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# OPTIMIZING LAST-MILE LOGISTICS IN ONLINE RETAIL: THE ROLE OF CUSTOMER PERCEIVED VALUE IN SHAPING SUSTAINABLE CUSTOMER EXPERIENCES

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## ABSTRACT

The rapid growth of the e-commerce market has elevated logistics to a key enabler of customer experience and sustainability in maintaining competitive advantage. In the emerging economies like Egypt, the logistics systems are faced with structural, technological and sustainability limitations that directly influence consumer perceptions and behavioral reactions. This research intends to explore how the efficiency of logistics, online integration of technology, and customer-oriented strategies plays a role in the development of sustainable customer experience. This is summarized in constructs of fascination and satisfaction of customers in Egypt online retail sector. This study hypothesizes and empirically estimates a mediational framework in which the perceived customer value offers the interaction between logistics competence and customer fascination (CF). This study conducted a questionnaire that was distributed to 300 active online customers in Egypt. The analysis of the hypothesized pathways was conducted using structural equation modelling. The results show that logistics efficiency has a strong positive direct and indirect effect on CF and satisfaction. The integration of technology shows a two-sided effect, the direct effect on customer outcomes is negatively related, and the indirect effect mediated by perceived value is positively related and statistically significant, which means that technology positively affects customer experience only when it is perceived as value-added. Customer-oriented plans have fascination and satisfaction effects that work only via perceived value hence, validating complete mediation. Overall, the process of perceived customer value appears to be the key driver that transforms the logistics performance and sustainability practices into the meaningful customer experiences. The present research contributes to the academic discussion by taking the exploration of the logistics-customer experience relationships to a developing-country context and providing practical implications to online retailers and logistics companies interested in enhancing their competitiveness through value-based and sustainable logistics approaches in Egypt.

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**KEYWORDS:** Online retail logistics; Customer perceived value; Sustainable customer experience; Customer fascination; Technology integration; Last Mile.

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## 1 INTRODUCTION

With modern realities marked by an ever-growing consumer needs and high-paced technological changes, the supply chain has taken on a more crucial role, especially in the context of online retailing (Christopher, 2016; Ivanov et al., 2023). This is still the young phenomenon that brings forward new responsibilities that come after close contact with customers who are the blood of any business (Hübner et al., 2020). Therefore, organizations must note that, in this technologically advanced environment, the successful application of enterprise resource planning (ERP), customer relationship management (CRM) and other information systems is not enough to create value, it should be combined with active interaction with customers (Bharadwaj et al., 2013; Büyüközkan & Göçer, 2018). Neglecting these requirements can put firms at risk of losing their competitive position to bigger retailers or of being entirely lost from the marketplace (Porter & Heppelmann, 2015).

Contemporary consumers expect far more than the mere acquisition of a product; they are aware of the importance of service excellence and are demanding superior service offerings from them (Parasuraman et al., 2020). When given a choice between different product delivery options, they are especially attracted by the ease with which they can select the time, location, and method of delivery (Vakulenko et al., 2019). Consequently, the most important part of the operations of a company is its network of stakeholders (Freeman et al., 2021). Stakeholders include suppliers, trading partners, distributors, and the organization's internal units. Research shows that critical success factors of supply chain organizations can be realized by customer engagement, which is enabled by the capabilities of retailers and other supply chain partners in the chain (Gligor et al., 2020; Shabbir et al., 2021). Thus, the most important requirement for the effective operation and management of a company is the strategic alignment with its consumer stakeholders, such as suppliers, trading partners, distributors, and internal departments, to achieve its critical success factors (Mentzer et al., 2001; Hübner et al., 2022).

In the last few years, the online retail sector in Egypt has experienced rapid development, and it has become an important part of the national trade (UNCTAD, 2023). This growth can be attributed to the improvement in technology, the variety of electronic payment methods, and the widespread availability of the Internet (World Bank, 2022). Furthermore, the growth of e-retailers during the pandemic of Covid-19 led to nearly 52% growth in

online sales in 2022 (Statista, 2023). This trend was seen due to the consumer awareness and trust that increased during the pandemic (OECD, 2022). As a result of this rapid growth, this movement has created both opportunities and challenges (McKinsey & Company, 2022). One of the core dilemmas facing companies that are in this industry is the need to provide an outstanding customer experience as well as provide delivery services of high quality (Huang et al., 2019). The two factors play a crucial role in developing consumer confidence and loyalty (Klaus & Maklan, 2013).

The improvements in efficiency of delivery and in the interactions with the customers are likely to have a positive impact on the customer experience perception in general (Vakulenko et al., 2019). However, the academic literature on online retailing has not yet thoroughly explored the logistics aspect of the same, more so in the Egyptian context (Elgazzar et al., 2021). To this end, the proposed study aims to develop and confirm measures and models that would improve the logistical effectiveness and sustainability, which would subsequently lead to CF in Egypt (Ivanov & Dolgui, 2020). The research is aligned with the study of the connection between operational effectiveness, sustainability, and optimal customer experience (Pagell & Shevchenko, 2014). In order to accomplish this aim, a comprehensive literature review of the already researched articles on the topic of logistics and business sustainability, and specifically online retailing (Seuring & Müller, 2008). This paper provides the foundation of the multidimensionality of logistics and its increasing pertinence in the retail industry. It also helps to define possible interrelation and correlation between logistics activities and other predictors of sustainable customer experience (Gligor et al., 2020). The latter stage involves an empirical study that aims at clarifying the impact of logistics on sustainable customer experience in various aspects (Hair et al., 2022). An adequate sample of Egyptian customers will be used to administer a structured questionnaire to make it possible to have a wide consumer base in the empirical analysis (Malhotra et al., 2017). The third step involves an intensive application of statistical methods to measure the usefulness and legitimacy of the intended sample (Kline, 2016). Systematic validity tests are used to investigate reliability and structural coherence with structural equation modeling used to test hypothesized relationships in the research (Hair et al., 2022). This method allows for a profound investigation of the different elements of logistics and their synergetic power. This will help

produce a sustainably developing CF in a dynamically changing Egyptian online retailing environment (Ivanov et al., 2023).

In that context, the research will shed light on the role of logistics in supporting customer experience, which in turn would contribute to the improvement of CF (Huang et al., 2019).

### **1.1. Background and Context**

The advent of the internet has a tremendous impact on retailing business. It contributed to more global opportunities (Laudon & Traver, 2022). E-retailing provides the firms with a competitive edge allowing them to offer diverse products to diverse customers (Chaffey & Ellis-Chadwick, 2019). The digital retail logistics have been proven to be essential in providing a satisfying shopping experience; therefore, they are a critical aspect of online business growth that requires the high-quality customer service (Hübner et al., 2020). Customer relationships and CS (CS) create strong influence on the success of e-commerce businesses on the long-term customer relationships. Research indicated that customer satisfaction comes with a good website structure which likely increases website traffic (Rose et al., 2012). In this regard, the implementation of new technological trends in how the websites are designed needs careful attention. Moreover, logistics activities need to be managed and coordinated to meet the needs of the internet-retail customers in a skillful manner (Büyükoçkan & Göçer, 2018). To satisfy these diverse needs, it is crucial that innovative technologies should be designed and the logistical processes should be thoroughly planned and synchronized well with the technology in place (Christopher, 2016).

The current practices include a diversity of online retail models, the main distinction between which lies in their shipping strategies and aligning of inventory systems (Hübner et al., 2016). The effectiveness of e-commerce will depend on whether it has a strong logistical base that will handle the needs of the clients beyond their expectations (Mentzer et al., 2001). In addition, it is of special interest the development of specific rapid-logistics facilities, coupled with the order-date control, the constant integration of exceptions, and tracking information, that is associated with service options (Vakulenko et al., 2019). The online retail sector in Egypt proves to be a highly favorable opportunity to businesses that operates in supply chain (UNCTAD, 2023). Market penetration is currently small, which means that there is a high potential of achieving high growth in this segment (World Bank, 2022). Several

forecasts suggest that the imminent future on e-commerce in the country will be very positive as several estimates portend tremendous increased trends in a few years (Statista, 2023). This phenomenal increase brings into focus the high need of consumers to interact with various touchpoints and channels in making final purchasing decisions, thus, emphasizing the growing significance of multichannel strategies (Verhoef et al., 2015). The ability of the e-commerce platforms to sell both value and products through the internet, coupled with such strategies, is becoming essential to business success (Laudon & Traver, 2022). Still, the lack of developed logistics networks in the country, as well as ineffective shipping systems and cash-on-delivery methods of payment, are significant to the companies that want to enter this market (Elgazzar et al., 2021). These logistical obstacles - or, more generally, infrastructural shortcomings - provide special opportunities to those companies that can promptly and efficiently respond to the alterations in the needs of the market (Ivanov & Dolgui, 2020). Organizations that capitalize on new logistics solutions are in a good place to trigger a tremendous growth at the local level (Christopher, 2016). Additionally, these organizations have greater advantage of access to high speed and reliable broadband infrastructures like fiber optic networks, which in turn makes them highly responsive and digitally integrated in their operations (OECD, 2022). All these technological and infrastructural benefits place these organizations in a better position to gain bigger market shares and have faster growth paths hence, creating an opportunity-based and growth-friendly competitive environment (Porter & Heppelmann, 2015). In this context, the current research defines sustainable customer experience as a multidimensional concept that is based on two complementary outcomes, i.e. CS (CS) and CF (CF) (Klaus & Maklan, 2013). The CS indicates the cognitive assessment of the logistics performance by the consumers, and CF is the long-lasting and profound emotional involvement and behavioral commitment of a customer (Huang et al., 2019). The last-mile logistics in the sphere of online retailing is both the most visible and the most experience-intensive part of the supply chain, which has a direct and significant impact on the perceptions of customers regarding delivery speed, reliability, flexibility, and service quality (Vakulenko et al., 2019). As a result, the value of last mile logistics becomes central to the development of the rational and emotional aspects of sustainable customer experience (Gligor et al., 2020).

### **1.2. Research aim, objectives, and questions:**

Based on the increased strategic significance of the logistics in online retailing and the unique challenges that define emerging markets, this paper aims at analyzing the relationship between logistics efficiency, technological integration (TI), and customer-oriented strategies in developing a sustainable customer experience in the Egyptian online retail market. Specifically, the study puts the CF and satisfaction as a higher level of the experiential results, which is mediated by the perceived value of customers.

The overall goal of this research is to construct and empirically support an integrative framework, which will identify how logistics-related capabilities can be utilized to create perceived value and support sustainable customer experiences within an e-commerce setting that rapidly develops in Egypt. To achieve this aim, the study pursues the following specific objectives:

- **O1:** To analyze the current state of logistics efficiency and sustainability practices within the Egyptian online retail ecosystem, including supply chain structures, operational norms, and stakeholder roles.
- **O2:** To establish and assess the critical logistics determinants including delivery speed, accuracy, cost-effectiveness, transparency and sustainability practices, which affect customer perceived value (CPV), satisfaction and fascination.
- **O3:** To examine the role of TI, including automation, artificial intelligence, and real-time tracking systems in enhancing logistics performance and sustainability outcomes.
- **O4:** To suggest evidence-based strategic provisions and best practice among online retailers and logistics service providers geared towards providing excellent, value-driven, and sustainable customer experiences in Egypt.

To complement these objectives, the study aims at answering the following research questions:

- **RQ1:** What are the principal logistics and sustainability challenges facing online retailing in Egypt, and how do they affect CS and fascination?
- **RQ2:** Which logistics attributes are most influential in shaping CPV and fascination in the Egyptian online retail context?
- **RQ3:** How does the adoption of advanced logistics technologies influence efficiency, sustainability, and customer experience outcomes?
- **RQ4:** How can logistics providers strategically align operational efficiency, sustainability initiatives, and customer-focused practices to

consistently exceed customer expectations?

### 1.3. Significance of the Study

The research has a significant contribution in both the theoretical and practical fields. Theoretically, it advances the academic knowledge on logistics and e-commerce by theorizing the CF as an upper-order experience outcome and empirically proving the perceived customer value as a central mediational variable. The study diversifies and generalizes models that are mostly created in the background of the developed economies into the setting of the developing market, thus filling a gap in the literature. In a practical application, the results provide practical implications to online retailers, logistics providers, and the policymaking of Egypt. The study will offer a strategic roadmap to improve the level of service delivery, improve the sustainability performance, and strengthen customer loyalty by identifying the logistics capabilities that have the strongest impact on customer value and customer experience. Additionally, it informs technology investment and guides by shedding light on the circumstances in which digital solutions improve and/or deteriorate customer outcomes.

Furthermore, the research has three major contributions. First, it translates the logistics and customer-experience research into a developing-country setting by carrying out an empirical study of online retail logistics in Egypt, which is a comparatively unexplored market in the available literature. Second, it proposes CF as a higher-order experience deliverable and supports CPV as a mediating mechanism, which bridges logistics efficiency, technology adoption, and customer-related approaches to customer outcomes. Third, the research clarifies the two-sided role of technologies integration, which proves that digital logistics technologies only improve customer outcomes when viewed as value-forming, thereby offering subtle findings regarding the use of technology in new e-commerce markets.

### 1.4. Scope and Structure of the Study

The current research is limited to the field of business-to-consumer (B2C) online retailing in the Egyptian market, particularly with respect to logistics-related processes in the first, middle, and last mile delivery. The research explores perceptions based on active online customers and stakeholders who have a first-hand experience on the use of logistics services. The rest of this paper is contented in the following organization. Section 2 summarizes the available literature on the topic of logistics, online

retailing, sustainability, and customer experience, and ends up developing research gaps. Section 3 provides the conceptual framework and involves the research hypothesis formulation. Section 4 provides the methodology which includes sampling design and statistical methods. In section 5 and 6, descriptive and inferential results are presented, respectively. Section 7 talks about the findings against the background of the available theory and practice. Lastly, the study ends with a conclusion, which presents the major contributions, managerial implications, and limitations, and future research perspectives.

## 2 LITERATURE REVIEW:

In very competitive markets, inability to constantly enhance logistics processes can cause disastrous negative results in organizations (Christopher, 2016; Gligor et al., 2020). Online retailing continues to grow quickly, posing a consistent challenge to the logistics operation, and leaving companies with little room to operate with but to seek out inefficiencies rife in any of their current operations (Hübner et al., 2020). The development of new technologies in logistics, as well as the use of modern management theory, is a key to the implementation of the long-term operational growth (Büyüközkan & Göçer, 2018). It can be improved by integrating information systems to pull information on the whole supply chain and make data-driven decisions (Ivanov et al., 2023). Although the re-engineering of the logistics processes can offer temporary as well as short-term relief, continued efforts to streamline the processes are also very important (Hammer & Stanton, 1999; Christopher, 2016). The perspective adopted is that to gain CF and a process optimizing tool requires a different supply chain structure which is known as the supply chain of CF (Gligor et al., 2020).

### 1.5. Logistics and online retailing

The past few decades have witnessed an influx of prevalence and relevance in the online retailing business, and this represents a drastic change in terms of the traditional retailing approach that many customers were accustomed to (Laudon & Traver, 2022). This trend increased by the beginning of the COVID -19 pandemic because of the convenience of accessing online platforms, a wide offer of products, convenient pricing, and different payment methods (OECD, 2022). All these factors contribute to making the shopping experience more enriched, contactless experience that significantly minimizes the time of the transaction but increases the efficiency (Pantano

et al., 2020). Online retailing also facilitates thorough demonstration and comparison of products and gives the consumers the benefit of making informed choices (Rose et al., 2012). Quick response to the customer response that is created by the marketplace is another major strength that drives online shopping (Hübner et al., 2020).

Today the ever-increasing online retailing is formed by several enabling marketing mediums such as the popular social media networks, the innovations of smart devices, the integration of unified payment networks, and importantly, the increasing internet penetration rates (Verhoef et al., 2015; UNCTAD, 2023). To take the customer shopping experience to the next level, it is necessary to focus on key service operations in the logistics umbrella and especially on the logistics related to the last-mile delivery operations (Vakulenko et al., 2019). Inability to meet the time-related demands of shipping options or the general consumer content can greatly hinder or limit the growth of the e-commerce environment particularly in those areas that are still developing (Elgazzar et al., 2021).

Studies have shown that the customers living in developing nations are likely to have a wider scope of expectations with regards to home delivery timings than their counterparts in the developed countries (Lim et al., 2018). In addition, the development of e-commerce delivery services is seemingly positively related to the increase in the quality of shipping services, which is a key factor in establishing a positive online shopping experience that meets customer expectations (Vakulenko et al., 2019).

However, logistics acts as a cultural shaper and a communicator of corporate social responsibility, corporate leadership, operations knowledge and customer orientation thus enhancing sustainability in businesses and reducing environmental risks (Pagell & Shevchenko, 2014). In the online retail sector in the UK, an excess of thirty-three billion products is ordered every year with an increasing percentage involving next day delivery or other express services (Statista, 2023). The ecological impact of transport and delivery of a subpopulation of these goods is a significant issue (McKinnon, 2021). Not many express delivery systems are electrified, and not much studies have been done on the environmental impact of e-grocery itself (Edwards et al., 2010). Nonetheless, the growing interest of retailers in providing various delivery services when ordering products online has increased the attention to CS as an instrument to bring in new clients and build on more lucrative and long-term relationships (Klaus &

Maklan, 2013). Online shopping and the related logistics satisfaction determine the ability of the customers to search, select, place an order, and deliver the product to the ultimate location of delivery (Huang et al., 2019).

### ***1.6. The importance of logistics efficiency in enhancing customer experience.***

Many private and public sector organizations have made service excellence a cornerstone of their strategy (Parasuraman et al., 2020). They aim to provide their customers with a unique, rewarding, and unforgettable experience (Klaus & Maklan, 2013). This experience leads to repeat sales by satisfied customers and word-of-mouth sales through their friends and contacts (Lemon & Verhoef, 2016). In a retail context, the concept of customer experience has made a great impact (Verhoef et al., 2009). An experience-based matrix shows the impact of good delivery on the customer retail online experience (Hübner et al., 2020). The efficiency of logistics is necessary to maintain high-quality customer experience and the customer lifetime value of customers (Gligor et al., 2020). Sustainability issues form the basis of logistics services in online shopping, and thus there is a need of proactive transport management by online retailer to improve customer relations (Pagell & Shevchenko, 2014). In a fragile post-COVID-19 environment, challenges to economic diversification and delivery of e-commerce are reflected in speed, reliability, and market competitiveness (OECD, 2022). The physical system is based on the inherent unpredictability of demand, as well as the complexity of the provided services, which is the basis of service performance enhancement and a commercial gateway (Christopher, 2016). The success of upstream logistics will be central to the provision of high-quality customer service (Mentzer et al., 2001). The most efficient delivery systems increase the ability of electronic retail to establish relationships where every transaction results in a higher level of profitability and lifetime values to create attractive delivery systems and supplementary services (Vakulenko et al., 2019).

For express delivery, avoiding missed delivery attempts is a vital aspect of customer experience (McKinnon, 2021). Not only because of consumer demographics nowadays, but also due to hectic lifestyles, customers tend to prefer flexible delivery options, including the ability to change their delivery time, offer alternative delivery points, receive a notification characterizing the delivery event, and track the timing of their delivery (Vakulenko et al.,

2019; Lim et al., 2018). With a global will to stay more sustainable and decrease traffic congestion, customer demands for flexible delivery are now growing stronger, including walkable urban logistics (Allen et al., 2018). Delay-sensitive customers have brought about what we know to be today's express delivery market and carriers' extremely high service standards (Huang et al., 2019). Typically, express carriers provide round-trip or point-to-point operations from the factory or distribution centers to the consumers (McKinnon, 2021). To improve efficiency, they work out territory balancing methods along with re-direction choices (Boysen et al., 2021). However, these methods are important only if delivery re-establishment can be prevented through the driver's smart decision-making (Boysen et al., 2021).

The efficiency of logistics has played a decisive role in differentiation in the rapidly growing sphere of e-commerce (Christopher, 2016). The e-commerce industry is marked by a plethora of typical qualities such as a large and diverse clientele spread across the country, complicated large-scale warehousing processes, the abundance of the range of products sold and the comparatively disjointed delivery channels (Hübner et al., 2016). As a result, the rate and responsiveness of goods delivery and distribution have rocketed to become a critical goal of maximizing CS (Huang et al., 2019). Warehouses are the staple backbone of the storage of goods and are the pivotal location where consumers can get a wide range of products in an efficient way (Rushton et al., 2017). Thus, the timeliness and efficiency of the logistics system depend not only on the strategic location of these warehouses but also on the conscious distribution of the storage space and optimal arrangement of shelving and storage facilities, which is required to meet the online purchases satisfactorily (Gu et al., 2010). For this reason, the role of logistics efficiency cannot be overestimated because it leads to the development of long-term customer trust and loyalty not to mention the operational effectiveness (Gligor et al., 2020).

In fact, efficient logistics is recognized as an important determinant of success in business (Christopher, 2016). An efficient logistics system is best suited to surmount the ability to overcome competitive challenges, meet customer expectations, and increase corporate value (Mentzer et al., 2001). Nevertheless, electronic retailers operating on a non-profitable basis are simply working as "business brochures" with no facility to ensure more logistics revenues than operating just with existing networks (Hübner et al., 2016). Indeed, these businesses are not

optimizing their effectiveness, and these lost opportunities represent the most significant cause of a negative result (Grewal et al., 2017). With the manifold improvements in internet technology and capabilities, the markets see the presence of a new active entrant, the pure player, who operates typically on a gain-oriented basis focusing on customer needs through a sophisticated customer relationship (Laudon & Traver, 2022). Their greenfield operations have efficiently combined retail's physical presence, the unique strength of operation in virtual space, and the new prolonged constraints (Verhoef et al., 2015). These are applied to all business areas within the operation. In the online retailing area, logistics are executed as the crucial link between retailers and customers, creating a unified customer experience (Hübner et al., 2020). Lists of recent announcements made by segment leaders outline their quest to meet this specific requirement (McKinsey & Company, 2022).

### ***1.7. Sustainable Logistics Practices in online retailing***

In traditional retailing, sustainability practices are usually focused on customers, so they are compatible with their immediate satisfaction and intensify the relationship with the buyer (Lemon & Verhoef, 2016). Suppose an unsatisfied customer can indicate a loss of credibility for the market stakeholders, and the repetition of these failures might originate the total loss of trust in the company by the consumer (Parasuraman et al., 2020). In e-commerce, for the valuation of sustainability practices, online retailing should start by highlighting aspects of the market factors such as web design and functionality, services that assist the decision process, before and post-sales service, and the delivery time (Rose et al., 2012). This is the only way to achieve CS, and therefore the goal of the corporate sector is not only the creation of value but also the maintenance of it, as satisfaction will determine loyalty to the company (Klaus & Maklan, 2013). The core strategy of business sustainability is to consider the long term, aligned with the well-being of individuals, society, and the natural environment (Elkington, 1997). In business practice, the green strategy focuses on the implementation of technology and culture that are more compatible with the physical life of societies (Pagell & Shevchenko, 2014; Bahareth & Soliman, 2024). In the context of logistics, the main objective is to save resources and ensure sustainable use of logistics and transport infrastructure (McKinnon, 2021). This strategy should prioritize growth through the reconciliation of sustainability and ambition, to

conserve and achieve the sustainability of resources because the future of economic agents, clients, and society can more easily be reached by the companies that bring new and long-term technologies (Ivanov & Dolgui, 2020).

Logistics is a significant aspect of both online and offline retailing, as logistics operations constitute the main part of all retailing activities (Christopher, 2016). It is believed that logistics can help drive progress on a wide range of pressing sustainability objectives (Seuring & Müller, 2008). As logistics was defined, it can be inferred that logistics can help us meet the current and often future needs for goods and services (Mentzer et al., 2001). It may also help us expand markets. Apart from the fact that we must also address problem areas and logistics-related constraints for countries, logistics can also be the bridge between economic growth and increased social inclusion, as logistics is the foundation on which the global economy operates (World Bank, 2022). Maintaining appropriate sustainable logistics also impacts development all over the world (UNCTAD, 2023).

A sustainable logistics process includes a completely circular logistics system and minimizes the environmental impacts during production, distribution, and reverse flow (Genovese et al., 2017). It was examined that logistics performance has a significant effect (Huang et al., 2019). Moreover, when designing, implementing, or evaluating logistics, companies need to put more environmental considerations into the decision-making of the logistics process (McKinnon, 2021). Environmental pressure, carbon footprint, nitrogen footprint, and local impacts on air, water, and soil, as well as resource depletion, should be considered (Edwards et al., 2010). Empirical insights and practical tips regarding this process are important (Pagell & Shevchenko, 2014).

### ***1.8. Overview of the online retail landscape in Egypt.***

Egypt is witnessing radical changes in its retail sector due to the most influential first wave of Internet applications, which are electronic business activities (UNCTAD, 2023). The most eminent wave is online retailing carried out through the electronic marketplace (Laudon & Traver, 2022). The current impetuous e-City has changed the retail landscape by enhancing access and coverage and ensuring designed shopping at any time (OECD, 2022). Initially, the transformation affected large, developed countries that dominate the supply chain (Christopher, 2016). The cutthroat competition and

the dedication of customers lead large suppliers to post their catalogs online (Porter & Heppelmann, 2015). Currently, the business has a global reach, and the major online retailers are omnipresent, providing care with no boundaries (Verhoef et al., 2015). They landed in the largest emerging countries, encouraging global deal flow (World Bank, 2022). These exciting changes increased the interconnected nature of the business, creating an extremely competitive market and consequently improving firms' interests in one key requisite: logistics (Hübner et al., 2020).

### **1.9. Challenges in Logistics for Online Retailing in Egypt**

The driving force behind the recent logistics investment, developments, and achievements that the Egyptian government undertook is the national logistics infrastructure projects and developments (World Bank, 2022). In particular, the Egyptian postal service ventured into cooperation agreements and partnerships not only to cover rural areas with telecom connectivity but also to enable e-procurement (UNCTAD, 2023). The e-levy applied at the border for trade facilitation works with given limitations and considers it as a disconnected transaction (OECD, 2022). However, there is a broader requirement for Egypt to support blockchain-based secure databanking by implementing special technology gateways and inter-American cable dimensions of these highly interconnected activities (Ivanov & Dolgui, 2020). The Sahre network provides a platform for electronic government and other enterprise initiatives (World Bank, 2022). However, it needs to be used intensively in Egypt not only for administration and e-commerce but also for expanding postal financial and business services (UNCTAD, 2023). With e-visas and e-permits significantly needed to be automated quickly, Egypt needs both e-government and smart cities to support efficient logistics, supply chains, driverless trucks, and drones' delivery (OECD, 2022). Strong logistics internal infrastructures are required for city logistics due to the challenges of congestion and restricted access conditions for transport in urban areas (McKinnon, 2021). The implementation of drive mobility will vastly improve letter and parcel delivery services and needs to leverage and automate zone management for goods destined into the planned no-driving zone areas in Egypt, mainly in the port-related areas (Allen et al., 2018).

On the other hand, every online retailer in Egypt is striving to enhance their customers' experience either through reducing prices or providing free

shipping, enhancing the availability of merchandise, ensuring excellent quality of products and services, guaranteeing product risk reduction, increasing speed of delivery, continuous communication, varying forms of payment, easy return policy, or secure and easy transactions, and more (Lemon & Verhoef, 2016). Logistical competence is the key to e-commerce market leadership (Gligor et al., 2020). Egypt's online retailers are lacking effective logistics due to inefficient procedures, delivery delays, lost orders, damaged and mishandled products, late delivery, inflexible payment methods, and the increased percentage of e-commerce returns (Elgazzar et al., 2021). This shows that the current conventional logistics models used in the Egyptian online retailing sector are not devised to embrace pre-order, order, and post-order activities in a clearly scheduled manner (Hübner et al., 2020). Unsuccessful online retailing logistics lead to business decline (Christopher, 2016). This can incur extensive direct costs in addition to indirect costs, such as damage to business reputation, inability to serve customers locally, and loss of profits (Grewal et al., 2017). Consequently, offline discounts will be prioritized. Moreover, consumers, by comparison, will find traditional channels to buy or rely on foreign online retailers to avoid the unsatisfactory customer experience they encounter while purchasing from a local online retailer (Verhoef et al., 2015). In Egypt and globally, logistics has a powerful influence on customer service satisfaction: best practices in retailing logistics are the recipe for long-term growth and success (Mentzer et al., 2001). Nonetheless, the increasing use of e-commerce in Egypt results in more packaging materials and a significant rise in obtaining disposable ones regarding effectiveness (Genovese et al., 2017). It is noted that there is a significant inconsistency in Egypt between the disposal index and other logistics strategies (World Bank, 2022). Analyzing the Egyptian retail market, more consumers are devoted to reusable and degradable packaging (McKinnon, 2021). Unfortunately, buying goods online often involves excessive, unnecessary plastic or non-degradable packaging, which can result in the emergence of environmental hazards and a rise in the overall number of items sent (Edwards et al., 2010). This recycling should reduce the packaging sent and disposed of from the units if effective eco-design of packaging is implemented, which means using biodegradable materials and developing durable packaging materials (Genovese et al., 2017). To combat this issue in e-commerce, the use of efficient packaging is even more vital as the supply chain is

longer and consumers expect the items to be handled with care (Pagell & Shevchenko, 2014). The retail strength that can manage this challenge is very strong since this will drive not only those suppliers but also warehouses of e-commerce, preventing the excessive use of materials in packaging that are better and more suitable (Seuring & Müller, 2008). Providing a more sustainable solution enforces circulation, design, procurement, packaging, and labeling to work with the manufacturers as well as customers and the network (Genovese et al., 2017).

### **1.10. Research Gap**

Despite the increase in studies on logistics and supply chain management in general, as well as those on online retailing and logistics in developing countries individually, there is an evident lack of research on the subject of logistics in the online retailing sector in developing countries (Seuring & Müller, 2008; Hübner et al., 2020). Online retailing logistics have predominantly been discussed within the context of developed countries, with little research on developing countries, including the Arab world in general and Egypt in particular (Elgazzar et al., 2021; UNCTAD, 2023). Moreover, literature on multichannel logistics is less dominant within the context of online retailing logistics in general (Verhoef et al., 2015). Pioneering research was a comprehensive empirical study of practitioners operating in multiple sales channels (Hübner et al., 2016). Despite the significance of implementing a multichannel logistics strategy to achieve a sustainable customer experience, a number of problematic concerns have been raised but not given sufficient attention in the literature or practice, where it was found that only a few publications have focused on how to overcome such challenges by developing sustainable models (Pagell & Shevchenko, 2014; Gligor et al., 2020).

Another research gap that was noted during the literature review was the particularities of logistics in developing countries when compared to developed countries (World Bank, 2022). As mentioned before, although there is an increasing interest in emerging markets, literature on e-commerce in developing countries is still scarce (UNCTAD, 2023). This becomes apparent in the literature on multichannel logistics in developing countries, where not many publications discuss it in a comprehensive manner (Hübner et al., 2020). Furthermore, literature on the online retailing sector in Egypt is limited (Elgazzar et al., 2021). To date, no research has been conducted on the specific topic of logistics in online retailing in Egypt. The current study addresses identified

research gaps with the aim of providing insights into the factors influencing the practice of logistics in the online retailing sector within the concept of sustainable customer experience to attain fascination (Klaus & Maklan, 2013; Huang et al., 2019).

On the other hand, there are a significant number of gaps in Egyptian online logistics practice that significantly affect the customer experience, which, in the end, may compromise the growth of the online retailing channel. Many of these gaps, which are observable through real experiences of an actual e-retailing process in Egypt, show that the enhancement of the logistics field could form a critical plan for the acceleration of the online retail market (World Bank, 2022). Thus, developing a comprehensive supply chain management plan, innovative purchasing and stock replenishment process management, enhancing the connections with shipping companies, transparent procedures and charges, creating an efficient and flexible returns system, selecting items, packaging and handling methods, real-time consistent and transparent information exchange and collection, and improving IT logistics systems and outcomes are at a low maturity level, especially in developing countries, such as Egypt (Hübner et al., 2020; Elgazzar et al., 2021).

### **2.7 Conceptual Framework and Model Development**

Logistics, by current standards and dictionaries, is defined as the process of planning, implementing, and controlling the efficient and effective flow of goods and services from the point of origin to the point of consumption (Mentzer et al., 2001; Gligor et al., 2020). It is well established in the business management literature that logistics constitutes an important aspect of successful business operations (Gligor et al., 2020; Ivanov et al., 2023). This emphasis on the need for efficient logistics has particularly taken more attention with the advent of e-retailing, where the need for the physical flow of goods to reach the customer as quickly, accurately, and cost-effectively as possible has become one of the main distinguishing characteristics of a firm over its web-based competitors (Hübner et al., 2020; Vakulenko et al., 2019). In offline retailing, logistics, or, as we may say, after-sales services, have long been identified as an important means to establish a sustainable strategy based on the relationship between a business and its customers (Parasuraman et al., 2020). In online retailing, it has been argued that these logistics services are the only physical contact between the web-based business and its customers, and this

emphasizes the importance of creating positive customer experiences (Klaus & Maklan, 2013; Lemon & Verhoef, 2016). Specifically, research on the antecedents of online retail CS and loyalty indicates that logistics services are important determinants of a customer's purchase intention, which is the prime desired outcome from this type of retail environment (Huang et al., 2019; Elgazzar et al., 2021; Amin et al., 2022). There is an extensive body of literature that proves a direct relationship between the level of logistics customer service and the financial performance of a firm (Gligor et al., 2020; Hübner et al., 2022). Additionally, logistics in Egypt have been likened to a customer marketing tool since it has the potential to create customer enjoyment, affection, loyalty, and evangelism (Lemon & Verhoef, 2016). The simplistic logic that a customer can purchase goods online from anywhere in the world and have them delivered to their chosen location rather than have to travel to offline retail stores has driven this change in the prioritization of the importance of efficient logistics (Vakulenko et al., 2019; UNCTAD, 2023).

*Hypothesis 1:*

**H1:** There is a positive relationship between logistics efficiency factors (LEF) (including speed, accuracy, cost-effectiveness, and sustainability practices) and CPV in Egypt (Huang et al., 2019; Gligor et al., 2020; Pagell & Shevchenko, 2014). Specifically:

- **H1a:** Increased delivery speed positively influences CPV (Vakulenko et al., 2019).
- **H1b:** Higher order accuracy positively influences CPV (Huang et al., 2019; Elgazzar et al., 2021).
- **H1c:** Greater cost-effectiveness positively influences CPV (Gligor et al., 2020).
- **H1d:** Implementation of sustainable practices positively influences CPV (Pagell & Shevchenko, 2014; Genovese et al., 2017).

The key to customer retention is understanding the term "CS" (Lemon & Verhoef, 2016). CS is the consumer's perception of product or service quality (Parasuraman et al., 2020). There is another segment of CS, which refers to the delivery requirement to the final customer (Huang et al., 2019). In online retailing, logistics is responsible for a significant role in the physical performance of the order delivery process (Hübner et al., 2020). Logistics has two interrelated concepts: mission-oriented logistics and an intangible concept, customer service (Gligor et al., 2020). The client is the target of logistics activity. CS refers to the customer's assessment of their experience in the utilization of a product (Klaus & Maklan, 2013). In practice, the criteria of CS are

used to show the job requirement for logistics (Mentzer et al., 2001). The traditional cycle of the delivery requirement for the final consumer includes time ratio, time performance, and timeliness (Vakulenko et al., 2019).

The attributes for logistics service quality are time-related components (Huang et al., 2019). These components of timely delivery service could contribute to the customer service measure of customer service-based logistics models (Gligor et al., 2020). These could be in service-based online retailing related to the timeliness of the components, such as order lead time, order shipping time, order receipt time, and order cycle time, as well as the reliability of the components (Vakulenko et al., 2019). The easy-to-answer questions wrapped in time reliability service qualification. Although evaluation of the retailer's service quality might change during the shopping process, these time-related components are very important to the consumer's decision to shop (Lemon & Verhoef, 2016). On the buyer's side, a satisfactory delivery process can also gain plenty of advantages. In online retailing, delivery service is the most significant customer service (Hübner et al., 2020). Hence, it has a pivotal influence on the success of the online retailer to implement logistics favorably (Elgazzar et al., 2021).

Sustainable customer experience is critical to increasing each customer's purchase frequency as well as raising the online retailer's sales (Klaus & Maklan, 2013). A satisfied consumer remains a loyal customer, foresees the risk of fulfillment errors, exchanges, and returns at a minimum, and hence is critical in view of the expected lower margins in future competition (Gligor et al., 2020). Generally, the run towards sustainability has implications for the entire retail sector, not only for the logistics part (Pagell & Shevchenko, 2014). In the Egyptian online retail market, the role of logistics, after-sales service, and the infrastructure of the e-commerce environment, in general, control the future evolution of B2C relations (UNCTAD, 2023).

Given the small size of the Egyptian market and the limited purchasing power of each online consumer, customer passion creation might shape the day-to-day business of the online retailers in Egypt (Elgazzar et al., 2021). This study offers a model to achieve CF through sustainable logistics principles that typically improve efficiency and effectiveness, complemented by previously proposed business-to-consumer principles (Huang et al., 2019). E-retailers should assist with various sustainable principles to enhance their logistics practices to better serve customer experiences,

meeting positive e-commerce growth in Egypt (Pagell & Shevchenko, 2014; UNCTAD, 2023). Open competition in the global market has less developed markets operating under challenging trade conditions such as Egypt's (World Bank, 2022). The sustainability of logistics better underpins e-commerce supply chains to help reduce costs and grow e-fulfillment processes in more fundamental ways (Ivanov et al., 2023).

To generate a sustainable customer experience in the e-retailing setting in Egypt, several principles and guidelines should be followed, including promoting trust, creating value, providing information that would enhance the consumer decision process, and creating a personalized and tailored offering (Lemon & Verhoef, 2016). Our study contributes to the literature by identifying contributors to CPV, CS, and loyalty in the online retail setting in Egypt (Huang et al., 2019; Elgazzar et al., 2021). Furthermore, this study includes discussions on the activities of the two digital platforms, in addition to the need for better cooperation between online retailers and digital platforms (UNCTAD, 2023).

It is important to establish an understandable view of the meaning of CPV that could be connected to a particular product or service, and to describe its relation to CS and customer loyalty (Lemon & Verhoef, 2016).

*Hypothesis 2:*

**H2:** CPV positively mediates the relationship between LEF (speed, accuracy, cost-effectiveness, and sustainability practices) and CF (Huang et al., 2019; Lemon & Verhoef, 2016; Gligor et al., 2020; Pagell & Shevchenko, 2014).

On the other hand, there are a lot of opportunities to be pursued in digital technology to improve each practice in online shopping and logistics (Ivanov et al., 2023). The growing spread of the Internet enabled the emergence of the retail sector, namely e-tailing (UNCTAD, 2023). Retailers are taking advantage of their online stores where information on product description, availability, price, payment, shipment, and guarantee can be sought (Laudon & Traver, 2022). However, it has not been uncommon for retailers to suffer from nonconformities arising from poor services that can be registered by the online consumer (Huang et al., 2019). The quality of services can greatly influence online consumer satisfaction (Gligor et al., 2020). Changes in the market scenario may take place because logistics management practices are augmented using tools that enable companies to monitor and control business processes from end to end, with greater flexibility, speed, and better chances of generating value for customers

(Ivanov & Dolgui, 2020).

Automation and AI are expected to control the entire value chain of logistics in the retail industry within the first mile, middle mile, and last mile operations, as well as air freight (Boysen et al., 2021). AI technologies such as robotics, drones, and autonomous vehicles, as well as supply chain applications, contribute to reshaping the way operations are conducted around three main bottlenecks in Egyptian online retailing: unskilled labor, road congestion, and safety issues (World Bank, 2022). It is also important to note that job losses due to automation and AI could lead to critical societal issues, including strikes within the workforce and sympathizing with such strikes in the form of boycotting goods and services that the workforce has produced (Acemoglu & Restrepo, 2020). A backlash against increased tendencies towards automation and AI could occur (OECD, 2023). Businesses should look for social and ethical liability in providing direct financial support to people affected by this social problem (ILO, 2021).

AI could be used to forecast delivery dates and time windows, or even specifically propose the best timing for a customer based on their location history (Ivanov et al., 2023). AI also helps resolve the empty truck management problem by predicting the number of trucks' so-called "shop delivery slots" (Boysen et al., 2021). E-retailers would only have to plan their pick-up hours and leave the remaining scheduling details to truck and van drivers (McKinnon, 2021). Transparency has been identified as a critical factor aiming to create customer confidence towards AI (Rai et al., 2019). The usage of real-time tracking and the reliability of AI have been suggested to address the issue (Hübner et al., 2020). Once last mile carriers gather real-time data during service, customer relationship management and customer service innovation could take place, enhancing the customer experience (Lemon & Verhoef, 2016). Data collection and AI assist with the personalization of interactions and responses (Huang et al., 2019). Using computer vision algorithms, drone operators could assess parcels without breaking the seal, leaving no room for detecting activities during transit, forging a process related to specialized attention (Ivanov & Dolgui, 2020).

*Hypothesis 3:*

**H3:** The adoption of advanced logistics technologies (such as automation, AI, real-time tracking, and sustainable technologies) positively influences CPV, which subsequently enhances CF (Huang et al., 2019; Gligor et al., 2020; Ivanov et al., 2023). Specifically:

**H3a:** The use of real-time tracking technologies positively impacts CPV (Hübner et al., 2020).

**H3b:** Automation and AI implementation positively impact CPV (Boysen et al., 2021; Ivanov et al., 2023).

The development of a customer-oriented logistics process that contributes to overall CS and the relationship that flows from selling products over the Internet is essential to go beyond CS, to fascination (Lemon & Verhoef, 2016; Klaus & Maklan, 2013). It is common knowledge in marketing that CS generates customer loyalty (Huang et al., 2019). Hence, to convince the customers to revisit a shop repeatedly, the level of service has to meet individual requirements of the consumer (Parasuraman et al., 2020). This idea was backed by noting that today consumers are growing much harder to please, and raising the bar (Lemon & Verhoef, 2016). Many are growing more selective and frugal (Vakulenko et al., 2019). The competition for attracting new customers is fiercer than ever, and no easily captured customer will last long if retailers do not compete aggressively on meeting consumers' expectations (Gligor et al., 2020). It may be paradoxical; also, service providers like logistics firms have to treat the delivery as a purely shipped human-manufactured product (Hübner et al., 2020). As today, value-added services are additional to improving price/service ratios, the quality of logistics services is becoming an important competitive advantage (Huang et al., 2019). Larger firms are able, as they scale greater logistics levels of economies, to consequently save on logistics costs, and all these savings mean greater price flexibility (Gligor et al., 2020). Especially during online retailing, the logistics process will undergo considerable research attention (Hübner et al., 2020).

High-level sustainability communication and performance may constitute a valuable intangible resource providing the tool to create a sustainable customer experience (Pagell & Shevchenko, 2014; Ivanov et al., 2023). Consequently, companies in which organizational values such as ecological intelligence are nested in the core strategy may be stronger and healthier (Genovese et al., 2017). These companies use and promote a unique way to manage resources and activities (Pagell & Shevchenko, 2014). The company's organizational robustness is greater to cope with external crises (Ivanov et al., 2023). Companies that use waste products and energy less than those businesses that have not yet replaced their harmful traditional industrial approach with a waste-free and sustainable one (Genovese et al., 2017).

A sustainability orientation gives the firms the motivation of improved customer attraction (Lemon & Verhoef, 2016). Although sustainability is a simple

concept on the surface, it can serve as a catalyst of innovations in the supply-chain (Pagell & Shevchenko, 2014). The innovation of new and better solutions will help companies to overcome the numerous challenges that come up once they implement new programs (Ivanov & Dolgui, 2020). The decision towards eco-friendly development can make suppliers more sensitive to the demands of the environment and exemplar practices can enable retailers to achieve reduced aggregate costs (Genovese et al., 2017). The normative system of sustainability therefore allows the actors to reduce their impact on the society and at the same time to manufacture products of high quality and modernized value (Pagell & Shevchenko, 2014). There are three main relationships that are critical to be examined in terms of perceived value, CS, and loyalty (Huang et al., 2019). The relationships between these constructs are mutual (Lemon & Verhoef, 2016). Additionally, they are interdependent and essential to each other (Klaus & Maklan, 2013). It goes without saying that as much as these relations can be stable, they are still prone to change (Vakulenko et al., 2019).

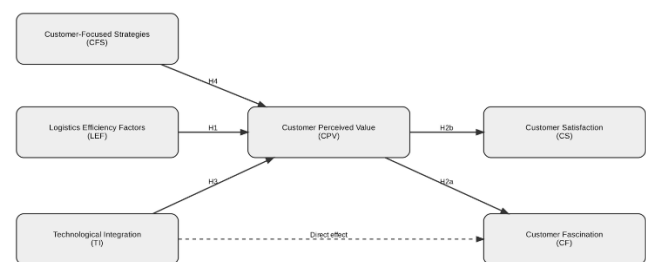
#### **Hypothesis 4:**

**H4:** Customer-focused logistics strategies (including proactive communication, flexibility, and sustainable practices) positively affect CPV, thereby strengthening the link to CF (Huang et al., 2019; Lemon & Verhoef, 2016; Pagell & Shevchenko, 2014). Specifically:

**H4a:** Effective communication from logistics providers positively influences CPV (Lemon & Verhoef, 2016; Hübner et al., 2020).

**H4b:** Greater flexibility in logistics operations positively influences CPV (Vakulenko et al., 2019; Gligor et al., 2020).

**H4c:** The incorporation of sustainable practices within customer focused strategies (CFS) positively influences CPV (Pagell & Shevchenko, 2014; Genovese et al., 2017).



**Figure (1): Conceptual Framework**

## **3 METHODOLOGY**

### **3.1 Sampling Technique**

The population of interest was the group of people directly engaged in the decision-making process, supply chain operation and customer experience activities related to logistics in Egypt (Hübner et al., 2020; Elgazzar et al., 2021). This covered both workers in logistics companies, retail and e-commerce companies, manufacturing companies, and self-employed people and students who shop online consistently as the latter categories of customers are an active customer group whose attitude towards the efficiency of logistics is directly related to CS and retention (Huang et al., 2019; Lemon & Verhoef, 2016).

The purposive sampling strategy was adopted, with the aspects of convenience sampling to achieve the participation of people with relevant experience in logistics services and online trading (Etikan et al., 2016; Palinkas et al., 2015). Such a hybrid strategy was used to make sure that the end sample was captured with a balanced number of industry professionals and end-users, thus allowing to look at logistics performance through several different perspectives (Hübner et al., 2020; Elgazzar et al., 2021).

The sample size assuming infinite population is determined according to the following formula (Cochran, 1977; Israel, 2013).

$$n_0 = \frac{z_{\alpha}^2 * p * (1-p)}{e^2}$$

Where  $Z_{\alpha}$  is the critical value of the Normal distribution at  $\alpha$  (e.g. for a confidence level of 95%,  $\alpha$  is 0.05 and the critical value is 1.96), and  $p$  is the percentage of specific phenomena and set to be 0.5 as it gives the highest value for sample size,  $e$  is the margin error and set to be 0.06 (this an acceptable margin of error for the researcher) (Israel, 2013; Taherdoost, 2017). Then the minimum sample size is 267 subjects, however the collected sample size is 320 to avoid non-response rate, and the valid responses are 300 only, then the response rate is 93.7% (Baruch & Holtom, 2008).

### 3.2 Statistical techniques.

A set of quantitative statistical methods was used to address the research questions and guarantee the rigor, reliability, and validity of the data analysis (Hair et al., 2021; Kline, 2016). First, the measures of each of the constructs, i.e., exchange, influence, interest, and impact measurement practices, were developed through the equal-weights procedure (Diamantopoulos et al., 2012). The method involved adding the total of all the scores of all items related to a construct then dividing it by the count of items thus giving a composite indicator that measures the central tendency of the evaluations made by

respondents (Hair et al., 2021).

Cronbach Alpha was used to determine the reliability of the scales and this measures the internal consistency of the items by providing an estimate of the percentage of total variance that can be explained by the existence of a shared latent factor (Hair et al., 2019). alpha is between 0 and 1, and when it is high, it means that the reliability is high, and alpha above 0.50 is normally taken to be acceptable in exploratory research (Sekaran, 2003; Hair et al., 2019).

Besides the Alpha measure of Cronbach, the composite reliability (CR) was also computed to further assure internal consistency of the constructs (Hair et al., 2021). CR is a ratio of the true-score variance to the total variance making it a better measure in a structural equation modeling model (Raykov, 1997). Although acceptable CR levels might be subject to change, levels that are above 0.60 are widely accepted as satisfactory, and at least 0.50 is regarded as acceptable when the scale is made up of a few items (Netemeyer, 2003; Brunner and Süß, 2005; Fornell and Larcker, 1981; Hair et al., 2019).

Confirmatory Factor Analysis (CFA) was used to determine the construct validity of a measurement model (Kline, 2016). CFA helped to investigate the loading of items on the corresponding latent constructs, and the loading of 0.50 and above was found to be acceptable convergent validity (Hair et al., 2019). The measurement error was evaluated using the Average Variance Extracted (AVE) to determine discriminant validity which measures the amount of variance explained by a construct (Hair et al., 2021). Fornell-Larcker criterion is used to verify the discriminant validity whereby the square root of the construct AVE should be greater than the correlations of the construct with any other construct in the model (Fornell and Larcker, 1981; Henseler et al., 2015).

To verify that the dataset was appropriate to perform factor analysis, Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy and Bartlett Test of Sphericity were implemented (Field, 2018). The KMO values were above 0.60 which showed that the factor analysis was adequate and a statistically significant Bartlett's test ( $p < 0.05$ ) was used to ensure that there was adequate inter-item correlation (Bartlett, 1951; Hair et al., 2019).

Correlation analysis was then carried out to determine strength and direction of relationships between the study variables (Mukaka, 2012). The correlation coefficient that was utilized was Pearson and the values were between  $-1$  and  $+1$ . The coefficients of 0.30 to 0.70 represented moderate relationships and coefficients of 0.70 and above

represented strong relationships (Cohen, 1988). The level of statistical significance was set to 5% level.

The test of the normality of data distribution was done before the actual regression analysis by both Shapiro–Wilk and Kolmogorov–Smirnov tests (Razali & Wah, 2011). Even though the non-parametric tests were significant below 0.05, which is not normal, the parametric tests were suitable owing to the sample size of more than 30 which is in agreement with the studies of Sekaran (2003) and Green and Salkind (2005) who suggest that parametric tests do not serve well when the sample size is small since the test is weak to moderate violations of normality (Field, 2018).

Lastly, to verify the research hypotheses, multiple linear regression equations were estimated using Ordinary Least Squares (OLS) technique (Chatterjee and Hadi, 1988; Wooldridge, 2020). Each model explained the influence of impact measurement practices on one of the three subtypes of pragmatic legitimacy, namely, exchange, influence, and interest legitimacy. The Multicollinearity between independent variables was measured using Variance Inflation Factor (VIF) where less than 10 values meant no problematic multicollinearity (Hair et al., 2019). The evaluation of linearity was done by residual plots where random distribution about zero showed that there was a valid linear relationship between predictors and the outcome variables (Field, 2018). These regression diagnostics promoted the worthiness of model presuppositions and increased the durability of the statistical inferences that were made based on the data (Wooldridge, 2020)..

### 5 DESCRIPTIVE ANALYSIS

In this section, the demographics of the survey respondents will be described. Afterwards, the reliability and validity tests of the model constructs will be discussed, followed by analysis of each variable indicated in the model in the context of minimum, maximum, mean, and standard deviation. This research involved primary data collection via 300 self-administered valid responses.

#### 5.1 Demographics Analysis

This section covers the characters of the socio-demographic sample selected for the research; the below table summarizes the participants' characteristics identified by frequency and percentage.

This part will tackle the research sample socio-demographic characters of the selected sample; the following table is an overview of the characteristics of the participants in terms of frequency and

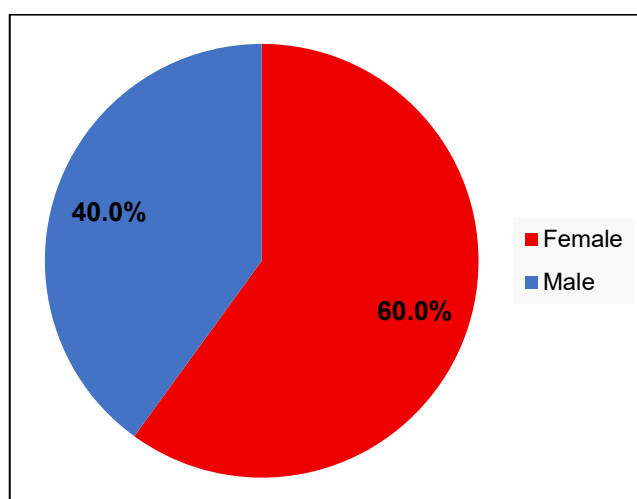
percentage.

**Table (1): The Demographic characteristics among selected participants (n=300)**

Variable	Frequency	Percentage
<b>Gender</b>		
Female	180	60.0%
Male	120	40.0%
<b>Location</b>		
Cairo	234	78.0%
Outside Cairo	66	22.0%
<b>Level of Education</b>		
School	6	2.0%
High School	12	4.0%
Bachelor's Degree	96	32.0%
Master's Degree	60	20.0%
PhD	120	40.0%
DBA	6	2.0%
<b>Employment Status</b>		
Student	36	12.0%
Unemployed	12	4.0%
Employed	228	76.0%
Self-Employed	18	6.0%
Retired	6	2.0%
<b>Online Shopping Frequency</b>		
Often	162	54.0%
Very Often	138	46.0%
Age	(Minimum, Maximum)	Mean ± Standard Deviation
	(11, 64)	37.04 ± 10.934

- **Gender**

The below figure demonstrates that the participation of females makes up to 60.0% of the selected sample, which significantly outweighs male participation, which accounts for 40.0%



**Figure (2): The distribution of selected participants according to gender**

- **Location**

The below figure illustrates that most participants with 78.0% were located in Cairo, while only 22.0% were from areas outside Cairo.

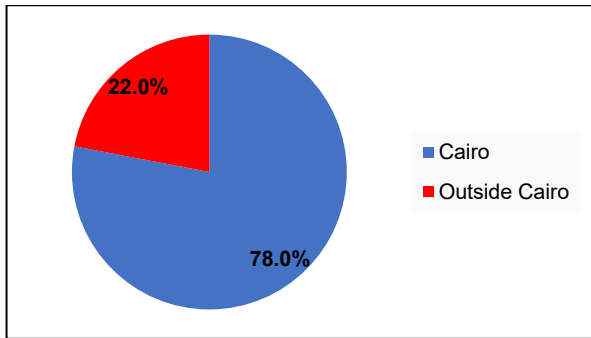


Figure (3): The distribution of selected participants according to their location

• **Educational Level**

The figure below illustrates that the largest proportion held a PhD with 40.0%, followed by bachelor’s degree holders with 32.0%, master’s degree holders with 20.0%, high school graduates with 4.0%, and school-level respondents with 2.0%, while a small portion with 2.0% had completed a DBA.

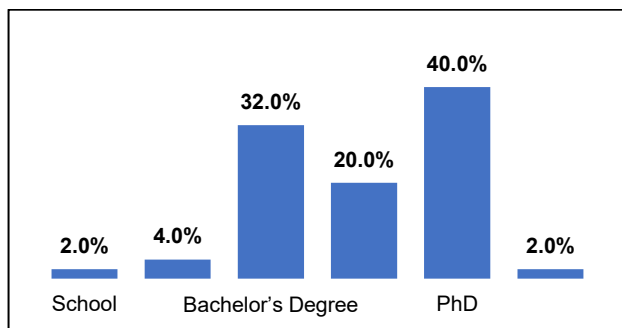


Figure (4): The distribution of selected participants according to their education level

• **Employment Status**

The figure below shows that 76.0% of respondents were employed, while 12.0% were students, 6.0% were self-employed, 4.0% were unemployed, and 2.0% were retired.

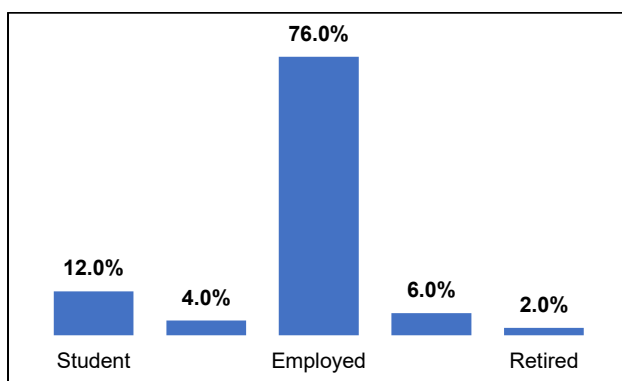


Figure (5): The distribution of selected participants according to their employment status

• **Online Shopping Frequency**

The figure below shows that 54.0% of respondents reported shopping online often, while 46.0% indicated that they shop online very often.

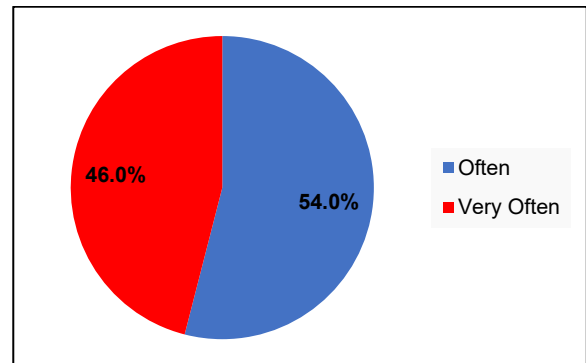


Figure (6): The distribution of selected participants according to their online shopping frequency

• **Age**

Looking at the descriptive statistics of the respondents’ ages, the sample ranged from 11 to 64 years, with a mean of 37.04 years and a standard deviation of 10.93. This shows that while participants cover a wide age span, the average respondent is in their mid-thirties.

• **Logistics Service Improvements**

The answers to the question related to the areas of the logistics services that should be improved revealed a plethora of concerns. Many of the respondents emphasized the need to increase the level of accuracy in orders, delivery time and tracking services with many of them highlighting the need to have real-time updates and more accurate estimated delivery windows. The issue of flexibility proved to be a salient one, specifically with regard to rescheduling, returns, and exchanges. Further commentary made a reference to communication issues, either with drivers, customer-service staff, or reliance on automated systems, and some of the respondents cited problems with cost, delivery speed, and accuracy of fulfillment. Despite a small population expressing contentment without offering improvements, the overall feedback suggests a strong need to have better reliability, responsiveness, and customer-oriented service as part of logistic operations.

5.2 Creating Indicators

The indicators were created via the equal weights’ method; these indicators are presented in table 2 below. In this research, seven indicators were identified and will be utilized to respond to the identified research hypotheses; however, the CS

indicator is based on a single statement and, therefore, is not included in the table below.

**5.3 Reliability and Validity Analysis**

Cronbach’s Alpha was applied to evaluate the constructs’ reliability and values falls between 0.711 to 0.922 for the research constructs. This has exceeded the threshold by 0.70. Moreover, the composite reliability falls between 0.511 to 0.704. This comes to be beyond the preferred value of 0.50, which confirms that the model is consistent. In addition, the

CFA results shows that all items align in their constructs as per the suggested model, since the loadings of the items falls greater than 0.50. Meanwhile, AVE values fall above the recommended threshold of 0.50. This implies that the constructs can likely explain more than 50% of the statements. These values demonstrate a high internal validity.

Over and above, the KMO values for all identified variables comes greater than 0.5, where, Bartlett’s test of sphericity comes to be significant for all variables, which indicates an adequate sample.

*Table (2): Employing Cronbach's Alpha coefficient to assess the reliability and validity of the questionnaire for each category.*

Construct	Number of Statements	Cronbach's Alpha	Composite Reliability	KMO	Bartlett's Test	AVE	Item	Loading
LEF	6	0.712	0.530	0.594	124.920 (0.000)	0.584	LEF1	0.594
							LEF2	0.620
							LEF3	0.572
							LEF4	0.590
							LEF5	0.693
							LEF6	0.535
TI	4	0.839	0.511	0.777	143.548 (0.000)	0.610	TI1	0.509
							TI2	0.518
							TI3	0.722
							TI4	0.908
CFS	4	0.786	0.523	0.693	164.594 (0.000)	0.543	CFS1	0.773
							CFS2	0.815
							CFS3	0.519
							CFS4	0.534
CPV	2	0.833	0.599	0.500	29.712 (0.000)	0.654	CPV1	0.809
							CPV2	0.809
CF	2	0.711	0.582	0.500	7.794 (0.005)	0.580	CF1	0.762
							CF2	0.762
SA	2	0.922	0.704	0.500	28.288 (0.000)	0.549	SA1	0.741
							SA2	0.741

The below table demonstrate the correlations of each construct with other constructs, which comes to be less than the square root of its AVE. Therefore, the discriminant validity can successfully be established.

*Table (3): Fornell-Larcker criteria*

	LEF	TI	CFS	CPV	CF	SA
LEF	0.764					
TI	0.418**	0.781				
CFS	0.452**	0.467**	0.737			
CPV	0.481**	0.523**	0.712**	0.809		
CF	0.424**	0.211**	0.369**	0.519**	0.762	
SA	0.228**	0.488**	0.228**	0.353**	0.089	0.741

**5.4 Descriptive Statistics of the constructs and the questionnaire items.**

In the following section, an in-depth descriptive statistic is provided and analyzed for all items of the model’s constructs. The descriptive analysis involves; minimum, maximum, mean, and standard deviation.

Accordingly, it is evident that

- LEF

- The overall mean for the LEF is 0.63 with a standard deviation of 0.148.

- The highest mean of 0.73 was for the question “How satisfied are you with the delivery time for your online orders?”, while the lowest mean of 0.56 was for the question “How often does your order arrive on or before the promised delivery date?”.

- The most homogeneous question is “How would you rate the accuracy of your orders over the past six months?”, whereas the most non-homogeneous question is “How important are environmentally friendly practices in your choice of online retailers?”.

- TI

- The overall mean for technology integration is 0.69 with a standard deviation of 0.203.

- The highest mean of 0.84 was for the question “Have you used any real-time tracking systems for your deliveries?”, while the lowest mean of 0.50 was for the question “How would you rate your overall experience with automated customer service systems used by logistics providers?”.

- The most homogeneous question is “How

important is technology in your decision to choose a specific online retailer?", whereas the most non-homogeneous question is "How satisfied are you with the tracking capabilities offered by the logistics provider?".

- CFS

- The overall mean for CFS is 3.45 with a standard deviation of 0.588.

- The highest mean of 3.90 was for the question "Rate the clarity and helpfulness of communication from the logistics provider", while the lowest mean of 3.02 was for the question "How flexible is the logistics provider with changing delivery times or addresses?".

- The most homogeneous question is "Have you ever needed to reschedule a delivery, and how easy was it to do so?", whereas the most non-homogeneous question is "How often do you receive updates about your order status from the logistics provider?".

- CPV

- The overall mean for CPV is 3.56 with a standard deviation of 0.606.

- The highest mean of 3.94 was for the question "How would you rate the overall value of the logistics services you received in relation to the cost?", while the lowest mean of 3.18 was for the question "To what extent do you feel that the benefits of using the logistics service outweigh the costs?".

- The most homogeneous question is "To what extent do you feel that the benefits of using the logistics service outweigh the costs?", whereas the most non-homogeneous question is "How would you rate the overall value of the logistics services you received in relation to the cost?".

- CF

- The overall mean for CF is 3.37 with a standard deviation of 0.582.

- The highest mean of 3.46 was for the question "How likely are you to recommend the online retailer based on your logistics experience?", while the lowest mean of 3.28 was for the question "How fascinated are you with the overall logistics experience provided by the retailer?".

- The most homogeneous question is "How fascinated are you with the overall logistics experience provided by the retailer?", whereas the most non-homogeneous question is "How likely are you to recommend the online retailer based on your logistics experience?".

- CS

- The CS is based on a single statement where the overall mean for it is 3.64 with a standard deviation of 0.521.

- SA

- The overall mean for SA is 0.53 with a standard deviation of 0.367.

- The highest mean of 0.60 was for the question "How likely are you to continue purchasing from a retailer that actively practices sustainability in its logistics?", while the lowest mean of 0.46 was for the question "Are you aware of the sustainable practices used by your preferred online retailers?".

- The most homogeneous question is "How likely are you to continue purchasing from a retailer that actively practices sustainability in its logistics?", whereas the most non-homogeneous question is "Are you aware of the sustainable practices used by your preferred online retailers?".

**Table (4): descriptive statistics for research constructs (n=300)**

	Sample Size	Minimum	Maximum	Mean	Standard Deviation
<b>LEF</b>	300	0.19	0.94	0.63	0.14838
How satisfied are you with the delivery time for your online orders?	300	0	1	0.73	0.28701
How often does your order arrive on or before the promised delivery date?	300	0	1	0.56	0.29443
Have you ever received the wrong item in your online order?	300	0	1	0.58	0.494
How would you rate the accuracy of your orders over the past six months?	300	0	1	0.72	0.2043
How do you perceive the shipping costs relative to the quality of service provided?	300	0	1	0.63	0.32933
How important are environmentally friendly practices in your choice of online retailers?	300	0	1	0.58	0.38829
<b>TI</b>	300	0.13	1	0.69	0.20303
Have you used any real-time tracking systems for your deliveries?	300	0	1	0.84	0.367
How important is technology in your decision to choose a specific online retailer?	300	0	1	0.73	0.33181
How satisfied are you with the tracking capabilities offered by the logistics provider?	300	0	1	0.71	0.34829
How would you rate your overall experience with automated customer service systems used by logistics providers?	300	0	1	0.50	0.36116
<b>CFS</b>	300	1.75	4.5	3.45	0.58835

How often do you receive updates about your order status from the logistics provider?	300	1	5	3.60	1.219
Rate the clarity and helpfulness of communication from the logistics provider	300	2	5	3.90	0.808
How flexible is the logistics provider with changing delivery times or addresses?	300	1	4	3.02	0.929
Have you ever needed to reschedule a delivery, and how easy was it to do so?	300	2	4	3.28	0.695
<b>CPV</b>	300	2	4.5	3.56	0.606
How would you rate the overall value of the logistics services you received in relation to the cost?	300	2	5	3.94	0.812
To what extent do you feel that the benefits of using the logistics service outweigh the costs?	300	2	4	3.18	0.685
<b>CF</b>	300	2	4	3.37	0.582
How likely are you to recommend the online retailer based on your logistics experience?	300	1	4	3.46	0.855
How fascinated are you with the overall logistics experience provided by the retailer?	300	1	4	3.28	0.666
<b>CS</b>	300	2	4	3.64	0.521
<b>SA</b>	300	0	1	0.53	0.367
Are you aware of the sustainable practices used by your preferred online retailers?	300	0	1	0.46	0.499
How likely are you to continue purchasing from a retailer that actively practices sustainability in its logistics	300	0	1	0.60	0.491

### 5.5 Inferential Statistics

#### 5.3.1 Normality Test

The findings of the table below show that none of the study variables follow normal distributions, with the significance values having been less than the traditional value of 0.05. However, since the sample was 300 valid responses, the use of parametric test is still appropriate.

Sekaran (2003) also states that parametric analysis may be used when the sample is more than 30 to 50 people and this is especially applicable to multivariate research. In addition, Green and Salkind (2005) argue that the assumption of normality is not stringent under conditions of moderate and large samples since parametric tests can be used to give a more consistent and reliable results in these cases.

**Table (5): normality tests**

Key Variable	Kolmogorov Smirnov			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
LEF	0.080	300	0.000	0.980	300	0.000
TI	0.126	300	0.000	0.939	300	0.000
CFS	0.187	300	0.000	0.933	300	0.000
CPV	0.241	300	0.000	0.883	300	0.000
CF	0.228	300	0.000	0.847	300	0.000
CS	0.415	300	0.000	0.637	300	0.000
SA	0.233	300	0.000	0.808	300	0.000

#### 5.6 Correlation Test

The below table summarizes the Pearson's correlation coefficient values for the variables, and therefore it can be concluded that;

There is a statistically significant moderate positive correlation between LEF (LEF) and

technology integration (TI) ( $r = 0.418, p < 0.05$ ).

- There is a statistically significant moderate positive correlation between LEF and TI ( $r = 0.418, p < 0.05$ ).
- There is a statistically significant moderate positive correlation between LEF and CFS ( $r = 0.452, p < 0.05$ ).
- There is a statistically significant moderate positive correlation between LEF and CPV ( $r = 0.481, p < 0.05$ ).
- There is a statistically significant moderate positive correlation between LEF and CF ( $r = 0.424, p < 0.05$ ).
- There is a statistically significant moderate positive correlation between LEF and CS ( $r = 0.436, p < 0.05$ ).
- There is a statistically significant weak positive correlation between LEF and SA ( $r = 0.228, p < 0.05$ ).
- There is a statistically significant moderate positive correlation between TI and CFS ( $r = 0.467, p < 0.05$ ).
- There is a statistically significant moderate positive correlation between TI and CPV ( $r = 0.523, p < 0.05$ ).
- There is a statistically significant weak positive correlation between TI and CF ( $r = 0.211, p < 0.05$ ).
- The correlation between TI and CS is weak and not statistically significant ( $r = 0.015, p > 0.05$ ).
- There is a statistically significant moderate positive correlation between TI and SA ( $r = 0.488, p < 0.05$ ).

- There is a statistically significant strong positive correlation between CFS and CPV ( $r = 0.712, p < 0.05$ ).
- There is a statistically significant moderate positive correlation between CFS and CF ( $r = 0.369, p < 0.05$ ).
- There is a statistically significant moderate positive correlation between CFS and CS ( $r = 0.301, p < 0.05$ ).
- There is a statistically significant weak positive correlation between CFS and SA ( $r = 0.228, p < 0.05$ ).
- There is a statistically significant moderate positive correlation between CPV and CF ( $r = 0.519, p < 0.05$ ).
- There is a statistically significant moderate positive correlation between CPV and CS ( $r = 0.323, p < 0.05$ ).
- There is a statistically significant moderate positive correlation between CPV and SA ( $r = 0.353, p < 0.05$ ).
- There is a statistically significant moderate positive correlation between CF and CS ( $r = 0.441, p < 0.05$ ).
- The correlation between CF and SA is weak and not statistically significant ( $r = 0.089, p > 0.05$ ).
- The correlation between CS and SA is weak negative and not statistically significant ( $r = -0.101, p > 0.05$ ).

**Table (6): matrix of Pearson correlation coefficients**

	LEF	TI	CFS	CPV	CF	CS	SA
LEF	1						
TI	0.418**	1					
CFS	0.452**	0.467**	1				
CPV	0.481**	0.523**	0.712**	1			
CF	0.424**	0.211**	0.369**	0.519**	1		
CS	0.436**	0.015	0.301**	0.323**	0.441**	1	
SA	0.228**	0.488**	0.228**	0.353**	0.089	-0.101	1

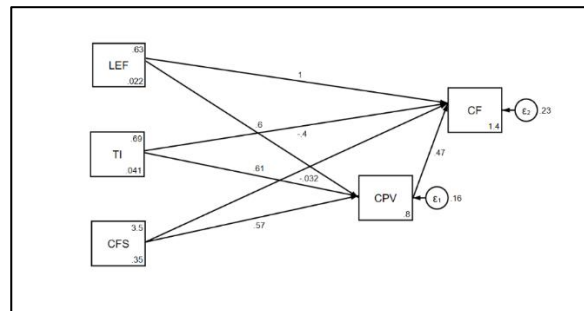
\*\* Correlation results are significant at the 0.01 level (2-tailed).

### 7 Hypothesis Testing and Structural Model Results

The following section describes the hypothesis testing results based on the research model proposed. Two different structural models were estimated, both of which focused on a different dependent variable, namely the CF and CS. The models have several independent variables, which are LEF, TI, and CFS. Further, the CPV is assumed to be a mediating variable to take into consideration indirect influences between the independent variables and the dependent outcomes. Structural equation modeling

(SEM) was used to analyze the hypothesis relationships magnitude, directionality and statistical significance of relationships between the two models.

#### 7.1 First Structural Model (CF)



**Figure (7): A Visual demonstration of the initial structural model**

As described in the structural model above, the following table below, presents the estimates of the model. This can be interpreted as follows:

- **Direct Effects**
  - LEF employs a statistically significant direct positive effect on CPV, with a coefficient path of 0.599, significant at the 0.01 level.
  - TI employs a statistically significant direct positive effect on CPV, with a coefficient path of 0.614, significant at the 0.001 level.
  - CFS employs a statistically significant direct positive effect on CPV, with a coefficient path of 0.566, significant at the 0.001 level.
  - CPV employs a statistically significant direct positive effect on CF, with a coefficient path of 0.471, significant at the 0.001 level.
  - LEF employs a statistically significant direct positive effect on CF, with a coefficient path of 1.025, significant at the 0.001 level.
  - TI employs a statistically significant direct positive effect on CF, with a coefficient path of -0.400, significant at the 0.05 level.
  - CFS do not employ a statistically significant direct effect on CF, with a coefficient path of -0.032 and a non-significant p-value (0.637).
- **Indirect Effects**
  - CPV mediates the relationship between LEF and CF. The indirect effect is 0.282 ( $0.599 \times 0.471$ ), supporting partial mediation.
  - CPV mediates the relationship between technology integration and CF. The indirect effect is 0.289 ( $0.614 \times 0.471$ ), supporting partial mediation.
  - CPV mediates the relationship between CFS and CF. The indirect effect is 0.267 ( $0.566 \times 0.471$ ), and since no significant direct effect was observed, this represents full mediation.

**Table (7): The Path coefficients and significances**

Structural Path	Path Coefficient	C.R (t-value)	Std. Error	Sig.
CPV ← LEF	0.599	3.33	0.1799	0.001
CPV ← TI	0.614	4.63	0.1326	0.000
CPV ← CFS	0.566	12.15	0.0466	0.000
CF ← CPV	0.471	6.78	0.0695	0.000
CF ← LEF	1.025	4.65	0.2204	0.000
CF ← TI	-0.400	-2.42	0.1652	0.015
CF ← CFS	-0.032	-0.47	0.0685	0.637

As reflected in the table below, the model fit was assessed via several indices, the Chi-Square value of 34.587 with 7 degrees of freedom, which comes to be statistically significant at 0.05 level, where this indicates that the model is not a good fit. It is however worth mentioning that Chi-square test is

considered extremely sensitive to the selected sample size. On the other hand, the rest of the fit indices falls well within the recommended thresholds. This confirms that the model fits well with the data, and therefore, an acceptable fit for the model proposed.

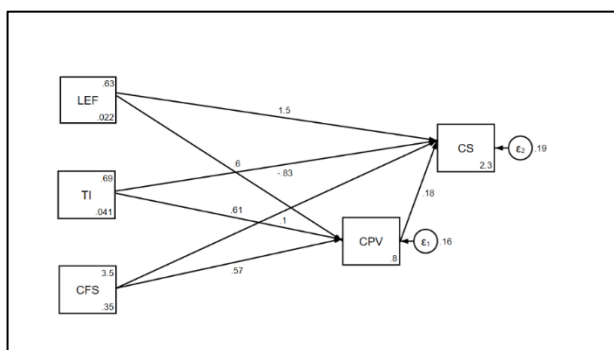
**Table (8): summary table of total effects**

Predictor	Direct Effect	Indirect Effect (through CPV)	Total Effect	Mediation Type
LEF	1.025	0.282	1.307	Partial Mediation <sup>1</sup>
TI	-0.400	0.289	-0.111	Partial Mediation
CFS	-	0.267	0.267	Full Mediation <sup>2</sup>

**Table (9): Assessing the fit of the indices**

Indices	Abbreviations	Recommended Criteria	Results	Good Fit
Chi-Square	$\chi^2$	P-value > 0.05	34.587	<b>✗</b>
Degrees of Freedom (df)			7	
Level of Significance			0.000	
Normed Chi-Square	$\frac{\chi^2}{df}$	$1 < \frac{\chi^2}{df} < 5$	4.941	<b>✓</b>
Root Mean Square Error of Approximation	RMSEA	< 0.05 Good Fit < 0.08 Acceptable Fit	0.026	<b>✓</b>
Normed Fit Index	NFI	> 0.90	0.952	<b>✓</b>
Relative Fit Index	RFI	> 0.90	0.982	<b>✓</b>
Incremental Fit Index	IFI	> 0.90	0.945	<b>✓</b>
Tucker-Lewis Index	TLI	> 0.90	0.925	<b>✓</b>
Comparative Fit Index	CFI	> 0.90	0.940	<b>✓</b>

**7.1 Second Structural Model (CS)**



**Figure (8): visual representation of the second structural model**

As described in the structural model above, the following table below, presents the estimates of the model. This can be interpreted as follows:

**• Direct Effects**

- CPV employs a statistically significant direct

positive effect on CF, with a coefficient path of 0.471, significant at the 0.001 level.

- LEF employs a statistically significant direct positive effect on CF, with a path coefficient of 1.468, significant at the 0.001 level.

- TI employs a statistically significant direct negative effect on CS, with a coefficient path of -0.827, significant at the 0.05 level.

- CFS do not employ a statistically significant direct effect on CF, with a coefficient path of 0.101 and a non-significant p-value (0.112).

**• Indirect Effects**

- CPV mediates the relationship between LEF and CS. The indirect effect is 0.180 (0.599 × 0.180), supporting partial mediation.

- CPV mediates the relationship between technology integration and CS. The indirect effect is 0.111 (0.614 × 0.180), supporting partial mediation.

- CPV mediates the relationship between CFS and CS. The indirect effect is 0.102 (0.566 × 0.180), and since

<sup>1</sup> Both direct and indirect effects are significant.

<sup>2</sup> Only indirect effect is significant.

no significant direct effect was observed, this represents full mediation.

**Table (10): The Path coefficients and significances**

Structural Path	Path Coefficient	C.R (t-value)	Std. Error	Sig.
CPV ← LEF	0.599	3.33	0.1799	0.001
CPV ← TI	0.614	4.63	0.1326	0.000
CPV ← CFS	0.566	12.15	0.0466	0.000
CS ← CPV	0.180	2.81	0.0641	0.005
CS ← LEF	1.468	7.21	0.2035	0.000
CS ← TI	-0.827	-5.42	0.1525	0.000
CS ← CFS	0.101	1.59	0.0632	0.112

The model fit was evaluated using multiple indices. As demonstrated in table 12 below, the Chi-Square value of 30.646 with 7 degrees of freedom comes to be statistically significant at the level of 0.05, where

this indicates that the model is not a good fit. It is however worth mentioning that Chi-square test is considered extremely sensitive to the selected sample size. On the other hand, the rest of the fit indices falls well within the recommended thresholds. This confirms that the model fits well with the data, and therefore, an acceptable fit for the model proposed

**Table (11): summary table of total effects**

Predictor	Direct Effect	Indirect Effect (through CPV)	Total Effect	Mediation Type
LEF	1.468	0.108	1.576	Partial Mediation
TI	-0.827	0.111	-0.716	Partial Mediation
CFS	-	0.102	0.102	Full Mediation

**Table (12): Assessing the fit of the indices**

Indices	Abbreviation	Recommended Criteria	Results	Good Fit
Chi-Square	$\chi^2$	P-value > 0.05	30.646	✗
Degrees of Freedom (df)			7	
Level of Significance			0.000	
Normed Chi-Square	$\frac{\chi^2}{df}$	$1 < \frac{\chi^2}{df} < 5$	4.378	✓
Root Mean Square Error of Approximation	RMSEA	< 0.05 Good Fit < 0.08 Acceptable Fit	0.014	✓
Normed Fit Index	NFI	> 0.90	0.978	✓
Relative Fit Index	RFI	> 0.90	0.963	✓
Incremental Fit Index	IFI	> 0.90	0.948	✓
Tucker-Lewis Index	TLI	> 0.90	0.975	✓
Comparative Fit Index	CFI	> 0.90	0.940	✓

## 8 DISCUSSION

The current study focused on the effect of efficiency in logistics, integration of technology, and customer focus on the customer outcomes that were fascination and CS in the Egyptian online retail market, where CPV served as a mediating variable (Huang et al., 2019; Lemon & Verhoef, 2016). The empirical findings are strong evidence of the put forward mediational model, as perceived value is the key driver by which operational and strategic improvement can lead to positive customer experiences (Gligor et al., 2020; Klaus & Maklan, 2013). In the three dimensions reviewed including logistics efficiency, technology integration, and customer-oriented strategies, the CPV was the main mediator (Huang et al., 2019). This addition of perceived value by these aspects then increased CF as well as satisfaction, thus supporting value-based theoretical hypotheses stating the influence of

perceived value to shape service attribute appraisals, which consequently guides emotional and behavioral reactions (Lemon & Verhoef, 2016; Zeithaml et al., 2020). Logistics efficiency and technology integration was partially mediated. These factors had a direct and indirect impact on the fascination of customers based on their perceived value (Vakulenko et al., 2019; Hübner et al., 2020). Improvements like faster delivery or higher accuracy of orders did not only add to perceived value but also created immediate spikes in interest in the customers (Huang et al., 2019). It is worth noting that technology integration had a negative direct influence, presumably because of frustration due to automation hiccups or unreliable systems, but the indirect influence mediated by the perceived value was positive (Ivanov et al., 2023). This paradoxical trend demonstrates a dualistic character of the process of technology integration in online retail logistics: the use of innovations such as automation, artificial intelligence, and real-time tracking is

supposed to increase efficiency, yet poorly introduced or obscure systems can destroy the customer experience (Boysen et al., 2021; Rai et al., 2019). In Egyptian environment, false reporting of delivery, hardcore automated customer care, and less human touch may create frustration and reduce satisfaction where digital solutions are not in line with customer expectations (Elgazzar et al., 2021; UNCTAD, 2023). However, the positive indirect impact through perceived value proves the fact that technology can be regarded as the source of CF and satisfaction only in the case when it is perceived to bring concrete value in terms of convenience, reliability, and transparency (Lemon & Verhoef, 2016; Vakulenko et al., 2019).

Customer-oriented strategies, on the other hand, such as proactive communication, flexibility and responsiveness displayed complete mediation. They had no direct effect on fascination or satisfaction, but their effect was felt only when the customers felt that they were value-enhancing (Klaus & Maklan, 2013; Huang et al., 2019). This fact strengthens the belief that even the most clearly customer-focused practices need to be clearly framed and presented as meaningful to stimulate real emotional/behavioral response (Lemon & Verhoef, 2016). The results in general highlight the paradoxical nature of technology as a part of the customer experience: the flawed execution of systems can cause direct harm to the perceptions, and the successful, value-adding solutions may not only rebuild and increase satisfaction but also through the prism of perceived value (Rai et al., 2019; Ivanov et al., 2023). Conclusively, the perceived value by the customer comes out as the mediating variable that allows logistics performance and technology implementation to convert into significant customer value (Huang et al., 2019; Gligor et al., 2020). To the managers, this has the implication that investments in operations and technology need to go beyond just the efficiency gains, but it also needs to be seen as being valued by the customers (Lemon & Verhoef, 2016). Without this perception even the good strategies may not make an impact. The secret of creating fascination and satisfaction to customers is therefore not on what the organizations should do, but rather on how the customer will see the value in what it is doing (Klaus & Maklan, 2013).

## 9 MANAGERIAL IMPLICATIONS

The research findings have practical implications to the practitioners and policymakers who want to increase sustainable customer experience in the online retail market of Egypt.

### 9.1 Online retailers' implications.

Business retailers need to focus on strategies to enhance the value of logistics as a differentiating and customer-retention tool (Gligor et al., 2020; Hübner et al., 2020). The direct benefits of the CS and fascination can be expected in response to investments in quicker delivery, accuracy of order, transparent costs, and flexible returns policy (Vakulenko et al., 2019; Huang et al., 2019). Retailers can also make the sustainability efforts of the company visible to customers, like through environmentally friendly packaging, or efficient delivery plans, since perceived value mediates the effects of such efforts on customer experience (Pagell & Shevchenko, 2014; Genovese et al., 2017). Notably, the implementation of technology is to be customer-focused; online technology is to make the process of shopping and delivery easier, not to disregard human services (Rai et al., 2019; Lemon & Verhoef, 2016).

### 9.2 Implications to logistics providers.

Reliability, real-time visibility, and responsive communication are recommended service attributes that logistics service providers should be oriented to (Hübner et al., 2020; Boysen et al., 2021). The findings show that technology can only improve customer outcomes in case it increases perceived value; thus, investments in automation and AI must be supported by transparency of systems, proper tracking, and simplified escalation to human support (Ivanov et al., 2023; Rai et al., 2019). Customers may also have a higher perception and development of long-term relationships with e-retailers by flexibilities in delivery time, active communications, and effective reverse logistics (Vakulenko et al., 2019; Huang et al., 2019).

### 9.3 Policy implications and infrastructure implications.

The policy makers ought to favor the creation of a unified logistics infrastructure to facilitate effective last mile delivery, especially in heavy traffic cities (World Bank, 2022; UNCTAD, 2023). Digital integration across logistic networks, facilitating sustainable transport solutions, and encouraging uniform environmental practices should be encouraged to improve the performances of the sector (Genovese et al., 2017; Ivanov et al., 2023). Strict regulations that allow innovation to thrive, without harming consumer rights, will be critical towards the continued growth and competitiveness in the e-commerce environment in Egypt (OECD, 2023; UNCTAD, 2023).

## 10 Future Research, Recommendations, and

## Conclusion

This research has shown that logistics performance is the underlying cause of sustainable customer experience within the online retailing industry in Egypt, and CPV is the mechanism that is very crucial in ensuring that operational efficiency, integration of technology, and customer-oriented strategies are transformed into CF and satisfaction. The results verify that the most significant and stable impact on customer outcomes is the logistics efficiency, whereas technology integration can influence customer experience only in case it is perceived as the value-adding one. Although customer-oriented strategies are critical to customer outcomes, they do so indirectly, which highlights the need to communicate the value instead of simply executing service programs.

These findings can be summarized in managerial recommendations that state that managers need to shift the logistics decision-making process to value creation and not merely on cost or automation. Online stores must be focused on reliability, accuracy, transparency, and flexibility of delivery processes, and the sustainability efforts should be

visible to customers and significant. The adoption of technology by the logistics providers must be done selectively to focus on reliability of the system, real time visibility and integration with human support. Regulatory support, urban mobility planning, and incentives of sustainable logistics solutions should be encouraged by the policymakers and infrastructure planners to help achieve efficient last-mile logistics.

Although this study has its contributions, it has several limitations. Causal inference is limited by the cross-sectional research design, and response bias can be caused by a self-reported perception. Moreover, the emphasis on Egypt does not allow one to generalize the results to other emerging or developed markets. Longitudinal designs should be used in future studies to understand how customer experience varies with time, other geographical settings should be used to extrapolate the model, and objective logistics performance measures should be used. In addition, future research can also investigate how the moderating effect of trust, digital literacy, or cultural influence can mediate the relationship between logistics capabilities and sustainable customer experience.

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