enterprises in executing advanced product innovation plans. External support can alleviate operational difficulties and promote sustainable growth in the sector.

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