

1 Chapter 3: Research Methodology

1.1 Introduction

1.2 Operational definitions for research variables

The following are the operational definitions for research variables. This kind of definitions ensures that the variables that are being used in this research study are defined appropriately. This approach will play a pivotal part in ensuring consistency, reliability, and validity of the research findings.

1.2.1 Delivery Delays (The Independent Variable)

Operational Definition: Delivery delays will hence be operationalized as the difference between the expected delivery time and the actual delivery time. This is normally in terms of hours or days depending on the service level agreement that has been agreed upon by the service provider and the client. This is an assumption because the time of delay will be measured in terms of customers' responses and delivery data.

1.2.2 Navigational Skills (The Independent variable)

Operational Definition: Measuring navigational skills implies a prospect of identifying how efficiently courier drivers can identify the best routes. This will be done by tracking and analyzing data gathered from GPS locations from delivery trucks as well as driver performance reviews as well as customer satisfaction feedback regarding time taken to deliver products and the correctness of the delivery addresses.

1.2.3 Adequate number of Vehicles (The Independent Variable)

Operational Definition: The need for a larger number of delivery vehicles can be quantified as the number of vehicles that can support the delivery volume of packages. This shall be calculated from records of the fleet management along with the number of deliveries per car on average per day.

1.2.4 Effectiveness of IT Systems (The Independent Variable)

Operational Definition: Validity of IT systems in the context of courier services can be defined in terms of how well the courier services organization is able to track and communicate the movements of parcels through their tracking systems. This will be assessed by the number of positive customer feedback received in the surveys, how often the system was up in the period, and correctness of delivery status reports.

1.2.5 Customer Satisfaction (The Dependent Variable)

Operational Definition: The general satisfaction of the customers with the courier services may be defined as a variable that we are going to use as the dependent variable. This will be done through Likert scale-based questionnaires in aspects including delivery speed, interactive Ness, problem-solving, and over-all satisfaction. Other comparable measures include the net admission rate and the Net Promoter Score. These operational definitions will help in having a structured approach to the collection and interpretation of data which will make the results poignant.

1.3 Research design

The presented study utilizes an explicit design framework for conducting mixed-methods research relying on the “research onion”. This framework helps adopt a systematic characteristic to examine the logistic management issues being faced by the courier services in Saudi Arabia.



Figure 1: Research Onion

Table 1: Research Design Strategies

Research Design	Category	Significance
Research Philosophy	Positivist	In respect of this research, the positivism epistemology of quantifying the effects of logistic management issues towards delivery constraints and customer satisfaction will be useful.
Research Approach	Deductive	This approach is appropriate in this study since it seeks to confirm or deny existing hypotheses that relate to some of the key issues of logistic management and their impact on courier service performance.
Research Strategy	Survey	Questionnaires are useful in that they enable a large amount of information to be gathered from the population selected hence can be useful in the current scenario of studying customers' experience or attitude towards the courier services.

Research Choice	Quantitative	The quantitative component includes such surveys that address specific quantitative aspects of passengers' experience, namely, delivery delays, sufficiency of vehicles, employees' navigation skills, efficiency of IT, and customer satisfaction.
Time Horizon	Cross-sectional	This approach is also suitable in the context of estimating the current situation with logistic management problems and customers' satisfaction in the courier services sector in Saudi Arabia. It enables assessment of the conditions that prevail together with a quick assessment of the perception that customers have about the products
Data Collection and Analysis Techniques	Statistical analysis of survey results	The quantitative data that will be obtained from the above-described surveys will be analyzed through statistical methods like descriptive statistics, correlation analysis and regression analysis. Thereby enabling the discovery of commonalities and correlations between logistic management problems and delivery delays

1.4 Research population & Sampling methods and Technique

This section gives information about the research population in the study and the ways and means used in samplings procedures, means of selecting the samples, as well as methods of determining the sample size.

1.4.1 Research Population

The research population for this study encompass customers and employees engaged in courier businesses in the Kingdom of Saudi Arabia. Particularly, attention is paid to those individuals who encountered these companies as consumers of the services providing logistics and delivery services. This research focuses on the large courier service providers that operate in service markets with extensive coverage and dominance in Saudi Arabia.

- **Customers:** Of mostly busy couriers for personal and business purposes, five hundred thousand respondents.
- **Employees:** About 10000 people or drivers, maintenance and other officials involved in the transportation chain.

These populations are classified into two main groups: consumers on the other hand are the customers who use services, while the providers refer to the employees who offer services. This makes it easier to get a view of both the exporter and the importer in terms of logistic management issues and customers' satisfaction.

1.4.2 Research Sample

The research sample is accompanied by the larger population of the study, and the sample size is selected based on Krejci & Morgan (1970) table of number that is to be selected from the population.

- **Customers:** According to the population density, the number of sample customers needed is approximately 384 for a population of about 500000.
- **Employees:** This means that for every population, the desired precision of 10%, confidence level of 95% and an estimated population of 10000 employees, the sample size required is approximately 370 employees.

These sample sizes help in making a certain level of certainty about the data collected that is representative of the total populations. Some of the classificatory variables that will be used in the sorting of the sample include age, gender, occupation, and how often they use the services of courier agencies in Tigray, Ethiopia.

1.4.3 Sampling Method & Techniques

The research approach for this study involves both probability and non-probability sampling methods for distribution and ease of sample access.

- I. **Probability Sampling:** For the selection of customer participants of the study, it uses systematic random sampling method. This sampling technique entails choosing every individual, for instance, a, b, c...from a list of clients who frequently use the courier

services while keeping in mind that the selected samples do not belong to any particular group. For instance, if the list is composed of 5000 frequent users, a sampling method where a user is selected after every thirteen users will give a sample size close to 384.

- II. **Non-Probability Sampling:** For employee participants, the research adopts “convenience sampling” in view of the fact that it is practically difficult to get hold of all employees. The sampling technique used here involves identifying and targeting easy-to-reach individuals such as drivers and the logistical workforce from specific courier branches/facilities. This approach will help in the inclusion of the participants who have practical experience on the issue with logistic management.

With these sampling methods integrated, the goal of the research is to obtain an adequate information concerning the customers and employees of the courier services sector in Saudi Arabia as well as their concerns and impressions. The use of this methodology ensures that the study has valid conclusions that can be used in performing an effective study on logistic management problems and satisfactorily meet customers’ needs.

1.5 Data Collection Method

This section describes the research tools employed in order to collect the relevant data to respond to the research questions and to validate the hypotheses. The major technique used for gathering the quantitative data in this study is the use of questionnaires in form of a survey. Below are the instruments utilized to measure the research variables: Below are the instruments utilized to measure the research variables:

1.5.1 The Independent Variable (Delivery Delays)

Concerning the independent variable Delivery Delays, the researcher administered a questionnaire developed by the researcher based on Mark (2022). This variable is assessed across three dimensions: size of delay, number of complaints, and conformance to customer expectations, which contains 12 questions., every dimension of the hypothesis is rated quantitatively in a 5-Likert-scale which includes ‘strongly disagree’, ‘mildly disagree’, ‘neither agree nor disagree’, ‘mildly agree’, ‘strongly agree’. Through this Questionnaire design, all the aspects have been covered to provide a qualitative measure to rate the critical dimensions that determines the extent and impact analysis of the delivery delays.

Table 2: Instrument for the Independent Variable: Delivery Delays

VARIABLE	DIMENSIONS	NUMBER OF ITEMS	SOURCES
DELIVERY DELAYS (X)	Causes of Delay	1	Question 5
	Frequency	1	Question 6
OVERALL		2	

1.5.2 The Independent Variable (Deficient Vehicles and Navigational Skills)

Table 3: Instrument Table for Deficient Vehicles and Navigational Skills

Variable	Dimensions	Number of Items	Sources
Deficient Vehicles and Navigational Skills (X)	Perception of vehicle adequacy	1	Question 7
	Rating of navigational skills	1	Question 8
	Types of issues experienced	1	Question 9

1.5.3 The independent Variable (Information Technology in Courier Services)

Table 4: Instrument Table for Information Technology in Courier Services

Variable	Dimensions	Number of Items	Sources
Information Technology in Courier Services (X)	Frequency of tracking	1	Question 10
	Effectiveness rating	1	Question 11

1.5.4 Customer Satisfaction (The Dependent Variable)

The perception of Customer Satisfaction was measured using a structured questionnaire that was prepared based on the existing literature of customer satisfaction measures and the theories. This instrument incorporates Likert scale-based questions covering various aspects: the delivery time, the frequency and quality of the communication, the manner in which the issues have been resolved and, not the least, the quality of the services offered. Other features like NPS and the customer retention rates are also combined in the context of evaluating the overall level of customer satisfaction.

These instruments were geared toward providing quantitative numbers by featuring a set of close-ended questions and qualitative data through organizations of relevant open-ended questions allowing for a greater scope of understanding logistic management concerns and customer attitudes exclusive to the Saudi Arabian courier service sector.

1.6 Types of Data

In this research study both primary data and secondary data were employed in the establishment of a rich methodology for assessing logistic management challenges in the context of the courier services industry in Saudi Arabia.

1.6.1 Primary data

Primary data is collected by the researcher in person and is collected purposefully for that particular study.

The major data was largely elicited from questionnaires administered on customers as well as employees of identified leading courier service firms within the Kingdom of Saudi Arabia. These surveys were intended to gain direct feedbacks on factors including delivery time, driving ability, sufficiency of conveyances, efficiency of IT, customer satisfaction, and measure towards trust rebuilding.

Open-ended interviews, conducted with survey participants, served as supplementary quantitative data that offered conversational elaborations and qualitative perspectives on logistic management difficulties and customers' experiences.

1.6.2 Secondary data

Secondary data is which has been gathered by other researchers with a view to address a different research study that is still pertinent to the research and can be used in the study.

Literature review was only the first step of the whole research, and secondary data proved to be very helpful in this part. Sources included peer-reviewed journals, and industry reports, and prior studies offered theoretical knowledge and empirical data on logistic management in concern area and customer satisfaction, and examination of the courier services sector.

The data gathered for this research was both primary and secondary but the primary data was gathered for the purpose of answering the research questions as well as testing hypotheses formulated in this research.

Secondary data, was collected from external sources and offered a general perception of the industry environment and its trends, which helped in analyzing primary data. Through adopting both primary and secondary data collection techniques, this study guaranteed the holistic study of the logistic management problems and the customers' satisfaction position within the Saudi Arabian courier services industry and provided strong conclusion as well as various practical recommendations to the relevant stakeholders.

1.7 Data Analysis Methods & Procedures

After collecting data, it is essential to analyze the information gathered to draw meaningful conclusions. The Statistical Package for the Social Sciences (SPSS), specifically version 28, will be used to analyze the collected data.

1.8 Conclusion

The operational definitions highlighted in this study are essential components in achieving reliability and validity in measurement of the research variables. These definitions guarantee that the variables being measured can be described in detail, leading to accurate and tangible research results. Since the operational definitions of the research variables indicate how the variables will be measured and analyzed in this study, the research study remains highly structured. These definitions play crucial roles in providing a framework for identifying the specifics of the logistical management problems of the courier services industry in Saudi Arabia and, therefore, in formulating the strategies for improving delivery efficiency and customer satisfaction.