

**KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY,
KUMASI**

**IMPLEMENTATION AND INFLUENCE OF CROWD-LOGISTICS ON THE
PERFORMANCE OF THE COURIER INDUSTRY IN GHANA**

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degree of**

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DECLARATION

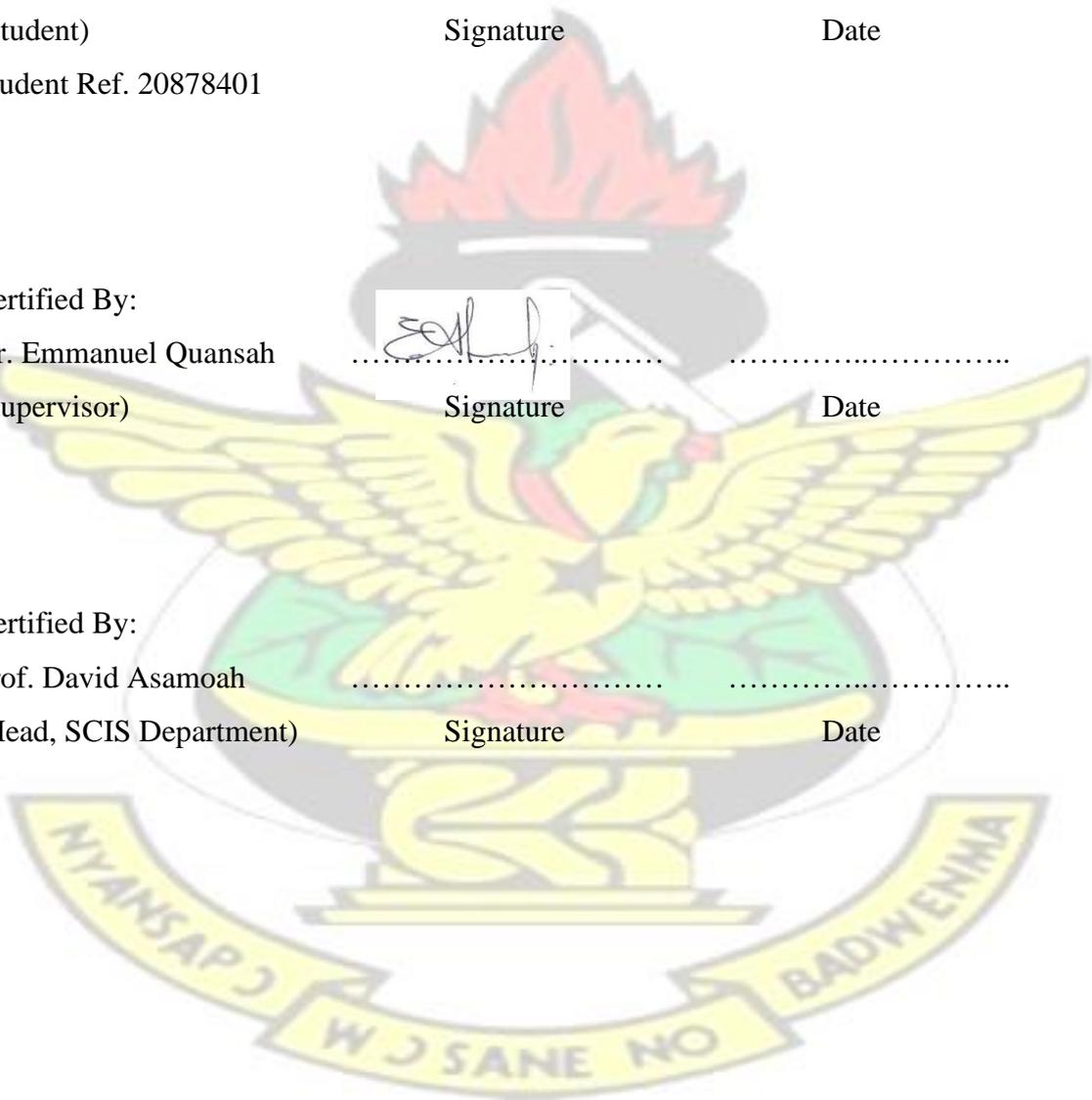
I, William Bamfo-Apori, hereby declare that this submission is my own work towards the Master of Philosophy in Logistics and Supply Chain Management and that to the best of my knowledge, it contains no material previously published by another person nor material which has been accepted for the award of any degree of the University, except where due acknowledgement has been made in the text.

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DEDICATION

I dedicate this work to God Almighty and the Bamfo-Apori family for the endless love and blessings showered on me as always.

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ABSTRACT

The courier industry has become essential in parcel delivery as orders are expected to be physically delivered to required destinations. A technology-driven platform known as crowd-logistics, has been introduced into the industry to connect riders, vendors, and consumers for the delivery of parcels. This study therefore, is purposed to explore the implementation and influence of crowd-logistics on the performance of the courier industry in Ghana. Interest in the crowd-logistics subject is because, courier operations within the last mile in recent times have been regarded the least efficient, most expensive, time-consuming, and non-sustainable component of logistics operations. The study utilized the exploratory research design approach and the qualitative research method to allow for first-hand knowledge from the crowd-logistics system providers due to the dearth of scientific literature. The findings revealed that, crowd-logistics in Ghana is a technology-based system, characterized in two models; “peer-to-peer” and “business-to-peer”. Secondly, the system allows for parcels to be delivered on-time at relatively cheaper cost, while being challenged by non-availability of courier investors, non-professional riders, cyber-attacks and hacking. Also, the system offers economic, social, environmental, and technological opportunities; though there exist threats of, poor and expensive telecom network, driver platform switches, competition, and industry regulations. Unlike other countries, crowd-logistics’ operation in Ghana is such that, system providers assist drivers in the acquisition of vehicles on lease or credit. This should not be the responsibility of the platform provider, but due to the low level of investment in the industry and the need to keep trusted and bonded drivers. Prior delivery, it is recommended that, parcels are physically inspected to confirm their legality; while those in transit are insured against any loss or damage. It is also recommended the need for a more responsive feedback system, while adopting the USSD code mode for placing requests from non-smart phones and technology illiterates. Essentially, it is required for management to invest into research, development and innovation to stay updated in the industry. Couriers must therefore look forward to a more efficient and effective industry that is likely to be laden with advanced technology applications.

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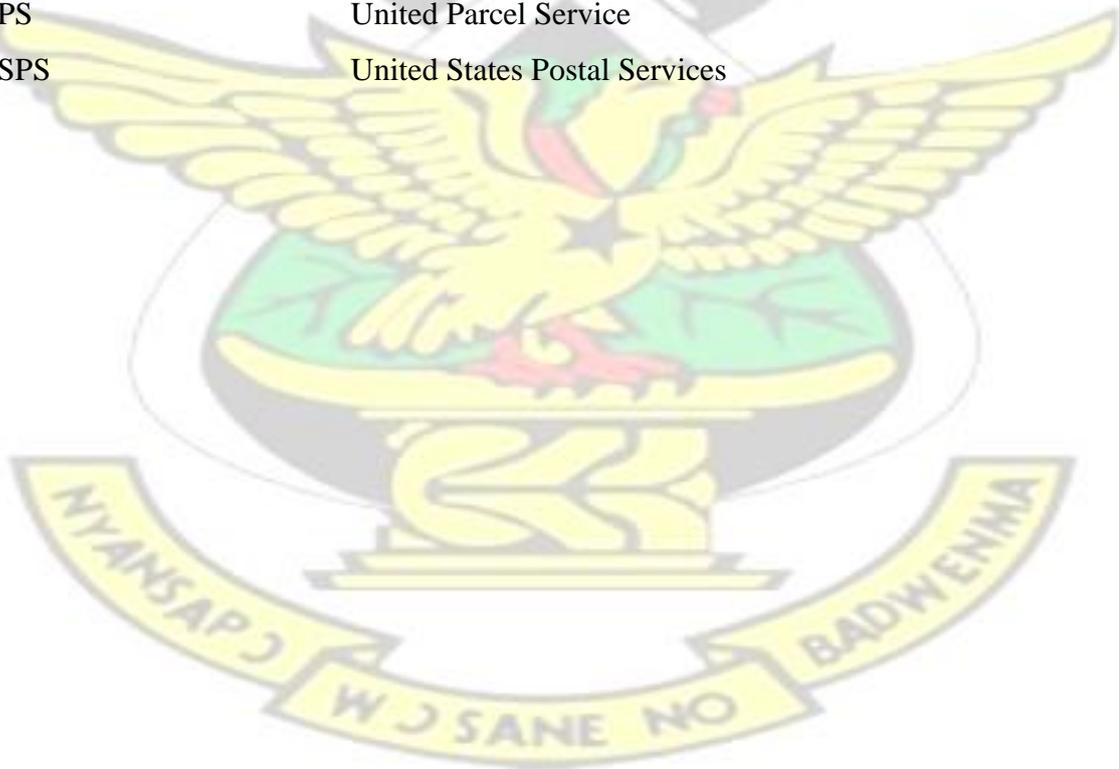
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LIST OF ABBREVIATIONS/ ACRONYMS

B2B	Business-to-Business
B2C	Business-to-Customer
C2C	Customer-to-Customer
CEP	Courier Express Parcel
CGT	Cooperative Game Theory
CLMM	Crowd-Logistics Maturity Model
GPS	Global Positioning System
P2P	Peer-to-Peer
PCSRC	Postal and Courier Services Regulatory Commission
RBV	Resource Based View
ROA	Return on Assets
ROE	Return on Equity
SWOT	Strength, Weakness, Opportunities, and Threats
TNT	Thomas Nationwide Transport
UPS	United Parcel Service
USPS	United States Postal Services



CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

The number of parcel deliveries made by courier services has increased during the past few years throughout the world. The world's parcel market, which was valued at less than US\$ 250 billion in 2018 (Dietman, 2020), exceeded US\$ 500 billion as of 2020 (Research and Markets, 2021). This according to Mons Cabré (2021), is due to the rising global trend of the e-commerce business model that allows for customers to make purchases without being physically present at the sales point or store (Frehe, Mehmman and Teuteberg, 2017). It is also followed by the technological advancement breeding digital companies who only own information technology (IT) platforms, yet control and coordinate parcel delivery through courier service operations to the final consumer in the last mile (Chopra, 2018).

The last-mile or final-leg service of the parcel supply chain where customers receive their parcels are handled by courier service providers (Halldorsson and Wehner, 2020). The last mile service offered by courier organisations is the most important component of the value chain among the first and middle miles (Vakulenko, Shams, Hellström and Hjort, 2019). This is because, the last mile is the stage where parcels get to the final consumer, and so consumers are often not interested in learning about what happens in the first mile (parcel collection stage) and the second mile (intermediate parcel exchange stage).

Despite its significance, last-mile courier operations are now seen as the least efficient-cost-effective element of the delivery process according to Lim, Jin and Srari (2018), as well as the stage with the most urgent environmental issues (Abdul-Hamid, Zhang, Aishatu, Akosua and Fathia, 2021). The cost of courier operations in the delivery of parcels within the last mile according to Lal and Fianu (2018), often exceed 50% of the total logistics costs in the supply chain. This is as a result of the difficulty and cost involved for courier operators to handle the rising parcel market with their own existing infrastructure and equipment – offices, warehouses, car or motorcycle (Liu and Max Shen, 2021). It has therefore, become a cause for worry to all stakeholders within the supply chain (manufacturers, distributors, retailers, transporters, and customers) especially courier operators, as it impedes their overall organisational performance.

Courier operators have always been required to solely invest into sophisticated routes, extra stops, failed deliveries, driver salaries, maintenance, repairs, and robust fleet acquisition and management, should they want to enhance performance and meet the rising demand in the parcel delivery market and enhance performance. Such investments locks-up capital, disallowing couriers to further invest into expanding their reach in opening branches in different locations. To correct this challenge, a crowdsourcing business model has been introduced into the courier industry. Crowdsourcing is a novel business model that prioritizes temporary access to assets or equipment over actual ownership.

According to Howe (2006, p. 176), a pioneering researcher, crowdsourcing is "the act of a company or institution taking a function previously performed by employees and outsourcing it to an undefined (and generally large) network of people in the form of an open call". In providing a more recent and thorough definition, crowd-logistics was defined by Estellés and González (2015) as a type of participatory online activity in which a person or organisation (for profit and not for profit) propose to a group of people with varying levels of knowledge, heterogeneity, and the voluntary completion of a task via a flexible open call.

Some globally recognized examples of crowdsourcing organisations are Airbnb and Uber. According to Mazurek (2020), Airbnb, the largest hospitality and accommodation provider in the world, owns no rooms; whereas Uber, the world's largest taxi service provider, owns no cars. Though both organisations own none of the assets or equipment required to perform their core mandates of providing rooms or taxi services respectively, they have grown to become multi-billion-dollar corporations with global presence. Their success is largely dependent on the use of the crowdsourcing model to provide solutions for smarter and more efficient usage of resources.

Crowdsourcing however, allows for organisations to turn to a body of people and obtain needed knowledge, goods, and services (Qin, Van der Velde, Chatzakis, McStea and Smith, 2016). The idea underlying the concept is that, people contribute their underutilized property to the community in order to provide something of value. In return, both the people and the business that creates and operates the platform receive something of value in the form of cash from the customer (Mons Cabré, 2021). The crowdsourcing concept can be applicable to logistics and transport operations, which has

been termed crowd-logistics in some studies. Crowd-logistics is considered as one of the radically different solutions to improve performance of the courier industry in terms of cost efficiency, delivery time, service quality, reliability, item safety and even environmental sustainability.

In spite of the benefits and competitive advantages that follows crowd-logistics implementation, most courier service providers especially in emerging economies have not been able to fully leverage the system to improve the delivery of parcels to customers and enhance general organisational performance (Frehe et al., 2017). Even major courier operators like the United States Postal Services (USPS) and FedEx are yet to introduce crowd-logistics into their operations. They still rely on their own infrastructure, equipment, know-how, and prestige to capture a share of the emerging same-day-delivery market that crowd-logistics is known for (Carbone, Rouquet and Roussat, 2017). In addition, there have been significant investments made in crowd-logistics in the United States, allowing start-up businesses to compete to meet consumer demand for same-day and immediate delivery of restaurant meals (such as Deliveroo, Grubhub, and Delivery Hero) and retail purchases – such as Instacart and Deliv (Carbone et al., 2017).

The situation in Ghana is no different, as the only state-owned postal and courier operator with specialty in next-day deliveries, Ghana Post has also been relying on its own infrastructure, know-how, and fleet to provide customers with same-day delivery services. Without relying on crowd-logistics, the Ghana Post has in the year 2022 invested heavily in the procurement and distribution of 73 fleet of equipment. These include 15 trucks, 8 pickup trucks, and 50 motorbikes. The goal for this investment is to augment and strengthen the company's resolve to provide world-class services to customers (Mensahfio, 2022). Despite making such investments, Ghana Post is yet to enhance performance and take the lead in the parcel delivery of the postal and courier industry in Ghana.

On the other hand, emerging courier organisations like Glovo, Uber, Bolt, Yango Tangama, Malandi Deliveries, Okada.com among others in Ghana, have invested into crowd-logistics to provide instant delivery services to consumers' pressing demands, particularly in the last stage of the supply chain. Though they do not own the vehicles and motorcycles like Ghana Post does, the crowd-logistics model enables them to

manage a large fleet of these assets from several individual owners in close proximity to customers for the purpose of providing parcel delivery faster, cheaper, and more reliable.

The steady introduction of crowd-logistics in the courier industry for parcel and goods delivery is gradually gaining some academic and business attention in Ghana and abroad. Most studies have concentrated on the challenges of crowd-logistics from the perspective of the customers, and riders or drivers (Gevaers, Van de Voorde and Vanelslander, 2014; Frehe et al., 2017; Gdowska, Viana and Pedroso, 2018; Lim et al., 2018). Others have looked at the impact of crowd-logistics on the environment (Abdul-Hamid et al., 2021), whereas Gläser, Jahnke and Strassheim (2021), carried out a literature review study on the opportunities and challenges of crowd logistics for courier, express, and parcel service providers on the last mile.

These academics have yet to explore the internal and external benefits and challenges of crowd-logistics from the perspective of the courier industry. As a result, it is intriguing to consider critically how crowd-logistics is implemented and how it influences the performance of Ghana's courier industry. This further motivated the study to delve into the strengths, weaknesses, opportunities and threats of crowd-logistics from the standpoint of courier service providers in a developing country like Ghana.

1.2 Statement of the Problem

The global advent of technology has resulted into very demanding consumers. Consumers today expect to receive purchased goods or items via technology-assisted online platforms at the right time, place, price, and condition with just the click of a button (Weiss and Onnen-Werber, 2019). This has influenced the global ecommerce sales to increase by 89% between the years 2019 to 2022, thus \$587 billion to \$5.717 trillion respectively, with a forecasted increase of 10% (\$6.310 trillion) by the end of 2023 (Baluch and Main, 2023).

The growth of e-commerce has influenced the increase in freight delivery or transportation, as orders are expected to be physically delivered to the required destinations of customers. This requires for a more efficient and effective courier service delivery system. However, courier operations within the last mile in recent times have been regarded as the least efficient, most expensive, time-consuming, and non-sustainable component of logistics operations within the supply chain (Lindholm, 2013;

Gdowska et al., 2018; Lim et al., 2018). The industry is also faced with issues such as; consumer-driven economy, failed deliveries, reverse logistics, and policymakers' environmental measures (Cardenas et al., 2017).

Gevaers et al. (2014) express specific concerns about the fact that, the rising costs and inefficiencies particularly in the parcel deliveries, have become an unavoidable problem for courier service organisations. Consumers may have to reconsider performing the delivery tasks should they conduct a cost-benefit analysis and discover it is less expensive, faster, and even more efficient to acquire and deliver parcels or goods all by themselves rather than engaging courier service providers (Lal and Fianu, 2018).

Such developments in most cases impede the performance of respective service providers in the courier industry. Consequently, most courier services providers are being influenced by the market to reduce delivery rates to the barest minimum, so as to remain competitive and survive the competition-laden market. This constant reduction of prices to remain competitive derail courier operators' financial ability to expand as businesses and improve their fleet strength in order to provide consumers with efficient and effective delivery services within the last mile (Gläser et al., 2021). As a result, one of the suggested ways to deal with the current problems in last-mile package delivery is crowd-logistics.

Crowd-logistics from the crowdsourcing business concept is an emerging area that courier service providers are beginning to explore. Crowd logistics (CL), is a substitute last-mile delivery system that has recently emerged as a result of the e-commerce boom, the system aims to lower service costs (economic), foster relationships (social), and reduce associated environmental emissions, which will have a positive impact on traffic and pollution (Abdul-Hamid et al., 2021). From Uber's global experience, crowd-logistics is thus regarded as, one of the radically different solutions to organisational performance indicators such as cost, delivery time, item safety, and even environmental sustainability challenges confronting the last leg of parcel delivery (Gläser et al., 2021). Uber operates just by having temporary access to assets and equipment (cars and motorbikes) instead of investing hugely into having actual ownership (Odongo, 2018).

The crowd, delivery-men or riders, view crowd-logistics as a chance to make money from an activity that does not take a great deal of effort because they routinely travel along the same route for personal or business reasons (Gdowska et al., 2018). Crowd-logistics deliveries are viewed from the standpoint of the eventual consumer as having a better service level due to the great amount of operational flexibility implied by this strategy (Carbone et al., 2017).

Crowd-logistics may result in a significant decrease in transport costs from the standpoint of the merchants or retailers (Frehe et al., 2017). From courier operators' view point, crowd-logistics allows for them to manage fleet of cars and motorcycles they do not own (Odongo, 2018). In that, investments required for the acquisition of cars and motorcycles for the delivery of parcels is borne by the crowd (ordinary people) with the aid of crowd-logistics system.

Regardless of the benefits crowd-logistics offers to the respective stakeholders, most courier service organisations in an emerging economy like Ghana are yet to adopt. Majority of courier service providers in Ghana still operate the manual or traditional system to deliver parcels efficiently and effectively. These organisations still invest into sophisticated routes, extra stops, failed deliveries, driver salaries, maintenance, repairs, and robust fleet acquisition and management all by themselves. They are thus, unable to expand and provide more efficient and effective delivery services.

However, the few who have been able to switch to the new concept (crowd-logistics) may not have incurred such investments to acquire the motorcycles and cars, but may have been faced with some challenges in the introduction, integration and implementation of the system. While many studies have discussed the challenges that users, riders, and/or drivers face when utilizing the crowd-logistics system (Gevaers et al., 2014; Frehe et al., 2017; Gdowska et al., 2018; Lim et al., 2018), other study has concentrated on the effects of crowd-logistics on the environment (Abdul-Hamid et al., 2021). Also, Gläser et al. (2021), conducted a literature review study on the benefits and drawbacks of crowd logistics for last-mile courier, express, and parcel service providers.

In different cases, whereas some studies have provided models for developing the growing crowd-logistics networks (Frehe et al., 2017; Dietmann and Kathrin, 2020), others have focused on the influence of crowd-logistics simply on the last mile (Odongo,

2018; Mons Cabré, 2021; Ali et al., 2020). In addition, most recent studies (Mehmann et al., 2015; Mladenow, 2016; Carbone et al., 2017) have focused on using literature reviews to analyse the opportunities and challenges given by crowd-logistics. Although in high demand, publications analysing the application and effects of crowd-logistics on the performance of the courier sector are hard to come by.

Consequently, based on the studies mentioned above, these authors are yet to examine the advantages and disadvantages of implementing crowd-logistics from the standpoint of the courier companies that use them. In my judgment, no study on crowd-logistics has been done with a realistic data set from the viewpoint of courier service providers. This served as the basis for the decision to conduct investigation into the use of crowd-logistics and its impact on the performance of the courier sector.

By first providing an overview of actual crowd-logistics applications; the study aims to fill the gaps and establish the foundation for future implementations that will be successful; and to unravel the influence that CL could have on the performance of Ghana's courier industry. The analysis therefore, goes even deeper into the details of the system's advantages, disadvantages, opportunities, risks, and potential for improvement in Ghana's courier business.

1.3 Objectives of the Study

The primary goal of this research is to critically explore the implementation and influence of crowd-logistics on the performance of the courier industry. The specific goals are:

- i) To describe the characteristics of crowd-logistics operations in Ghana's courier industry.
- ii) To critically explore the strengths and weaknesses of the crowd-logistics business model on Ghana's courier industry.
- iii) To critically explore the opportunities and threats of crowd-logistics business model on Ghana's courier industry.
- iv) To determine the influence of crowd-logistics on the performance of Ghana's courier industry.

1.4 Research Questions

- i) How does the crowd-logistics system operate in Ghana's courier industry?
- ii) What are the strengths and weaknesses of the crowd-logistics business model on the courier industry?
- iii) What are the opportunities and threats of the crowd-logistics business model on the courier industry?
- iv) How does crowd-logistics influence the performance of the courier industry? Is it possible to improve service quality, delivery reliability, and flexibility and reduce delivery times and cost?

1.5 Significance of the Study

Over time, consumers have come to value receiving parcels or packages at the ideal time, location, price, and quality. Due to the growing demand of making their purchases online, consumers in recent years are paying attention to courier delivery services (Weiss and Onnen-Werber, 2019). This has encouraged some courier companies to also adopt a technology that offer customers the liberty to have items purchased online to be delivered in the comfort of their expected address. For these reasons, a crowdsourced business model that has been successfully used in the passenger travel and hospitality industries for their operations, have been introduced globally. This system is called crowd-logistics.

Thus, with regular interactions of ecommerce and online buying platforms, consumers are gradually understanding and favouring the operations of crowd-logistics in courier industry. However, the majority of Ghana's courier organisations are yet to adopt the crowd-logistics system since they are somewhat skeptical about its potential advantages and disadvantages. As a result, customers continue to complain about the courier industry's excessive delivery prices, arbitrary delivery delays, damaged packages, and other problems. It must be emphasized that, this is a compelling argument in favor of doing research into the implementation and influence of crowd-logistics on the performance of the courier industry. In general, it is to be said that, the motivation to conduct this study is for both academic and management/practical purposes.

This study therefore, is useful for executives and management personnel within the courier industry. These executives will get to know and understand pertinent issues such as internal and external benefits and challenges that the system poses, so as to inform the decision to invest into the system for their courier business. Managements may also include in their investment strategies and plans, measures to reduce the weaknesses and impact of the threats, so as to leverage on the strengths and opportunities improve performance and make appreciable financial gains. In the end, players of the courier industry will benefit from the good results of this study.

Also, with the existence of unnecessary competition in the courier industry, this study will be relevant to executives in bringing to their notice the need to understand the real benefits and challenges in the implementation of the crowd-logistics business-technology model in the delivery of goods and parcels. Results of the study will help industry-players to know if crowd-logistics is actually the answer to their last-mile courier delivery challenges. To the management and executives of courier organisations, this study is very timely and relevant to industry executives because, technology is on the rise in making some nations and industries like courier services very progressive.

By filling in the context and knowledge lacuna on the impact of crowd-logistics on the performance of the courier sector from the perspective of a developing country, this study will contribute other ideas in terms of academic incentive. There has so far been little discussion on the strengths, weaknesses, opportunities and threats that courier service organisations face with the introduction, and implementation of crowd-logistics in the delivery of goods and parcels in a developing country like Ghana. There is therefore substantial evidence for further studies to be made into the implementation and influence of crowd-logistics on the performance of the courier industry taking into consideration the perspective of the courier organisations.

In conclusion, this study will act as a guide for future studies that are similar to it. It is important to note that, this study can be utilized as a starting point for future debate on the performance of the courier sector generally, as well as on the specific topic of crowd-logistics.

1.6 Scope of the Thesis

The introduction of crowd-logistics and its impact on Ghana's courier industry's performance was the study's stated area of interest. The study looked at the internal (strengths and weaknesses) and external (opportunities and threats) aspects of implementing the crowd-logistics business model from the viewpoint of courier service providers. Therefore, the study's scope was limited to the courier service sector, using crowd-logistics business technology during the last mile stage of the parcel supply chain, and utilizing (13) service providers who are formally registered with the Postal and Courier Service Regulatory Commission of Ghana (PCSRCG).

Furthermore, the study used the approach of purposeful sampling for choosing the participants. Using this technique, the study focused just on those who were actively involved in the Ghanaian operations of crowd-logistics' in the courier industry. Consequently, only those with knowledge of the concept under investigation (Shaheen and Pradhan, 2019).

The study in addition adopted the purposive sampling technique in the selection of participants. This technique allowed for only persons who are directly involved in the operations of crowd-logistics for their courier services in Ghana to be considered. Thus, persons who are knowledgeable about the situation being investigated (Shaheen and Pradhan, 2019).

1.7 Overview of Methodology

The study employed the qualitative research method, exploratory research design, and the cross-sectional time horizon. The target population was limited to all personnel of courier service organisations officially registered and in good standing with the Postal and Courier Service Regulatory Commission of Ghana (PCSRC). And as of December 31, 2022, the total number of courier service organisations on the database of the PCSRC were 110 (Paye-Baah, 2022).

From the total population, the study used thirteen (13) participants, by selecting one senior official each from selected thirteen (13) couriers operating the crowd-logistics system and registered with the PCSRC. To deduce the thirteen (13) sample of participants as foretated, the study adopted the purposive sampling technique. This technique was essential because, the study needed persons with some special traits,

qualities and features, as well as persons physically involved in the setting-up and operations of the crowd-logistics system in Ghana.

The study in addition adopted only primary data through field interviews with the thirteen (13) senior officials of the sampled courier firms. These interviews were undertaken by the use of interview guide as the data collection instrument, to allow for participants to share their experiences in an unrestricted manner, while affording the author, the flexibility to follow up on interesting issues that emerged in the process. The study also selected a pilot group of three (3) sampled courier organisations ascertain whether the research instrument (interview guide) is consistent with the goals and questions of the study, and to as well estimate the time required for answering questions.

After the collection of data, this study went further to analyse the data by adopting the content data analysis. By the content data analysis and after transcription of gathered, the study as well adopted the six basic steps for analysing qualitative data as proffered by Braun and Clarke (2013 in the following order: Data familiarization and organisation; initial codes generation, theme coding, theme review; theme definition and naming; and report drafting.

1.8 Limitation of the Study

The study's use of the exploratory research technique and qualitative research method resulted in a number of limitations. The study was also challenged for being based on observations and responses made by the participants from the population. Findings derived from qualitative data are thus, consistently exposed to biases resulting from the author's subjective interpretation (Yin 2003). As a result, the author must focus on the literature they have chosen for their thesis and evaluate when there has been an appropriate amount of saturation.

The study's sample size also has several drawbacks. The sample frame is not necessarily typical of the entirety of Ghana's logistics, transportation, and supply chain industries, nor is it indicative of events in other parts of the world. The inferences made can only be applied to the population of crowd-logistics courier companies in Ghana, leaving out the traditional or conventional courier companies.

Furthermore, only a single participant from each crowd-logistics organisation was engaged for this study in terms of data collection. Even if the participant was typically a senior member of the crowd-logistics companies, their impression of that individual does not necessarily reflect the perceptions of other members of the firm. This study's sample was thus, drawn from some crowd-logistics companies operating in the courier industry.

Another drawback acknowledges that, crowd-logistics courier sector is still quite young, not reached maturity, highly dynamic, and experiences rapid change. And because this industry is new, there is little information available regarding its business strategy, strategies, and future prospects. The study also considered crowd-logistics operations within the last mile only and not the entire supply chain of a parcel, involving producers/manufacturers, wholesalers, distributors of large quantities of goods, riders or drivers, vendors, and those looking for courier services.

1.9 Organisation of the Thesis

There are five chapters in the thesis. The background, problem statement, objectives and research questions, significance, scope, and study organisation are all covered in the first chapter, which is the study's introduction chapter. The next chapter, Chapter Two, gives a review of the literature that has already been published. This review helps readers comprehend the current state of knowledge in the field of study, as well as the problems and research gaps that still need to be filled. The conceptual, theoretical, and empirical analysis of the thesis issue under investigation is especially presented in this chapter. Laying a strong theoretical foundation is intended to support the discussion, data analysis, and conclusion that follow.

In Chapter Three, the methodology or approach for this thesis is laid out. It emphasizes the study strategy, design, data sources, methods of data collection, and strategy for data analysis. The fourth chapter conducts a content analysis of the information gathered through the conducted interviews in order to provide the research's findings. In conclusion, the study presents the summary of finding, conclusion of the study, recommendations for both managerial adoption as well as a foundation for more academic research in the field.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter of the study presents detailed review on literatures and theories related to the topic; implementation and influence of crowd-logistics on the performance of the courier industry. Journal articles, books, and other research documents are reviewed in this chapter. Major areas covered in the review includes; conceptual literature review (crowd-logistics, last mile parcel delivery, and courier service operations); theoretical literature review; and empirical literature review of the study.

2.2 Conceptual Review

2.2.1 Crowd-logistics

Crowd logistics is quite a recent topic and concept. The concept operates with a technology platform and a crowd (human beings) to perform transportation or delivery tasks. Such platforms have been approved in most sectors of the economy i.e., hospitality, passenger transportation and general transportations. However, the situation and studies of using crowd-logistics to deliver parcel freight is emerging in developing countries like Ghana, and would require adequate attention.

The word "crowdsourcing" and the "sharing economy," also known as "collaborative consumption," are the sources of the term "crowd logistics" (Mehmann, Frehe and Teuteberg, 2015). Howe (2008) popularized the term "crowdsourcing," as a neologism created from the phrase, "crowd" and "outsourcing." It alludes to a company's outsourcing to the general public of some tasks. The phenomenon involves "a highly varied group of approaches that share one obvious attribute in common: they all depend on some contributors from the crowd. But the nature of those contributions can differ tremendously" (Howe, 2008, p. 176). The concept that people have resources (financial, intellectual, material among others) that can be used to carry out conventional commercial operations through information technology platforms (websites and mobile applications) is the foundation for the growth of crowd practices.

Although, according to Schulze, Seedorf, Geiger, Kaufmann and Schader (2011), a "crowdsourcer" is essentially a company that assigns a task to people as a crowd. According to more recent definitions, the crowdsourcer could just as easily be someone

who requests the crowd's voluntary participation in a task. This pertains to the sharing economy's "peer-to-peer for-profit" paradigm (Schor, 2016). The sharing economy, according to Avelino et al. (2015), includes distinct models of distributed production and consumption that make use of modern technologies and connect people together in fresh ways with individuals playing provider and producer roles.

Crowd practices are confirmed to support the current shift to the sharing economy (Schenk and Guittard, 2011). The definitions of the terms "crowdsourcing" and "sharing economy" differ and sometimes overlap (Schenk and Guittard, 2011). Experts and academics in consumer research and economics are currently focused on these new streams (Tussyadiah, 2015; Miguel et al., 2022; Belk, 2014; Sundararajan, 2017).

Crowd logistics in particular has not received much study attention despite these current trends. The phenomenon is mentioned in just a few articles, including the study conducted by Chen, Prentice, Weaven and Hsiao (2022, p. 434) on algorithms for mobile crowdsourcing issues, which mentions the potential formation of an "urban crowd logistics paradigm where a participative pool of urban crowd-workers is co-opted to perform a variety of last-mile tasks". In their study of various components of location-based systems, Mladenow, Bauer and Strauss (2016) noted that in logistics, services may incorporate the crowd and employ the concepts of crowdsourcing in a variety of ways. Last but not least, Mehmman et al. (2015, p. 117) emphasize that research in this area is still in its early stages and define crowd logistics as "the outsourcing of logistics services to a mass of actors, whereby the coordination is supported by a technical infrastructure". They examine numerous German circumstances to do this.

According to Mehmman et al. (2015), the practice of assigning logistical tasks to a significant number of (perhaps non-commercial) actors, with the coordination enabled by a technology platform that is hosted and managed by a crowd logistics provider, is known as crowd-logistics. Crowd-logistics, according to Jeremic and Andrejic (2019), is essentially the application of the crowdsourcing idea to logistics. Additionally, it is a type of order fulfilment that sends packages directly to customers using a network of unlicensed, neighbourhood couriers (Mons Cabré, 2021).

Furthermore, according to Bubner, Bubner, Helbig and Jeske (2014), crowd-logistics is a system that makes it possible to develop new logistical services as well as enhance existing ones, for instance, during last-mile delivery, in terms of volume, speed, and flexibility, in order to produce economic win-win effects for all stakeholders. In other words, crowd-logistics is a part of a network since technology allows users to deliver products for other people in order to make better use of the space in their car. Because of this, crowd-logistics is also a component of the collaborative or sharing economy, a rapidly growing market that is disrupting established sectors (Rai, 2017).

The discussion of crowd logistics among corporate executives has been robust in contrast to the paucity of scientific contributions. According to Bubner et al. (2014), who first used the term in DHL-Trend Radar and confirmed it in the most recent edition (Bubner et al., 2016), the growth of crowd logistics may have a substantial impact on the logistics industry in less than five years. It is defined as "logistics where private people or semi-professionals (i.e., handymen who are on the go all day) become part of the delivery chain and do deliveries" (Carbone et al., 2017). According to some experts (Tussyadiah, 2015), the term "crowd-shipping" refers to "using the crowd to transform delivery" and emphasizes shipping at the expense of other logistics activities.

Crowd-logistics provides a digital platform for regular people or non-professional local riders to deliver packages or goods from stores or individual suppliers to the expected destination, much like Uber does with passengers (Applin, 2015). As an illustration, Uber, a renowned provider of logistics services, operates under the Crowd-logistics model (Applin, 2015). According to Bubner et al. (2014), crowd logistics in the courier sector enables the creation of new logistical services as well as the expansion of currently offered services (such last-mile delivery) in terms of volume, speed, and flexibility. All stakeholders and stockholders will have a beneficial economic impact as a result of these advantages. In this paper, we use the term "crowd-logistics" in the broadest sense to refer to the outsourcing of logistics services to a volunteer crowd or the general public, where the coordination is supported by a technology platform, in order to achieve economic, social, and environmental benefits for all stakeholders and shareholders.

2.2.2 Characteristics of Crowd-logistics

The first type of crowdsourcing was crowd working, in which participants in the crowd assume the roles of employees and take over tasks that had previously been completed "within" an organisation (Blohm, Zogaj, Bretschneider and Leimeister, 2018). The growing digitization of society provides significant support for the emergence of new types of labour (Haas, Blohm and Leimeister, 2014). Crowd working is organized through a sharing platform for information and communication that is run by a business or an intermediary (Blohm et al., 2018). This platform can be accessed from the outside world via the internet as well as from within the company via an intranet or a sharing platform (Leimeister, 2012).

According to Frehe et al. (2017), the sharing platform can be either an online or physical platform that makes it easier to share resources and reduces asset overcapacity. The platform acts as a communication tool that may be used in a variety of ways, such as through a web browser or a mobile device. The sharing platform has currently had an impact on the field of logistics, where a corporation offers the technical infrastructure and any person can serve as both a client and a supplier (Mladenow et al., 2016). The crowd-logistics system is what is known as it.

According to Carbone et al. (2017), the process of connecting people and organizations to peers (travellers, movers, licensed drivers, owners of empty storage spaces, etc.) through cooperative platforms and mobile apps in order to make the best use of scattered, idle logistics resources and capabilities is known as crowd logistics. Among the crowd-logistics information systems are Internet networks and mobile applications (Carbone et al., 2017). According to Odongo (2018), Uber and Airbnb are two instances of internet networks being used to control access to private assets.

The program then enables them to communicate about the pricing, the pickup/delivery address, and the contact information in a target-oriented way once both requests have been logged by the framework, which then searches for matches between crowdsourcers and crowdsources (Mladenow et al., 2016). This is primarily the result of society becoming more digital (Mehmann et al., 2015). The idea is based on actual physical connections since technology makes it possible for passengers or drivers to make better use of the excess space in their vehicle by carrying and delivering products to other people (Rai, Verlinde and Macharis, 2017). Odongo (2018) makes the case in his study

to support this that crowd-logistics is a good illustration of harnessing the power of IT and the internet to create new systems for organizing human activities.

By creating a crowdsourcing platform, a new market is created where the supply and demand for time and mobility may be matched (Rai et al., 2017). The majority of the service in this business model is reportedly provided by the crowd rather than by the company's staff, according to Rai et al. (2017). The crowd either requests or offers a service, with the company acting as a mediator. They provide an IT infrastructure that can store master data, track talks, and execute payment transactions because the mediator is in charge of coordination (Rai et al., 2017; Odongo, 2018). Mladenow et al. (2016) claim that crowd-logistics organizations act as middlemen to link volunteer drivers with logistic suppliers and recipients who require transportation.

Both the requester and the driver of the transportation must register on the site. By exchanging basic information, registration links users together (Mladenow et al., 2016; Carbone et al., 2017; Rai et al., 2017; Odongo, 2018). After registering, users receive an email with a link to authenticate their account as well as a confirmation of their registration. The service seeker can then access the online application using their login credentials and add a transportation request that satisfies their needs (Carbone et al., 2017). The user has the choice of accepting or rejecting the request. Once the transportation request submitted by the requester is accepted by the deliverer, a notification email will be sent to the service seeker (Carbone et al., 2017). This will serve as proof that the delivery driver has accepted our offer to deliver the package.

In a second example, the individual (service seeker) files a delivery service request online or using an app and demands that an item be delivered to demonstrate what happens when a consumer buys certain things online. The approved "couriers" who are nearby the dispatch point receive the confirmed order data from the crowdsourced delivery platform (Mehmann et al., 2015). The delivery task is accepted by the first courier who accepts, much like how the Uber app works.

A study by Kafle, Zou and Lin (2017), in contrast, found another type of crowd-logistics that takes the shape of a two-tiered crowdsourced delivery system. Trucks are employed in the first layer to move items from distribution hubs to a relay station, and crowdsourcing is used in the second tier (Kafle et al., 2017). In the second tier, vehicles,

cyclists, and pedestrians complete the final mile of delivery by relaying packages from trucks. When a carrier posts pickup and delivery requests online, the system allows users to bid to complete a portion of those requests (Kafle et al., 2017). Packages are passed between a truck and individual clients at relay locations. For requests for which no bids were received (or for which the submitted bids were too expensive), the corporation selects the winning bids and arranges the truck routes that visit the relay locations and delivery destinations.

In light of the aforementioned considerations, research have shown that crowd-logistics calls for the deployment of a technology-driven system that connects delivery or courier service providers and courier service seekers. Crowd-logistics, however, can start from individuals or online stores to the last couriers or from distribution trucks to final couriers. The crowd-logistics systems, on the other hand, are used in this study to deliver packages directly from customers or online retailers to the ultimate courier. For instance, a customer purchases some goods from a store online or in person. The customer then requests a delivery service online or through a mobile application, and the crowdsourced delivery platform sends the confirmed order details to any qualified "couriers" who are present in the area of the dispatch point. The delivery comes to a close after sender or receiver makes payment to the rider either through electronic payments (mobile money) or hard cash. This has been presented in Figure 1 (How Crowd-logistics System Works) below as adopted from Fung Business Intelligence Center (2019).

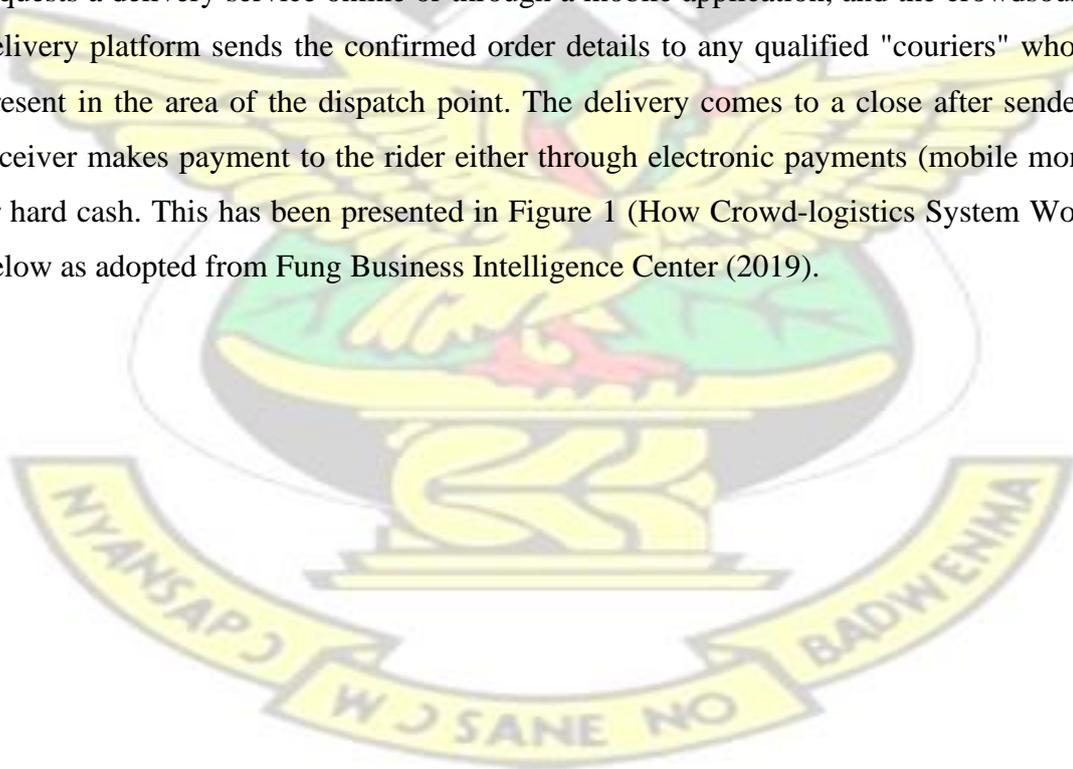




Figure 1: How the Crowd-logistics System Works

Source: Fung Business Intelligence Center (2019)

2.2.2.1 Crowd-logistics in Ghana

As the nation's economy and trade grow, Ghana's parcel and courier delivery is expanding at an unprecedented rate (Ansah, Obiri-Yeboah and Akipelu, 2020). According to Abdul-Hamid et al. (2021), the increase culminated with an increase consumer demanding for delivery of their pages just in time (right place time, price, and condition). Courier organisations keep springing-up all-over the country, especially, urban areas. This actually informed government's decision to officially deregulate the courier and postal industry in 2003 by establishing the Ghana Postal and Courier Regulatory Commission (PCSRC) under the Postal and Courier Regulatory Commission Act, 2003 – Act 649 (Paye-Baah, 2022).

According to Paye-Baah (2022), the Act accord the PCSRC the sole responsibility for the implementation of national policies under the control of the Ministry of Communications and in line with the Postal Policy through its Board – the PCSRC Board of Commissioners. Though the deregulation of the system may have offered opportunities to private organisations to be involves in postal and courier services, there still exist challenges of delivery delays, theft and damages, high delivery cost and many others. Therefore, to overcome Ghana's courier difficulties, innovative alternate solutions are required.

There are numerous options put out to regulate the sector (Armah et al., 2010). Businesses in African markets are rapidly gaining access to new information technology, such as mobile and Internet technologies, according to Dadzie, Winston, and Hinson (2015). In Ghana, the notion of crowd logistics was indirectly used because one in ten drivers and passengers had voluntarily delivered items or packages to someone at their destination.

A few businesses in Ghana's logistics-technology market are creating platforms that make it simple for participants to connect, send, and receive goods. Despite the fact that the idea has just recently gained traction in Ghana, not enough research has been done on it for the sector and other stakeholders to put it to use. A thorough scan of the term "crowd logistics in Ghana" led to the discovery of just one connected relevant research publication, which was titled Crowd Logistics' Impact on Environmental Sustainability in a Developing Economy: A scan in Ghana (Abdul-Hamid et al., 2021).

The influence of crowd-logistics on the last mile delivery of the courier sector is one competitive approach with promise for Ghana's growing markets, but it has gotten comparatively little rigorous empirical investigation. This study can be expanded to know the characteristics of crowd-logistics last mile delivery; bottlenecks of crowd-logistics operations in the last mile delivery from the perspective of the courier organisations operating the systems; and the offering of solutions to the challenges identified.

Consequently, this study I believe will set the tone for further studies of crowd-logistics in the last mile delivery in Ghana. It will further present stakeholders in logistics and supply chain management with information about exactly what destruct crowd-logistics

from functioning efficiently and effectively in an emerging economy like Ghana and Africa at large.

2.2.3 Last Mile Delivery

Retailers and merchants in general are under pressure to deliver customers' orders quickly and with high-quality goods due to the growth of e-commerce (Allen et al., 2018). Currently, many of these vendors provide their customers the option of home delivery, shop pickup, or smart lockers. Today, the majority of internet buyers use last mile delivery services to get their purchases to their front doors.

According to Kafle et al. (2017), the "last mile" is the distance that commodities must travel from a depot at the edge of a metro region to customers inside the city. According to Vakulenko, Shams, Hellström, and Hjort (2019), the last mile of a parcel delivery service is the location where the consignment is delivered to the recipient, either at the recipient's home or at a collecting point. By confirmation, last mile delivery refers to the distribution activities or method from the final drop point inside the supply chain process to the last transit point of goods as quickly as feasible (Aized and Srail, 2014). The ultimate stage of the supply chain, where commodities are delivered to the final consumer, is how Gevaers et al. (2014) simply referred to it.

The author attempts to clearly separate delivery portion of last mile from the complete logistics and supply chain process in regards to this study. Ewedairo, Chhetri and Jie (2018) define last mile logistics as all activities involved in delivering products to their end consumers, including storing and warehousing, sorting, routing, and delivery. Last mile logistics typically refers to overall, warehousing, storage, and inventory, but last mile delivery particularly refers to the delivery portion of the last mile logistics process (Slabinac 2015; Ewedairo et al., 2018; Vakulenko et al., 2019). As a result, this thesis' study of last-mile delivery excludes all other logistical tasks and procedures such as inventory management and scheduling, consolidation, sorting, and storage. The frequent but low-volume distribution of goods over short distances to end users is classified as last mile delivery, in accordance with Kin, Spoor, Verlinde, Macharis, and Van Woensel's (2018) research. Slabinac (2015) defines last mile delivery as the high frequency, low volume delivery of final items. Last mile delivery is an essential link in the last mile logistics and transport chain.

Ewedairo et al. (2018) uncovered a number of viewpoints on the complexities of last mile delivery. This covers topics like talking about online retailer delivery, online grocery deliveries, and condensing urban freight. In their study on last-mile delivery, Alvarez-Palau, Calvet-Lián, Viu-Roig, Gandouz, and Juan (2021) focused on the transportation of food from a distribution center to various camps. Ekici and Ozener (2020) looked the last-mile distribution of humanitarian aid from regional distribution hubs to impacted communities.

Aized and Srari (2014), modalities of delivery (Ehmke, 2012), distances travelled (Ehmke, 2012), and the kind of delivery (B2C or B2B) have all been examined in studies on last-mile logistics (Cardenas et al., 2017; Harrington et al., 2016). Numerous difficulties with pick-up and delivery across shorter distances are also highlighted in the existing literature (Gavaers et al., 2014; Ehmke, 2012). The focus was still on B2B deliveries done with smaller trucks when Cardenas et al. (2017) examined last-mile deliveries performed in commercial buildings (Ehmke, 2012).

The size, physical limitations, and population density of cities—all critical factors in the efficient operation of last-mile logistics—determine how frequently deliveries are made and how far they must travel (Cardenas et al., 2017). According to Seghezzi, Mangiaracina, Tumino and Perego (2021), last-mile delivery frequency is frequently high while tonnage per delivery capacity is low, in contrast to low frequency and larger tonnage per delivery at the global level. Delivery frequency has grown as a result of the requirement for greater freight brought on by e-commerce (Seghezzi et al., 2021).

Last mile delivery makes it easier for items to be transferred for business-to-business (B2B), business-to-consumer (B2C), and consumer-to-consumer (C2C) transactions (Allen et al., 2018; Alharbi et al., 2022). Delivery from one warehouse to another or from one warehouse to another firm is referred to as B2B delivery (Alharbi, Cantarelli and Brint, 2022). For instance, this may happen from a vendor of auto components to a mechanic shop or from a meat market to a restaurant. Longer distance trips in large vehicles like trucks and vans are frequently required for delivery. Contrarily, B2C refers to delivery from businesses to customers. Smaller portions of the goods that can be delivered or picked up by the customer are included in the delivery. Consumer-to-consumer transactions are under the C2C typology. Overall, volume, frequency, and

vehicle size can be used to distinguish between each last mile typology's characteristics (Aljohani and Thompson, 2020).

Comparing the first and middle miles, the final mile is often considered to be the most crucial mile. However, it has also been determined to be the most expensive and inefficient element of the supply chain, and it presents substantial urban planning issues (Bosona, 2020; Castillo et al., 2018). Last mile delivery vehicles are also linked to environmental pollution, safety issues, and infrastructure damage (Abdul-Hamid et al., 2021). The complexities of last mile delivery contribute to its unpredictability within the framework of the metropolis.

According to Harrington, Singh, Kumar and Wohlrab (2016), the last mile delivery falls under the last hierarchy of the supply chain and city logistics systems. Because of its level of inefficiencies and associated problems, which increase the cost of operating the last leg of the supply chain process, it is the weakest part of the entire process. It is easy to see how delays and inefficiencies at this leg will cost both the supplier and the consumer money (Morganti and Dablanc, 2014).

Following from the discussions above on the last mile delivery, the study found that, prior to the e-commerce boom, brick and mortar establishments served as the delivery endpoint for goods, requiring customers to physically visit them in order to make a purchase. However, since each customer who purchased the items at a separate location now need delivery, the last mile delivery has made things more challenging. According to Castillo, Bell, Rose and Rodrigues (2018), transport, logistics, and courier companies must maintain a last mile delivery system that ensures prompt delivery, accurate order, delivery tracking, security and insurance, convenience, and cost-effective delivery.

2.2.4 The SWOT Elements

An individual or organization can identify strengths, weaknesses, opportunities, and threats relevant to company competitiveness or project planning by using the SWOT (Strengths, Weaknesses, Opportunities, and Threats) technique (Frederick and Bhat 2022). Additionally, it offers a structure for formulating strategic planning and assessing a business's competitive position. According to Namugenyi, Nimmagadda and Reiners (2019), the management team uses the SWOT analysis technique to identify the internal

and external elements that affect the company's and its business performances. Other names for it include situational analysis and situational evaluation.

The method can be used as a tool to evaluate the strategic positions of organisations of various types (for-profit enterprises, state and local governments, NGOs, and others) and is intended for use in the decision-making process. It also aims to make it simpler to examine an organisation, program, or industry's advantages and disadvantages from a practical, fact-based, data-driven perspective. It seeks to identify the internal and external factors that are helpful and harmful to achieving the objectives of the project or organization. Users commonly ask and react to questions to provide crucial information for each area in order to make a SWOT method useful and identify their competitive advantage.

Therefore, firms must coordinate their business plans in order to accomplish their goals within a given time frame. According to Namugenyi et al. (2019), the business alignments and strategies are broad plans for reaching certain corporate goals. Using SWOT analysis, organisations can assess data elements pertinent to business alignments and strategies in a number of enterprise settings. While external threats and opportunities exist, an organisation's internal strengths and weaknesses also have a role in how well it performs.

Opportunities and threats are often viewed as external, whilst strengths and weaknesses are frequently viewed as internal. A company's strengths are what it excels in and what sets it apart from its competitors, according to Namugenyi et al. (2019). These strengths include things like its powerful brand, devoted clientele, stable financial position, cutting-edge technology, etc. For instance, a hedge fund may have created a proprietary trading method that outperforms the market. The company must next decide how to leverage those findings to draw in new investors. On the other hand, defects prevent a business from operating to its utmost capacity (Namugenyi et al., 2019). A weak brand, higher-than-average turnover, excessive levels of debt, an insufficient supply chain, or a lack of cash are a few instances of areas where the firm needs to improve in order to remain competitive.

According to a study by Yadav and Sharma (2014), electronic business platforms give companies access to niche markets, time savings, no time constraints, price and product comparison, cost effectiveness, flexible target market segmentation, quick information exchange, and quick purchasing processes. On the other side, weaknesses are internal issues or limits that may hamper or inhibit an organisation's effectiveness. Security, fake websites, fraud, fewer discounts and bargaining opportunities, lengthy delivery times, impossibility of physical examination, lack of personalized service, limited product or service offerings, limited exposure, limited advertising, and customer satisfaction are among the weaknesses in the operations of electronic business platforms (Yadav and Sharma, 2014).

In a SWOT analysis, opportunities are characteristics or aspects that help or enable organizations with linkages to external entities. Businesses can take use of these unimportant components (Eastwood, Culp, Turner, Goodman and Ricketts, 2016). Opportunities could refer to advantageous outside elements that might give a company a competitive edge. According to a study by Yadav and Shama (2014) study, prospects for businesses using electronic platforms include; growing technology and e-commerce acceptance, ongoing global trends, rising user numbers, sophisticated customers, consistent global expansion, high availability wide business growth, and advertising.

Threats are things that could potentially hurt an organisation. Threats are additional outside, unfavourable factors that can delay or prevent the company's goals from being accomplished. According to Yadav and Sharma (2014), threats that crowd-logistics couriers face are; challenges with rivals, environmental changes, legal and regulatory changes, innovation, privacy concerns, lack of direct engagement, fraud, risk, and technology-related infections are the threats halting the development of electronic platform operations.

In contrast to the academic contributions electronic platforms like crowd-logistics, discussions SWOT analysis have further been made on some globally recognised courier organisations operating the crowd-logistics business model namely, Uber, Thomas Nationwide Transport (TNT), and United Parcel Service (UPS). According to Pereira, Upenik, Testolina, Ascenso and Ebrahimi (2021), the adoption of crowd-logistics into its operations offers Uber some strengths such as; largest ride-sharing platform, first-mover advantage, great brand awareness, distinctive pricing system, more affordable prices than

competitors, favourable contractual arrangement with drivers, innovative business strategy, dual rating system, minimal operating costs, and high market valuation. On the case of TNT, the company's strength in the adoption of crowd-logistics is wide network base, quality in service, technology oriented, track and trace feature, strong workforce and recognitions awards and global accreditation (Hitesh, 2018). Whereas on the strengths of crowd-logistics on UPS issues like global presence, technologically cutting edge, first-rate customer support, and affordable prices were identified (United Parcel Service – UPS, 2020).

In terms of the weaknesses in the introduction and implementation of the crowd-logistics businesses model into Uber's operations, Pereira et al. (2021) asserted there are many scandals, consistent profitability cannot be achieved, the model is simple to copy, unethical hiring practices, little consumer loyalty, privacy problems, and an uncertain business strategy. According to Hitesh (2018), issues like limited modification in service delivery, low market growth, and effect from 'NotPateya' cyber-attack are the weaknesses of TNT after the implementation of the crowd-logistics business model. Whiles in the case of UPS, the adoption of crowd-logistics present weaknesses such as the over-reliance on the United States market, transportation cost-dependent rates, inadequate staff safety, and inability to offer services on holidays (UPS, 2020).

By considering opportunities of implementing crowd-logistics, Pereira et al. (2021) in the instance of Uber, found the opportunity to enhance reputation by increased responsibility and performance, investing in the future, expanding operations, and investment in green technologies, and strengthening and diversifying products or services offered. In the case of TNT, opportunities identified were huge products and services, expanding operations, growing market, and growing demand for technology-aided delivery services (Hitesh, 2018). And for the UPS, the opportunities in the adoption of crowd-logistics are, expansion through mergers, portfolio diversification, growing technology and ecommerce market, and 24/7 service – increase days of operations (UPS, 2020).

Last but not least, the Uber case revealed threats to the adoption of the crowd-logistics business model, including drivers and customers switching platforms, frequent legal disputes, growing competition causing thinner profit margins, increased industry regulation, self-driving cars, and fraudulent behaviour by drivers (Pereira et al., 2021).

According to Hitesh (2018), the threats identified for TNT in the courier industry are increased competitors, economic slowdown, and over-demanding clientele. Whereas on the case of UPS, threats included intense competitiveness, political turmoil, various national legislation, and the global epidemic (UPS, 2020).

From the above discussion, it is apparent that, every organisation has its own strengths, weaknesses, opportunities and threats whiles operating crowd-logistics in the courier industry. According to Frada and Clyde (2008), operations of companies in general within developing countries can be rationalized and mechanized with the introduction of technology effectively and efficiently. This will enhance performance and gives competitive advantage (Frada and Clyde, 2008). It is thus important to also explore the strengths, weaknesses, opportunities, and threats in Ghana's courier industry after the adoption and implementation of the crowd-logistics business model.

2.2.5 The Courier Industry

Since ancient Greece invented the idea of messengers, courier service activities have continuously changed and grown into a substantial industry in Persia to transport important communications (Gläser et al., 2021). Beyond just delivering messages to their intended recipients, the courier profession has developed into a billion-dollar enterprise. The emergence of e-commerce and large online retailers, as well as thousands of other firms that take online orders and ship goods to clients, have all contributed to the recent development in online commerce. Courier services have expanded dramatically as a result of the epidemic, in contrast to many other businesses that failed.

The Cambridge Dictionary defines a courier as a person or organisation that transports a message, package, or letter from one location to another. In order to send or receive any type of package or consignment from one location to another, such as a single letter delivered from within your city, country, or from outside, you must use a courier service (Gulc, 2020). According to Vignesh and Jagadeeswaran (2019), courier service delivers products, items, or goods from point of origin (sender/supplier) to point of consumption (consumer/buyer). Courier service focuses on express door to door delivery for either on-demand pickups or time-definite delivery.

According to Vignesh and Jagadeeswaran (2019), couriers often receive and deliver items after receiving them from the sender inside the last mile. The process for receiving and delivering things may vary depending on whether it is a same-day, on-demand, or other types of service. For instance, a customer's order gets delivered immediately when they register with the on-demand kind. In other words, when a customer places an order, a courier is assigned to them, who promptly picks up and delivers the products (Odongo, 2018).

2.2.6 Trends in Courier Service

According to Okemiri, Nwogbaga and Nwebonyi (2017), couriers are different from traditional postal services in terms of aspects including speed, security, tracking, signature, specialization and individualization of express services, as well as rapid delivery times. Regular mail services are typically cheaper than couriers' "premium services," which are frequently more expensive. Their use is hence typically limited to parcels where one or more of these qualities are thought to be essential enough to warrant the cost (Vignesh and Jagadeeswaran, 2019).

Courier services are accessible on a range of scales, including local, regional, national, and worldwide services (Mahamad, Sulaiman, and Leng, 2018). Some of the well-known courier services in the world are DHL, DTDC, FedEx, EMS International, TNT, UPS, J & T Express, and Aramex (Gläser et al., 2021). These courier companies often operate on a hub-and-spoke arrangement, providing services globally.

Many courier services used to rely heavily on the need for speedy (same day) delivery of important documents. Due to modern communication technology, such as email and video conferencing, this demand has, however, decreased recently (Mahammed et al., 2018). Due to this, many businesses were compelled to go elsewhere for workers, and in many cases, they shifted their focus to transporting bigger shipments. This market category is still expanding as more products are being delivered to customers' homes thanks to mail order and online shopping. Since it is anticipated that items purchased online or through the mail would arrive within a few days, courier services are commonly used (Gulc, 2020).

There are several trending happening in the courier industry such as technological developments, sustainability, economy, fuel prices, same-day-delivery issues and many others. However, for the purpose of this study, the technological development within the courier industry has been discussed:

2.2.6.1 Technological developments

The courier sector is not an exception to the fact that technology continues to be a catalyst for change in many businesses (Odongo 2018). Due to the nature of the business, the courier services sector has historically lagged behind other industries in adopting technology. It is increasingly easier for customers, including private persons, to order and use courier services. Emerging technologies have significantly changed how business is conducted in the courier sector today, fuelling the sector's expansion (Gulc, 2020). The market for courier services is anticipated to reach a staggering \$400 billion by 2024, according to a recent estimate (Industry Today, 2022).

The industry has grown every year as a result of the development of new technology. Delivery robots, crowd-logistics, GPS software and route tracking, drone deliveries, and courier management software are some of the technological innovations that are reshaping the courier sector (Agyemang, 2022).

Courier Management Software: Courier management software is one of the disruptive technological trends in the courier services industry. It has attributes including route optimization, route monitoring, and real-time updates for the dispatch team and the client (Ninikas, Athanasopoulos, Zeimpekis and Minis, 2014). The days of customers skipping crucial events while waiting for deliveries to arrive, frequently with ambiguous ETAs, are long gone. Customers can check the status of their delivery from their phone using delivery management software like Circuit.

Along with the vehicle's current location, the dispatcher will also be able to see any stops the driver has made and their intended next stop in real-time. The best delivery management software also includes features for taking pictures of products as they are delivered or for getting the customer's signature. This makes the courier more effective while lowering confusion and potential future conflicts.

The Crowd System: With the aid of technological advancement, there now exist platforms that bring together seekers and providers of courier services (Gdowska et al., 2018). When consumers purchase goods online most especially, and seek to have same delivered to a designated place, technology has made it possible with just a click of the button of the phone or through a web-system (Odongo, 2018). This crowd system enhances courier service provision operators only invest in the system that manages a fleet of equipment from ordinary or individual non-professional riders or drivers.

Delivery Droids: Due to their cost-saving capabilities and delivery efficiencies, delivery droids have assumed a prominent role in the courier services sector. With the use of sophisticated technology like cameras, sensors, and other programs, these "smart" cars can complete all delivery needs without the aid of a driver (Garus et al., 2022). The robots are directed to deliver the goods to the correct locations by a remote operator in a control center. These droids reduce costs while removing the possibility of human error by doing away with the necessity for a driver.

GPS Software and Route Tracking: GPS driver tracking has also changed the courier services sector. The communication gap between dispatchers and couriers is filled through GPS tracking. As a result, delivery efficiency improves (Wanganoo and Patil, 2020). The courier industry also places a great deal of importance on route tracking. Drivers can create a route that saves time and fuel and ensures on-time delivery of the package by using the best route planning software (Wanganoo and Patil, 2020). This promotes consumer loyalty and helps establish your business as trustworthy.

Drone Deliveries: Amazon was the first e-commerce company to use a drone to deliver a delivery in the beginning of 2016. The first drone delivery took place as a result. This form of product delivery uses drones to reach customers, as the name would imply. Drones are generating a lot of buzz because of their quick product delivery while avoiding traffic, potential strikes, and labour expenses (Wanganoo and Patil, 2020).

In relation to the above discussions on the courier industry, it is to be said that the advent of technology and ecommerce most especially has transformed the face of the industry. industry players, especially courier service providers are investing in some of these technological systems to improve the quality level of the delivery services they provide at a relatively cheaper cost. These technology systems or software definitely do come at

a cost, but help to influence the performance of courier service providers in a positive manner.

2.2.7 Organisational Performance

Organisational performance measurement is a multifaceted idea. Due to the fact that organisational performance could only be realized through performance measurement, it was necessary to first comprehend what performance measurement was all about. Performance evaluation is a critical factor for assessing an organisation's ability and accomplishment (Prathap and Mittal, 2010). According to Tuttle and Heap (2008), performance measurement is the process of quantifying activity because measurement is the act of quantification and performance derives from action. They underlined how important it was to exceed competitors in terms of effectiveness and efficiency while upholding strict client requirements. According to Lim and Biswas (2015), effectiveness in this context meant how well the needs of the customer were addressed. This was done with the general guiding principle that the consumer was always right. Efficiency in this context meant evaluating how well a business utilised its resources to meet a certain level of customer satisfaction (i.e., total output against total input).

As a result, effectiveness and efficiency are seen as the two key components of performance. Abasilim and Edet (2015) underline that efficiency is a measurement of how economically the firm's resources are utilised when offering a specific degree of stakeholder satisfaction, in contrast to effectiveness, which refers to the amount to which stakeholders' expectations are met. To attain superior relative performance, an organization must beat its competitors in terms of effectiveness and efficiency (Abbasi and Zamani-Miandashti, 2013).

Financial measures of performance are obtained from an organisation's records, or they might be found in the accounting report, the benefit and loss statement, or both. Since they may be independently evaluated and verified, financial measures are also included as target measures (ElKordy, 2013). However, in order to fully assess execution, it is essential to offer non-monetary execution proportions related to monetary metrics. The abstract execution proportions of execution and non-monetary metrics are other names for the same thing. In addition to providing information on progress in respect to customer requirements or rivals as well as other non-budgetary goals that may be crucial

in achieving productivity, the use of non-monetary performance metrics supports bookkeeping measurements.

The five categories of execution that are most frequently used for measuring association execution are: authoritative performance, operational execution, consumer loyalty, employee fulfilment, and learning and development (Khan, 2020). Sales volume increase, profit and income improvement, intended location part of the growth, and profitability rate are factors that can be utilized to evaluate hierarchical execution (Ampountolas, Shaw and James, 2019). Efficiency, quality performance, auspiciousness, enhancement of qualitative features, reduction of waste, and enhancement of generating performance are used to measure operational execution (Chirchir, 2018). Employee satisfaction is measured by worker development, employee assurance, and profitability (Rahman, Akhter and Khan, 2017).

No one execution proportion should be compared to its own, according to Raman et al. (2017). Different indicators (financial and non-financial) should be combined based on prior analyses in order to gain a true picture of how an organisation is doing. As a result, both financial (Return on Assets (ROA), Return on Equity (ROE), deals and benefit development, and benefit development) and non-financial (worker development, customer loyalty, fulfilment with execution compared to competitors, and overall fulfilment) measures were used in this investigation to evaluate the effectiveness of the authority.

Like a machine, a business will fail to function properly if important components, such as procedures, systems, and structure, are out of alignment or prevented by a breakdown between those components. Also like a machine, a business needs to be set up, operated, and maintained. The capacity (the human resources used by the undertaking) performs these limits. Unquestionably, the most significant switch for bringing about changes in company execution is capacity (i.e., an affiliation's delegates). The middle limitations of an affiliation are typically included in the overall capabilities of the capacity employed in the affiliation.

2.2.8 Organisational Performance in the Courier Industry

A precise description of organisational performance was needed to explain the multifaceted performance phenomenon. The older performance measurement literature

was collated by Neely, Gregory and Platts (1995), who came to the conclusion that performance could be broken down into four dimensions: quality, time, cost, and adaptability. According to Rajagopal, Krishnamoorthy and Khanapuri (2018), three areas of organizational outcomes specifically fall under the purview of organizational performance: financial performance (profits, return on assets, return on investment), market performance (sales, market share), and customer satisfaction/value added.

Organizational performance, according to Richard et al. (2009), is the difference between a company's actual output or results and its aims and objectives. Establishing organizational goals, monitoring progress toward those goals, and making necessary adjustments to accomplish those goals more effectively and efficiently are a few of these actions. There are at least three main reasons why a courier service provider would want to assess their organizational performance: first, to lower operating costs; second, to use these measures to drive revenue development; and third, to increase shareholder value (Keebler and Plank, 2009).

According to Keebler and Plank (2009), measuring operating costs can help determine whether, when, and where operational changes should be made to cut costs, highlight areas for better asset management, and aid in attracting and keeping valuable customers by increasing the price-to-value ratio of the offered products through cost savings and service enhancements. Furthermore, changes in the performance of the courier industry that were taken into consideration by the procedures that determined on share price and dividend policy may have had a significant impact on returns on shareholder investments and the company's market value (Keebler and Plank, 2009).

Logistics companies, such as courier service providers, began to view time as a source of competitive advantage in the 1980s based on the observation that service providers who were successfully competing in time tended to excel at improving quality, understanding shifting customer needs, utilizing emerging markets, entering new businesses, and generating new ideas and incorporating them into innovations. As a result, logistics companies began to concentrate on reducing distribution-related waste, such as time, effort, defective items, and inventory (Njambi and Katuse, 2013). Logistics skills are essential in the tough competition that is time- and quality-based. In actuality, rather than innovation, many businesses—especially those engaged in the parcel and product delivery markets—succeed due to their logistical systems.

According to a study on logistics management by Leachman, Guerrero and Madanat (2013), the majority of researchers assessing organisational performance shared the view that different performance assessment was necessary. Prior to the 1980s, when performance measurement was being evaluated, it was primarily focused on the cost accounting technique, which included financial key performance indices including return on investment and profit plus earning per share (Gomes, Yasin and Lisboa, 2006). However, critics have pointed out that emphasis primarily on financial metrics has led to short-term thinking and disregard of other non-financial variables that contribute to the effectiveness of logistics organisations (Thru-logachantar and Zailani, 2011). In their research, Dsouza and Williams (2000) emphasized the importance of procedures and tasking flexibility measurement as a solution to deal with market volatility and satisfy a variety of client expectations.

According to Prathap and Mittal (2010), general organisational strategies included competitive priorities that were primarily concerned with effectiveness, quality, affordability, delivery, flexibility, innovation, and responsiveness. Additionally, competitive priorities were frequently utilized to gauge the effectiveness of organisational strategies (Bartuševičienė and Šakalytė, 2013). According to Gomes et al. (2006), the majority of courier businesses used cutting edge technologies and logistics approaches like just in time (JIT), concurrent engineering, and employee empowerment to achieve these goals. However, according to Thru-logachantar and Zailani (2011), recent developments in the courier industry have introduced a new dimension that has shifted the emphasis of general organisational performance toward supply chain and logistics capabilities in order to achieve quality, cost effectiveness, and delivery time goals as well as goals for innovation and responsiveness. As confirmation, a study by Zailani and Rajagopal (2005) emphasized the significance of examining the core competitive priorities, which included quality, delivery, and flexibility, when assessing organisational performance.

In contrast, they neglected other competitive criteria including cost, innovation, and responsiveness in favour of focusing just on three elements for performance measurement. Cost and the introduction of new products, which are closely tied to innovation and responsiveness to customization, were crucial in fostering synergy in the

expansion of the courier sector as they might ultimately influence the sales trend of the service provided (Thrulogachantar and Zailani, 2011).

Owing from the discussions above, it is to be said that there are different strategies from which organisations in the logistics industry in general and courier industry to be specific measure performance. However, on the grounds that general organisational strategies comprised of competitive priorities that mainly focused on effectiveness, quality, cost, delivery, flexibility, innovation, and responsiveness, the study adopts the performance characteristics as indicated by (Prathap and Mittal, 2010).

2.2.9 Influence of crowd-logistics on courier industry performance

By putting the notion of crowd-logistics into practice, all stakeholders and stockholders could gain financial advantages (Frehe et al., 2017). Crowd-logistics offers the option of an immediate delivery as long as a driver or rider is adaptable, in contrast to typical courier service providers that frequently only offer one delivery tour per day (Dietmann and Kathrin, 2020). According to Rougès and Montreuil (2014), the precise assignment of an item to a driver allows for the customisation of the delivery in the same action. According to McKinnon (2016), crowd-logistics may be advantageous for express delivery and failed deliveries.

Expensive van fleets are unnecessary, and crowd-logistics provides flexibility by customizing deliveries to meet the needs of both customers and drivers. A reduction in the number of failed deliveries may be achieved by integrating direct communication between the crowd-logistics driver and the parcel recipient (McKinnon, 2016). Lower transportation costs and incentives for sending packages to customers are advantageous (Mladenow et al., 2016). Crowd-logistics offers customers the choice of a straightforward delivery by establishing a new level of delivery between the service provider and the client (Wang, Zhang, Liu, Shen and Lee, 2016). According to McKinnon (2016), the ability to drive for crowd-logistics gives locals the chance to save travel costs or earn more money because deliveries typically have a high net margin. The small delivery-related additional costs are to blame for this.

The company's reputation as a customer-environmentally-friendly company is its greatest strength, according to Mladenow et al. (2016). Arslan et al. (2019) utilized the capacity of the crowds to statistically analyse the delivery while it was in transit. The findings

back up the assertion made by crowd-logistics that last-mile delivery costs and vehicle miles can be decreased, preferably with a combination of ad-hoc drivers and a dedicated vehicle fleet as backup (Arslan, Agatz, Kroon and Zuidwijk, 2019). This lowers delivery costs for retailers (Rougès and Montreuil, 2014). According to Cohen and Muoz (2016), employing crowd-logistics can make consolidation easier by streamlining the delivery path.

Frehe et al. (2017) claim that crowd-logistics makes it so that, in contrast to traditional delivery systems, the courier firm does not own their delivery fleets and drivers, resulting in a substantially cheaper cost for maintenance, insurance, and administrative expenses. A delivery's often high net margin also provides people with the opportunity to supplement their income or lower their travel costs, according to McKinnon (2016). The small delivery-related additional costs are to blame for this. The company's image as a client- and environmentally-friendly company is its strength (Mladenow et al., 2016).

Courier Express and Parcel (CEP) service providers may be freed from expenses, restrictions, and difficulties by using crowd-logistics concepts for industries with slim profit margins and low returns on investments (Ködel and Von Danwitz, 2017; McKinnon, 2016). Due to lower delivery costs in this shift, the market segment may be expanded. This may be especially advantageous to small-town retailers and the convenience sector because it makes them more competitive with regard to large e-commerce companies (Ködel and Von Danwitz, 2017). Because of these factors, a partnership between CEP service providers and crowd-logistics service providers, particularly in inner cities, may be advantageous (Ködel and Von Danwitz, 2017). Less money may be invested in a logistical infrastructure thanks to the deployment of a crowd-logistics network (Carbone et al., 2017).

People can increase the capacity for parcel transit and reduce the explicitly required conveyance of packages when they use the crowds' free transportation resources, whether they do it in their own vehicle, on foot, or with public transportation. Consolidating transport volume leads to decreased traffic density, energy resource savings, and a decrease in CO₂ emissions (Carbone et al., 2017; 2013; Dörrzapf, Mitteregger, and Berger, 2017; Mladenow et al., 2016; Wang et al., 2016). Overall, it is possible to lessen the environmental impact (Rougès and Montreuil, 2014). A decline in oil imports may cause cities to save money in the short term and reduce their national

account deficit. Long-term infrastructure and transportation cost savings are possible (Paloheimo, Lettenmeier and Waris, 2016).

The uniformity and security of packages or other commodities being delivered to the ultimate customer are improved by crowd-logistics. It consequently helps to decrease failed deliveries (McKinnon, 2016). According to McKinnon (2016), crowd-logistics may be advantageous for express delivery and non-failed deliveries. The problem of failed delivery is eliminated from the system by incorporating direct communication between the crowd-logistics driver and the parcel recipient (McKinnon, 2016). In essence, this enables constant contact between the rider and the recipient of the product, particularly with regard to the location or ideal delivery site.

Crowd-logistics gives customers the chance for a more dependable delivery by adding a new degree of delivery between the service provider and the consumer (Wang and Xie, 2016). By specifically assigning a product to a driver or rider, the delivery can be personalized in the same action (Rougès and Montreuil, 2014). Wang and Xie (2016) claim that crowd-logistics gives customers greater control over delivery alternatives and the ability to choose more precise time slots, assuring that the customer will be present at the time of delivery and reducing the likelihood of unsuccessful receptions.

The ability to deliver packages quickly and instantly, including same-day delivery, is another significant effect of crowd-logistics on the courier sector (Odongo, 2018). In order to provide their consumers more promptly, businesses use crowd-logistics for last-mile deliveries via courier services. Businesses may satisfy quick gratification demands from customers and still guarantee that their shipments arrive when expected (Odongo, 2018).

When the courier sector uses crowd-logistics, the quality of the services is improved. Since GPS technology is utilized to continuously track the shipments and provide real-time information on the delivery status, crowd-logistics, according to Rougès and Montreuil (2014), gives customers and retailers greater visibility into the transportation process. The system allows customers to follow the progress of their packages, which increases chain visibility, makes it more appealing, and enhances customer service, according to the authors.

Emerging issues with a crowd-logistics service include worries about safety and privacy, as well as the loss and degradation of tangible products (Mladenow et al., 2016). When compared to the traditional last-mile logistics with CEP service providers, crowd-logistics displays a larger possibility of the delivery of stolen, lost, or damaged shipments or items (McKinnon, 2016). Additionally, crowd-logistics drivers run the risk of transporting dangerous or illegal products or, in the worst-case scenario, taking part in terrorism. It might be challenging to identify who is responsible for losses or damages because the functions played by conventional businesses have changed. Given that the corporation just acts as an intermediary and the drivers do not have contracts, a clear distribution may be challenging. Specific delivery constraints, insurance coverage, and inspections of the reliability of crowd-logistics drivers undertaken by the crowd-logistics service provider can all stifle these suspicions (McKinnon, 2016; Mladenow et al., 2016).

Additionally, process enhancements, feedback mechanisms, and digitization may present a chance to address these issues (Holmström, Holweg, Lawson, Pil, and Wagner, 2019; Rougès and Montreuil, 2014). Data security and privacy are crucial, particularly when it comes to residential delivery where some consumers might be reluctant to give their addresses. According to Rougès and Montreuil (2014), trust between senders and couriers can also be a major problem. Legal guidelines are therefore required (Mladenow et al., 2016; Wang et al., 2016). The majority of the time, there are general prerequisites, penalty policies, and obligations for service use (Wang et al., 2016).

The competitive environment may be a difficulty in the relationship between crowd-logistics enterprises and CEP service providers. In addition, crowd-logistics provides a way for crowd-logistics firms and CEP service providers to work together. However, providing acceptable service quality may be challenging due to the collaboration (DHL International GmbH, 2013; McKinnon, 2016).

Four factors need to be carefully considered from an economic perspective. The production and use of software, customer and employee training, route instructions, or GPS devices, to name a few, might all result in higher costs (Mladenow et al., 2016). Also, based on the used business model, crowd-logistics drivers may receive an appropriate remuneration in relation to the costs of the delivery in the event of additional

journeys. Deliveries in progress with minor delays are not affected by this issue (McKinnon, 2016).

The third factor is the widespread application of crowd-logistics in urban areas, which indicates a necessary quantity of customers, drivers, and delivery personnel (Ködel and Von Danwitz, 2017; McKinnon, 2016). Fourth, according to some writers, the environmental impact must be thoroughly assessed in and of itself (Chen, Fan, Pan and Zhou, 2020; Paloheimo et al., 2016).

From the discussions above it can be said that the relationship between crowd-logistics and the courier industry is largely positive though there exist some challenges. Crowd-logistics allows for parcels within the courier industry to be delivered in an efficient and effective manner to the right place, at a relatively cheaper rate or charge, and in the right condition without damage, within the right time customer expect to receive the parcel. In the end, crowd-logistics improves cost efficiency, delivery time, service quality, delivery reliability, item safety, and environmental sustainability. Emerging issues with a crowd-logistics service include worries about safety and privacy, as well as the loss and degradation of tangible products (Mladenow et al., 2016). Others included a greater chance of receiving packages or commodities that were stolen, lost, or damaged (McKinnon, 2016), data privacy and confidentiality difficulties, and trust issues (Rougès and Montreuil, 2014).

2.3 Theoretical Review

2.3.1 The Game Theory

Game theory is the study of cooperation and conflict when many people are required to make decisions that could affect the interests of other participants (Xu, Li, Xu, Xu and Lai, 2020). When the behaviours of numerous players are connected, game theoretic concepts can be used (Dai and Chen, 2016). These agents could consist of any number of people, organizations, businesses, or even all three. A vocabulary for constructing, analysing, and understanding strategic scenarios is provided by game theory concepts (Dai and Chen, 2016).

The non-cooperative and the cooperative game theories are the two primary strands of game theory, according to Xu et al. (2013). When players can benefit more by cooperating than from acting alone, the cooperative game theory can be used (Xu et al.,

2013). We employed cooperative game theory techniques that heavily focused on the gain sharing issue to construct the goal and interview question on the effect of crowd-logistics on the performance of the courier industry. Cooperation is becoming more crucial today to increase the overall effectiveness of logistics and associated services like crowd-logistics (Drechsel and Kimms, 2010).

Horizontal cooperation has been proved to be effective at reducing overall costs and raising service standards in logistics, in addition to the more well-established vertical model of collaboration (Drechsel and Kimms, 2010). According to game theory, horizontal logistics collaboration can reduce overall costs and improve performance (Crujssen, Cools and Dullaert, 2007; Dror, Wertheim, Frase-Mackenzie and Walajtys, 2012). Despite these benefits, Muir's (2010) research found that horizontal collaboration is not widely used in logistics. The absence of a suitable decision-making model is a key barrier to the implementation of horizontal collaboration (Xu et al., 2020).

To make decisions and better understand the impact of the crowd-logistics business model for parcel delivery on the performance of the courier industry, a cooperative game-theoretic approach was utilized in this study. The cooperative game theory was used to analyse the fair profit distribution and stable coalition formation, which were key components of the cooperation model (Dror, Wertheim, Fraser-Mackenzie and Walajtys, 2012). This kind of collaboration called for businesses or service providers to pool their resources for logistics and the delivery of goods as well as their private information (Drechsel and Kimms, 2010).

The objective was to improve logistics efficiency, for example, by reducing logistics, delivery, and storage costs (Crujssen et al., 2007), expediting the delivery of goods, or reducing the harm that transportation-related activities due to the environment (Pan et al., 2011). The cost of transportation was the main focus of the idea. According to research (Crujssen, Dullaert and Joro, 2010; Ergun, Agarwal, Houghtalen and Ozener, 2009; Pan et al., 2011), horizontal collaboration in logistics can save transportation costs by 10% or more. This study's assessment of cooperative game theory has a sizable financial stake given the significance of Ghana's courier business.

The concepts put out by game theory served as a guide for the study on crowd-logistics and its influence on the courier industry's performance (cost effectiveness, service quality, logistics management, delivery time, delivery reliability, and delivery flexibility) in Ghana.

2.3.2 Resource Based View Theory

The internal sources of an organisation's persistent competitive advantage are intended to be explained by the resource-based concept (Kraaijenbrink, Spender and Groen, 2010). According to Tukamuhabwa, Eyaa and Derek (2010), the Resource Based View (RBV) of the organisation holds that internal resources are sources of competitive advantage. Such resources are priceless, uncommon, distinctive, and hard to find elsewhere. Resources that can facilitate the formulation or execution of strategies that increased performance, exploited market opportunities, or eliminated looming risks are considered important (Barney and Clark, 2007).

Resources and capabilities are heterogeneously dispersed within organisations, and resources and capabilities are imperfectly mobile, causing organisational disparities to remain stable over time (Karia and Wong, 2011). These two premises form the basis of the RBV theory. In terms of the resources and capabilities they have access to or own, every organisation is distinct from other organisations (heterogeneous). These variations set one organisation apart from another, and according to Karia and Wong (2011), an organisation's success is a result of its organisation-specific (idiosyncratic) resources. Thus, an organization's individual resources, talents, and capacities make up a collection of its resources or the basic idea behind the resource-based viewpoint (Karia and Wong, 2011).

For instance, a resource in the logistics sector is described as a necessary element or prerequisite for the development of an organisation's talents as well as for the expansion and operation of logistics (Aldin, Brehmer and Johansson, 2004). An organisation is made up of both tangible and intangible resources, according to the resource-focused perspective (Kraaijenbrink et al., 2010). Each organisation within the same industry is diverse (heterogeneous) as a result of this collection being unique to each company. This means that no two organisations have the same experiences, assets, or talents, or have created the same organisational cultures (Barney and Clark, 2007).

Strategic choices are ultimately influenced by these various resource endowments among enterprises (Shang and Marlow, 2005). The RBV was used by Ganotakis and Love (2012) to explain the advantages of logistics management to enterprises. According to Ganorakis and Love (2012), entrepreneurial organisations are believed to benefit from the flexibility and efficiency of the logistics system. The corporation was able to establish a competitive edge thanks to its ownership of exclusive assets. They found that a company's capacity to gather and make effective use of the right mix of resources gave it a competitive edge (Ganotakis and Love, 2012). Wong and Karia (2010) provided evidence for RBV's emphasis on the idea of hard-to-copy organizational qualities as sources of business returns and ways to boost performance and acquire a competitive edge in their study.

The RBV had been used to assess corporate performance in strategic literature. It is crucial to note that RBV has just recently been used in research on logistics management to look at how logistical capabilities and resources affect logistics performance (Lai, Li, Wang and Zhao, 2008; Yang and Lim, 2017). According to Lai et al. (2008) from the logistics literature, the RBV theory is a good choice for supply chain and logistics management studies. This study discovered a strong correlation between logistical capability and successful organizations. Lai et al. (2008) used RBV theory to investigate how information flow affects 3PL providers' competitive advantage, whereas Yang and Lim (2017) looked at how logistical capabilities affect firm performance.

The resource-based view (RBV) of organisations focuses primarily on their internal advantages and disadvantages, as opposed to industrial organisation economics, which emphasized the organisation's external opportunities and threats. The reason for this, according to Shang and Marlow (2005), is that an organisation's internal resources and capacities may be easier to manage while the outside environment is unstable. In order to investigate the benefits, drawbacks, opportunities, and dangers of integrating crowd-logistics into the operations of courier companies in Ghana, the RBV served as the theoretical basis for this study.

2.4 Empirical Review

2.4.1 Characteristics of Crowd-logistics

Four crowd delivery ideas were distinguished by Dörrzapf, Mitteregger and Berger (2017) based on the characteristics of the crowd-logistics system. First, there is the delivery to the customer's home from one or more stores. Second, from a store or stores to a pickup location, such as a railway station. Thirdly, from a pickup location, such as a store, to the customer's residence. The fourth and last point is from point to point like university departments (Dörrzapf et al., 2017).

According to a study by Odongo (2018, p.13), "crowd-logistics is done through collaborative platforms and mobile apps that connect individuals and firms to peers" (travelers, movers, licensed drivers, and owners of available storage space, among others). This can as well be observed from the findings presented above that, the participants shared similar opinion regarding how their companies operate in the last mile. In the study, Odongo (2018) divided the 10 organisations under analysis into two clusters: platforms that are "business-to-customers" (B2C) and "peer to peer" (P2P) in nature. The business-to-consumer cluster is made up of startups and programs launched by major ecommerce businesses. P2P is only produced by startups. These new businesses serve as platforms for demand fulfillment and long-distance delivery; typically, the two peers negotiate all terms of the transaction. Odongo (2018) found that the business to consumer cluster was the largest at the time of the study, but given how quickly this industry is changing and how it is changing, the situation could change quickly.

Crowd-logistics was found to require some facilities and elements in order to be able to function in the study conducted by Carbone et al. (2017). The study reveals that, the facilities are technology-based or hard facilities. For the technology-based facilities, Carbone et al. (2017) discovered they are made up of computers, mobile devices, data and storage house, routers, data and internet boosters, Wi-Fi, GPS location application. The hard facilities according to their study were vehicles, motor bikes, bicycles, scooters and road networks. Carbone et al. (2017), further reveal the elements of the crowd-logistics system to be drivers, general public, compensation, voluntary service, delivery time, company type, goods type among others.

From Mladenow et al. (2016), crowd-logistics operate in such a way that a corporation offers the technical infrastructure and any person can serve as both a client, vendor and a supplier subscribe to do business. Their study revealed that, crowd-logistics facilities and elements operate in a chain that allows for orders to be placed on the technology platform, from which delivery persons or vendors respond by accepting and making available the item as requested for picking and delivery by riders to the expected delivery address.

Furthermore, Mehmman et al.'s (2015) study on the process of crowd-logistics operations reveals that the consumer requests a delivery service online or through an app and expects an item to be delivered. The crowdsourced delivery platform then sends the confirmed order details to any approved "couriers" who are close to the dispatch point so that the package can be picked up and delivered to the specified destination (Mehmann et al., 2015). Kafle et al. (2017), in contrast, found another type of crowd-logistics that takes the shape of a two-tiered crowdsourced delivery system where after download of app, registration, and request or order is made, trucks are employed in the first layer to move items from distribution hubs to a relay station, and crowd-logistics is used in the second-tier vehicles, cyclists, and pedestrians complete the final mile of delivery by relaying packages from trucks. This type of crowd-logistics system is used for bulk goods, something that Ghana's transport and logistics space is yet to embrace.

2.4.2 Strengths and Weaknesses of crowd-logistics in the courier industry

A qualitative study by Yadav and Sharma (2014) found that companies have access to a global market, time savings, no time restrictions, price and product comparison, cost effectiveness, flexible target market segmentation, quick information exchange, quicker purchasing processes, and niche markets as benefits of using electronic business platforms, of which crowd-logistics is a part. The Crowd Logistics Maturity Model (CLMM) was created using a thorough literature study (LR) and quantitative data analysis (QDA) of existing business models to substantiate this assertion. A global market, time savings, no time restrictions, price and product comparison, cost effectiveness, flexible target market segmentation, quick information exchange, quicker purchasing processes, and niche markets are just a few of the additional advantages offered by crowd-logistics business concepts that Mehmman et al. (2015) identified.

The distribution of flows is made simpler (a smart algorithm ensures that the most suitable driver is chosen to fulfil the delivery) thanks to the strengths of crowd-logistics, which provides descriptions, localizations, and ratings for supply and demand (our on-demand delivery platform connects customers with local couriers). This discovery is based on a study by Carbone et al. (2017), "The Rise of Crowd-Logistics: A New Way to Co-Create Value." The researchers assert that the organization of crowd logistics exhibits distinct characteristics that ensure flows are primarily distributed among a group of people using a peer-matching application or bidding mechanism, depending on the shipper's preference or assignment by the platform.

Pony Express crowdsourcing logistics for last-mile delivery in B2C e-commerce was the subject of another study by Seghezzi et al. (2021), which found that the system generated and encouraged interaction between the sender, recipient, and deliverer (rider) of a parcel. In this situation, crowdsourcing logistics stands out as a creative and promising solution that guarantees deliveries are delegated to a network of "common" people through an open call and works with clients to assure effective parcel delivery.

On the other hand, despite the fact that crowd-logistics has several positives, Yadav and Sharma's (2014) literature review analysis reveals that it also has significant shortcomings. The researchers' findings showed that security, fake websites, fraud, fewer discounts and bargaining opportunities, lengthy delivery times, the impossibility of physical examination, a lack of personalized service, product or service limitations, limited exposure, limited advertising, and customer satisfaction were the weaknesses in the operations of electronic business platforms. Yadav and Sharma's (2014) study findings are supported by research from Mladenow et al. (2016) on the fact that, emerging limitations of a crowd-logistics service relate to actual products being lost or damaged, as well as issues with safety and privacy. Additionally, McKinnon (2016) analysis revealed that the crowd-logistics business model exhibits a higher likelihood of the delivery of stolen, lost, or damaged packages or items as compared to the traditional courier delivery.

In their study on crowd-logistics the last-mile delivery, Dietmann and Kathrin (2020) added that crowd-logistics drivers are exposed to the risk of carrying illegal or hazardous goods or even of unintentionally taking part in a terrorist act, corroborating the findings made by Mladenow et al. (2016) and McKinnon (2016). The survey also showed that

because the average business's functions have changed, it can be challenging to identify who is responsible for losses or damages. Given that the corporation just acts as an intermediary and the drivers do not have contracts, a clear distribution may be challenging. According to Dietmann and Kathrin (2020), these uncertainties can be suppressed by precise delivery constraints, insurances, and assessments of the crowd-logistics drivers' dependability made by the crowd-logistics service providers.

According to Gläser et al. (2021), there are some risks and uncertainties with crowd-logistics. The results of their literature review study on the advantages and disadvantages of crowd logistics on the last mile for courier, express, and parcel service providers show that crowd-logistics services might not be as dependable as those offered by conventional courier firms (Gläser et al., 2021). Due to several safety concerns, it is possible for theft, parcel damage, fraud, or late delivery to occur. The challenge, in the opinion of Gläser et al. (2021), is to who is in responsibility of handling such issues. The study also indicated that there are certain privacy concerns when shops share customer buying patterns and home or workplace addresses with passersby or crowds (Gläser et al., 2021).

The market and security concerns are crowd-logistics' shortcomings, according to Mehmman et al. (2015) in their research *Crowd Logistics: A Literature Review and Maturity Model*. The study's findings also showed that organisations will need to take into account the level of market rivalry as well as the degree of transparency, supplier verification, user verification, and security in terms of safety. In order to increase security and expand service to other cities, the research also called for the inclusion of an insurance policy for the operation of service providers (such as third-party insurance). Additionally, a study by Arslan et al. (2019), on the crowd-logistics business model's flaws discovered extra expenses like insurance, training for part-time employees, and legal fees. To guarantee the consistency of the service quality, training is required. Due to their high turnover rate, couriers have very significant training expenses.

Additionally, digitalization, feedback systems, and process improvements may present a chance to address these issues or limitations (Kunze, 2016; Rougès and Montreuil, 2014). Data security and privacy are crucial, particularly when it comes to residential delivery where some consumers might be reluctant to give their addresses. According to Rougès and Montreuil (2014), trust between senders and couriers can also be a major

problem. Legal guidelines are therefore required (Mladenow et al., 2016; Wang et al., 2016). In general, general prerequisites, penalty guidelines, and obligations for service use are required (Wang et al., 2016).

2.4.3 Opportunities and threats of crowd-logistics in the courier industry

According to Dietmann and Kathrin (2020) in their research on crowd-logistics in the last mile delivery, the rise of the technology, specifically e-commerce industry is a major driver of expansion for startups and business owners in the crowd-logistics sector. According to study by Barclays (2014), logistics providers are usually upbeat about the future, which is consistent with this. According to a study by Barclays, 92% of suppliers think that future chances for growth would be brought about by the continuous growth of online commerce. However, more than 50% of respondents said that managing the expanded capacity requirements was a critical area they saw as a threat to future growth. With improved technology and more international distribution, there is a nearly 35% potential for growth, which might be boosted by investing in additional delivery choices. 28.3% of respondents are concerned about an increase in deliveries made by merchants' delivery services, and 33.8% are concerned about consumers who are becoming more price-sensitive and may choose to use retailer-led services since they are less expensive.

In addition to these options provided by the crowd-logistics business model, Arslan et al. (2019) discovered that the threat of uncertainty and sustainability of the sizable pool of part-time labour force are the drawbacks of the crowd-logistics business model. According to the study, managing the geographically distributed labour force can be a significant external barrier. Castillo et al. (2017) discovered in their study carried out in New York that the crowd's participation can be susceptible to a significant degree of unpredictability, leading to changes in the service capacity offered, concurring with Arslan et al. (2019). The study also showed that, in comparison to deliveries made by a standard courier service provider, such oscillations led to a decreased rate of on-time delivery. Analysing more than 14,000 courier delivery requests across the US produced comparable results. Only 67.9% of the designated tiny shipments could be delivered, according to Ermagun, Shamshiripour, and Stathopoulos' investigation (2020). Many authors (Archetti, Savelsbergh and Speranza, 2016; Frehe et al., 2017; Arslan et al. 2019) advise introducing a courier service provider or permanent drivers into a crowd-logistics system to overcome this issue.

Accordingly, in their study on the impact of crowd logistics on environmental sustainability in a developing economy: an examination in Ghana, Abdul-Hamid et al. (2021) found that crowd logistics positively effects the environment but necessitates appropriate participation from the crowd. They contend that it will very challenging to control riders once they are no longer employed as permanent employees by the courier companies that provide the crowd-logistics platform. The advantages of efficient and effective delivery, which crowd-logistics demands, are hindered by this.

The majority of riders or drivers in the crowd-logistics courier set-up, according to a study by Le and Ukkusuri (2019) that examined past and present delivery behaviours and potential employees' desire to work as CS driver-partners, are there for financial gain. Because the majority of them work on a temporary, part-time basis, they are frequently not motivated to assure consistent, effective, and efficient delivery.

2.4.4 Influence of crowd-logistics on the performance of courier industry

Crowdsourcing for the last mile delivery: An approach for platform selection is the title of a case study, Mons Cabré (2021) conducted in Matario, Spain. He discovered that one way that crowd-logistics systems affect organisational performance is by giving customers a choice of different delivery options. This gives the platform a competitive edge over the ones that are currently active in the city and can serve as one of the key points of emphasis when introducing the platform to the general public (Mons Cabré, 2021). The study also discovered that the ability to schedule a delivery time and monitor the parcel's whereabouts at any time gives the consumer a sense of the service's quality, which lowers their concern of placing an order online and not being available to receive the package at home (Mons Cabré, 2021). The study also showed that all of the various crowd-logistics systems under investigation encourage user contact and participation in order to deliver packages efficiently and effectively. The system provided a platform for fostering a sense of neighbourhood among parcel senders, receivers, riders, and drivers. Crowdsourcing has the potential to reunify communities that may have fallen out of touch and out of relationships during the past 10 years due to digitalization (Mons Cabré, 2021).

The results of a study on the impact of crowd logistics in changing the last mile delivery model show that individuals and other actors, including technology entrepreneurs and conventional logistics companies, can now offer new services thanks to crowd logistics platforms. Compared to the conventional courier delivery system, this service is more effective and efficient (Odongo, 2018). This backs up the findings presented by Seghezzi et al. (2020). The final mile delivery was found to be the most expensive stage of the delivery process prior to the invention of crowd-logistics. As a result, crowd-logistics' introduction has enhanced last-mile deliveries.

By more effectively balancing supply and demand, crowd logistics also boosts market efficiency and competition (Odongo, 2018). The study also demonstrated that using ICT to develop new mobility systems has clear financial benefits (Odongo, 2018). Odongo (2018) and Mladenow (2016) agreed that, the prospect of a direct economic gain is what drives a company's decision to utilize a crowd logistics method. It is demonstrated through simulations and analytical models how crowdsourcing for same-day delivery or real-time (on demand) delivery can lead to lower costs for the courier industry players and ultimately lower prices for the end user (Chen et al., 2014).

Ali (2020) underlined that, the use of crowdsourcing could improve online service delivery in metropolitan areas and operational efficiency in his study on the influence of crowd-logistics in the last mile. The study also discovered that crowdsourcing deliveries appears to be financially feasible because the crowd worker manages vehicle ownership, fuel costs, and upkeep. Additionally, crowdsourcing aids in reducing traffic congestion because fewer automobiles and trucks are used by logistic organisations and individuals, which helps prevent administrative fines and restrictions (Ali, Ateljevi, Stevi and Terzi, 2020).

Organisations offering delivery services in the last mile in recent times are required to employ technology aided systems to reduce waste, save money, reduce CO2 emissions, and boost customer happiness. Mehmam et al. (2015) also obtained issues of environmental and economic benefits as the impact of crowd-logistics on organisational performance through a systematic literature review (LR) as well as a quantitative data analysis (QDA) of existing business models. In terms of economic benefits, the study focused on revenues and the simplicity of payment following service delivery, whilst in

terms of environmental benefits, the study took into account company plans and the rapidly growing market for crowd-logistics.

The goal of crowd-logistics, according to Gdowska et al.'s (2018) paper Stochastic last-mile delivery using crowd-logistics, is to lower the overall delivery cost in a same-day last mile delivery system while preserving the flexibility of infrequent couriers to accept or reject the assigned delivery. The study also demonstrates how crowd-logistics connects businesses with part-timers who have spare capacity in an effort to create a win-win situation. The outcomes also showed that, particularly for last-mile delivery, crowd-logistics delivery aids courier organisations in reducing logistics costs while ensuring delivery is done safely to the correct destination within time (Gdowska et al., 2018). This substantially contributes to meeting the rising demand for deliveries for e-commerce, particularly during certain e-commerce promotional periods.

Crowd-logistics was found to have strengths to fulfil a market mediation function, making the distribution of flows easier (a smart algorithm ensures that the most suitable driver is chosen to fulfil the delivery), by offering descriptions, localizations, and ratings for supply and demand (our on-demand delivery platform connects customers with local couriers). This conclusion is based on a study by Carbone et al. (2017) entitled "The Rise of Crowd-Logistics: A New Way to Co-Create Value." The peculiarities of the urban environment also have an impact on how well crowd-logistics activities are carried out. Urban areas with infrastructure like effective bus and subway systems and bike lanes are undoubtedly more appropriate for this use.

According to the aforementioned empirical investigations, crowd-logistics generally has a positive impact on the performance of the courier sector by increasing efficiency and effectiveness. The research has also demonstrated that the influence can be divided into advantages for the economy, society, and environment. However, this study takes into account the impact of crowd-logistics on the performance of the courier sector in terms of service quality, delivery reliability, and flexibility as well as decrease delivery times and cost for the purposes of this study.

CHAPTER THREE

METHODOLOGY

3.1 Introduction

This chapter presents the procedure that was followed for carrying out the study; the implementation and influence of crowd-logistics on the performance of the courier industry. Specific activities performed have been discussed in themes such as; research methodology, research philosophy, research approach, type of research method, research design, time horizon, and data collection. There also exist a section in this chapter that presents details on how data collected were handled, processed, and analysed (data management and analysis).

3.2 Research Methodology

A research methodology is the full procedure of using a research philosophy, framework, and system to address an issue (Ahmed, Opoku and Akotia, 2016). According to Traver (2009), as referenced by Baffour Awuah (2013), the research methodology chosen for a study should specify the theoretical perspective and approaches used to address the research issues. In a clearer illustration, Saunders, Lewis and Thornhill (2016) recreated "The Research Onion" (Figure 2), whose goal was to make all facets of research technique simple. This study detailed the research methodology used for this investigation, including the philosophical stance, and embraced the research onion in part. This study went on to describe the research methodology, choice of approach, and proper strategy for data collecting and analysis.

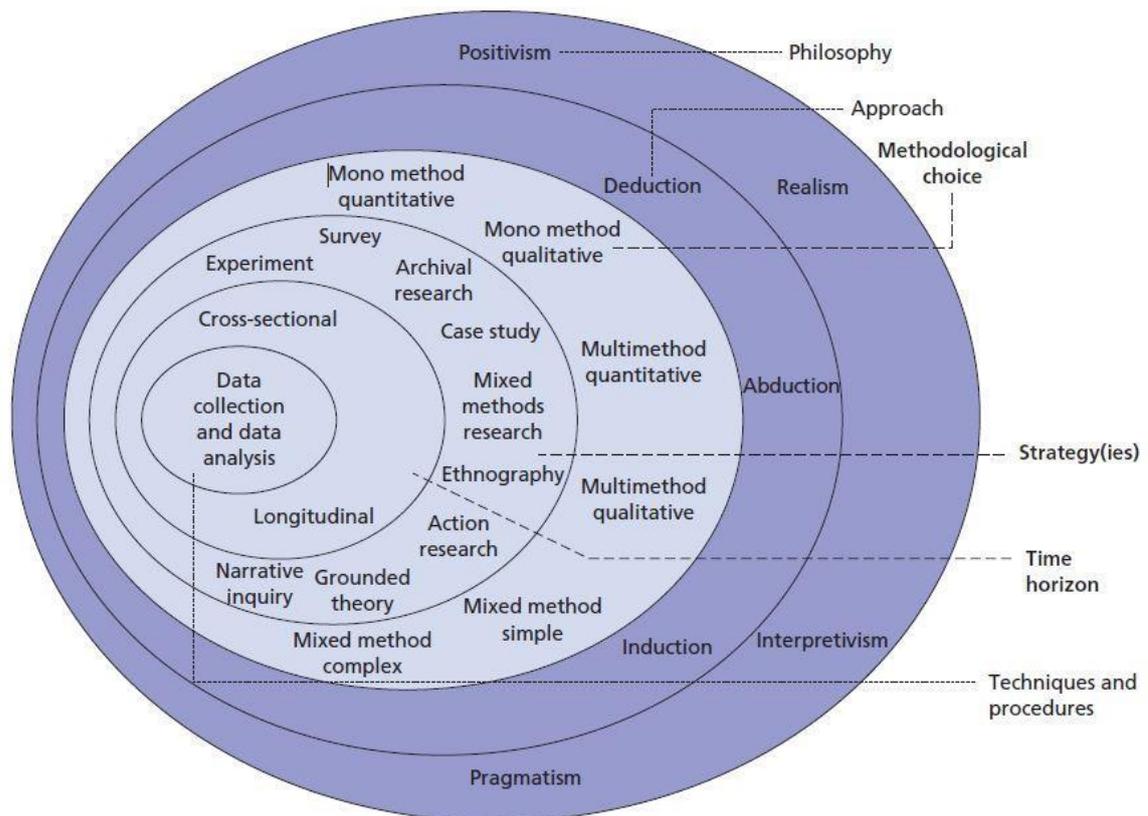


Figure 2: Research Onion
Source: Saunders et al. (2016)

3.3 Research Philosophy

Numerous techniques have been used by researchers to explain their research philosophy. It was defined as "a system of beliefs and assumptions about the development of knowledge in a field" (Saunders et al., 2016, p. 52). They claimed that the emergence of new information and ideas is necessary to address a specific organizational challenge. This line of thinking holds that the choice of problem-solving strategy by a researcher has a significant bearing on the study (Saunders, Lewis and Thornhill, 2012).

According to Saunders et al. (2016), certain assumptions are formed at every level of the study process. These presumptions include those regarding human understanding (epistemological), the facts that any research must deal with (ontological), and the extent to which the researcher's values impact the research (axiology). Each of these assumptions entails considerable changes, which affect how the research processes are carried out (Creswell and Poth, 2016). The following sections address the fundamental presuppositions of these philosophical viewpoints and paradigms.

3.3.1 Ontology

The nature of reality, evaluations of presumptions about how the world functions, and adherence to a point of view are all topics covered by ontology, which can be separated into objectivism and subjectivism. According to Saunders, Lewis and Thornhill (2009), objectivism emphasizes how social processes exist independently of social actors. Saunders et al. (2009) utilized the management phenomenon as an illustration of an objectivist principle that may be comprehended apart from social actors. The worldview of the researcher is another factor in objectivism.

Contrarily, constructivism focuses on how social phenomena are produced as a function of social actors' perceptions and behaviors (Chynoweth, Knight and Ruddock, 2008; Saunders et al., 2012). They continue by claiming that social actors continually engage in interpretation and interaction with one another and their dynamic surroundings to create dynamic phenomena that make sense of these social phenomena.

3.3.2 Epistemology

The method through which the researcher learns about the phenomenon is addressed in this area of philosophy. In a certain field of study, epistemology establishes the reliability of accepted knowledge (Knight et al., 2008). Epistemology, according to Dawood and Underwood (2010, p. 18), is the study of the "origins, nature, and construction of knowledge as well as the claims and assumptions that are made about what the nature of knowledge is."

Additionally, it tries to answer the question: What should the researcher consider to be knowledge required to be studied? What sources of information are there? What are true convictions? What are the knowledge structures and boundaries in the proposed field? How can a researcher gather information? In other words, it creates the philosophical basis from which a researcher can assess the reliability of a body of knowledge.

In order to justify beliefs, epistemology seeks to answer certain questions, such as: What qualifies as a justified belief? How can the idea of reason be comprehended? Whether there is an internal or external justification in one's mind. According to an epistemological perspective, there are different sources of knowledge, including intuitive, empirical, logical, and authoritarian knowledge (Sarens and Merendino, 2019).

3.3.3 Axiology

According to Dawood and Underwood (2010) and Saunders et al. (2016), axiology is a branch of philosophy that affects how much importance the researcher accords to the whole inquiry as well as the techniques they choose to use. In the total research process, the values possessed by the research items are quite important. They also have an impact on the quality of the findings, which are formed by the researcher's accepted philosophical perspectives, study methodologies, and experiences in addition to objective or subjective criteria, thoughts, opinions, and experiences (Saunders et al., 2012).

An inquiry is classified by Saunders et al. (2016) as value-free or value-laden depending on the researcher's engagement. On the other hand, if the researcher's values influence the study, the methodology used to approach the research is subjective, and the researcher influences the research's ontology, the research is said to be value-laden.

3.3.4 Research Model Types

The research model type are frameworks that can be used to build a research plan while incorporating the theories, philosophies, and practices of a discipline. The essential concepts serve as the foundation for the study's goal, research question, tools or measurements used, and analysis methods. The two sorts of research model types on which the bulk of research philosophies are based are positivism and interpretivism. These serve as a guide for the theories and research approaches. The researcher now studies and describes the numerous research models in accordance with the adopted "research onion" in the following sub-sections after discussing the research philosophies above. It should be noted, researchers have certain preferences for their research models in relation to the research philosophies they choose.

3.3.4.1 Positivism

According to Knight et al. (2008), the positivist viewpoint can be characterized as the use of methodologies from the natural sciences to analyze social phenomena. The researcher must observe a social occurrence and generate quantifiable data in order to generalize the findings in the form of a scientific law-like cause and effect (Saunders and Tosey, 2012).

The data are entirely derived through systematic observation of the phenomena; therefore, the positivist researcher has no personal impact (value-free) on them (Saunders et al., 2009; Saunders and Tosey, 2012). They go on to say that the researcher collects data using quantitative, statistically-analyzable approaches. According to Saunders et al. (2009), positivist principles can be applied by social science researchers in specific cases, such as when testing hypotheses. In positivist research, an observation is used to generate a hypothesis that is then tested in order to confirm or deny an existing theory.

3.3.4.2 Interpretivism

According to the interpretivism research approach (Creswell 2009; Saunders et al. 2009), events in society are examined in light of the particular value system of the society or culture in which they take place. As a result, the study is interested in investigating a social phenomenon through research among individuals in order to comprehend it from peoples' perspectives and viewpoints (Saunders and Tosey, 2012). Interpretivist research must take part in the process by adopting an empathic perspective (Saunders et al., 2009). Values held by the researcher and other participants may also have an effect on interpretivist research, claim Saunders and Tosey (2012). It also entails collecting qualitative data from small samples.

3.3.5 Philosophical Position and Research Model Adopted for the Study

According to Fellow and Lui (2015), a researcher must disclose his or her perspective and leanings on ontological and epistemological issues. The research philosophy, according to Saunders et al. (2009), differs based on the study questions and aims. Accordingly, constructivism or realism was the ontological philosophical stance adopted in this study to understand the key characteristics of crowd-logistics and courier business performance. In addition, the epistemological assumption adopted is subjectivity, and axiology position is value-laden.

Furthermore, the research model type adopted for this study is the interpretivism. Nonetheless, these philosophical stances and the interpretivism research model type chosen for this study resulted in the adoption of the qualitative research method and strategy. The adopted philosophical position and research model type for this study have been summarised in Table 1 below;

Table 1: Summary of the philosophical position for the study

Research Philosophy	Interpretivism
Ontology	Constructivism/ Realism
Epistemology	Subjectivity
Axiology	Value-laden
Research Model Type	Interpretivism
Research Method	Qualitative

Source: Adapted from Saunders et al. (2016); Akoti (2014)

3.4 Research Approach

Which research approach to utilize as the cornerstone for creating a research strategy is the most crucial choice a researcher must make. A researcher needs to be aware of the research methodology that would best address his or her research issues, claim Saunders et al. (2016). The term "research philosophies" can refer to a wide range of approaches to the development of theories. However, the study considers that, it is important to highlight the many approaches to study reasoning. Deductive and inductive research methodologies are widely acknowledged (Saunders et al., 2009; Ahmed et al., 2016). Below is a brief discussion of these methods.

3.4.1 Deductive

The deductive method has a propensity to lean more toward positivist-related studies. Saunders et al. (2016) claim that the process of applying theory starts with the researcher developing a hypothesis based on an existing theory and gathering data to be analyzed in order to assess the hypothesis. If more study is required, the process may be repeated with a different hypothesis. In other words, a problem is solved using the theory, and conclusions are drawn from the results.

3.4.2 Inductive

The inductive method starts with the development of a theory that is ultimately tested by more data collection, as opposed to the deductive method, which starts with the formation of a new hypothesis or the modification of an existing one. To investigate, characterize, and explain the patterns discovered in the early data acquired (Saunders et al., 2016). As a result, the researcher is able to contextualize data and occurrences. After gathering data from a relatively small sample for analysis, the inductive researcher

develops a theory to address the problem. This enables the researcher to creatively construct a new theory and interpret the facts.

3.4.3 Research Approach Adopted for this Study

The philosophical stance of interpretive research determined the best research methodology for this investigation. As it is a logical process that ensures known premises are used to generate untested discoveries, the researcher chose the inductive approach. The inductive approach made it possible to comprehend how crowd-logistics was implemented and how it affected the performance of the courier business phenomenon, find themes and patterns using the acquired data. Additionally, interactions from specific to generic were inferred using the inductive approach.

Additionally, the inductive methodology used in this study allowed for the utilization of a single research strategy and methodology to identify a reasonable and workable solution to the issue. A "single method" research approach (qualitative) was chosen after careful examination of the research's general and specific aims as well as the research questions. This aided in the choice of an additional exploratory method for data collecting and tools for data analysis.

3.5 Type of Research Method

The selection of the research methodology is the third layer of Saunders' research onion, as shown in Figure 2 (Saunders et al., 2016). The first step of the study design, according to Goyal (2020), is the type of research methodology that researchers choose for their studies. Although it is influenced by the researcher's philosophical stance, the type and selection of research methodology is a useful technique to turn a set of research questions into a project. There are three different types of research methods: qualitative research methods, quantitative research methods, and mixed research methods.

3.5.1 Qualitative Research Method

The qualitative research method is the process of looking at occurrences from the viewpoint of the participants. According to Fellows and Liu (2015), the goal of the qualitative research approach is to understand how people or groups see the world. According to Saunders et al. (2016), the qualitative research method is the most effective at exposing phenomena. The qualitative approach is different from the quantitative

approach, which is solely based on data volume or data analysis methods using graphs and statistics. However, proper inductions are used to understand the data for the qualitative research (Reichertz, 2013).

According to Fellows and Liu (2015), one of the main benefits of using a qualitative research approach is the ability to provide in-depth evaluations of intricate human and cultural processes as well as more detailed reasons for human events. The analysis of such experiences from individuals in their natural circumstances provides a researcher with a wealth of knowledge and insight (Saunders et al., 2012).

3.5.2 Quantitative Research Method

In order to extrapolate the results to the subject under investigation, the quantitative research approach, according to Maree (2007), carefully and impartially assesses mathematical data from only a certain subgroup of a population. The primary goal of quantitative research is to evaluate a theory or hypothesis that deals with the relationship between two or more variables (Struwing and Stead, 2013). Using the quantitative research method, researchers can frequently attempt to establish a causal relationship between a construct and circumstances. In support, Morgan (2014) argued that through logically predetermined study designs, quantitative research is connected to theory testing.

Furthermore, quantitative research employs some type of structured observation or a questionnaire to measure the constructs under investigation (Struwing and Stead, 2013). According to Rasinger (2014), data that can be quantified in some way is a defining feature of quantitative research. In order to identify patterns in people, the quantitative research approach, according to Payne and Payne (2004), splits the social world into elements known as variables. Statistics may be used to ascertain how these variables relate to one another because they can be expressed numerically as frequencies or rates. Empirical investigation is the main emphasis of quantitative research. Individuals are given the survey instrument, and their responses are subsequently combined to create overall measurements for the target group (Struwing and Stead, 2013).

3.5.3 Mixed Methods

The mixed method research design combines the two approaches aforementioned (qualitative and quantitative approaches). The mixed methods research design, according to Dornyei (2014), is used when the study has both qualitative and quantitative components. Interviews and surveys are used in a mixed-methods research approach to gather data. After considering the benefits and drawbacks of purely qualitative and quantitative bias in research, this strategy makes use of the two methods (O'leary, 2014). The mixed method research design enables the researcher to examine tendencies that can be further examined by qualitative research after being investigated through quantitative research.

3.5.4 Type of Research Method Adopted

To accomplish the objectives of this investigation, the qualitative research option was selected. This study was able to undertake naturalistic inquiry, which tries to fully comprehend social phenomena in their natural setting, through the use of qualitative research (Cutler, Halcomb and Sim, 2022). Additionally, it made it possible for the study to offer a complete grasp of the subject, in this case, the application and impact of crowd-logistics on the performance of the courier sector (Creswell and Creswell, 2017).

The qualitative study improved talks between the researcher and the participants by allowing them to freely express themselves and go into great detail about their unique experiences with the subject. More crucially, setting up the study in a qualitative framework allowed for deeper probing of participants for information and elicit pertinent answers. Additionally, it enabled for the gathering of information via open-ended conversational engagement.

3.6 Research Design

A research design is a plan or instruction book for carrying out a certain study, according to Gardner, Freeman, and Lee (2016). The technique to be utilized depended on the type of research question, the study's overarching objectives, the body of available data, the time constraints, and the study's guiding principles (Saunders et al., 2009). Descriptive, experimental, explanatory, and exploratory research designs are the four primary categories of research designs.

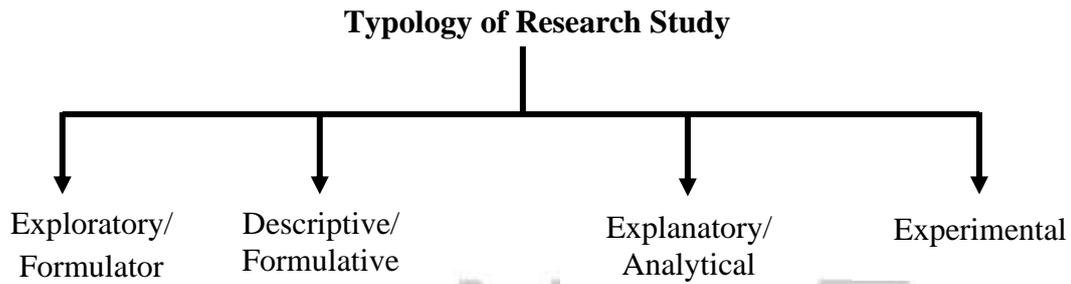


Figure 3: Types of Research Design

Source: Akhtar (2016)

3.6.1 Exploratory Research Design

The primary stage of research is an exploratory research design, and the goal of this research is to get fresh understanding of a phenomenon. According to Groundar (2012), this research strategy aims to establish an issue for more precise study into the topic or to develop a hypothesis. This is used when there are few, if any, prior studies or research to which references can be made.

Insights and familiarity with the topic are the main goals of exploratory research design in preparation for a subsequent, much more in-depth inquiry. When there is little existing study on an issue, exploratory investigations are typically more relevant. An enterprising researcher would be interested in such a subject to gain insights given the paucity of information accessible about it. Thus, given the limited understanding on the social interaction patterns of members of a majority monastery (Akhtar, 2016).

3.6.2 Descriptive Research Design

A collection of techniques and processes used to characterize study variables is known as descriptive research design (Eyisi, 2016). The design describes, reports, or specifies the characteristics of a specific circumstance or phenomena. It methodically tries to explain a situation, issue, phenomenon, service, or program; it also provides information about, for example, the living arrangements of a community; or it reflects attitudes toward a problem (Akhtar, 2016).

In order to describe these factors, descriptive studies respond to the who, what, why, and how queries. These kinds of research studies might talk about topics like consumer attitudes, intentions, and behaviours, or they might talk about how many rivals there are

and how they compete. Statistical research or diagnostic research are other names for descriptive study. It provides information and details on the population or phenomenon under study. For calculating frequencies, averages, and other statistical calculations, the description is employed.

3.6.3 Explanatory Research Design

When the objective of the study is to analyse a novel world that has not before been explored, the research strategy is referred to as explanatory (Akhtar, 2016). The inquiry is primarily concerned with the reasons or "why" of an occurrence. There are no comparisons or elements associated to change (Creswell, 2009). When the target audience is an ill-defined group of people, the explanatory research design is typically used to frame a topic for specific investigations or to build a study design.

Other types of research designs can be employed after this design, which serves as the initial phase in the research process. The relationship between two or more variables that is hypothesized in explanatory study, say, not just that, A and B are related; but also, that A has a specific impact on B. In other terms, we may say that an explanatory study concentrates on figuring out the "why" behind correlation.

3.6.4 Experimental Research Design

Typically, experimental research design is connected to the natural sciences, which adhere to stringent protocols and are not influenced by the researcher's own beliefs. According to Saunders et al. (2009), a scientist working in a lab is an example. Studies of the causal relationships between the variables and the strength of their interaction are conducted through experiments. For addressing "how" and "why" issues in explanatory and exploratory research, this approach is appropriate (Saunders et al., 2009). Additionally, according to Creswell (2009), experiments are conducted in a controlled contextual setting that enables researchers to concentrate solely on the treatment's impact on the phenomena or subject. Experimentation research, he added, is quantitative.

Even though experimental research can offer a deep insight of the factors being examined, the designs occasionally necessitate costly and challenging experiments. Complete randomization, randomized block designs, Latin square designs, and factorial designs are a few famous experimental designs.

3.6.5 Research Design Adopted

This study selected the exploratory research design in accordance with the adopted qualitative research technique in subsection 3.5.4; the inductive research approach in subsection 3.4.3; and in further accordance with the goal and aims of the research. Also, the study adopted the exploratory design because there is yet to be studies on the implementation and influence of crowd-logistics on the performance of the courier industry. This aided the study to explore the strengths, weaknesses, opportunities, and threats on the implementation of the crowd-logistics system in the courier industry.

Also, a foundation study that enables future researchers in the study area to quantify mass responses into data that can be inferred statistically has been developed. As an interpretivism philosophical viewpoint (Table 1), the exploratory design was chosen in order to gain insights to serve as the basis for future, more focused study rather than to produce conclusive remarks. The exploratory study design also reinforced the study to remain with the qualitative research approach and the use of interviews to gather data from participants.

3.7 Time Horizon

The term "time horizon" for research refers to how long a researcher anticipates to take to carry out their study and reach their goals. The researcher wants to look at the population throughout this time period. A temporal horizon can be a period of time for conducting research or a series of events that occur across time, according to Saunders et al. (2016). The academic researcher decides on the time horizon based on the objectives and plan of the investigation. Because of this, the researcher can be drawn to studying the population across time or at a particular period in time. There are two primary categories of study in terms of time. The two forms are cross-sectional research and longitudinal study (Saunders et al., 2016).

3.7.1 Longitudinal Time Horizon

A longitudinal study is an observational research design that gathers data from the same sample over an extended period of time. Longitudinal studies can last anything from a few years to several decades, depending on the type of data that needs to be gathered. Through longitudinal investigations, trends throughout time are identified. The advantage of a longitudinal study is that it enables academic researchers to follow

observations, record changes, and identify any changes in the characteristics of their participants. One of its most important features is that the longitudinal study spans multiple points in time. As a result, they are able to determine the correct sequence in which the events occurred.

3.7.2 Cross-sectional

Cross-sectional studies are observational studies, just as longitudinal studies, in which data is gathered in its whole to investigate a population at a certain point in time and analyse the relationship between relevant factors. A cross-sectional study seeks to identify and explain interactions among study components at a certain period, as opposed to a longitudinal study, which looks for trends across time. Data for the cross-sectional study is gathered once, occasionally over the course of days, weeks, or months.

Collecting information for a research question is the aim of cross-sectional studies or investigations. It is important to note that only one session of data collection is required for this study, and that no previous or subsequent data collection is necessary. In a cross-section horizon observational study, for instance, the investigator does not alter anything about the participants' natural surroundings while collecting data on them.

3.7.3 Time Horizon Adopted

A cross-sectional study seeks to identify and explain interactions among study components at a certain period, as opposed to a longitudinal study, which looks for trends across time. Therefore, instead of using a longitudinal temporal horizon, this study used a cross-sectional one. The first justification for the choice is the deadlines for submitting the thesis work. Additionally, because it was an observational study, the cross-sectional horizon enabled for the gathering of data on the subjects without affecting anything or interfering with their world as it naturally exists. Finally, because data for this study were only gathered once per person and within a short period of time (17 working days), the cross-sectional horizon was chosen.

3.8 Study Site

Regarding the study's goals, courier companies that use the crowd-logistics system for last-mile package delivery were taken into consideration. The Greater Accra Region of Ghana was the location of the study. This is due to the fact that the bulk of crowd-logistics courier providers are based in this area.

3.9 Data Collection Method

3.9.1 Population for the Study

Onen (2016) claims that population refers to the whole quantity of the research's study participants or study setting. According to Rasinger (2014), a target population is the demographic in which a researcher is most interested and the subject of their study (Melville and Goddard, 2004). Struwing and Stead (2013) defined target population as the sum of all factors that are concentrated on. In reference to the study site, objectives, and research questions, the population of this research comprised of all personnel of courier service organisations officially registered and in good standing with the Postal and Courier Service Regulatory Commission of Ghana (PCSRC). As of December 31, 2022, the total number of courier service organisations on the database of the PCSRC was 110 (Paye-Baah, 2022).

3.9.2 Sample and Sampling Techniques

Passmore et al. (2019) defined sample as the total number of study participants. For the purpose of this study, the author used (13) participants from the total population. The (13) participants were made up of one (1) senior official or personnel each from the organisations presented in Table 2. The study arrived at the (13) participants because, first, this study reached saturation as new findings were not emerging from the participants by the (13th) interview. This sample size is in line with the suggestions made by Hennink and Kaiser (2020) in their study; Sample Size for Saturation Qualitative Study. They discovered that, empirically based qualitative research tended to attain saturation after only a small number of interviews (9–15) or focus groups (4–8), particularly for those with homogeneous study population are reached. To further justify the sample size, Guest et al. (2006) in their study reached saturation of themes by undertaking the 12th interview in their analysis of 60 interviews.

To reach the thirteen (13) participants, this study adopted the purposive sampling method. The goal of sampling is to choose a subset of the population to reflect the entire population (Boddy, 2016). Sampling, according to Sarantokas (2005), is the method utilized to gather samples for research. In order to make accurate generalizations about the group from the sample, sampling is the process by which a researcher selects a unit of individuals that is comparable to the group being researched (Sapsford, 2007). According to Nueman (2011), non-probability sampling techniques and probability sampling approaches are the two different categories of sampling techniques.

3.9.2.1 Purposive Sampling Technique

In order to deduce the sample from the population of this study, the purposive sampling technique was adopted. Purposive sampling is a category of non-probability sampling techniques in which units are chosen for the sample because they meet certain criteria for the researcher (Saunders, 2016). It is also known as subjective, biased, or judgmental sampling. To accomplish the goal of the study within the constraints of available resources, it tends to choose the most productive segment of the population. According to Meissner, Klassen, Creswell, Plano Clark and Smith (2012), the procedure entails selecting study participants based on their expertise or experience in a topic of interest to the researcher.

The purposive sampling ensured that participants were selected based on particular qualities, traits or features that were most appropriate for the study and avoided recruiting persons who have no interest on crowd-logistics and courier industry performance. Purposive sampling was also chosen because it is consistent with the qualitative research approach, in which the author tried to determine the individual phenomenon in-depth rather than draw general conclusions from statistics. The technique moreover, allowed for the consideration of persons who are directly involved in crowd-logistics within the courier industry of Ghana. Thus, persons who are knowledgeable about the situation being investigated (Shaheen and Pradhan, 2019).

The purposive sampling technique further ensured that, the participants were involved in or with the situation or the experience that has been acquired regarding crowd-logistics, last mile parcel delivery, and courier services in Ghana. Nonetheless, the adopted sampling technique (purposive) allowed for the collection of data from participants who

fulfil additional criteria set that requires for participants to be senior officials/ decision makers of courier organisations in Ghana, operating a crowd-logistics system in Ghana’s courier industry as presented in Table2 (Sampled Population).

Table 2: Sampled Population

Organisation	Target Population
Glovo	1
Uber	1
Bolt	1
Yango	1
Glovo	1
Okada.com Ghana	1
Deliveries Ghana	1
Malandi Delivery Services	1
Delivery Champion Ghana	1
Emirad Express Ghana	1
Farboost Erands	1
Tangkama	1
Swoove Delivery and Courier Services	1

Source: Field Data (2023)

3.9.3 Types of Data

The study adopted only primary data. Primary data, according to Johnson and Schoonenboom (2017), is a kind of information that is gathered by researchers directly from first-hand or primary sources using a range of tools such questionnaires, experiments, surveys, and interviews. Primary sourced data are generally reliable, accurate, and objective because they were acquired to address certain study concerns. As a result, using primary data for this study is required by the exploratory research design and inductive research approach. Thus, the primary data made it possible to collect information to investigate the phenomena (crowd-logistics and its impact on courier sector performance), as well as to clarify the observed pattern (Saunders et al., 2016).

3.9.4 Sources of Data

The primary information was gathered through field interviews with one senior official in each of the (13) sampled courier organisations operating the crowd-logistics system of courier services in Ghana as presented in Table 2 above. After considering the traits of

all previous interview data gathering techniques, an in-depth interview method was selected for this study. In-depth interviews are the most suitable, according to Lyon, Møllering and Saunders (2015), who stated that difficult and open-ended questions might be used to explore new insights. The use of closed-ended or structured questions has been found to limit the amount of information that can be disclosed during an interview. In-depth interviews are therefore seen to be more flexible because all the information needed to answer the questions is learned during the interview.

Thanks to the in-depth interview process, the author was able to start the face-to-face talk with pre-planned questions. Interviewees had the opportunity to elaborate on the problems being studied. As a result, using in-depth interviews as a source of information for this study was the best option.

3.9.5 Data Collection Instrument

According to Prior, Mather, Ford, Bywaters and Campbell (2020), data collecting is the procedure of gathering and analysing information on particular variables in a set-up system that enables one to assess results and address applicable queries. Using an interview guide, primary data were gathered from the field during one-on-one interviews with the aforementioned key informants.

In-depth discussions with key informants were made possible by the interview guide, which also aided in fostering relationships between the researcher and participants (Saunders et al., 2018). The type of data to be collected, the amount of time available, and the study's goals all had a role in the choice of this instrument. This gave the author the chance to dig deeper and gain a comprehensive grasp of the application of crowd-logistics and its impact on the performance of Ghana's courier business.

The interview outline also gave participants the freedom to speak freely about their experiences, giving the author the opportunity to explore any noteworthy points that came up throughout the interview. Participants were asked open-ended questions throughout the interview and were asked to provide narrative responses (Attride-Stirling, 2019). The interview guide was divided into sections and organized using English language structure in accordance with the study's diverse objectives. With participants' consent, each interview session was audio-recorded individually.

3.9.5.1 Pilot Study

After creating the data collection tool (interview guide) and prior the main data collection stage of this research, a pilot study was conducted. A small-scale preliminary investigation called a "pilot study" is generally conducted before a larger investigation to narrow the scope of the questions and clarify their language. This research's pilot study was carried out with three (3) participants involved in crowd-logistics in the courier industry in Ghana.

The author also visited the offices of the three (3) sampled courier companies—Okada.com Ghana, Deliveries Ghana, and Malandi Delivery Services—to establish the validity of the research tool. All three of these companies are registered with the Postal and Courier Regulatory Commission of Ghana and are in good standing. Last but not least, this pilot study was conducted to see if the research tool (interview guide) is consistent with the objectives and research questions, as well as to estimate the amount of time needed to answer questions.

3.9.6 Procedure for Data Collection

To collect data for this study, the author first sought for permission from the Kwame Nkrumah University of Science and Technology – School of Graduate Studies, and acquired an introductory letter from the Information Systems Department. The (13) participants were then engaged in their respective offices after being sampled purposively. The initial engagement with participants was to seek their consent to be a part of the study and introduce to them the research, its objectives, and the academic, national, and global benefits thereof. To avoid interfering with organisational activities and schedules, arrangements were established with the participants for data collection on convenient dates and times. The author then followed-up with reminder phone calls and texts so as to validate the time and date of each participant's interview.

Thereafter, the author visited the offices of participants on the agreed dates and time to have the interviews conducted and audio recorded. The in-depth interviews took place at the offices of the participants, and were recorded on my phone using an audio recording app; after which they were transcribed into Microsoft Excel. In addition to recording the interview, notes were also recorded, partly as a precaution against technical difficulties.

Nonetheless, the author's ability to concentrate on the participant's responses as well as to formulate new queries, go deeper into existing issues, and request clarification on pertinent points were all aided by the act of additional note-taking. The interview process was guided by a list of questions that were derived from the literature research and served as a guide to ensure that the major crowd-logistics and courier industry performance areas were covered

3.9.7 Ethical Considerations

The study adhered to the ethical standards and regulations necessary for social science-related research. It also adhered to the ethical procedure and principles of the Kwame Nkrumah University of Science and Technology (KNUST). To maintain the secrecy, anonymity, and interest of participants, a variety of ethical standards were taken into account in accordance with these rules.

3.9.7.1 Permission

First, the author sought clearance from the sampled courier operators presented in Table 3.2 before collection of data. This was done by the personally issuing-out copies of introductory letters from the KNUST – Information Systems Department.

3.9.7.2 Voluntary Participation

Participants were not coerced into participating in this study. After being permitted by management to undertake the study, the author explained the reason for the study to each participant and waited for their consent before each session of interview commenced.

3.9.7.3 Confidentiality

The principle of confidentiality was regarded as important throughout the study and data collection process specifically. The author, maintained confidentiality by ensuring protection of the data from any third-party. This was done by placing all responses and documents under lock and key and for computer, under high-powered password.

3.9.7.4 Anonymity

Pseudonyms were used to hide the identity of participants. This allowed for the participants to provide some sensitive details without any fear. The author also, avoided

including any link of information that may aid a third party to easily trace the participants.

3.9.7.5 Plagiarism

A piece of writing that has been plagiarized is one that has been taken from someone else and presented as the author's own work (Helgesson and Eriksson, 2015). By using in-text citations and references in the study, the author made sure that all pertinent publications (books and journals) from which secondary information was obtained were properly acknowledged and cited in order to prevent plagiarism.

3.9.7.6 Reliability Consideration

The approved tools and principles for analysing qualitative data or research-work were well followed-through to ensure reliability. This study used triangulation by comparing the primary data with secondary data, and author's observation. Reliability was enhanced in the study by the use of prolonged engagement with data, and persistent observation negative case analysis. To further validate the data gathered, the author ensured constant testing and data comparison by the use of Microsoft-Excel spreadsheet to record data.

3.10 Data Management and Analysis

According to Creswell and Poth (2016), data analysis is the process of obtaining valuable information from raw field data. To achieve this, data must be ready for analysis, understood, represented, and interpreted in its overall significance (Creswell and Poth, 2016). The study used the content analysis system to analyse the data since it was a qualitative study. According to Bogdan and Biklen (1992, p.145; cited in Tagoe, 2009), this type of analysis includes "working with data, organizing it, breaking it into manageable units, synthesizing it, searching for patterns, discovering what is important and what is to be learned, and deciding what to tell others".

This involves preparing and organizing the data for analysis, then distilling and reducing the data into themes before presenting the themes as figures, tables, or a discussion, according to Creswell (2007). This method of analysis was initially created to examine and evaluate text. Recently, it has been used for spoken data such as transcripts of interviews, old emails, and other documents. This shows that qualitative content analysis is performed when working with data that needs to be interpreted. One of the benefits of

adopting qualitative content analysis, according to Mpere (2015), is that a significant amount of data is carefully and methodically analysed. In other words, it transforms data into something flexible, orderly, and manageable for analysis. On the other hand, its flaw stems from the fact that vital and fascinating content must be avoided in wide categorization (Burnham et al., 2004).

The information gathered through interviews was organized in this study into four categories: description, verbatim narrative, field notes, and participant quotation (Creswell, 2003). Nonetheless, the content analysis was done by recording every interview session of participants and transcribed each recorded file from audio format to Microsoft Word (text) format. The study thus, adopted the six basic steps for analysing qualitative data as proffered by Braun and Clarke (2013) to conduct the content analysis

Step 1: Data Familiarization and Organisation

All raw data were prepared, sorted, and transcribed after information was acquired through interviews. All of this data were written and structured to increase readability and facilitate analysis. The transcription accurately captured the events from the focus groups and interviews. Thus, I familiarized myself with the entire raw data-set gathered by transcribing all the audio data into excel documents. I actively read through the transcribed data and identified repeated responses. This step gave me a fair idea of what responses were made as per each question.

Step 2: Generating Initial Codes

After data transcription and familiarization, I took notes on possible data key points of interest, relationship between data items, and other initial thoughts in order to generate codes. The most fundamental component of the raw data set that may be studied in relation to a situation is termed as a code (Huser et al., 20016). And so, I documented where and how patterns occur in each question, to reduce data by collapsing data into labels to create categories and themes for efficient data analysis.

Step 3: Theme Coding

At this stage, I examined the coded and collated data extracts to search for possible themes of essence to this study and code them accordingly. I sought for themes by analysing, combining and comparing codes related to each other. Essential themes selected were that which offer important connection between data items and provided

answers to research questions. And so, a list of themes was selected for further analysis and selection.

Step 4: Reviewing Themes

After the search were made for the themes in step 3, several themes were arrived at. At this step (4), I sought to re-examine them all as against how they (themes) align to the study objectives. I reviewed the themes by taking a look at coded data placed within each theme to ensure adequate fitness level. All of the initially coded themes were evaluated, examined, and refined in order to further strengthen the analysis. In addition, concepts that link them together for greater understanding and coherence were discovered through research into their causes, consequences, interactions, and other aspects. Subthemes evolved as a result of this approach, and links between subthemes were discovered.

Step 5: Defining and Naming Themes

At this step, I selected the names of themes required to be included in this study's final report. These names are brief, adequately descriptive and go relative to the study's objectives. The following topics have been established and given names for the examination of this study: Crowd-logistics characteristics, advantages and disadvantages, risks and possibilities, and the impact of crowd-logistics on the performance of the courier industry.

Step 6: Producing the Report or Manuscript

This is the last step of the content analysis where final analysis, report and description of findings were done. In writing my final report, I considered the aforementioned themes, and presented the dialogue link with each theme to assist rising dependability through the thick description of the results. At this stage, I presented data as offered by participants based on the themes and codes they fall-in. At every question asked participants, I considered relatively distinct responses to offer readers a fair idea of how each group of participants think.

3.11 Validity of the Response

In determining the validity of the response, utilizing pilot studies for the interview, as presented in Section 3.8.6.1, is the most important step. The interview guide's specifics were improved and changed as a result of participant feedback and suggestions. In the

end, the interview guide's language and clarity were enhanced, and sent out in its amended form after being polished and approved by the author's supervisor.

Additionally, all of the interviews were checked before the data analysis got underway. The transcribed data were sent to the participants for confirmation and verification to make sure they accurately reflected the ideas expressed by each participant during the face-to-face interviews. Respondents overwhelmingly approved the revised original interview question, demonstrating legitimacy of the data collection exercise. Question validity is therefore important in terms of the research's validity (Drost, 2011).



CHAPTER FOUR

DATA PRESENTATION, ANALYSIS AND DISCUSSION

4.1 Introduction

This section presents the data analysis, findings and discussion of the study. The study generally aimed at the implementation and influence of crowd-logistics on the performance of Ghana's courier industry. The findings as presented are discussed in a thematic format as deduced from the data gathered.

4.2 Theme Development

The methodology for content analysis that has been chosen is a qualitative data analysis approach that entails reading through a data collection, such as transcripts from in-depth interviews or focus group discussions, and looking for patterns in meaning to identify themes (Braun et al., 2022). Content analysis requires an active process of reflexivity where the researcher's personal experiences are essential in order to extract meaning from the data. The analysis provides the organisation of every content that is obtained from the field of any study. In an attempt to provide a direct response in terms of feedback from the participants, the themes were derived from the data gathered and corroborate with the study objectives or questions to serve as guide in determining whether the study's set target have been met.

This chapter therefore, presents findings explained by the participants on the implementation and influence of crowd-logistics on the performance of the courier industry in the Greater Accra Region of Ghana, in four parts; the first part presents the characteristics of crowd-logistics operations in Ghana's courier industry; the second, presents the strengths and weaknesses of the crowd-logistics system; the third presents the opportunities and threats of the crowd-logistics system; and the last part presents the effect that crowd-logistics system has on the performance of Ghana's courier industry.

4.3 Characteristics of Crowd-logistics in the Courier Industry

The purpose of this theme was to determine the ways by which the crowd-logistics business model or system is operated in Ghana's courier industry. This was on the premise that, there are different means of operating the crowd-logistics system in the courier industry the world over. According to Odongo (2018), crowd-logistics operation in the courier industry in terms of characteristics can be clustered into Business to

Business (B2B), Business to Customers (B2C); and Peer to Peer (P2P). From Dietmann (2020), the crowd-logistics system can be characterized by the delivery stage (first mile, mid mile, and last mile), the quantum of load to transport at a time or the mode of transport (trucks, saloon vehicles, motor bikes and bicycles). The revealed characteristics of the crowd-logistics system's operation in Ghana's courier industry from the findings relate to; the system's operation and payment mode, requirements (knowledge, facilities, and elements), and usability (subscription by drivers/riders and customers).

4.3.1 Crowd-logistics Operations in the Courier Industry Services

The study found that, there exist different ways by which organisations operate in the Ghana's courier industry with the crowd-logistics system as has been suggested by Odongo (2018) and Dietmann (2020). From the data gathered, these courier organisations may be operating some sort of software or technology in aiding with picking and delivery of goods or parcels, though the means by which these services are provided come in varied ways. The operations elements of the crowd-logistics system are related to business operations, payment mode, and supply chain mile.

4.3.1.1 Business Operation

The predominant business operation elements of the crowd-logistics in Ghana courier industry are Business-to-Customers and Peer-to-Peer.

Business-to-Customer

While there exist several modes of business operations in the crowd-logistics courier sector, the Business-to-Business mode is the system that connects at least two distinct participant groups – business and customers. The study revealed that, the system allows for courier seekers or customer to place orders from a vendor on the technology-driven platform (crowd-logistics) for delivery to be made to the authorized address of requester. The business-to-consumer cluster is made up of startups and programs launched by major ecommerce businesses. These businesses primarily operate in the retail sector. However, many of Ghana's platforms for crowd-logistics are not sector-specific. They provide services to many retailers. In majority of the time, regular people deliver the goods, while some businesses also use professional drivers in addition to regular people. Others, for example, might employ in-store customers to deliver products that their online customers have ordered in order to earn a small profit.

For those businesses, the start-ups that deliver goods directly from the vendor's store are considered e-commerce facilitators. In comparison to traditional couriers, such businesses are able to increase their potential consumer base, thanks to the ability to source from the crowd, and operate within Accra's business district, Tema Metropolis, and the areas around these areas, using speedier forms of delivery than conventional or traditional distribution. The majority of Ghanaian crowd-logistics companies, complete deliveries in a couple of hours, if not on the same business day.

When a customer makes a purchase on a vendor's website, the business-to-consumer crowd-logistics mode kicks in. When the seller gets the order, he chooses to use a crowdsourcing logistics platform and submits a delivery request there. After then, the crowdsourcing platform posts an open call to all of its users, and the request for item delivery is sent to all of the potential delivery people. The first deliveryman to accept from all those who are available gets the task. To pick up the item, the authorized delivery person visits the neighborhood warehouse or the vendor's point of sale, and subsequently delivers goods to the proposed receiver. Other times, sellers sign up on the crowd-logistics site, which is where orders are placed and delivery requests are made.

Our system registers vendors from whom customers will make purchase after either downloading the application or going online to place the order (food, drinks, pharmaceuticals, customized deliveries among others). Once order is placed, the system posts the request onto the platform for the specific vendor to take action. A rider in close range to the vendor's location then picks up parcel and makes prompt delivery to the authorized location. We are therefore said to be operating parcel delivery between business and individual customers (Participant 2: July, 2023).

By affirming the Business-to-Business operations in Ghana's crowd-logistics industry, other officials also remarked that:

We operate a non-specialized crowd-logistics system. This allows for us to provide a technology or application that houses registered drivers or delivery persons who bid for assignments real time, directly from customers or from customers through ecommerce websites connected to our platform (Participant 3; July, 2023).

Judging from the data gathered on parcel delivery type, it is to be said that, the actors involved in the B2B crowd-logistics courier system are five; the vendor/ ecommerce; crowd-logistics platform; delivery person; and receiver as shown in the flow chart below:

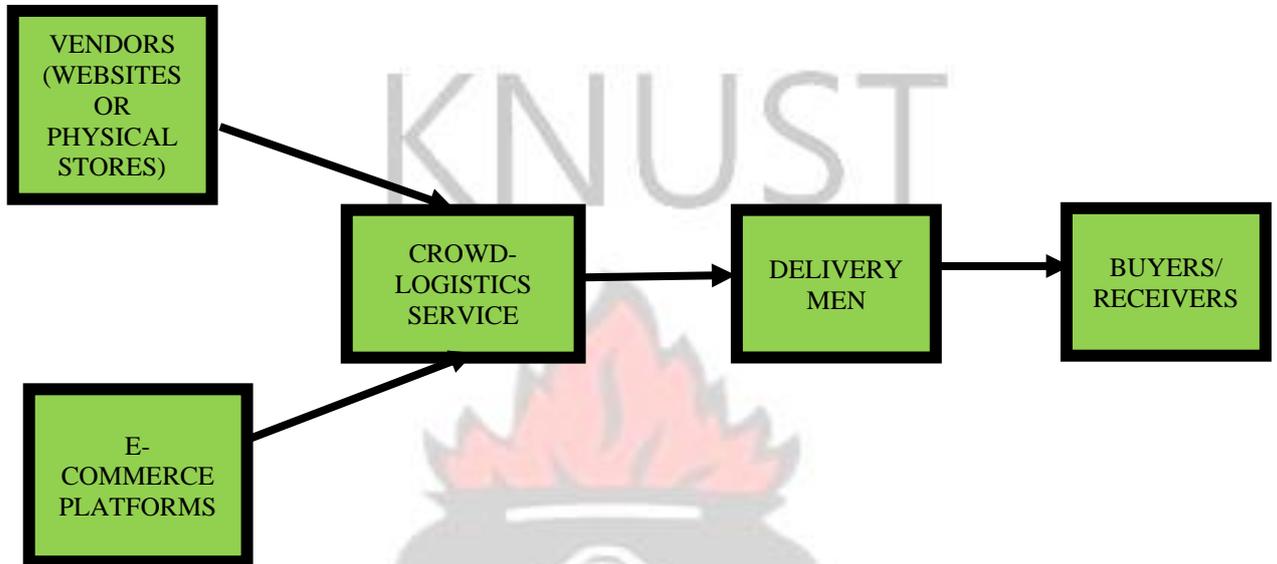


Figure 4: Business-to- Customer Crowd-logistics Flow Chart

Source: Author’s Construct (2023)

Peers-to-Peers

In contrast to the previously mentioned business-to-customer operation, the peer-to-peer system allows for the crowd-logistics operators to acts mediators between two people, the sender/receiver and the transporter. The sender's location, which might be their home or a different location decided upon by the two actors, serves as the genesis point, whereas the final location may be a anywhere. In most circumstances, the parties can agree on the delivery schedule. It must be kept in mind that, as stated on each company's website, same-day delivery is guaranteed by all of these businesses. Another important fact is that such businesses are not segmented by industry. They are generic, i.e., none of them are tailored to a particular industry. Everyone contributes to the delivery-man population, and everybody who signs up on these networks has the capacity to deliver. The majority of the time, the two peers agree on the transportation fee.

Our operation in the courier industry is more of a generic delivery system without any form of specialty. My company only provide a technology or application that houses registered drivers or delivery persons who bid for assignments real time, directly from customers or from customers through

ecommerce platforms. Our operation with the system is such that, the first courier or driver to accept the order secures the task, picks up the parcel from the sender and delivers same to the registered address or receiver (Participant 3; July, 2023)

The P2P business model in the crowd-logistics involve actors such as sender, the crowd-logistics platform, the delivery person and the receiver as illustrated in Figure 5 (Peer-to-Peer Flowchart) below:

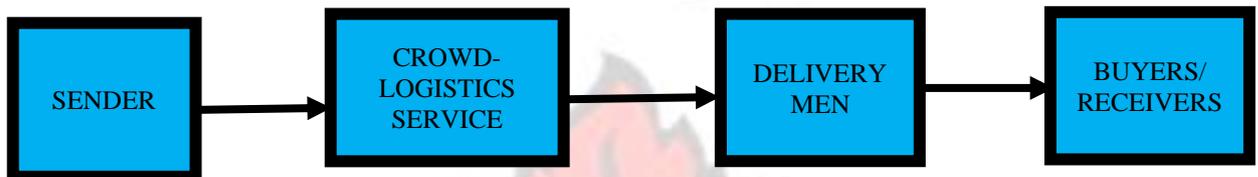


Figure 5: Peer-to-Peer Crowd-logistics Flow Chart

Source: Author's Construct (2023)

By extension, it is to be said that, Ghana's courier industry in recent times have seen couriers operating technology aided platforms or applications in the delivery of goods and or parcels. This platform from the data as presented above, takes the form of "Peer-to-Peer" and "Business-to-Customer". Thus, senders may either request for a rider or driver on the crowd-logistics platform to perform delivery service, or a customer may place an order from a vendor/ ecommerce platform for delivery to be made to the authorized address of requester. In both cases, payment of service could be made by the sender/ vendor or by the receiver to the delivery person who pays a percentage to the system operator; or the platform takes delivery amount from vendor/sender or receiver and pays a percentage to the delivery person as revealed by participant 8 and 11 respectively;

With our system, customers or sender pays for services either via hard cash, mobile money, PayPal, or any other approved electronic payment platform to the courier rider, who then pays an agreed percentage to our organisation via an account (Participant 8; July, 2023).

Our system has been configured in such a way that, the customer or sender pays for the service enjoyed either via mobile money or any other approved electronic payment platform to the crowd-logistics platform's account in the name of the

rider. The platform automatically deducts its percentage and pays the remainder to the rider or delivery person (Participant 11; July, 2023).

According to Rai et al. (2017), there exist two modes of payments in the crowd-logistics system; the forward and reverse payment systems. And so, while some system operators adopt the forward payment system, others adopt the reverse payment system. While in the forward mode the platform obtains the delivery amount from the vendor and then gives a percentage to the delivery person, the reverse mode allows for money to flow from the ultimate customer to the delivery person.

4.3.1.2 Supply Chain Mile

From Dietmann (2020), the crowd-logistics system can be characterized by the delivery stages; first mile, mid mile, and last mile. The quantum of load to transport, the time involved, and the mode of transport (trucks, saloon vehicles, motor bikes and bicycles) informs the characteristics of the crowd-logistics system operated in Ghana in terms of supply chain miles. In relation to this study, it is revealed that the last-mile is the only stage in the chain where the crowd-logistics system is operated in Ghana's courier industry.

Last-mile Delivery

Organisations operating the system either receive orders of parcels from individuals or vendors to be delivered to the final consumer. Goods involved here are not bulk, but often retail related goods. This stage of supply chain is characterized by the frequent but-low volume distribution commodities over small distances. According to Vakulenko et al. (2019), the final mile of a parcel delivery service is when the consignment is delivered to the recipient, either at the recipient's home or at a collecting location. On this, a participant of the study's interview remarked that:

Our operation starts from individuals, vendors or online stores to the final consumers. We deal with short distance movements and concentrate in non-bulk items or parcels with low-weight. These are the reasons, our platform host delivery men with saloon vehicles and not those with trucks for bulk cargo deliveries (Participant 9: July, 2023).

But perhaps, more telling was the response of participant 2:

The crowd-logistics system we operate host only retail vendors and delivery-men using motor bikes and bicycles with attached storage boxes that will not even permit them to transport bulk cargo. The mode of transport alone concludes that, delivery to the final consumer of parcels is frequent and for short distances within Accra and Tema Metropolis (Participant 2: July, 2023).

Judging from the responses, it is apparent that the crowd-logistics courier operations in Ghana is characterized by the last mile supply chain of parcel deliveries. The mode of transport automatically permits for light-weighted goods, in retail-related quantities to be delivered in short distances as major characteristics of crowd-logistics in the last mile courier system.

4.3.2 Requirements for Operating Crowd-Logistics System

From this study, crowd-logistics operations in Ghana can be termed as a system where crowd working is organized through a sharing platform for information and communication that is run by a business or an intermediary who is the software provider. This platform can be accessed from the outside world via the internet as well as from within the company via an intranet or a sharing platform. By offering the platform to connect vendors, drivers, and consumers, this system does not work in isolation as just a software, but with the aid of some facilities, elements, and human intervention. Therefore, the predominant interventions required for the efficient and effective operations of the crowd-logistics system are; facilities, elements, and human intervention

4.3.2.1 Facilities for Courier Operations

Like every technology software, crowd-logistics technology requires the support of some facilities to operate in a more efficient and effective manner. The revealed facilities required for the operation of the crowd-logistics technology are related to technology and transport.

Technology Facilities

Mobile phones, location services, digital payment infrastructure, verified user profiles, online reviews, platform-specific algorithms, communication application programming, information data and storage yards, routers, Wi-Fi, internet, and internet boosters are

among the technological infrastructures needed for the operation of the crowd-logistics system from the study. These facilities together aid in hosting the software on a mother system and open it up for connections by the crowd and consumers. For instance, with the aid of mobile phones and internet access, a customer is able to request for a courier service via the platform with just a click of the button. These same mobile phones allow for drivers to receive delivery orders and drive accordingly to the expected address with the aid of the location or GPS system on the phone.

The digital payment system either via mobile money, credit or debit cards or any other electronic means allow for the swift transaction of delivery services. For some of the companies in Ghana according to the data collected, their system has a digital payment interface that allow for consumers to secure online payment via their bank accounts or any other accounts as approved by the system. The study revealed that, in order for the system to protect consumers against drivers who may want to take advantage of the online payment system and wander around before making delivery of parcels, some of these companies have made parcel delivery prices fixed.

Additionally, the foundational pillars of every online marketplace are verified user profiles and online reviews since they build trust and transparency among a dispersed network of customers and suppliers or sellers. The service seekers, vendors, and deliver persons after downloading the crowd-logistics application create an account, followed by verification. This is to ensure validation of their personality and other important bio-information required for the purpose ease of traceability. In addition to verification, the review component of the system gives users the chance to evaluate and rank the drivers or riders they have just engaged in order to help other users decide if they will desire that driver's services or not. The system accumulates the ratings of all its registered drivers for customers decision making.

The communication application programming and platform-specific algorithm of the system allows for the matching or connecting drivers to customers after requests have been made. This technology allows for drivers in close proximity to the courier seeker to bid for the order made such that, the first bidder often wins. On this, an official with one of the crowd-logistics organisations in Ghana gave his remarks on the technology facilities employed to have their system function properly:

The technology dimension of the facilities employed to run our crowd-logistics system comprises of computers, mobile devices, digital payment infrastructure, location services, verified user profiles and online reviews, communication application programming interfaces and platform-specific algorithm, data and storage yard, routers, Wi-Fi, internet and internet boosters among others (Participant 6: July, 2023).

Transport Facilities

The study revealed that, the technology facilities alone as foretold will not be adequate to have the parcels physically delivered from the sender to the receiver. From the data gathered, crowd-logistics in Ghana leverages various means of locomotion (walk, bicycle, motor bike, car among others) and road infrastructure to aid in the physical delivery of the parcel or goods after the platform connects senders and delivery persons. Thus, the system requires the assistance of transport facilities such as walk, vehicles, motor bikes, bicycles, roads.

The locomotive transport facilities in the crowd-logistics system are offered by the crowd or their investors to aid in the distribution of parcels. However, for the purpose of competition in Ghana's courier industry, crowd-logistics companies have partnered with vehicle leasing companies to offer vehicles to registered drivers or riders on credit basis. Thus, aside their core mandate to provide the crowd-logistics technology, they spend time and energy negotiating on behalf of drivers to have new vehicles.

The road facilities or network on the other hand, if offered by the government of Ghana. The system requires accessible and uncongested road networks to enhance the swift delivery of parcels. Most of these companies operate in the Greater Accra Region of Ghana that assure the system of majority accessible roads as compared to the other regions.

In the case of making the physical delivery of parcels after the platform has linked sender and riders or delivery persons together, we require facilities such as vehicles, motor bikes, courier storage bags, and accessible roads. Once these facilities are set, available and functioning very well, we are able to deliver all orders received from service seekers (Participant 13: July, 2023).

To conclude on this, it is to be said that, whereas the technology facilities allow for requesters / senders to meet riders or delivery persons or for buyers to meet vendors (sellers) and riders; the road and transport facilities provide physical mediums required for the delivery or transport to be made. This confirms the fact that, the system allows for delivery to begin and complete in a chain, for which without any of the facilities, delivery cannot be complete. From the data gathered, it is revealed that, apart from the different facilities used in the transportation of the parcel or goods, Ghana's courier industry houses companies that use similar facilities in their day-to-day operations.

4.3.2.2 Elements for Crowd-logistics Operations

In addition to the facilities required to enhance the performance crowd-logistics operations, the system also requires some elements. Following from the findings of this study, the crowd-logistics elements identified are; crowd, digital implementation, compensation, voluntary, delivery time, company type, and goods type.

Crowd Effect

The crowd, is known to be a group of individual persons who perform the task of drivers or riders for a fee. These are persons who operate as either full-time or part-time riders or drivers. From the gathered data, this element is present in all the crowd-logistics organisations under this study, and hinged largely on the network effect. The crowd as individuals offers their transport facilities to the crowd-logistics organisations by subscribing and registering on their system to provide delivery services.

Digital Implementation

The crowd-logistics system practiced in Ghana requires the aid of digitalization. Unlike the manual crowd-logistics system as practiced in some countries, the study into Ghana's courier space revealed that, the organisations operate via a digital system to connect drivers, vendors, and courier seekers. And so, with the aid of the various companies' system app or website, an order can be placed and a driver is connected to the order in a digital manner.

Compensation

Both the crowd and crowd-logistics organisations operating in the courier industry exist to make economic gains. From the data gathered, it was revealed that, the courier organisations receive a percentage for every trip performed by the crowd; while for the

crowd, they receive a form of compensation for every trip of delivery service they provide. And so, like every organisation, the crowd-logistics organisations provide remuneration for their workers (crowd), though they are temporal. Due to competition in Ghana's crowd-logistics courier space, the companies under this study revealed other means of bonuses and incentives to their riders or drivers, for a stated number of trips covered within a week. This is to incentivize the drivers or riders to stay with them and not switch to competitors.

Voluntary Engagement

The crowd's involvement into the provision of their assets for delivery services is voluntary. In Ghana, the crowd have the liberty to subscribe to any crowd-logistics company and work with them. They are also allowed to switch as and when they wish. The study reveals that, in Ghana, most of the crowd (drivers) are registered to almost all the crowd-logistics platforms within their catchment area. They have separate phones connected to each of the platforms so as to have access to orders simultaneously. .

Delivery Time

Time is another very essential element in the crowd-logistics space. Consumers in recent times have become very sophisticated such that, they seek to have parcels delivered to them on-time at a relatively cheaper cost. For this reason, the delivery time in this system as regards this study revealed a short-time period. Goods in this system are delivered in minutes or hours, or same-day delivery in a worst-case scenario.

Company Types

The crowd-logistics industry in Ghana has been observed to be made up by different kinds of companies. The industry is dominated by both globally established firms and indigenous start-ups. Also, except for a few of the companies that specialize in courier parcels delivery services only, most of these organisations are into the delivery of both human and goods.

Goods Types

Ghana's crowd-logistics courier industry has been observed to transport anything or everything with regards to the space capacities of the transport facilities (walk, bicycles, motor bikes, saloon vehicles, among others). From the data gathered, one of these organisations specializes in the delivery of food, drinks, pharmaceuticals, and

customized delivery within the size of a motor bike storage bag. This is because, the company's system is connected to human-walk, bicycle and motor bike delivery operators, as they are considered the most cost-efficient mode of transporting parcels.

In relation to the elements required for the successful operation of the crowd-logistics chain, an official noted that:

From our operation value chain, the elements we consider to fully complement the crowd-logistics system and operation's technology are traders/ partners (wholesalers and retailers); general public (buyers), part-time riders, remuneration, goods type among others. In our case, we employ services of riders who operate full time and suppliers (firms or traders) who we consider as partners. We are very much particular about the size of goods or parcel to be delivered since we operate with motor bikes, bicycles, walking with courier storage bag affixed on them (Participant 7: July, 2023).

From the responses above, one will note that, in general terms, elements required to complement the technology-aided crowd-logistics platforms and the delivery value chain of courier organisations in Ghana are human beings (delivery service seekers or buyers, suppliers or traders, riders or drivers). It can also be noted that whereas some courier companies allow for voluntary registration for service delivery, other require for fulltime service of riders and or drivers. These riders or drivers are compensated with the payment made by the buyers or service seekers after delivery is successfully completed. The crowd-logistics courier operating companies in Ghana so far take keen interest in the size, weight, and type of the goods or parcels since the transport facilities they use are basically saloon cars, motor bikes, and bicycles.

4.3.3 Subscription of the Crowd-logistics Platform

To further reveal the characteristics of the crowd-logistics system operated in Ghana's courier industry, the study examined the subscription of the platform. Consumers, vendors, ecommerce platforms, delivery persons, and customers cannot get connected onto any of the crowd-logistics platforms until they subscribe or registered. The revealed platform subscription or usage are related to the crowd and customers.

4.3.3.1 Crowd Subscription of the Crowd-logistics System

Individuals (crowd/drivers) can gain access to crowd-logistics platforms as either part-time or fulltime delivery-men, only when they are officially registered with the company. This study revealed that, the crowd-logistics organisations require for the crowd or prospective drivers to meet some qualifications and requirements before they are integrated into the system.

The majority of these platforms in Ghana specifically examine driver's licenses, insurance, and documentation of reliable vehicles, and they advise drivers to connect their registration with their social media accounts to build an online reputation or community. Other platforms need users to provide a copy of their driver's license and vehicle registration, participate in a personal interview, pass a secure background check, and then finish a brief orientation program in order to register as a driver.

On the issue of crowd subscription of the system, a participant of the study remarked that:

For individuals or the crowd to subscribe to our platform and successfully provide services for payment per trip or delivery, the following process will have to be followed through; download app, register with the company, visit company for further inspection of driver's license and other documents, vehicle test and registration, and account opening. Once account is opened, driver monitors map or system for order. He then checks in notification, receive orders, pick up order or parcel, make delivery, and ensure receiver of parcel confirm delivery. We can say that, with our system, only one order is allowed to be accepted at a time by the rider or driver (Participant 1: July, 2023)

Affirming the above statement, other participants also remarked that:

We require for prospective riders to first download app, register with the company online, visit company for further inspection of license and other physical tests, test motor bike and its registration and insurance documentations, and account opening. Orders close to rider's prevailing location are dropped into their account. He then picks up a chain of orders in the vicinity, and delivers same according to the authorize addresses of recipients. Our operation is such

that, a number of orders can be picked on a route at a time for deliveries (Participant 12: July, 2023).

The different types of crowd-logistics systems being operated in Ghana offer similar means for which riders, drivers, or the crowd (drivers or riders) subscribe to the system. These riders or drivers must provide the necessary documentation for strict inspection and prove and also provide their vehicles, motor bikes, or bicycles for physical inspection and test to confirm their roadworthiness before account is opened for them to do business with courier companies. This exercise helps for parties of the various platforms establish a community of trust and transparency. It also promotes customer's reliability of the services provided such that in the case of any missing item for instance, identification can be done by reaching out drivers who contacts and bio-information are with the company.

4.3.3.2 Customer Subscription of the Crowd-logistics Platform

Aside of the crowd or delivery persons, the study revealed that, courier service seekers or customers also have to be registered unto crowd-logistics systems to be able to place orders. On their phones, customers are required to download the application or in some cases go onto the crowd-logistics organisation's website to place, get registered and place order or subscribe to delivery service requests. This brings to fore the means by which the general public can place orders for the delivery of their products by service providers via the technology-aided platform.

On the case of customer subscription of the platform, a participant made this report:

We require that, customers first download our app; register their particulars on the app; receive email with a link to authenticate their account and confirm registration; access online application using log-in credentials and add transportation request that satisfy needs. The delivery driver may then accept or not the request; notification texts or email is issued to the service seeker once the request is approved by the deliverer; parcel is then issued to the courier, sender tracks delivery; parcel reaches receiver; and receiver finally confirms completion of the delivery (Participant 11: July, 2023).

In another case, it is revealed that, the platform host vendors from which customers place orders. Such systems in Ghana are operated via the company's website that do not necessarily require for consumers to register their bio-details before accessing or placing orders. This system is also linked to ecommerce platforms from who order for delivery are made after consumer purchase an item. Response of an official in this regard has been given as;

In the case of my company, the crowd-logistics platform allows for customers (buyers) to place orders of goods and deliver same to the required location in a systematic manner. When customers buy goods online from any e-commerce platform, the person (service seeker) submits a delivery service request online or via our app and requests that item be delivered. Our platform then sends the confirmed order details to any approved "couriers" who are available in the area of the dispatch point. The goods are then picked and delivered to the address and location as expected (Participant 9: July, 2023).

Relative to the foregoing revelations of this study on customer's usage of crowd-logistics platforms, it was revealed that, the system requires for customers to either download their application or go online to have access. All these protocols for subscribing the system are essential for the purposes of authentication and security. This further build some level of loyalty and transparency to the crowd-logistics system being provided.

4.4 Crowd-logistics Strengths and Weaknesses in the Courier Industry

The purpose of this theme was to determine the strengths and weaknesses of the crowd-logistics system as implemented in Ghana's courier industry. This was on the premise that, the companies operating the system in Ghana's courier space may have encountered some positives and negatives in the system's implementation and operations. The strengths and weaknesses are considered the internal elements of the SWOT Matrix. According to Ali et al. (2020), an organisation's strengths are what it excels in and what sets it apart from the competitors, while its flaws prevent it from operating at its full potential. The internal factors of the performance of the crowd-logistics system for the purpose of this study are related to three elements; decision for system implementation; system implementation; strengths of the system; and weaknesses of the system.

4.4.1 Decision to Implement Crowd-logistics System

Generally, making investments into technology-related businesses the world over come along with some decision-making actions. In technology, change is constant such that, organisations who seek to keep up with the pace must be forthright and strategic in thinking. The fact that crowd-logistics companies are free from investing into vehicles and managing them do not mean initiating and implementing the system or platform in a developing country like Ghana come cheap.

Hosting and operating the system alone come along with huge investments. The study revealed that, in Greater Accra alone, over fifteen start-up crowd-logistics companies had to wind-up or close-down since the industry was not that favourable. The study further revealed that, even some globally acclaimed crowd-logistics organisations had their Ghana's subsidiary operations collapse and had to re-strategize before re-starting operations. This is to say that, Ghana's crowd-logistics operations is very competitive and requires some detailed market research and studies to meet up for consumers' and crowds' demands.

This is to say that, even though the burden of procuring and managing fleet of vehicles is taken-off the shoulders of crowd-logistics companies, there is more into the taking of decisions to begin operating the system in Ghana. Further revelations of this study showed that, most of the globally known and recognized crowd-logistics companies, before commencing business in Ghana have gained experiences in operations in some developing countries in Africa and other parts of the world. The predominant decisions for establishment of crowd-logistics operations in Ghana include previous experience, re-strategizing, and research and feasibility study.

4.4.1.1 Previous Experience

Most of the international companies operating the crowd-logistics system in Ghana started operations in other parts of the world before setting up a branch in the country. By this, they had gained enormous experience as to how the system performs in both developed and developing countries. And so, the decision to begin Ghana's operations resorted in some instances to the experiences they have had with some African countries most especially. Previous experiences are essential during decision making moments for wrongs to be corrected before establishing new branches. On the issue of decisions taken

by crowd-logistics companies before commencing business in Ghana, a participant of this study remarked that:

The decision to commence operation in Ghana was quite straight forward. This is because, before Ghana, we were operating in five different countries in Africa - Morocco, Uganda, Kenya, Nigeria, and Cote D'Ivoire, whose terrain and economy are almost similar to Ghana's (Participant 2: July, 2023).

4.4.1.2 Research and Feasibility Studies

Research and feasibility study is essential prior taking any investment decisions. Researching into Ghana's crowd-logistics space gives a fair idea to prospective investors of what to expect before setting-up. Research activities identifies strengths, weaknesses, opportunities, and threats that is found with Ghana's crowd-logistics space, so that investors will adequately prepare before starting operations. From the study, it is revealed that some organisations undertook research and feasibility studies before commencing business in Ghana. On this, a participant of the study reported that:

Our decisions to commence operation in Ghana was tough. This is because, prior entry into Ghana's transport market, we have had details of logistics startups that never lived up to expectations and collapsed after a short while in operation. And so, we researched and studied into the crowd-logistics market. We then concentrated on passenger transportation and now have included the parcel courier service with attention on food deliveries (Participant 8: July, 2023).

4.4.1.3 Re-Strategizing

In spite of the experiences, research and feasibility studies conducted before commencing business in a particular country, the industry or economy may take you by storm and disallow organisations to achieve set goals. Data gathered here revealed, it is always prudent to do further studies of the business and industry and re-strategize so as to reap good gains. In some cases, the re-strategizing steps are taken whiles business is ongoing. Whereas in other cases, re-strategizing is done whiles the company had paused operations.

This study therefore revealed that in some cases of decision making to operate in Ghana, already existing companies that have collapsed, rely on re-strategizing to find their foot back into operations. On this case, a participant reported that:

We commenced operations in Ghana with globally acclaimed crowd-logistics companies but could not catch up with the intensity of competition at the time. We had to then wind up, re-strategize and make a return to re-commence business operations in Ghana. The main strategy was to offer bonuses to the riders and making rates affordable for customers. We have as well partnered Lease Africa to loan out brand new cars to qualified drivers on our platform (Participant 9: July, 2023).

It is to be said that, Ghana's crowd-logistics space is loaded with competition and so will require continuous study and research of the market in order to match up with competitors. The system is such that because the crowd are eligible to subscribe unto any platform at any time, the number of individuals on the platform as delivery persons do not automatically result into the making of delivery trips that brings money into the system operating companies. The crowd decide to work on platforms that offer juicy bonuses for the trips they undertake. In the case of Ghana, to buy the loyalty of these crowd, crowd-logistics companies aside of their core mandate to operate the system, are also to assist them acquire vehicles on hire purchase. Without having a base of loyal deliver persons, decisions to operate in Ghana's crowd-logistics space will be a challenging assignment.

4.4.2 Strengths of Crowd-logistics Model in the Courier Industry

The implementation of the crowd-logistics system allows for these companies to enjoy internal benefits the system comes with. From the study, it is revealed that, crowd-logistics offers consumers with service quality in terms of on-time delivery of parcels at a relatively cheaper cost. The predominant strengths of the crowd-logistics system are grouped into five factors namely; service quality, service reliability, connectivity, minimal operation cost, and time sustainability.

4.4.2.1 Service Quality

In the courier industry, crowd-logistics is wielded the strength in the provision of quality services. The predominant service quality factors from this study are speed, transparency, personalisation, and technology-driven.

Speed

Delivery of goods is gradually gaining some more attention the world-over in recent years. It is no surprise that the world's parcel market, which was valued at less than US\$ 250 billion in 2018 (Dietman, 2020), exceeded US\$ 500 billion as of 2020 (Research and Markets, 2021). Accordig to the data gathered, the increasing attention of the industry has resulted in shorter delivery cycles and complex logistics networks. Data revealed that, the new service is no more same day delivery but delivery in the next minutes or hours possibly. And so, in Ghana, physical shop vendors, ecommerce platforms, and individuals parcel senders seek to have their parcel delivered to the expected address on time. An official of a crowd-logistics company under this study reported that:

By operating in Ghana's courier and transport space, the strengths that our system carry is by provide quality service in ensuring swift delivery of parcels to the prospective address of the receiver. Our system is very efficient to the extent that, once an order for courier service is made, immediately, a delivery-person in close proximity is informed. Again, because we rely on motor bikes most especially, road traffics and congestions do not impede our delivery operations (Participant 6: July, 2023).

The crowd-logistics systems offer the companies the opportunity to host numerous fleets of vehicles without investing into any of them. This allows for them to have presence in most locations within their catchment areas of operations, and speed up deliveries in urban areas most especially. The strengths of the crowd-logistics system here lie in the possibility to create a pool of deliver persons, for customers to have one available courier within a short time after request is made.

In terms of speed, the system promotes the making of several trips in a day, unlike the conventional system like Ghana Post's EMS delivery which is noted to make one delivery tour per day. Further, the mode of transport also influences the speed with the crowd-logistics systems. Most of these companies relay on either motor bikes or saloon

cars that are able to make delivery within minutes and hours. Something the trucking delivery system will not be able to offer.

Technology Oriented

It was further revealed that, the crowd-logistics system enhances the delivery of parcels because it is technologically oriented. Without any physical presence, data gathered reveal that, customers can place orders by just a click of button and parcel will be picked at their door step for onward delivery to be made. On this case, a participant remarked that:

Our system is technology-driven and so allow for orders and deliveries to be done with ease. As an organisation, the system automatically generates reports for management decision making actions on everything we require in terms of trips or distance covered by individual or the entire crowd the system hosts (Participant 6: July, 2023).

As a technologically-powered system, crowd-logistics allows for communication between all players on the platform to be done without physical presence. It is also important to note that, for tactical, strategic, and managerial decision makings, the system automatically generates reports and data depending on the period required. This is something the conventional or traditional courier services cannot provide. Management with this accurate data, will at every material moment re-strategize so as to stay in business and enhance services. Such strategies will further aid the organisation to increase market share and stay profitable.

Service Personalization/ Customization

Additionally, it was revealed that, service personalization or customization also stays as a strength factor of the crowd-logistics system in Ghana's courier industry. A participant of this study reported that;

Our strength as a "ride-hailing" organisation is the provision of customized services to customers. Parcels are delivered as and when they are received, and not wait for a while to have a number of them pile-up for delivery to be made in a batch (Participant 9: July, 2023)

Unlike the conventional courier system, the crowd-logistics courier service operation ensures that, each parcel is management and delivered individually. Regarding timetables and the handling of unforeseen circumstances, among other things, a high degree of customization is made available. Simply put, in crowd-logistics, convenience is a key factor, such that service seekers are willing to pay for services requiring for the delivery of their parcels only at a time. This also contributes to the short-time period of delivery that the crowd-logistics courier industry is known for.

4.4.2.2 Connectivity

The crowd-logistics system provides a wide network base that offers the chance for vendors, deliver persons and customers to link-up, by just a click of a button. Without this system, a customer who needs courier services will have to travel distant in search for one; while at the same moment a courier will be seated ideal in search for delivery business. A participant of the study gave his report on connectivity:

The main strength of our crowd-logistics system is that, it offers the platform for individuals (senders and receivers) and drivers who hitherto may not have met to do business, to get connected in the delivery of goods. By hosting a number of drivers, services from our system are stress free to the customer most especially and saves their time in search for couriers, since the drivers are almost always in close proximity to these customers making requests (Participant, 4: July, 2023).

It is seen that, the crowd-logistics system is very essential in linking up courier seekers and courier givers or providers. The system therefore promotes business among the players and create a social community for them. For retailers and startup businesses who are unable to invest into delivery facilities to offer instant delivery to customers, the crowd-logistics system links them up to couriers who can provide such frequent delivery trips on their behalf. Also, some of the platforms link up vendors and buyers who may be distant from each other. In a way, the system in Ghana from the data gathered, promotes socializing, connections, and activities of startup businesses.

4.4.2.3 Service Reliability

In spite of the heavy demands consumers make for JIT (Just-in-Time) courier delivery services from the crowd-logistics system where parcels are delivered to the right place,

right time, right price and right quality, they also expect some high level of reliability in service according to data gathered for this study. Consumers seek to engage services of couriers who are reliable and trustworthy, in order to entrust into their delivery persons valuable parcels. This study revealed that:

Our system is associated with transparency by allowing for customers to track and trace the locations of the delivery persons transporting their parcels. Our company is also noted for chalking recognitions awards and global accreditation (Participant 9: July, 2023).

Consumers with crowd-logistics courier delivery services are able to know the locations of their parcels before they get to the final destination. Once there is adequate level of transparency, it must be said that, consumers overtime will build some trust for the services the company in question provides. Consumers will as well consider the services very reliable. By so doing, consumers will stay loyal to the company and its brand as they have pictured a high level of dependability in the mind of the consumer.

4.4.2.4 Minimal Operating Cost

Another strength that the crowd-logistics courier system possess is that fact that, the system's operating cost comparatively is on a low. Aside of operating the system and ensuring it runs efficiently and effectively, these companies do not engage in other extra activities. On this case, a participant asserted that:

Our duty as a crowd-logistics company is to provide and operate the technology to connect courier seekers and couriers. Because we do not invest into the procurement of vehicles, we are not responsible for managing the fleet registered on our system (Participant 1: July, 2023).

Crowd-logistics is only a community of a technology platform that connect people who have assets (motor bikes, cars, or bicycles) to persons who need their services at a fee. By the mode of operation, companies operating the system do not bother investing into the assets as it is done with the traditional courier service operations. That should mean, the cost to be incurred in the management of these fleet in terms of fuel, repair and maintenance, motor insurance, road worthy certificate among others is off the accounting books of the crowd-logistics system providers.

The system also does not allow for the companies to keep drivers as permanent staff who would have been due to monthly salaries, social security, health among others. All such expenses are not part of the operation cost of the system operators aiding in them operating minimal budgets.

4.4.2.5 Time Sustainability

The crowd-logistics system saves time for management and consumers. The study reveals that, management will not be over-burdened to have to manage fleet of cars, while consumers will not have to wander around in search for couriers with the crowd-logistics system. On this, a participant of this study revealed that:

I think our system helps to save time for all the players in the industry. In that, management only concentrates on the running of the system, as consumers will place orders for courier services by just a click on the phone instead of walking to post offices (Participant, 2: July, 2023).

The crowd-logistics systems allow for management to concentrate on measures required for the system to improve and serve its purpose of connecting vendors, delivery persons, and customers. If not the management of fleet under their watch will have been a tedious assignment that will have taken majority of management's time. Management will be locked-up with frequently managing road accident issues and other situations that will spend so much of their time. For consumers, the crowd-logistics system, allows them the time to have been used to wander about in search for couriers to be saved. Prior the crowd-logistics system, consumers had to spend time in visiting shops to make purchases. All these are things of the past with the implementation of the crowd-logistics system in Ghana's courier industry.

4.4.3 Weaknesses of Crowd-logistics Model in the Courier Industry

In spite of the strengths that the crowd-logistics system poses in Ghana's courier industry, there are some lapses that data gathered for this study revealed. The crowd-logistics system is faced with so many lapses. The revealed weaknesses of the crowd-logistics system in Ghana according to the findings are; investment, technology, service delivery, usability, drivers, and customers.

4.4.3.1 Investment Issues

The crowd-logistics system in Ghana is challenged with issues of investments from private individuals into the industry. Ghana's transport and courier industry is noted for the usage of 'second-hand' vehicles and motor-bikes that do not perform adequately as expected. Crowd-logistics companies from the study therefore seek for investors to augment the services they provide especially in the procurement of the vehicles. An official of one of the crowd-logistics companies under study revealed that:

We are very much challenged with having individuals invest into the procurement of vehicles to augment the rickety ones, as consumers take very keen interest in this. In Ghana, we have seen that people are not willing to invest into the procurement of brand-new vehicles to offer efficiency and effectiveness in our chain of service delivery. This is the reason we had to partner with MOOVED Company to provide vehicles on lease to drivers though that is not our core mandate (Participant 1: July, 2023).

4.4.3.2 Technology Infections

Operating a technology system like crowd-logistics that opens an organisation up to the world is faced with some challenges. The prominent technology infections that impede the performance of the crowd-logistics industry are; telecommunication issues, cyber-attacks, ease-to-copy business model.

Telecommunication Issues

The crowd-logistics system operations in Ghana are faced with challenges such as poor internet signal and reach, and expensive internet data. The system relies greatly on telecommunication network and electricity power. However, as Ghana's telecom space is not very improved but expensive takes a toll on our performance as a crowd-logistics organisation. On this, a participant remarked that:

In fact, one major challenge I seek to draw your attention to is the fact that, Ghana's telecommunication service is quite poor and even expensive. Our system is such that, drivers must be on the internet all day for the receipt of orders. And so, in the case where the cost of internet data is expensive, it eats into their earnings. Also, the internet signal in some parts of Greater Accra (the capital region) is poor and thus, causing delays in delivery (Participant 5: July, 2023).

It is seen here that; the cost of internet data eats into the earnings of the drivers and that do not offer them the needed motivation to continue doing business with us. Also, in the case where delivery persons will have poor internet signals enroute a delivery address, such that location of the said place is done with phone calls, derail the responsive nature of our system and service. This cause so much delays and increases the cost of service to the customer. Serving as a demotivating factor to seek for our service another time.

Cyber Attacks

Like any technology system or software, crowd-logistics systems suffer from frequent system hacking and technology-related viruses. Such technology infections or sicknesses negatively impacts on the performance of the system. From the study, it was revealed that, even drivers were sometimes able to by-pass the system with having orders, making deliveries, and yet paying nothing to the company. In other cases, drivers are able to fake number of trips in the system so that, they can earn bonuses. A participant of this study confirmed this challenge by making this revelation:

We have been faced with technology related challenges such as poor internet signal, cyber-attacks, hacking of the system by drivers, and infections like virus attacks. As we seek to make the system more efficient and effective, these weaknesses continuously pull us behind and impedes or services delivery as an organisation (Participant 9: July, 2023).

Easy-to-Copy System

The crowd-logistics system is reported to be one of these technology-driven businesses that is so easy to copy or develop. In this case, Ghana is laden with so many crowd-logistics companies to the extent that, about fifteen of them collapse in the past two years. This is to say that, without any huge investment, one can copy or develop similar system and add to the already stifled competitive industry. This is the reason why the industry is laden with so many start-up businesses. In view of the system's easy-to-copy weakness, the crowd-logistics industry in Ghana is likely to see so many start-ups springing-up and proving similar services.

One thing I have realized is that, the system is just like any mobile app. It is easy to write, programme, develop, and run. Persons looking forward to invest into such business do not need much to start, except the technical; know-how to get running the application (Participant 12: July, 2023).

4.4.3.3 Service Delivery Challenges

Crowd-logistics exist in the courier industry to provide timeous delivery of goods to customers at a relatively cheaper cost. It has however been revealed from this study that, the service lags behind in terms of the service being provided by four factors namely; physical inspection of parcels, feedback system, limited modification of service, and nature of goods limitation.

Physical Inspection of Parcels

Because the system promotes privacy, in most cases, the goods or parcels to be delivered are not physically inspected before delivery. Also, the fact that drivers are directed straight to the courier seeker to pick up the goods, the company is unable to physically inspect and confirm the legality of the parcel for delivery. The system is such that everything is done online so as to save time. This has been a challenge with crowd-logistics system operations especially when most customers take advantage of how the system operate to deliver illegal goods like narcotics.

Though drivers have the right to perform such physical inspection, they often do not bother since all they care is to perform the task and make their earnings. This is contrary to the case of the conventional courier service providers like the post office. They ensure every parcel is inspected and re-packaged if the need be to ascertain its authenticity and legality before approved for delivery. The response by a participant has been given below:

My company is faced with challenges of making deliveries of illegal parcels largely because our drivers do not perform physical inspections though it is their duty to do so. On countless occasions, the company has been charged on legal grounds for transporting illegal parcels which we often argue our way out due to the contract we sign with the drivers, that we are not liable for any such issues (Participant 10: July, 2023).

Poor Feedback System

Further, the crowd-logistics system in Ghana is faced with the challenge of operating a poor feedback system to both drivers or riders and customers. Except for just one organisation, I saw a number of drivers and customers at their offices seeking for redress of issues. For the drivers, some of them have their system disconnected to reasons not known to them. For customers, it was revealed that, most of them are there to report on loss of items and or unprofessional behaviors of some drivers.

As a technology operating organisation, seeking to provide quality service in an efficient manner to save time, the situation of feed-back was not the best. It is to be said that, even some of the companies do not have a phone contact on their websites except for a space that allows one to make reports which is almost always unattended to. Both drivers and customers, complained about the poor manner of the companies' customer response system, just as I also experienced same. A participant on this case reported that:

As an organisation, we have not been able to over the years, beefed-up our customer service department to align with the growth and development of the business and our branches. Because we get overwhelmed with the number of incoming calls and demands, we deleted our official contact numbers and replaced with a 'bot' message responder thinking that will be more efficient but has not lived up to expectations. And so, this is something management is taking a critical look at (Participant 1: July, 2023).

Limited System Modification

The crowd-logistics system basically is known to offer a platform that connect vendors, riders or drivers, and customers for the delivery of parcels to an expected address. In this regard, the system in Ghana according to the gathered data is known for just this and cannot be modified to perform other services. The system is static in its operation. For this reason, it has taken years and yet some crowd-logistics couriers using saloon vehicles for their services are yet to consider motor bikes and other modes of transport. We can say therefore that, due to the limited system modification of the crowd-logistics technology, a company like Uber in other countries had to generate another system to handle its food delivery called UberEats. It is to be said therefore that, the already existing Uber system due to limitation of modification could not accommodate the UberEats. A participant for this study remarked that:

We are challenged with modifying our system to specifically attend to parcel deliveries. Our system was written and programmed specifically for the delivery of human passengers. However, as demand in parcel delivery grew in Ghana, we decided to use the same system to operate that area, instead of modifying the already existing system due to limitations (Participant 4: July, 2023).

Limitation in the Nature of Goods

It is noted that, goods considered for delivery in Ghana's crowd-logistics system is not general but limited. As the system operates in the last mile only, it can be said that goods delivered here are in retail quantities, not too big enough, and are also with less weight. This is also the case because the transport facilities used are generally saloon cars, motor bikes, bicycles, and even in some cases by walking. With such limitations, the system is also losing out on customers and businesses that seek for bulk cargo deliveries. A participant in this case of weakness has remarked that:

By operating a system that host retailers as vendors and motor bike and bicycle riders as deliver persons, our services handle only retail or small items. The size of parcel we can deliver should not exceed the size of the carrier storage bags we provide our riders (Participant 2: July, 2023)

Usability

It is one to provide for a more efficient and effective system to aid in the delivery of parcels; and it is another for the people for which the services are to be provided have the knowledge and skills to operate. In a country that has majority of its population being technology-illiterates, it becomes difficult for the business' operations to thrive. There is thus a challenge with customers' not being able to use the system because they are illiterates. In other cases, some drivers who seek to venture into using their vehicles for this service are limited since they are illiterates in technology and that will not allow them to adequately operate the system. Like it is done with some technology platforms, crowd-logistics organisations in Ghana are yet to introduce the USSD system that allows for users (consumers and drivers) to connect onto the system via codes say *123#. A participant in this case of weakness has remarked that:

Though our system is quite direct, responsive, and easy to use, we have noticed that its usage is limited to only a fraction of the Ghana's population who have knowledge to operate the internet and smart phones most especially. This is the reason why our branches so far are in urban areas knowing this challenge exist in Ghana (Participant 5: July, 2023).

Challenges with the Crowd

There is also the challenge emanating from platform players onto operating of the system. Drivers or the crowd most especially are essential in the physical delivery exercise of parcels. Without them, crowd-logistics companies will not be in business as they offer their assets and services in the delivery of parcels voluntarily for a fee. But then, these individuals are known for attaching their problems to the organisations. In several news portals, drivers are known for scandals of rape, molesting, and perceived kidnapping of passengers.

In other cases, these drivers are not professionals in the delivery of services. It is known that most crowd-logistics organisations orient and provide periodic training for drivers just so they can operation professionally. Yet, these drivers, due to the voluntary nature of the service that allows them to move in and out at any time gives no credence to such professional development being offered them. Responses have been given by participants below:

Handling of unprofessional drivers is a very tough task, especially considering the competition in the market. Should we stifle our mode of conducts or rules of engagement, we may be booted out of business as the drivers who perform the physical delivery service will switch to competitors. For this reason, they do whatever they like and negatively impact the company's brand with scandals such as theft, rape, molesting and kidnapping of passengers (Participant 12: July, 2023).

4.5 Crowd-logistics Opportunities and Threats

According to Frada and Clyde (2008), operations of companies in general within developing countries like Ghana can be rationalized and mechanized with the introduction of technology effectively and efficiently. This will enhance performance and offer competitive advantage (Fraga et al., 2008). However, it is to be said that, the

introduction of technology especially in developing countries has not been free from external opportunities and threats. Opportunities are factors or traits that benefit or make it easier for firms to connect with outside organisations (Eastwood et al., 2016). Threats, on the other hand, are external, unfavorable influences that may delay or prevent the organisation from achieving its goals (Yadav and Sharma, 2014).

In Ghana, like many other countries, a technology known as crowd-logistics has been implemented into the country's courier space to aid in connecting service seekers, voluntary riders or drivers, buyers, and traders by just a click of the button. Though the system's implementation in Ghana is yet to reach a decade, many are the opportunities and threats the system is noted for.

4.5.1 Opportunities of Crowd-logistics Model in the Courier Industry

In addition to the internal positives that the crowd-logistics system presents into the courier industry, there are also some external positives as well. There exist external elements that have positive impacts on the performance of the crowd-logistics system. The revealed opportunities associated with crowd-logistics operations in Ghana are related to three factors: social, environmental, and economic.

4.5.1.1 Social Opportunities

Opportunities are favorable outside circumstances that could give a company a competitive edge (Yadav and Sharma, 2014). The introduction of crowd-logistics therefore into the courier industry has provided a technology-driven platform that connect persons who hitherto may not have met anywhere but need each other for a delivery service (customers, vendors, riders or drivers among others) to communicate, meet, and build further connections.

The system in its basic operations helps in the fostering of relationships whiles engaging in business. The system in terms of social relationships set crowd-logistics companies apart from the conventional or traditional couriers. The predominant socially-related opportunities from this study come in two modes; global trends and sophisticated customers.

Global Trends

The advent of technology and social media most especially in recent years have offered the platform in connecting people who may not have ever met without the platform. Social media as a borderless system bring people from all works of life together by just connecting to the internet. This has gradually influenced the demands of consumers the world-over to connect to people and transact business. The same with the crowd-logistics system. Like the social medial platforms, the crowd-logistics system according to data gathered offers opportunities for vendors, drivers or riders, and customers to meet online or on an app and do business. It is to be said that, the growing number and use of social media as a prevailing global trend has influenced the rise in the usage of the crowd-logistics system. Such global trends of connecting people on platforms is a contributing factor to the opportunities that the crowd-logistics system possess to thrive. On this, a participant made this suggestion:

Truthfully, I have noticed that people have resorted to the usage of our platform in the delivery of parcels as it works just like social media platforms. As people tend to spend more time on phones that anything else, our system as downloaded on their phones offers them easy means to have parcels delivered (Participant 8: July, 2023).

Sophisticated Industry Players

Consumers in recent years have become very demanding and more sophisticated in any product or service they seek to procure. These consumers seek to have goods delivered to them in the comfort of their homes at a relatively cheaper cost by just placing orders via apps on their phones. In the same vein, vendors are also looking forward to sell their products to these consumers regardless the boundary or distance. Whereas, individuals who have available their assets and spaces are willing to offer their services in the delivery of parcels; by having a group of persons with the mind-set to get connect on a common platform to transact business is an opportunity that the crowd-logistics system must leverage on and stay competitive in the courier industry most especially. A participant for this study made this revelation:

I can see this company is in business and growing in terms of expanding locations because the people have become very sophisticated and demanding for more in terms of parcel delivery. With my experience I know that, consumers wish

to have goods delivered to them without any stress. In making business transactions easier, our system provides for them the connection (Participant 11: July, 2023).

4.5.1.2 Environmental Factors

Environmental issues have become very topical the world over and in all sectors. According to Abdul-Hamid et al. (2021), the last mile delivery system is linked to environmental pollution, safety issues, and infrastructure damage issues. In addition, issues for the courier industry include the consumer-driven economy, unsuccessful deliveries, reverse logistics, and politicians' environmental regulations (Cardens et al., 2017). This is to be said therefore that, operations of the courier industry within the last mile are linked to environmental pollution issues according to the data gathered. The predominant environmental factors offering opportunities to the crowd-logistics technology operations is global environmental attention.

Global Environmental Attention

In the 21st Century, environmental issues have become very topical in every sector of the global economies. Global, regional, and national organisations have invested hugely in promoting environmental protection issues. This attention has reached the logistics industry, specifically the last mile that is noted to be laden with pollution issues. By extension, the crowd-logistics system operates in such a manner that, helps in the reducing the emission of pollution elements like carbon (CO₂) from vehicles and motor bikes into the environment. One of the participants for this study revealed that:

Our investment into technology for courier operations offers us some opportunities as an organisation. The promotion of green technology and sustainability the world-over fits into our objectives as organisation by employing the services of motor-bikes, bicycle, and human-walk (Participant 10: July, 2023).

4.5.1.3 Economic Factors

The crowd-logistics system is also offered the opportunity to make economic gains. Like every business, the system offers investors opportunities improve and enhance their

reach so as to earn some revenue and profits. The economic opportunities earned by the system as per this study are in two folds; expanding operations and growing markets.

Expanding Operations

Organisations within the crowd-logistics courier industry relative to this study are making economic gains by expanding their operations. Most of such organisations used to be start-ups in some countries, who through economic gains have extended their frontiers to Ghana's logistics and courier space. Even after their operations in Ghana, some of them have extended their reach to other parts of the country apart from the Greater Accra Region. On this case, a participant made this assertion:

As an organisation, we have been enjoying some opportunities in the operation of this technology system. Some of such opportunities are the making of financial gains by expanding our business and reach through mergers and partnerships with automobile suppliers, and the opening of branches (Participant, 8: July, 2023).

But perhaps, more telling was the response of Participant 13:

By operating crowd-logistics in Ghana's courier industry, the opportunity of technology to grow and develop new businesses have been enjoyed by us. Thus, the emergence of start-up businesses like ours have been powered by technology, to have branches the world over and two more in Ghana's logistics space within the last three years (Participant 13: July, 2023).

Growing Markets

Another economic opportunity that the crowd-logistics system possess is the growing market factor. The system like other technology-driven market centers have offered opportunities for other businesses and industries to thrive. Thus, as crowd-logistics organisations expand their frontiers in making economic gains, the system has aided other markets (courier, retail, food, ecommerce markets among others) to also grow. The system also provides opportunities for individuals to also make financial gains by making available their unused spaces or vehicles for delivery services. A participant considered for this study's interview remarked that:

The introduction of our system has indeed contributed to the growth of the courier industry and market, as consumer demands keep increasing. Also, by connecting vendors in the food, drinks, and pharmaceutical industries, to delivery persons, and consumers, such industries have seen their markets grow and improved their financial earnings as well (Participant 8: July, 2023).

4.5.2 Crowd-Logistics Threats in the Courier Industry

Threats are external factors that have the potential to harm an organisation and its operations. Threats emanate from external forces and for that manner go beyond the reach of organisations to curtail or prevent if possible. These are factors that organisations can implement strategies to reduce their negative impacts and not to prevent them from happening. The crowd-logistics system aside of the opportunities it earns also face external challenges impeding the performance of their operations. These threats from the study are related in four forms: market, legal and regulation changes, general consumer attitudes, and technology.

4.5.2.1 Market

The courier industry's market in Ghana is laden with external challenges. These challenges impede the operation of the market and the benefits that investors or organisations seek to gain. The introduction of the crowd-logistics even makes the situation worse in the situation where investors may not have to have huge capitals to make such investments. This is the reason why the courier industry in Ghana in recent times is noted of also hosting a number of start-up organisations. The predominant market related threat of the crowd-logistics system in the courier industry of Ghana includes competition and economies of scale.

Competition

The crowd-logistics courier industry is noted as one of the very competitive business environments. The business model is such that, one does not need to possess so much capital to set-up and run, since except for investing into the development and running of the system, the physical delivery leg of the chain is performed by delivery-men on voluntary basis. From the data gathered, the system is such that, organisations will not have to procure, keep, and manage fleet of vehicles as it is done by the individual crowds themselves. For all these reasons and more, the industry is seen to as a good breeding

ground for start-up businesses. The increase in numbers of organisations providing very similar service in the courier industry has resulted in Ghana's crowd-logistics industry associated with growing competition. A participant reported that:

One major threat we face as an organisation operating the system in Ghana's logistics and transport space is the growing competition. There seem to be so many organisations in the system, thus heightening the level of competition, and influencing the pricing of our services, as we all seem to provide similar services (Participant 4: July, 2023).

Economies of Scale

Another external challenge bothering the crowd-logistics system in terms of the market factor is economies of scale. Unlike the conventional or traditional courier operations, the crowd-logistics courier industry provides customized services. Such services require that, one's parcel is delivered at a time especially when time and speed of delivery is a factor. This kind of personal or customized services often come along with premium costs that may be a disincentive to the general populace. However, as the traditional courier system provides the bulk delivery services where parcels are collected from different persons and delivered in a batch, the system enjoy economies of scale and that reflects into customers enjoying reduced cost of delivery in the end. Such services pose some intense threats to the crowd-logistics courier industry especially when customers are willing to trade-off speed and timeous delivery for reduced-cost delivery. A participant from the interview remarked that:

Since we started operations in Ghana, we have been faced with the persistent-cheaper mode of delivery service challenge provided by the traditional courier service providers. Our services are personalized and done as and when an order request is made. The reason why our charges look quite expensive as compared to traditional couriers (Participant 4: July, 2023).

4.5.2.2 Legal and Regulatory Changes

As the crowd-logistics courier industry keep expanding, there have been several legal issues and regulations initiated to manage the system and industry. Couriers in this industry in 2018 were issued a one-month ultimatum by Ghana's Ministry of Transport to brand vehicles operating their services just like ordinary taxi cabs. The industry has

been destructed with legal issues of whether the mode of operations make the crowd-logistics organisations, technology companies or transport companies. Other legal and regulatory threats in Ghana also have to do with whether the system drivers are commercial or private drivers. In addition, the government of Ghana has recently introduced the “Digital Transport Guidelines” and imposed a new levy for GHS 1.00 for every trip. The Driver Vehicle and License Authority (DVLA) has been forcing crowd-logistics companies to share real-time trip and customer data with them. Drivers here have as well started paying a mandatory GHS 60.00 annual fees for using crowd-logistics platforms in the country, in addition to their cars undergoing road-worthy tests every six months. A participant in this case asserted that:

In 2018, I recall that, the Commercial Taxi Drivers Association of the Ghana Private Road Transport Union (GPRTU) petitioned the Ministry of Transport to take action over what they described as a breach of Legislative Instrument (LI) 2180 regulation 130. This demanded for us to brand our vehicles in the accepted taxi colours and display a taxi sign on top. In the end, our association was able to argue our way out (Participant 1: July, 2023).

4.5.2.3 General Consumer Attitudes

Consumers are very key in influencing the performance of the crowd-logistics system in Ghana’s courier industry. Without consumers, such businesses will not have existed or possibly collapse in a brief period should they even exist. However, in the case of Ghana’s crowd-logistics courier operations, one of the major threats being faced is the general attitudes of consumers. Ghanaians are largely conservatives and so take much time in changing that which they are used to. They prefer sticking to the old and already existing ways of doing things than switch to a new way. This has made it challenging for the crowd-logistics system to take full force in the courier industry. Once as an industry, a number of prospective consumers have not been interested in the usage of the system due to the normal Ghanaian conservative attitude, the traditional or conventional system of courier services still seem as threats. A participant on the case of Ghanaian consumer attitudes remarked that:

Operating in Ghana's logistics and courier space has been quite tough even after existing for the past four years. We did some studies and realized that, the Ghanaian people are naturally conservatives and do not easily resort to change. We are still marking time in hope that, along the line, the people will be okay with our system (Participant 11: July, 2023).

4.5.2.4 Technology (GPS System)

Technology is also one major external threat identified by this study. Though technology exist to make living easier, it still poses some threats to the crowd-logistics courier industry. One major dimension of the crowd-logistics system that gave operators advantages over their competitors was the use of the technology-aided GPS system in tracing routes and reaching out to the geographical locations of senders and receivers of parcels. However, in recent times, GPS system have become generic apps that allow for anybody anywhere to use in tracing geographical locations. In this case, commercial drivers, individuals, and the conventional/ traditional courier operators now do have easy access to this app in performing delivery services as is done with the crowd-logistics system operations. This issue alone can be very threatening to the crowd-logistics system's operations in Ghana, as the then competitive advantage element is now known or used by all. A participant in this case reported that:

When we started operating in Ghana, one of the features of our operations that consumers loved so much was the fact that there is a system that shows the movement of the vehicles and the picking-up points and delivery-points of trips. But in recent years, the GPS system is used by all as it has become a generic app that can be used by our main competitors, I mean those operating the manual courier system (Participant 13: July, 2023).

4.6 Crowd-logistics Influence on the Performance of the Courier Industry

According to Gulc (2020), emerging technologies like crowd-logistics have significantly changed how businesses are conducted in the courier sector today, fueling the sector's expansion. The development of new technology has led to the industry's yearly growth. Delivery robots, crowd-logistics, GPS software and route tracking, drone deliveries, and courier management software are some of the technological innovations that are reshaping the courier sector (Agyeman, 2022). This is thus to say that, unlike the

conventional or traditional courier operations, technology like crowd-logistics has contributed into the recent growth and expansion of the courier industry globally.

In the case of Ghana, like many other countries, specific courier organisations and the industry has seen some growth conforming to the assertions made by Industry Today (2022) that, the market for courier services is anticipated to reach a staggering \$400 billion by 2024, according to a recent estimate. The purpose of this theme therefore, was to determine the influence that the crowd-logistics system has on the performance of Ghana's courier industry.

4.6.1 Crowd-logistics Influence on Courier Industry

The introduction of crowd-logistics' operation into Ghana's courier industry has experienced both positive and negative influences from both internal and external sources as have been earlier revealed. To the respective organisations in the industry, the system's operation from the fore-going reports shows that, most of them are in business now because of the technology they operate. As a technology, crowd-logistics system offers the platform for persons (service seekers, riders or drivers, and vendors) who hitherto may be seeking for each other, but will not have met. This is thus to say that, the system has largely brought businesses alive especially start-ups and offered extra income to parttime riders most especially. The revealed effect that crowd-logistics system has on the courier industry has been grouped into three factors namely: process automation, service quality, and industry image and brand.

4.6.1.1 Process Automation

Crowd-logistics technology has aided in the automation of processes to ensure successful delivery service in Ghana's courier industry. Activities in the delivery chain from the sender to the receiver of parcels have been automated such that, players except for the delivery persons do not get physically involved in the processes. The predominant process automation elements that crowd-logistics use to impact the performance of the courier industry are: order processing, tracking, digital payment infrastructure, and real-time data generation.

Order Processing

In the crowd-logistics courier operating system, business commence once an order is made. With this technology-driven system, order processing commences once request for courier service is made from the sender of parcel, to a network of "common" people who are registered delivery persons in close proximity to the sender are notified. The first delivery-person to accept is handed the delivery deal. By just a click on the phone in placing an order, all these activities are processed automatically to have drivers or riders showing up at the doorstep of senders of parcels to physical delivery to commence. On the case or order processing, this is what a participant had to day:

The system we operate is automatic and do not require too much human interfaces. For instance, should you place an order for our service from your phone, all that is required is for you to wait, as in a bit, you will see the delivery person at your door-step. All the communications and notices are done automatically once you place the order without stress (Participant 7: July, 2023).

Tracking and Tracing

The system by impacting the courier industry offers consumers the opportunity to track and trace the movement of their parcel till it reaches the expected destination. This is made possible since the system and its interfaces are automated and aided by technology. This makes the courier industry look transparent in the delivery of parcels most especially and in building the attract and loyalty of consumers as well. A participant in this case made some assertions:

After placing an order, consumers have the opportunity to track and trace the movement of the delivery ride and even get to know the minutes it will take to arrive. Once parcel has been picked this same system offers customers the chance to again trace the movement of the delivery ride till it gets to the final destination and trip is closed from their phones as the system is automated (Participant 6: July, 2023).

Digital Payment Infrastructure

The crowd-logistics system provides courier industry opportunity to have delivery trips invoiced and paid by consumers via the digital payment infrastructure that the system presents. According to the survey, digital payments continue to spur digital innovation in

the courier sector just as they do in other sectors. In Ghana, the platforms are such that, once delivery is completed, customers are invoiced and payment is made. This has as well influenced the courier industry in the sense that mobile money, bank accounts, debit card payments among others are all accepted by the digital payment infrastructure of the crowd-logistics technology.

Though we accept payment of delivery services via hard cash, our system is also opened to payment via electronic platforms connected to our system. Our system allows for service payment to be done via mobile money, bank transfers, and debit cards (Participant 9: July, 2023).

Real-Time Data

One other major impact that the crowd-logistics system has brought into Ghana's courier industry is the opportunity to provide real-time data of all trips, kilometers covered, persons involved, service charges among other in real-time. Because the system is automated, the industry can now boast of meaningful data that can aid management, and policy makers to take decisions.

With the crowd-logistics system, the industry also enjoys a more efficient and effective system especially degrading data collection and management. The system offers on-time delivery data and results on industry covered trips per time depending on that which is required. I mean, our company can have real-time data for all trips to manage for tailored decision-making actions (Participant 4: July, 2023).

4.6.1.2 Improved Delivery Services

To the courier industry, the crowd-logistics system has improved delivery services from point of origin to the point of receipt of parcels. Shorter delivery cycles and intricate logistical networks are results of the increasing priority placed on delivery of goods. Couriers in the industry have made several investments and attempts to move away from next-day-delivery to same-day-delivery services of parcels to prospective receivers. For instance, the Ghana Post has recently made some investments into acquiring some fleets to augment already existing ones so as to offer persistent same-day-delivery services which are yet to be achieved.

However, with the introduction of the crowd-logistics system, the courier industry can now boast of offering delivery in minutes and hours and not same day. The narrative has now changed to the point where delivery is made as and when consumers want within a brief period of time. In this regard, the power of crowd-logistics and its impact on Ghana's courier industry lies in the possibility to create a huge pool of delivery persons, that provides for a high possibility of these delivery persons to be located in close proximity and within a short time to service seekers. A participant of this study revealed that:

When the courier industry in Ghana uses the technology, the quality of the services is improved. Consumers are sure of having their parcels delivered to the right place, in the right time, in the right condition and at a relatively cheaper cost. They even have the opportunity to trace the movement of their parcels till they reach final destination (Participant 5: July, 2023).

4.6.1.3 Industry Image and Brand

From the study, crowd-logistics is regarded as, one of the radically different solutions to courier industry performance challenges such as cost, delivery time, item safety, and even environmental sustainability confronting the last leg of parcel delivery. Prior the introduction of the crowd-logistics system, consumers have had to go through these challenges just so to have their parcels delivered. In some cases, especially with short distance deliveries, customers even prefer making deliveries all by themselves without recourse to existing couriers.

These challenges that consumers went through at the time, gave the post and courier industry of Ghana some bad image, and lost their reputation as well. However, the introduction of the crowd-logistics system according to reports from participants of this study, has released some new breath into the courier industry to regain its image and reputation. The predominant factors in terms of image and reputation of crowd-logistics' impact on the courier industry is in two forms; the environmental impact and corporate reputation.

Environmental Impact

Crowd-logistics has impacted the courier industry in terms of its image and brand by making positive environmental impact. The system operates in a manner such that

drivers or riders move only when they accept an order instead of wandering around seeking for deals as it is with the conventional or traditional service providers. By staying-put in wait for orders, the crowd-logistics system ensure the reduction of carbon emissions into the environment. Such operations enhance the image and brand of the country's courier industry as has been reported by one of the study participants:

Gradually, the courier industry in Ghana is seen to be contributing to environmental protection matters. This is because, with the technology, there is reduced traffic density, energy resource savings, and a reduction in CO2 emissions resulting from transport volume consolidation. Riders or drivers instead of wandering around in burning fuel just for business, will only have to move when there is a confirmed order (Participant 10: July, 2023).

In addition, crowd-logistics has improved the image of Ghana's courier industry by adopting environmentally effective and efficient modes of transport for the delivery of parcels. this has been confirmed by one of the study participants as reported below:

For environmental protection matters, our system promotes the usage of motor bikes, bicycles and even in some cases walking as modes of transport to deliver parcels, that are known to have lower or no rates of CO2 emissions into the country's environment. Even our motor bike mode of parcel transport is not engaged in road traffics, therefore ensuring very little or possibly no emissions of CO2 into the environment (Participant 2: July, 2023).

Corporate Reputation

Aside enhancing the industry's image via its impact on the environment, the crowd-logistics system according to the data gathered, also provides some corporate reputation to the courier industry. By the provision of enhanced delivery services and gradually eradicating the challenges that the last mile is known for, crowd-logistics system has gotten consumers to be in love with the services they provide resulting in enhancing the reputation of the courier industry. On this, a participant reported that:

When the courier industry in Ghana uses crowd-logistics, the quality of the services is improved, and as a result, positively impacts the performance and reputation of the courier industry. The system thus, enhances the industry's image

by allowing for customers to follow the progress of their packages, which increases supply chain visibility, makes it more appealing, and enhances customer services (Participant 13: July, 2023).

4.7 Discussions of the Results

Businesses have always had to adapt to the times, but the availability of technologies like mobile networks, social media, cloud computing, and big data analytics has sped up the rate of change for courier services today and are transforming the e-commerce sector. Operators of crowd-logistics have undoubtedly changed the game. It has altered how people and packages go from one location to another. The study's findings indicate that the crowd-logistics method is the best option in Ghana should organisations lack the human resources to deliver a product. Although there are still certain difficulties in the courier industry, the mobile application-controlled taxi or motorbike alternative has become something useful. The finding of this study has been discussed below:

4.7.1 Characteristics of crowd-logistics operations in Ghana's courier industry

This study was conducted to look into the implementation and influence of crowd-logistics on the performance of Ghana's courier industry. From the findings with regards to the characteristics of the crowd-logistic system's operation in Ghana's courier industry, it became clear that first, the system is technology-based and offers a platform that link courier seekers, courier providers and in some cases vendors. Thus, operators of the system in Ghana invest into the technology to invite courier seekers and providers. From Mladenow et al. (2016), crowd-logistics operate in such a way that a corporation offers the technical infrastructure and any person can serve as both a client, vendor and a supplier subscribe to do business. According to Odongo (2018), crowd-logistics uses collaborative platforms and mobile apps that connect individuals and organizations to peers (such as passengers, movers, licensed drivers, and owners of empty storage spaces), among others. These can as well be observed from the findings presented above that, the participants shared similar opinion regarding how their companies operate in the last mile. The findings thus reveal that, the system's operation in Ghana is in two forms; "peer to peer" and "business-to-customer".

According to Carbone et al. (2017), facilities used in the crowd-logistics system are grouped into two dimensions; technology and transport facilities. As established in this study, the technology-based facilities are computers, mobile devices, data and storage house, routers, data and internet boosters, Wi-Fi, GPS location application among others. Whereas the transport facilities are made up of transport facilities (vehicles, motor bikes, bicycles, and road networks), courier bags, generally accessible roads among others. To make these facilities functional, the system also use elements such as drivers (parttime and fulltime), general public, compensation, voluntary service, delivery time, company type, goods type among others. All such crowd-logistics facilities and elements operate in a chain that allows for orders to be placed on the technology platform, from which delivery persons or vendors respond by accepting and making available the item as requested for picking and delivery by riders to the expected delivery address (Carbone et al., 2017; Odongo, 2018; Mehmam et al., 2015).

Further from the findings, it became apparent that, to subscribe the platform, this study found that, both courier seekers and providers and or vendors are to first download the application onto their mobile phones or computers and provide their basic information in the form of registration. As courier seekers place request for courier or items, riders or vendors, confirm and attend to the request by offering their respective services. Riders will then pick up parcels from the vendor or from the courier seeker and have them delivered to the address specified. According to Mehmam et al. (2015), the individual (service seeker) requests that an item be delivered by submitting a delivery service request online or using an app. The crowdsourced delivery platform then sends the confirmed order details to any approved "couriers" who are close to the dispatch point in order for the package to be picked up and delivered to the specified destination (Mehmam et al., 2015). A study by Kafle (2017), in contrast, found another type of crowd-logistics that takes the shape of a two-tiered crowdsourced delivery system where after download of app, registration, and request or order is made, trucks are employed in the first layer to move items from distribution hubs to a relay station, and crowd-logistics is used in the second-tier vehicles, cyclists, and pedestrians complete the final mile of delivery by relaying packages from trucks. This type of crowd-logistics system is used for bulk goods, something that Ghana's transport and logistics space is yet to embrace.

The study further acknowledges that, characteristics of crowd-logistics system and its operations in the courier industry hinges on both the Resource Based View Theory (RBVT), and the Game Theory. The RBVT of an organisation holds that, internal resources are sources of competitive advantage, that are priceless, uncommon, distinctive, and hard to find elsewhere (Tukamuhabwa et al., 2011). Courier operators in Ghana therefore leverage on the crowd-logistics system as an internal resource to offer them some competitive advantage over those operating the traditional or conventional courier system. With the RBVT, organisations only invest into the technology as the resource and invite the general public as client, vendors (partners), or riders in the complete delivery of on-time courier services.

On the other hand, when activities of numerous agents are interdependent, game theoretic principles are applicable (Dai and Chen, 2016). This is where the agents could be any mix of people, organisations, businesses, or all three. By this principle of the game theory, crowd-logistics as a collaborative platform bring from far and near a mix of people (courier seekers, courier providers, and vendors), who can be individuals, groups, or organisations to transact business together. The cooperative form of the game theory as adopted by this study, requires that all players within the crowd-logistics courier chain benefit by cooperating than standing alone. Thus, technology company or operators, riders, and vendors all benefit from the service they each render from the payment made by the service requester or seeker. And so, with that cooperative effort, customer also get to have their requests on-time as expected.

4.7.2 Strengths and weaknesses of crowd-logistics business model on Ghana's courier industry

The study established that, the implementation of crowd-logistics system into Ghana's courier industry has seen some strengths and weaknesses. According to Ali et al. (2020), an organisation's strengths are what it excels in and what sets it apart from the competitors, while its flaws prevent it from performing at its best.

In terms of strength, the study established that, the system guarantee service quality and reliability; connects vendors; minimal operating cost; and sustains delivery time. The system also promotes transparency and trust by offering customer opportunity to track and trace the movement of the vehicle carrying their parcels this delivery is completed.

The study further established the weaknesses confronting the crowd-logistics operators to be investment challenges; technology infections; and service delivery challenges. These organisations from the findings, invest into research, innovation, and development to enhance the impact of the strengths and reducing the impact of the weaknesses so as to adequately serve the customer, crowd, vendors, market, among others. Investments into researches is very important so that these companies will catch up new technologies that may show-up to further enhance the courier industry, so that the business is not taken out of business.

The findings of this study in terms of strengths and weaknesses of the crowd-logistics system in the courier industry affirm the assertion made by Kraaijenbrink, et al. (2010) that, the internal sources of an organisation's persistent competitive advantage are intended to be explained by the resource-based view theory (RBVT). According to Tukamuhabwa et al. (2011), the RBV of the organisation holds that internal resources are sources of competitive advantage. Such resources are priceless, uncommon, distinctive, and hard to find elsewhere. Resources that can facilitate the formulation or execution of strategies that increased performance, exploited market opportunities, or eliminated looming risks are considered important (Barney and Clark, 2007). In this case courier operators in this study use a resource called crowd-logistics technology to bring onboard persons who need each other (customers, vendors, riders, and the general public) to perform a special task of delivery of goods, something the conventional or traditional courier run short of.

4.7.3 Opportunities and threats of crowd-logistics business model on Ghana's courier industry

The study acknowledged that, the opportunities that crowd-logistics system enjoys are economic, social, and environmental factors. In terms of economic, the system from the findings provides organisations with expanding operations and market growth. For social reasons, the study identified global trends and sophisticated industry players. Whereas, global environmental attention was found for the environmental opportunity that the crowd-logistics system enjoys. This affirms the revelations made by Abdul-Hamid et al. (2021) that, crowd logistics in the courier industry, as a system that has recently emerged as a result of the e-commerce boom, aims to lower service delivery costs (economic), foster relationships (social), and reduce associated environmental emissions resulting

from road traffic and congestion. Also, according to Yadav and Shama's (2014) study, prospects for businesses using electronic platforms include; growing technology and e-commerce acceptance, ongoing global trends, rising user numbers, consistent global expansion, high availability wide business growth, and advertising.

According to Yadav and Sharma (2014), threats that crowd-logistics couriers face are; challenges with rivals, environmental changes, internet challenges (signal and cost), global economic downturn, legal and regulatory changes, keen competition, innovation, privacy concerns, lack of direct engagement, fraud, risk, and technology-related infections are the threats halting the development of electronic platform operations. It can also be observed from this study that, external challenges face by crowd-logistics in the courier industry are related to; the market; legal and regulatory bodies; consumer attitudes; and technology; global economic downturn, privacy issues, poor but expensive telecom network, drivers and customers switching platforms, sophisticated customers, legal disputes, growing competition causing thinner profit margins, increased industry regulations, fraud, risk, and technology related infections among others.

4.7.4 The influence of crowd-logistics on the performance of Ghana's courier industry

The study also acknowledged that, without the crowd-logistics system, the courier industry will run on a purely manual basis, where consumers will have to travel to courier offices or the Post to send their parcels, while recipients will as well walk to these Posts to pick the parcel. This medium is stressful, take longer days or time, unpredictable delivery window, expensive but professional riders, non-traceability of goods among others. The findings specifically revealed that, the crowd-logistics system impacts the courier industry by offering automated processes; improving delivery services; and enhancing image and brand. This is thus to say that, the crowd-logistics system result is some economic, social, environmental, and technological gains to Ghana's courier industry.

According to Mladenow et al. (2016), emerging issues with a crowd-logistics service include worries about safety and privacy, as well as the loss and degradation of tangible products. When compared to the traditional last-mile logistics with the Courier Express

and Parcel service providers, crowd-logistics displays a larger possibility of the delivery of stolen, lost, or damaged goods or items (McKinnon, 2016).

According to Dietmann and Kathrin (2020) the rise of the technology, specifically e-commerce industry is a major driver of expansion for startups and business owners in the crowd-logistics sector. In consistent with the assertions above, a study by Barclays (2014) revealed that, logistics providers are usually upbeat about the future of the crowd-logistics in the courier industry. This study therefore established that, the future of the courier industry looks brighter and bigger, since future customers will become very sophisticated and demanding even more than the customers we see today, who seek to have packages and parcels delivered to the right place, time, condition, and at the right price.

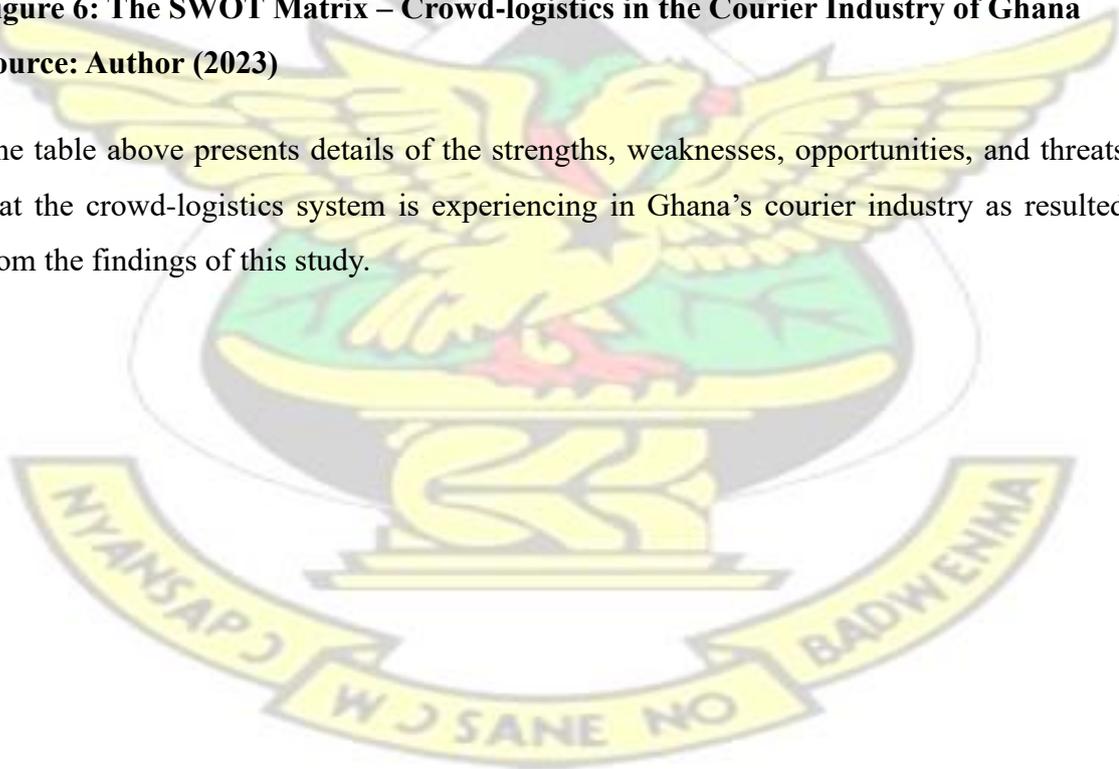
In relation to the influence that crowd-logistics has on the performance of the courier industry, the “game theory” (cooperative game theory) has been adopted. According to Dai and Chen (2016), when activities of numerous agents are interdependent, game theoretic principles are applicable. This is where these agents could be any mix of people, organisations, businesses, or all three. By this principle of the game theory, crowd-logistics as a collaborative platform bring from far and near a mix of people (courier seekers, courier providers, and vendors), who can be individuals, groups, or organisations to transact business together. The cooperative form of the game theory as adopted by this study, requires that all players within the crowd-logistics courier chain benefit by cooperating than standing alone, which result in the overall enhancement of the industry performance. Thus, technology company or operators, riders, and vendors all benefit from the service they each render from the payment made by the service requester or seeker.

4.8 Crowd-logistics in Ghana's Courier Industry



Figure 6: The SWOT Matrix – Crowd-logistics in the Courier Industry of Ghana
Source: Author (2023)

The table above presents details of the strengths, weaknesses, opportunities, and threats that the crowd-logistics system is experiencing in Ghana's courier industry as resulted from the findings of this study.



CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

The concluding chapter of this study reflects on the entire research of evidence on the implementation and influence of crowd-logistics on the performance of Ghana's courier industry. In view of this, the summary of the study and the main findings based on the specific objectives of the study are elaborated. The chapter also presents the conclusions, recommendations and limitations and suggested areas for further studies.

5.2 Summary of Findings

The study was purposed to understand the implementation and influence of crowd-logistics on the performance of the courier industry in Ghana. It was grounded in the "Cooperative Game Theory – CGT" and the "Resource Based View Theory – RBVT". The CGT emphasises on the fact that, players in a chain benefit more by working together than standing alone ((Xu et al., 2013); which for this study is a competitive advantage that the crowd-logistics system possesses. According to Tukamuhabwa et al. (2011), the RBV of the organisation holds that, internal resources are sources of competitive advantage, and that they can facilitate the formulation or execution of strategies that increased performance, exploit market opportunities, or eliminated looming risks are considered important (Barney and Clark, 2007). And so, couriers operating a technology like crowd-logistics, get to have some competitive advantage over their colleagues operating the traditional or conventional courier system.

The study also adopted constructivism (ontology), subjectivity (epistemology), and value-laden (axiology) as its philosophical stances. In line with the objectives of the study, the qualitative research method was adopted. This allowed for the researcher to acquire very deep understanding about the subject matter (crowd-logistics in the courier industry) from the viewpoint of participants (Cresswell et al., 2020). The study also adopted the exploratory research design approach since there is yet to be a study on the implementation and influence of crowd-logistics on the performance of the courier industry.

Consequently, the study considered 13 participants as it reached saturation as new findings were not emerging from the participants on the 13th interview, therefore further interviews were not conducted. The study also used purposive sampling to prevent recruiting people from the general population who have no interest in the topic and to ensure that participants are chosen based on certain qualities, features, or attributes that best suit the study. In addition, both primary and secondary data were employed in the study. The primary information was gathered through interviews with significant participants from thirteen (13) businesses that run the crowd-logistics system in Ghana's Greater Accra Region. The study looked at documents, newsletters, and bulletins on crowd-logistics, the courier business, organizational performance, logistics, and supply chain management to gather secondary data. In order to analyse the data acquired, the study ultimately utilized the content analysis research methodology.

5.2.1 Characteristics of Crowd-logistics in Ghana's Courier Industry

The study sought to first describe the characteristics of crowd-logistics operations in Ghana's courier industry. It was found that, crowd-logistics is a technology-based system, characterized in two models; "peer-to-peer" and "business-to-peer". The "peer-to-peer" model offers the platform to connect courier seekers and providers, whereas, the "business-to-business" model connects courier seekers, courier operators and vendors. The system also allows for the usage of technology and transport facilities.

On one hand, the technology-based facilities as identified comprised of computers, mobile devices, data and storage house, routers, data and internet boosters, Wi-Fi, GPS location application among others. On the other hand, the transport facilities are made up of vehicles, motor bikes, bicycles, courier bags, generally accessible roads among others. The study identified elements required to make the system functional such as; drivers (parttime and fulltime), general public, compensation, voluntary service, delivery time, company type, goods type among others.

To operate the system, courier seekers, delivery-men, and vendors are all supposed to download the application and make entry of their basic information in the form of registration. A request is then made from the buyer for vendors to make available request to be picked and delivered to the address as specified by the courier seeker. In other

cases, the request is made by the courier seeker for the rider who is in close proximity to pick-up the parcel from the sender and have it delivered to the specified address.

5.2.2 Strengths and weaknesses of crowd-logistics business model on Ghana's courier industry

Also, this study in terms of strengths established that, the system provides quality services with speed, technology usage, and customization. The system also provides opportunities for connecting people, ensure service reliability, reduced operating cost, and sustaining time in operations. The study further established the weaknesses of the crowd-logistics business model to be; low investments, crowd challenges (unprofessionalism and scandals), technology infections (poor but expensive internet, cyber-attacks, and easy-to-copy system), and service delivery issues (no physical inspection of parcels, poor feedback system, limited system modification, poor usability, and limited nature of goods).

5.2.3 Opportunities and threats of crowd-logistics business model on Ghana's courier industry

Furthermore, the study established in terms of opportunities the system brings are; economic (expanding operations growing other business markets, and profitability); social (global trends, and sophisticated industry players); environmental (global environmental attention). The study in addition, established the threats of crowd-logistics system in Ghana's courier industry to be; market-related issues (competition and economies of scale); legal and regulatory changes, general consumer attitudes, and technology infections.

5.2.4 The influence of crowd-logistics on the performance of Ghana's courier industry

The study established that, crowd-logistics in the courier industry has brought about automation of major processes in parcel or goods delivery like; order processing, tracking, invoicing, invoicing and payment, as well as on-time delivery data and results on industry covered trips. It has also improved delivery services, and enhanced the image and brand of the courier industry in Ghana in terms of corporate reputation and environmental, social, and economic improvements.

The study concluded that, future of the courier industry looks brighter and bigger, but with some matters of uncertainties. That the courier industry is going to be laden with more technologies, customers, operators, riders, but with heightened level of competition. Also, as technology is constant with change, some couriers may be taken out of business should a new innovation be introduced into the courier industry.

5.3 Conclusion

The study concludes that, introduction of the crowd-logistics system has brought about some positive changes in Ghana's courier industry, by bringing together participants in the sector (vendors, riders, courier seekers, and the general public) who may not have previously encountered one another. This conclusion is based on the fact that, the industry can currently rely on crowd-logistics to enhance express delivery of packages from individuals, vendors, or e-commerce platforms to the specified address on time and at a relatively lower cost due to the numerous limitations that the conventional or traditional courier system was faced with, as it goes manual.

Despite the benefits that the crowd-logistics system brings to Ghana's courier sector, the research also found that there are concerns over privacy, safety and security of delivery, and who should be held liable for any loss or damage. Should it be the system operator or the delivery-man? There is also no means by which drivers or riders in the crowd-logistics system inspect and repackage the parcel to confirm the type of goods, be it illegal or dangerous like narcotics. The system is also challenged by specific delivery constraints, insurance coverage, and inspections of the reliability of crowd-logistics drivers undertaken by the crowd-logistics service provider can all stifle these suspicions.

The study in addition established that, the crowd-logistics operators' feedback systems for clients, riders and drivers, are quite subpar. The study saw many clients and drivers coming in and out of the operators' offices to get their problems resolved. Customers were there to report of the missing or damage of their items or parcels, or to criticize drivers for their unprofessional behaviour, while riders and drivers faced troubles with account disconnections and delays in compensation payouts.

Also, as a purely technology-based system, the study concluded that, Ghana with a number of its population being illiterates are unable to access, the reason why the system is only operated in a few metropolises in the country. Ghanaians are conservative with

high tendency to resist change for a long time, the reason the crowd-logistics system is yet to be fully embraced by the entire populace.

Finally, the study discovered that with the introduction of technology, the future of the courier sector appears huge and bright. However, courier owners and crowd-logistics operators need to beware of the ongoing technological development so as to adequately plan and keep up with the pace, and prevent themselves of future collapse as has been done with some conventional couriers like Ghana Post in recent years. After the government separated the operations of the Ghana Post and Ghana Telecom companies, one thing that was certain was that, Ghana Post was more lucrative at the time than Ghana Telecom, for which workers even preferred to join Ghana Post. However, after a while when technology brought in electronic mails (emails), quickly the Ghana Post has become a pale shadow of itself whereas the Ghana Telecom, now Vodafone Ghana is flourishing. The study's conclusion is that the prevailing courier sector will still see some growth as a result of technological advancements and innovation.

5.4 Recommendations

5.4.1 Implications for Managers

First of all, it is recommended that parcels and packages are safeguarded from losses or damages. Operators of the crowd-logistics system must initiate measures to protect parcels against any loss or damage. Notable of such protective measures is the adoption of insurance policies. Operators must ensure that delivery men do not insure against the loss and damages of their vehicles alone but the parcels they convey as well. Such insurance policies will relieve both operators and delivery-men from the struggle to push blame and delay in making good such losses and damages to the customer. Insurance will make good such losses and with such act to good riddance, the corporate image and reputation of the system operators will be enhanced and as well make them competitive.

To protect parcels from any loss or damage, it is also recommended that; operators adopt contracts that will specify who to be held liable in the loss or damage of parcel in delivery. Thus, before engaging services of delivery-men, operators must state categorically in the contract as to who is to be held responsible in the case of any act of loss or damage of parcels. There must be a legally endorsed documentation binding either the system provider or riders or drivers for any such loss or damage of parcels.

For the purpose of not transporting illegal goods, it is also recommended that parcels prior delivery must be physically inspected. Crowd-logistics operators as part of the contract they sign must insist that drivers or riders physically inspect the packages before transporting to the prospective destination. Without inspection, drivers or riders will be held responsible for any legal damages that may be caused as a result of being accosted by security personnel for the possession and transportation of illegal and dangerous goods. Unlike the conventional or traditional courier system who are noted to specially package items themselves before delivery, drivers in the crowd-logistics system are known to only pick and deliver the goods.

Furthermore, in the situation of addressing the subpar communication system from crowd-logistics organisations to their clients (riders and ride seekers), the system must have a more responsive feedback system. It is recommended that, crowd-logistics system operators must operate a more responsive feedback system with both drivers and services seekers (customers). Operators may have to employ responsive electronic customer service desk instead of the physical desk that will require drivers and customer to travel long distances to only make report on their issues. This will help to first, improve the corporate image of these companies and the system being operated; build trust and reliability among all players in the chain; reduce the quantum of persons (drivers and customers) trooping the office premises for re-dress of issues; and also save productive time.

To address the issue of usability with majority of Ghana's population that are technology illiterates, this study recommends that, crowd-logistics organisations introduce the telecommunication USSD coding format for making and receipt of orders and deliveries. In a developing country like Ghana, where majority of the population do not have the requisite basic skills to operate technology systems like crowd-logistics, will require another mode of placing request using the USSD system (say *123#) for order placement and delivery services. This USSD system will allow for customers using non-smart phones to be able to access the system and place orders for courier and delivery services to any address of their choice.

Finally, the study recommends that, crowd-logistics firms invest into research, innovation, and development so as to stay updated in the courier industry. Businesses in general have always had to adapt within times, but the availability of technologies like

mobile, social media, cloud computing, and big data analytics has sped up the rate of change for courier services today and the extent to which they are transforming the e-commerce sector. This is largely thanks to the investments governments and organisations have been making in technology to better the lives of the people. It is therefore required for crowd-logistics system operators to keep making investment into research, innovation, and development to keep-up with the pace that the technology industry is experiencing. Couriers are therefore, advised to look forward to a more efficient and effective industry that is likely to be laden with advanced technology applications.

5.4.2 Implications for Theory

In terms of theory, crowd-logistics is the system that provides a platform for vehicles owners and or providers to connect with vehicle seekers for the transportation of human passengers, parcels or general cargo. This system in theory relieves logistics firms the burden to invest into the procurement of vehicles, moto bikes, and bicycles for making deliveries. However, findings from the study imply that, crowd-logistics system providers in reality and in the case of Ghana, are not relieved of the burden in the provision of the vehicles for delivery assignments. Though the system providers do not directly invest into these vehicular assets, they partner with leasing companies to offer such assistance to persons willing to drive but without the capital to procure a vehicle. Through these partnerships, system providers are able to increase their sales, trips, market share, and general performance, with very reliable, loyal, and bonded drivers.

Also in theory, it is known that the system operates with the aid of the internet, therefore requiring riders and ride seekers to connect with internet aided phones. However, this study implies that, majority of Ghanaians are technology illiterates and conservatives against any form of change and so the need for the theory to consider the use of telecom USSD codes. This will expand the crowd-logistics market share in the courier industry as, all kinds of mobile phone holders can gain access to the system and transact business.

5.5 Suggestion for Future Research

It is suggested that, further studies are conducted on the implementation and influence of crowd-logistics on the performance of the courier industry of Ghana, by extending the

reach to all other cities and regions experiencing the operations of the system to ensure generalization of the findings.

Further studies should also be conducted on the crowd-logistics system in Ghana's courier industry by involving all parties in the entire supply chain such as; such as manufacturers, bulk distributors, wholesalers, riders or drivers, vendors, and courier service seekers and not the courier service providers only as was done in this study. Another study can be conducted on the crowd-logistics system in Ghana's courier industry by the use of quantitative research method so as to broaden the number respondents and improve the level objectivism.

More importantly, a comparative analysis can be conducted between the crowd-logistics courier services and the conventional or traditional courier services operations in Ghana. Results from this study will offer interested parties detailed information regarding the strengths, weaknesses, opportunities, and threats of both modes of couriers and the reasons to invest or subscribe to any of the two.



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APPENDICES

APPENDIX II

INTERVIEW GUIDE

KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY – KUMASI

SCHOOL OF GRADUATE STUDIES

A. Characteristics of crowd-logistics operations in Ghana’s courier industry.

1. How does your company operate in Ghana’s courier industry?
2. What do you know about the crowd-logistics system or platform? Please provide your brief understanding
3. What are the facilities your company use in this operation?
4. What are the elements required in making the platform functional?
5. How does the crowd (riders) subscribe to your platform?
6. How does the customers (senders and receivers) use the platform?
7. How does your organisation get paid after delivery has been done by the crowd (riders)?

B. Strengths and Weaknesses of the crowd-logistics business model on Ghana’s courier industry.

8. How was the decision to implement this system in Ghana? What kind of research and background checks did you do to arrive at this decision?
9. How was the implementation of the system into your courier operations in Ghana?
10. How do you benefit (strength) from the crowd-logistics business model in operating courier services?
11. How have you enhanced the strength of the system?
12. What are the weaknesses of the crowd-logistics business model in operating courier services?
13. How have you been able to overcome these weaknesses?

C. Opportunities and Threats of the crowd-logistics business model on Ghana’s courier industry.

14. Why adopt crowd-logistics courier services instead of traditional courier services?
15. What are the opportunities of the crowd-logistics business model on the courier industry?
16. How has your organisation been able to leverage on these opportunities to enhance performance?
17. What are the threats being incurred in the introduction and implementation of the crowd-logistics business model in the courier services?
18. How have you been able to overcome these threats?

D. Influence of crowd-logistics on the performance of Ghana’s courier industry.

19. How is the crowd-logistics courier service different from the traditional courier service?
20. How would parcel delivery have been without the crowd-logistics system?
21. How has crowd-logistics influenced the performance of your courier organisation?
22. How has crowd-logistics influenced the performance of Ghana’s courier industry?
23. How do you envisage the future of the courier industry with the crowd-logistics system?

APPENDIX II
LETTER OF INTRODUCTION



Kwame Nkrumah
University of Science
and Technology, Kumasi

College of Humanities & Social Sciences
SCHOOL OF BUSINESS

DEPARTMENT OF SUPPLY CHAIN AND INFORMATION SYSTEMS

KSB/SCIS/I.4

July 18, 2023

TO WHOM IT MAY CONCERN

Dear Sir/Madam

LETTER OF INTRODUCTION-MR. WILLIAM BAMFO-APORI

This is to introduce to you **Mr. William Bamfo-Apori**, Mphil. student reading Logistics and Supply Chain Management in the Department of Supply Chain and Information Systems, KNUST School of Business.

As part of course requirements, students are to undertake a field study on a topic of their choice. **Mr. William Bamfo-Apori** has chosen to undertake his study in your organization on the topic, "**Implementation and Influence of Crowd Logistics on the Performance of Courier Industry.**"

It will be greatly appreciated if you would allow him to undertake his Data collection at your organization and offer him any other assistance needed so that his research can advance the frontiers of learning.

For any further clarification, please do not hesitate to contact the Department via email: scis@knust.edu.gh or call 0322 495436. You may also reach **Mr. William Bamfo-Apori** on cell phone number +233 208 281 499.

I count on your co-operation.

Sincerely

Prof. David Asamoah
Head