Report On

DATA-DRIVEN INSIGHTS TO IMPROVE CUSTOMER EXPERIENCE IN E-COMMERCE

RESEARCH DISSERTATION

for the Swiss School of Business and Management

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DATA-DRIVEN INSIGHTS TO IMPROVE CUSTOMER EXPERIENCE IN E-COMMERCE

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Declaration

This is to declare that the report entitled "*Data-Driven Insights to improve Customer Experience in E-commerce*" is prepared for the fulfilment of the **Dissertation** of the **Doctor of Business Administration** (Global DBA) by me under the guidance of **Hrvoje Volarević, PhD**.

I confirm that this dissertation truly represents my work. This work is not a replication of work done previously by any other person. I also confirm that the contents of the report and the views contained therein have been discussed and deliberated with the research guide / mentor.

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Abstract

In the fiercely competitive landscape of e-commerce, data-driven insights play a pivotal role in enhancing the customer experience and maintaining a competitive edge. By leveraging data analytics, e-commerce firms can gain valuable insights into customer preferences, behaviours, and trends. These insights enable firms to personalize the shopping experience, anticipate customer needs, and deliver targeted marketing campaigns. The study aims to ascertain the necessity of data-driven insights and their influence on customer experience in e-commerce firms, investigating factors affecting the usage of data-driven tools, identifying key drivers of customer experience improvement, and analyzing their impact on firm performance. A mixed-methods approach will be employed to gather data from 250 Indian e-commerce users through surveys, focusing on customer experience factors. Secondary data from various sources supplement industry trends. Statistical tests, including ANOVA, Regression, and Correlation, helps analyze patterns. The main findings of the study revealed significant relationships between various factors and customer experience in the e-commerce industry. Factors like convenience, competitive pricing, accessibility, user reviews, global reach, and trackable shipments demonstrate statistically significant associations with customer experience. Demographic characteristics such as gender, age, residence, and usage of e-commerce also exhibit strong associations with customer experience ratings. Challenges encountered by consumers while shopping online positively influence customer experience, while factors like price, product selection variety, and fast shipping significantly impact consumer decision-making. Additionally, there is a moderate positive correlation between customer support quality and overall customer experience, indicating the importance of effective customer service in enhancing the e-commerce experience. Ultimately, by harnessing the power of data,

e-commerce firms can create more engaging, seamless, and personalized experiences for their customers, driving higher conversion rates, repeat purchases, and long-term business success.

CHAPTER 1

INTRODUCTION

1. INTRODUCTION

1.1 Research Background

Nowadays, the internet and electronic commerce have made it possible for people to share information with one another. As the number of e-commerce outlets grows, data-driven insights will become an increasingly important instrument. Big data analytics, also known as BDA, is a valuable method for processing large data sets and deriving insights from them. It is especially true in the context of global e-commerce, which creates an enormous quantity of data. The e-commerce sector has been significantly influenced by BDA in recent years. The vast majority of companies have implemented BDA to enhance the quality of the self-service consumer experience they offer. The promotion of a company's goods is the primary function of social media's role in e-commerce, making it an essential component. It is the most important marketplace for conducting business online.

E-commerce analytics, such as identifying the demographics that are most likely to be interested in their products and marketing those products, calls for a variety of perspectives on data-driven insights. For the purpose of this study, the characteristics of data-driven insights such as "the field of marketing (Value), the attribute of interest (viability), the data that are commercial (vendible), the location of the target audience (venue), and the local lingual terms and their synonyms (vocabulary)" were utilized. It indicates that the management of vast amounts of data, processing, and extraction of usable information from it is what big data is all about (Painuly et al. 2021).

The retail industry has been inventing new business models and digital services for customers ever since the advent of the Internet, particularly in the field of electronic commerce (Hagberg et al. 2016; Jonsson et al. 2017). The new system provided support for the following areas:

“e-commerce (internet/online, mobile, etc.), omnichannel (integrating customer experience across all relevant channels), inter-firm functions (logistics and supply chain, marketing and merchandizing, information technology, etc.), business analytics (data aggregation to gain business insights such as mobile and social analytics, customer analytics), and intra-firm business-to-business marketplaces” (Software platforms that allow for the sharing of information between business partners and suppliers, as well as the management of business operations such as product purchasing and sourcing and negotiation) (Sundstrom 2019).

The term “data” refers to the raw data that represents the qualities of a certain item or event. (Detlor et al. 2013). Companies have begun to employ big data, which is seen as the new oil for today's digital economy. It is due to the fact that information contains a great deal of important knowledge that can be obtained from it (Sivarajah et al. 2017). The insights that can be gained from substantial amounts of data may become essential for firms that want to develop. Despite this, a large number of firms do not use big data to successfully improve their outcomes (such as their innovation capability) (Johnson et al. 2017), and others continue to doubt their ability to produce insightful data from the vast amounts of heterogeneous data they gather from various sources (LaValle et al. 2011). For instance, firms frequently make use of “dashboards, scorecards, and various other sorts of visualization” in order to acquire knowledge regarding what has occurred in the past (Ghasemaghaei & Calic 2019).

1.2 Data-Driven Insights

Following an analysis of the raw data, it will obtain data insights, which are the value and knowledge that has been gained. It is the well-considered judgments someone arrives at after analyzing the data in search of patterns and relationships. When an organization adopts what is referred to as a "data-driven approach," it means that it makes its strategic decisions on the "gathering, analysis, and interpretation or understanding of pertinent data." A data-driven approach like this helps firms to make better-informed judgments as opposed to depending on intuition and broad trends. To put it simply, businesses may create strategies and draw educated conclusions by using data.

Since firms frequently process substantial amounts of sensitive data relating to their "customers, employees, and the market, these entities are essential to maintain strict control over their customers' privacy while simultaneously extracting patterns from the aforementioned information (Kshetri 2014). Data-driven insight can be defined as the process of making progress from not knowing how to solve an issue to know how to solve it through the utilization of both current and previous data. Increasing managers' access to data-driven insights helps them enhance their firm strategy and the processes through which they make decisions (Ghasemaghaei & Calic 2019).

1.2.1 Stages of Data-Driven Insights

There are four stages of Data-Driven Insights which are stated below (oracle.com):

- **Predictive Data Insights**

Knowledge of what will occur in the future is known as predictive insight. Firms use data relationships to forecast probability and trends in the future by generating predictive insight. Perhaps the most popular type of data insight is predictive insight. To discover trends,

correlations, and causal relationships, businesses employ predictive insight. Predictive modelling and statistical modelling are two subcategories that can be used to further segment the category; however, it is crucial to note that both work together.

- **Prescriptive Data Insights**

Finding the most effective plan of action to achieve the most desirable outcomes and make the most of a given situation is an example of prescriptive insight. The combination of artificial intelligence and big data can help predict outcomes and determine what actions should be taken through a process known as prescriptive insight. Optimization and random testing are two other subcategories that might be derived from this category of insight.

- **Diagnostic Data Insights**

The process of analyzing data to gain diagnostic data insight involves looking at the data to figure out what caused an occurrence or why something took place. Methods such as data discovery, correlation analysis, drill-down analysis, and data mining are utilized rather frequently. The knowledge provided by diagnostic data helps answer the question of why something happened. As with the other categories, this one is subdivided into two additional categories that are more specific: discover and alerts, and query and drilldowns.

- **Descriptive Data Insights**

Understanding what has occurred in the past is the primary goal of the descriptive insight approach. The identification of patterns from the reporting of trends is the primary method firms employ to create descriptive insight from their data. Within firms, it is the most typical kind of insight that can be obtained from the data. Firms can have a better understanding of the current status of a business scenario with the assistance of descriptive insight, which makes it possible for developments, exceptions, and patterns to become clear in the form of reports.

1.2.2 Types of Data-Driven Insights

As data-driven insight progresses through the stages of descriptive, diagnostic, predictive, and finally prescriptive, the following are 7 distinct types of insight (Vella 2020). Some are quite clear and easy, while others are rare and difficult to find:

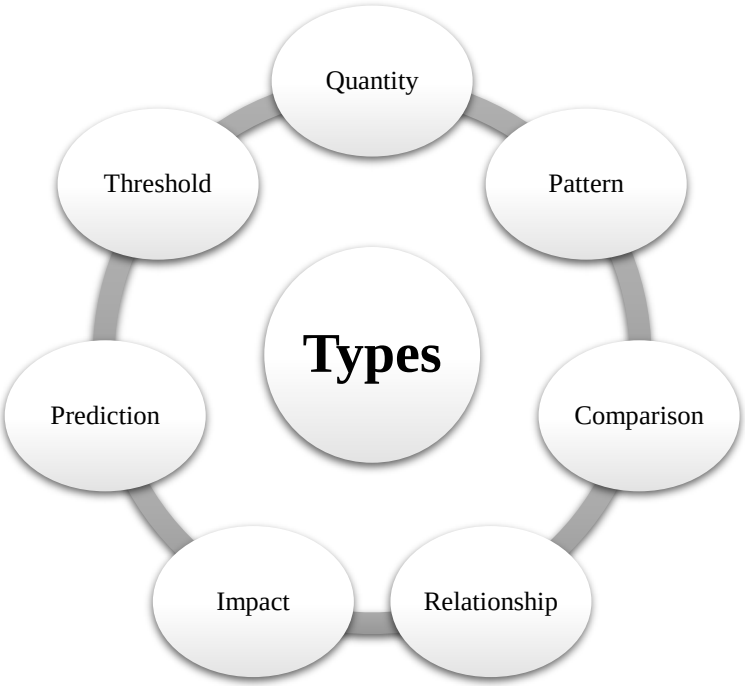

Figure 1.1: Types of Data-Driven Insights

Source: https://medium.com/sigma-1/7-types-of-data-driven-insights-af242434653

- **Quantity**

Even the most fundamental level of data analysis, which consists of simply summarizing the information, can generate useful insights. The information comprises fundamental descriptions of the data, such as counts, minimums, maximums, ranges, averages, and medians of the quantities, as well as proportions (of total and of groups), ratios, and ranks.

- **Pattern**

Patterns are the next noticeable insight that may be gained by evaluating the data over multiple time periods. It goes beyond looking at data from a single moment in time. Because it

demonstrates evidence of repeated “movement” in the results that is consistent enough to be used as information, patterns are the first “level” of animation, so to speak, of the data. The characteristics of patterns:

- “Variation — does it regularly peak at certain points?”
- “Duration — is it hourly, monthly, weekly, or yearly?”
- “Trend — is it decreasing or increasing?”
- “Rate of change — moving exponentially, linear, etc.?”
- “Type — S-shape, U-shape, V-shape?”

➢ **Comparison**

It should break it up into subsets to compare these groups if the dataset is large enough and the appropriate context is given. It responds in this way because different entities people, things, places, and so on act in unique and disparate ways. Comparisons demonstrate if two or more groups of data are comparable, distinct, or overlap on important data points. The categorical variables (or dimensions) are the ones that are most commonly used to create subsets of data: by historical periods, human characteristics, geographic region, category (e.g., goods, design, industry), behavioural or psychographic aspects, theme/topic (in text analytics), and so on.

➢ **Relationship**

The insights that can be gained from establishing (or disproving) the existence of relationships between the variables in a model provide an explanation and a hint at predicting future behaviour. Things to look into are as follows:

- the total number of associations between the variables
- signals: Are there any elements in the data that point to the presence of a relationship? Could it operate as an early warning?

- direct vs. indirect: Does the addition of a third variable make the relationship between two variables stronger?
- chain reactions: Which additional variables are impacted by this relationship?

➢ **Impact**

Following the identification of relationships between variables, the subsequent step is to determine and analyze the nature of those relationships in order to gain a better knowledge of their effects. The insights that are gained regarding the influence or significance of variable behaviour help identify what course of action should be done in response to the results.

➢ **Prediction**

To compare various courses of action to determine which will best achieve our intended response by "being able to extrapolate from the data a picture of the future by either forecasting (how things will develop from this point forward until a certain point in time) or back-casting (starting from some desired future point and figuring out the steps needed to get from there to our current situation)." The primary factors that influence our ability to formulate accurate forecasts are the characteristics of the dataset as well as the goals of the investigation:

- regression (linear, logistic, polynomial, random forest, etc.)
- choice models (conjoint, discrete choice, MaxDiff)
- simulation (agent-based, Monte Carlo, etc.)
- machine learning (support vector machines, neural networks, and decision trees)

➢ **Threshold**

Given that the analysis performed up to this point may have revealed a pattern in the data that is significantly influenced by X and Y variables that can be utilized to predict the results of

another variable, there is one more insight one can gather from the data: investigating and evaluating the limits or extremes of this influence (Vella 2020).

1.2.3 The Benefits of Data-Driven Insights

Data-driven firms have a higher level of confidence in the strategy that was selected. It can provide more accurate forecasts for the future. It can recognize emerging business prospects and trends in the sector far earlier. As a result, data-driven firms become more agile and effective. Data-driven insights can swiftly evaluate new techniques, measure the effectiveness of existing ones, and then change, as necessary. It can react to shifts in the market more quickly than its rivals as a direct result of the rapid input that receives (Kirchacker 2021). These specific advantages and more are offered by data-driven insights as follows:

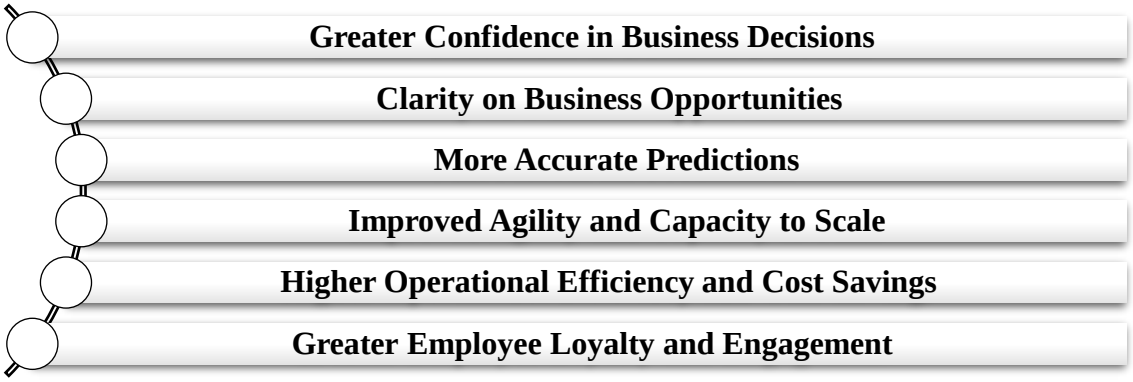

Figure 1.2: Benefits of Data-Driven Insights

Source: https: //www.sinequa.com/resources/blog/6-ways-a-data-driven-approach-helps-your-organization-succeed

- **Greater Confidence in Business Decisions**

Data-driven insights replace actual opinions with facts based on reasonable considerations. It's kind of in-depth data analysis offers clarity that cannot be obtained solely via the use of

intuition or opinion. It enables someone to assess their present performance in comparison to a benchmark and devise a plan of action to reach the objectives. A greater understanding of the effects of every business decision that is made will be attained by the individual. It clarifies the reasoning behind the decisions in a way that is both logical and tangible. When they commit to following a business strategy or goal, it lessens the likelihood of having second thoughts or regrets. Its certainty inspires a higher level of confidence on all of the organization's levels.

- **Clarity on Business Opportunities**

The entire process of market research can be made more efficient by utilizing data-driven strategies. The actions will become more powerful and informed as a result of this. Utilizing data in this way will allow someone to identify new threats and track industry shifts. Because of this, they can adapt more quickly. In addition to this, it assists businesses in recognizing upcoming trends in the industry before their competitors do. Companies will be able to capitalize on new business prospects more quickly with the help of data.

- **More Accurate Predictions**

Data-driven initiatives assist firms in uncovering strong insights that are concealed within their data. It can evaluate a variety of different firm strategies with an improved level of precision. The findings of those tests can lead to more accurate predictions in the future. The mining of data in a period that is very close to real-time can assist businesses in reducing the negative effects of their mistakes. It also helps speed up the recuperation process.

- **Improved Agility and Capacity to Scale**

Making data-driven decisions a top priority leads to the development of precise objectives and the evaluation of results. That usually results in performance enhancement over time. Departments that can track metrics and results can utilize that data to modify course content. It

makes it easier to make ongoing, incremental changes and improvements over time. As a result, it creates opportunities for course correction and the quicker implementation of innovative ideas. Data-driven firms can become agile and are better able to scale.

- **Higher Operational Efficiency and Cost Savings**

A data-driven strategy is used to hold everyone responsible for predetermined goals and quantifiable outcomes. A higher level of accountability may result in better cost savings and larger revenues. Based on the most recent facts, department managers can make wise decisions. Analysts can examine the data in order to discover solutions to save costs and reduce waste. Businesses are also capable of extracting additional value from pre-existing assets. It has the potential to result in greater cost reductions and increased organizational efficiency overall.

- **Greater Employee Loyalty and Engagement**

When an analyst set out to make a conclusion based on the data, the reasoning for that decision becomes crystal evident. The result leads to fruitful conversations based on facts and evidence. It helps prevent communication failures as well as positions that are hardened based on ego and opinion. It is possible for decisions to boost morale if these are based on objective evidence. When workers and managers can easily see the goalposts, it gives them a greater sense of control over the situation. That makes for better teamwork, increased employee engagement, and more consistency throughout the organization. The effect of this is typically improved loyalty, less turnover, and increased job satisfaction (Kirchacker 2021).

1.3 E-commerce

The word “electronic commerce” (often called “e-commerce”) refers to an extensive range of online economic activities comprising the purchase of goods and services. In addition to this, it refers to “any form of business transaction in which the parties interact electronically rather

than by physically exchanging goods or having direct physical contact." Electronic commerce is the process of controlling any transaction including the exchange of ownership rights or access to products or services through a computer-mediated network. The use of the Internet to purchase and sell goods is included.

Even though it is widely used, this definition does not go far enough in capturing recent advancements in this innovative and paradigm-shifting firm phenomenon. E-commerce can be described more broadly as the use of digital information handling and electronic communications technology in firm transactions to create, develop, and alter associations for the purpose of value creation between or among firms as well as between organizations and people (Gupta 2014).

1.3.1 Classification of E-commerce

As electronic commerce expands and makes more use of the Internet's features. National economies and industry structures may be significantly impacted. The Internet is used for the transfer of information, goods, and services. E-commerce can be broken down further into its parts according to the participants and the kind of transaction that takes place between business and customers (Rekha 2017). The primary categories are as follows:

Table 1.1: Classifications of E-commerce

		From: Supplier of Content/Service		
		Consumer	**Business**	**Government**
To: Consumer of Content/Service	**Consumer**	"**Consumer-to-Consumer (C2C)** • E-Bay • Peer-to-peer (skype) • Blogs & Communities • Product recommendations • Social Networks"	"**Business-to-Consumer (B2C)** • Transactional: Amazon • Relationship-Building: BP • Brand Building: Unilever • Media Owner • News Corp • Comparison Intermediary"	"**Government-to-Consumer (G2C)** • National government transactional: Tax • Inland revenue • National government information • Local government services"
	Business	"**Consumer-to-Business (C2B)** • Priceline • Consumer-feedback, communities, or campaigns"	"**Business-to-Business (B2B)** • Transactional: Suboffice • Relationship-Building: BP • Media Owned: Map business publications. • B2B marketplaces: EC21"	"**Government-to-Business (G2B)** • Government services and transactions: tax • Legal regulations"
	Government	"**Consumer-to-Government (C2G)** • Feedback to the government through pressure groups or individual sites"	"**Business-to-Government (B2G)** • Feedback to government businesses and non-governmental organizations"	"**Government-to-Government (G2G)** • Inter-government services • Exchange of Information"

E-commerce models that are based on technology can be classified into two categories:

- **Peer-to-peer group**

P2P stands for “peer to peer,” which refers to a model of communications that is decentralized and in which each party participates with the same capabilities and in which either party can start a communication session. A customer can directly exchange music with another consumer using the software application known as Gnutella. It eliminates the need for a market maker, which is typical in consumer-to-consumer (C2C) electronic commerce.

- **M-commerce**

The use of mobile devices is one of the defining characteristics of this phenomenon. Transactions can be completed by mobile customers by utilizing smartphones and wireless networks to connect laptops. Mobile wireless devices such as “personal digital assistants (also known as PDAs)” and cell phones can be utilized to complete financial and business-related transactions.

1.4 Customer Experience

The internal and subjective response a consumer has following any type of engagement, whether direct or indirect, with a business can be referred to as their customer experience. During the process of the purchase, apply, or provision of a service, direct contact usually occurs and is typically commenced by the customer. Indirect contact, which might take the form of “word-of-mouth recommendations or critiques, advertising, headlines, reviews, and other unexpected encounters with representatives of a company's goods, services, or brands,” is often used to describe such encounters. Indirect contact can also take the shape of social media interactions. The term "customer experience" refers to the whole of a company's

offerings, including not only the standard of the firm's customer service but also its "advertising, packaging, product, and service characteristics, level of usability, and dependability" (Meyer & Schwager 2007).

1.4.1 Good Customer Experience

In short, good customer experience can be achieved if someone:

- Ensure that customer service is given top priority throughout the whole organization.
- Utilize consumer feedback to have extensive knowledge of the customers.
- Create a system to assist with gathering input, processing it, and acting on it regularly.
- Reduce friction while addressing the particular problems and difficult obstacles that the customers face.

It is not exactly rocket science, but asking the consumers questions, listening to their reactions, and acting on their feedback can lead to a better overall experience for everyone involved.

1.4.2 Bad Customer Experience

There are many distinct types and sizes of bad customer experiences, but one can find a handful of concerns that were frequently mentioned in the customer experience statistics. The main reasons for bad customer experience include:

- Employees who do not understand customer needs.
- Long wait times
- Rude/annoyed workers
- Service that is not personalized

- Insufficient human interaction and too much automation
- Unresolved issues/questions

In the end, though, what constitutes bad customer experiences in the company will be unique, and the only way for business to learn about it is by making it possible for customers to provide feedback and then trying to lessen the influence of the elements that lead to a negative experience for the customers.

1.5 Customer Experience in E-commerce

E-commerce customer experience, often known as CX, refers to how the customers feel while they are shopping on the online business. The level of satisfaction a customer has with their experience in an e-commerce business is a significant factor in whether or not they will return to that site, make additional purchases, refer others to that store, and remain a loyal customer.

The way that an internet business serves its consumers is how the customers see it. They act and are loyal in accordance with their feelings. A satisfied consumer will return to the company and tell their friends about the company. Nobody is going to continue doing business with a company that treats its customers poorly. Making sure customers have a positive experience when shopping online is not only beneficial to a company's bottom line, but it is also essential. When customers do more of their shopping online, they bring with them ever-increasing standards for the quality of the service they receive (D'Alessandro 2020).

1.5.1 Importance of Customer Experience in E-commerce

To put it another way, when E-commerce firms provide customers with a positive experience, they are more likely to make additional purchases, remain loyal to the brand, and tell their friends and family about it. Things will get better in a:

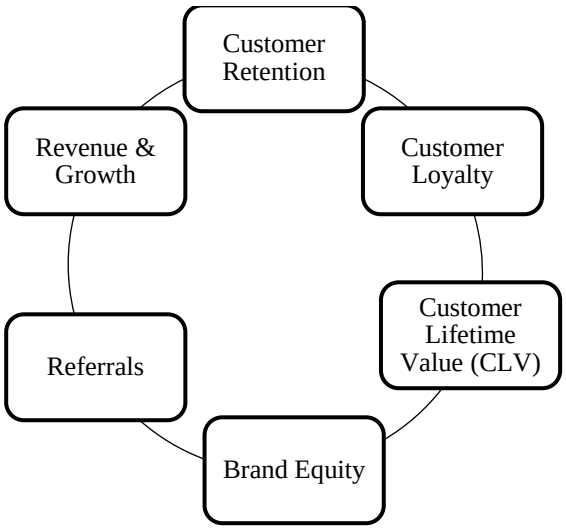

Figure 1.3: Importance of Customer Experience in E-commerce

Source: https: //www.qualtrics.com/blog/ecommerce-customer-experience

- **Customer Retention**

The term "customer retention" refers to a marketing approach that seeks to keep as many existing clients as possible while also working to strengthen connections with these customers. The customer churn rate, which measures the number of customers who left the business, and the customer acquisition rate, which measures how many new customers joined, both have a direct influence on your customer retention rate, which is the number of loyal customers firms were able to keep over a given time.

- **Customer Loyalty**

A strong bond that endures between a consumer and a company is called customer loyalty. It is what encourages customers to make additional purchases and decides them to do business with the company rather than a rival organization that provides comparable advantages.

- **Customer Lifetime Value (CLV)**

"Customer lifetime value (CLV)" is the amount of all the value that a customer contributes to the firm during their whole relationship with a particular brand. The value, rather than looking at the worth of individual transactions, considers all prospective transactions that could be done throughout a customer relationship and estimates the specific revenue that can be attributed to that customer.

- **Brand Equity**

Brand equity can be defined as the increased value that a product offering receives by having a known brand name attached to it. That sense of quality that one gets from a product's name recognition and reputation is what people mean. Building equity is an essential component of any successful business strategy and marketing mix since it is a powerful force in motivating consumers to remain loyal to a brand, and it even has the ability to influence pricing.

- **Referrals**

A referral is when someone is formally sent to another authoritative figure or individual who is capable of overseeing their situation. When someone receives a recommendation, they are being led somewhere else, frequently for aid or advice. "A referral is the act of directing someone else to another location or person for information, assistance, or action, usually to a person or organization with more experience or power."

- **Revenue and Growth**

A company's income over a certain period compared to an identical period in the company's history is what is meant by the term "revenue growth." Revenue growth is the rise (or decline) in a firm's revenues from one period to the next.

1.5.2 Ways to Improve the E-commerce Customer Experience

- **Prioritize improving the employee experience.**

Firms that lead the pack in providing an amazing experience for their customers have staff who are sixty percent more engaged than their competitors' workers. When employees are satisfied, customers are satisfied. Survey the employees and establish an employee experience program that is always active and enables feedback to be sent and acted upon in real time.

- **Ask the Following Questions to Check the E-Business**

Is our website visually attractive? How simple is it to locate particular products? Does every page and piece of information load correctly? Is the website's material informative and simple to read? Is it simple to view and edit the items in the shopping cart? How effective are after-sales, support, and customer service? Is the client experience pleasant?

- **Make the Website User-friendly**

Customers want web pages that are simple to use and provide them with the ability to look through all of your offerings and zero in on just what they are looking for. In the same way that categories are used in traditional stores, the online business ought to have its own set of categorizations. It should not be difficult to locate the search button, and the back end of the website should have everything properly marked and sorted. It is an effective strategy for managing the success of the customer base.

- **Maintain a Smooth Checkout Process**

Making the checkout process simple could lower the number of abandoned carts that people observe. It should be easy to use, have a clear shopping cart on every page, and secure payment processing. Making sure that the customer always sees the various checkout alternatives, including PayPal, will prevent them from reaching the checkout stage and discovering they do not accept their preferred payment method.

- **Provide Product Support**

Many customers demand online customer care because they buy products online so frequently. E-commerce may boost the likelihood that customers will get their issues answered by providing a variety of customer care channels, such as live chat, product support websites, forums, and so forth. Customers may look for a rival with a more user-friendly website if the business only provides one or two sorts of help choices and customers cannot easily have their problems answered.

- **Display Compelling Product Pages**

Clear navigation, attractive images, and descriptive writing are essential components of a compelling product page. Include pricing, a description of the product, and images of the product in use when an E-commerce firm quickly communicates its value proposition. Customers should be fully aware of the benefits of the items and be able to picture themselves utilizing them.

- **Utilize compelling and educational content on the website.**

Content can be employed as a customer acquisition technique to attract and grow the audience, but it can also serve as a constant source of authoritative guidance for them. Consumers are more likely to trust the E-commerce firm and return to the website when e-commerce produces content that is valuable to customers and that they like to read. Content needs to be updated often, consistently, and with a clear integration into the website.

- **Offer a Clear Return Policy**

The inability of customers to try the product on or use it before they buy it is a drawback of internet purchasing. Offer a fair, accessible, and transparent returns policy so that customers feel comfortable returning purchases.

- **Follow up**

Utilize the customer contact information the e-commerce firm has obtained as part of the order process to follow up with the customer to ensure everything went as planned after the purchase. Additionally, “it can give the customers a discount on future purchases, inform them of unique offers, new products, and services, and expand the e-commerce firm in this manner.”

- **Add Customer Reviews**

When customers need advice, these offer a genuine approach to assist them. Prospective buyers can research a product's quality, suitability for their needs, and reviews from previous customers to see if they were satisfied. On the website, offer a review section where customers may leave feedback and give their purchases a rating.

- **Hire Enough Seasonal Staff**

Thanksgiving, Black Friday, Mother's Day, and a host of other major events and holidays are all on the e-commerce calendar. It is crucial to have adequate employees on hand to oversee sales both during and after these times, when there may be exchanges and returns. Making sure businesses have the ability to oversee hectic times can prevent them from losing out on sales or consumer loyalty.

- **Watch out for emerging Internet of Things (IoT) technologies and what the future holds.**

Someone may prepare for the widespread adoption of smart gadgets by watching what they are capable of becoming into and studying this technology now. When it comes to voice-enabled gadgets, 65% of those aged 25 to 49 speak to them at least once a day, and 61% anticipate using them more in the future.

- **Measure Customer Satisfaction and Loyalty**

Lastly, if e-commerce wants to enhance something, it must determine it first in order to identify its weak points. E-commerce firms can rapidly determine how company products and services are being received by conducting customer satisfaction surveys (CSAT). Additionally, it can find out from the Net Promoter Score (NPS) how likely it is that the customers will recommend your company to others (D'Alessandro 2020).

1.6 Effective Ways to Collect Meaningful Customer Experience Data

The experience a customer gets becomes increasingly important as a differentiation for brands as consumer expectations rise. It is simple to see that enhancing customer experience is a prescription for success, even without these types of statistics. Data on customer experiences is crucial for any project because it alerts decision-makers to areas that need to be improved (Team, 2020). There are six effective approaches for gathering customer experience data:

- **Create Effective Customer Surveys**

The collection of qualitative data is one of the keys to the success of a customer experience project. Data without a quantitative or numerical foundation is referred to as qualitative data. Instead, it assesses how the customer felt about the level of the experience or service they experienced. It can gain insight into the customers' perceptions of the brand using qualitative data.

- **Get Customers to Rate You**

Asking customers to rate the company is another quick way to get information about their experiences. Customers may complete this quickly and it can provide the company with access to three crucial KPIs. These are “the customer effort score (CES), net promoter score (NPS), and customer satisfaction score (CSAT).”

- **Give Consumers Every Opportunity to Share Their Experience**

Giving consumers many opportunities to provide feedback is crucial if customer data is to be collected properly. In order to achieve a representative sample across all channels, e-commerce firms should make sure to disseminate customer experience feedback surveys. Consisting of in-person assistance, telephone assistance, online customer care resources, and online checkout methods.

- **Implement Social Listening**

90% of customers, it has been said, will use social media to contact firms to complain about bad customer service. It offers a useful resource for customer experience information. Utilizing social media monitoring tools is a common way to practice social listening. Social listening can efficiently help to improve the customer experience when used in conjunction with automated customer communication management.

- **Leverage Analytics and Cookies**

A lot of information about consumer online activity and interactions with online platforms is made available by web analytics. It can offer numerical customer information about the customer experience journey and potential friction areas. Cookies are yet another instrument for customer analysis. Additionally, mouse-tracking heat maps can reveal friction points and offer insights into the user experience.

- **Customer Support Trends**

Customer assistance is yet another excellent location to gather customer feedback. A person can identify reoccurring difficulties in the customer journey by looking at the common issues that help managed by support. For instance, firms can discover that they need to amend a product after conducting a customer experience analysis on support trends. Or maybe it should optimize stuff like tutorials or explainer films. Firms might also find some key issues with customer service (Team, 2020).

1.7 Measure and Analyze Customer Experience Insights to track the E-commerce.

Customer experience can appear to be a subjective idea that is challenging to quantify. To ascertain the level of customer experience in the business, it must rely on a variety of customer metrics that can be used singly or in combination. By having an assessable indication of the customer, it can monitor how it changes (or worsens) over time and use it to assess the success or failure of changes they make that might be hurting its consumers (Zaichenko, 2022). The top four measures used by customer experts to monitor customer experience over time are listed below:

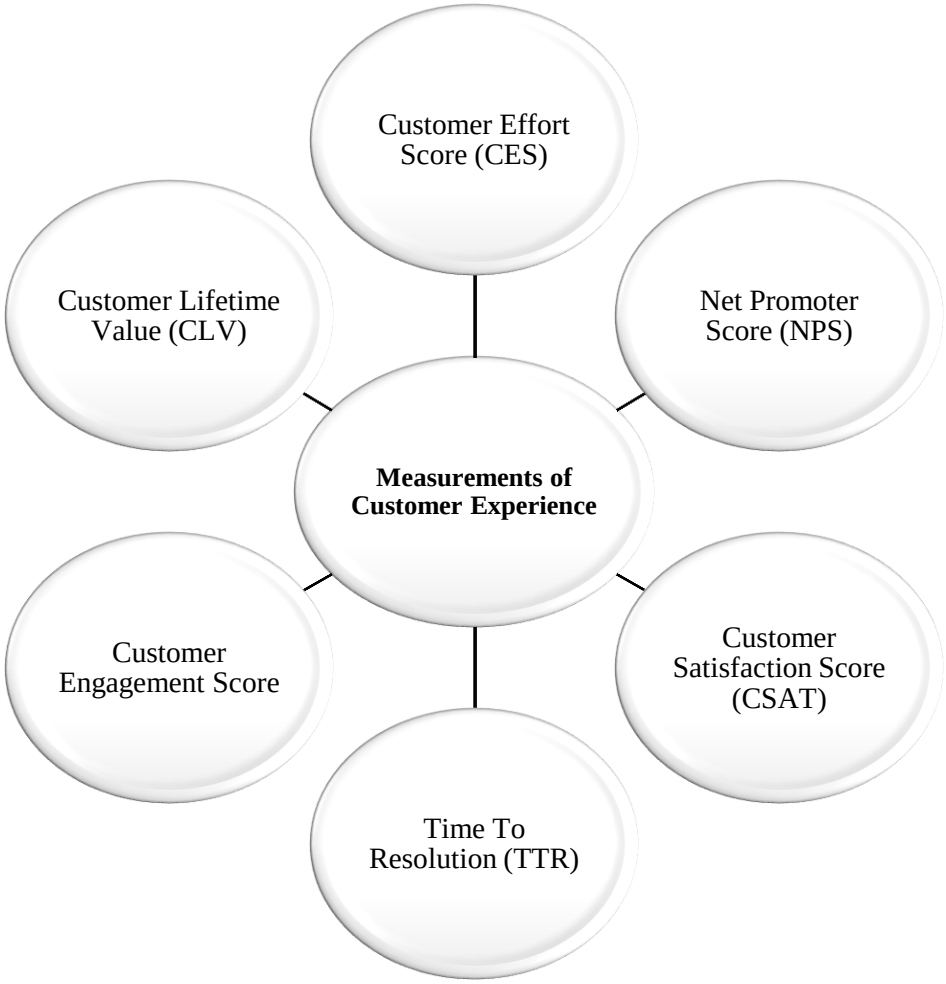

Figure 1.4: Measurements of Customer Experience

Source: https://landbot.io/blog/data-analytics-cx-management

- **Customer Effort Score (CES)**

In terms of how “difficult or easy” it is for the consumers to accomplish an action; a customer effort score evaluates their experience with a product or service. With questions like “How easy was it to get the problem resolved today?” CES surveys are typically handed out following a customer care contact. and a rating system with the numbers “1 for very difficult and 7 for very easy.”

- **Net Promoter Score (NPS)**

Customer loyalty is assessed by “the Net Promoter Score,” which is obtained by asking each customer a straightforward, closed-ended question. In order to quantify customer experience, NPS aims to produce an easy numerical score on a scale from 0 to 100. It may opt to slightly alter the question to better meet the company's needs and use a subsequent NPS query to get further information.

- **Customer Satisfaction Score (CSAT)**

The results of CSAT surveys indicate how satisfied the consumers are with the goods or services they receive. CSAT emphasizes the customer's attention on specific touchpoints they were happy with or unhappy with, as opposed to “the Net Promoter Score,” which encourages customers to consider their overall attitude toward the brand (and, subsequently, their likelihood of recommending it or not).

- **Time To Resolution (TTR)**

TTR is the average period of time it takes for customer service representatives to respond to a problem or ticket once the consumer has opened one. In order to compute it, all resolution times are added together, the total is divided by the total number of cases resolved, and the result is reported in days or business hours.

- **Customer Engagement Score**

The customer engagement score demonstrates how customers engage with the goods. Customers will have a better experience if engagement rises. Otherwise, e-commerce firms need to make more changes to their products to encourage customers to interact with them.

- **Customer Lifetime Value (CLV)**

"Customer lifetime value" is a determination that displays the financial value of a group of customers (or a single customer) over the course of their interactions with the business. The following data is necessary to compute CLV: durability of the customer, frequency of purchases, and purchase value. The choice of how to solve their issues is influenced by knowing a particular segment's CLV (Zaichenko, 2022).

1.8 Using Data-Driven Insights to Improve Customer Experience in E-commerce Firm

The key to business success is improving the consumer experience at each touch point. Businesses are increasingly developing the skills necessary to fulfil customer expectations and enhance the whole experience. Efforts to improve customer experience without making use of data analytics' advantages are restricted in scope and lead to few rewards. Data analytics is a tool that contact centres can use to analyze and interpret data, develop customer satisfaction initiatives, and overcome obstacles (Iyoob 2023). Here are some ways to enhance customer satisfaction using data analytics in an E-commerce firm:

1.8.1 Personalizing Customer Experience

There are recurring patterns and themes that analysts will find as they collect data from a variety of people across various platforms and demographics. It may create a consumer persona for the goods offered by the firm using these recurrent themes. Providing customers with personalized experiences has been shown to increase revenue by up to 15% and marketing efficiency by up to 30%. By looking at the customer's actions and preferences, data analytics may be used to give them a customized experience. Brands may correctly create offers based on this data that reflect customers' requirements and preferences.

1.8.2 Predict Market Changes

Marketers may forecast customer behaviour with a high degree of accuracy by using a carefully built user persona together with a wide range of essential pain points. Users like businesses that assist them in finding solutions to issues they were unaware of. And smaller businesses are also affected by this. Therefore, in order to identify future trends and take advantage of them,

any business that wants to outperform the competition in a crowded market must use data-based predictions.

1.8.3 Improve Customer Support

When users interact with the product, customer support is necessary. As a result, businesses must collect analytics to help customer service representatives. The main problems users may encounter when using the product can be foreseen through social media "temp checks" and direct consumer contact. As a consequence, the agents will receive contextual, data-based knowledge about the causes of important problems and how to fix them. Chatbots may also be used in marketing campaigns to reduce the burden of customer service representatives.

1.8.4 Solidify Brand Loyalty

The business recognizes shifting customer preferences, foresees market shifts, and customizes the customer experience. It is the business model for a successful enterprise that customers like. But data-based customer analytics does more than that. It also enables the identify gaps that can be exploited to enhance the customer experience and strengthen the brand's online reputation. Additionally, social media still holds a lot of promise for boosting brand recognition and loyalty. Social media is where consumers like to communicate with companies, which offers the chance to collect more personalized data.

1.8.5 Acting on Customer Feedback

A certain strategy to increase consumer satisfaction is to work on customer feedback. Data analytics may be used by E-commerce to collect, arrange, and evaluate customer feedback in

order to enhance their offerings. E-commerce may better comprehend consumer attitudes and pinpoint typical issues by using data analytics. It may then prioritize the regions that require quick attention once customers are aware of this.

1.8.6 Get Hands-On Real-Time Insights

When it comes to winning customers' confidence, real-time data may help e-commerce firms to perform at their best. It can resolve issues more quickly and guide conversations following changing consumer needs if they are given the tools to provide useful insights regarding customers' behaviour. E-commerce firms can give customers quick and precise resolutions thanks to real-time analytics, which enhances the entire customer experience.

1.8.7 Make Data-Driven Decisions

Data that has been correctly examined is necessary for decision-making by executives, marketers, and other contributors to the decision funnel. To provide a clear route to success, the manager combines customer requirements and corporate objectives while making choices. E-commerce may make a judgment based on evidence collected from the field rather than depending on feelings and seniority.

1.8.8 Track Performance

Tools that are AI-powered or comparable choices for data synchronization are available. The most crucial step is to create a report that details whether the customer's experience improved or deteriorated over a certain time. In essence, monitoring performance aids in identifying important indicators and areas for development.

1.8.9 Streamline Omnichannel Integration

E-commerce firms must simplify their omnichannel support to compete with the market and offer clients good services. E-commerce firms may analyze customer interactions across a range of contact points and use data analytics to find inefficiencies in their procedures so that they can be made more efficient. In order to improve the entire customer experience, E-commerce firms may use omnichannel integration to assist them make data-driven choices (Iyoob 2023).

1.9 Scope of the Study

The scope of this research is to establish Data-driven insights to improve customer experience in the e-commerce firm. This research will take place shortly. It will help the E-commerce firm to improve and to know about the experience of customers. This study is going to help the E-commerce firm to understand about purchasing decisions of the customers which is going to help them in enhancing their E-commerce activities that will help them in achieving their goals and objectives.

1.10 Research Problem

In recent years, e-commerce businesses have become highly widespread, quite useful, and extremely popular on social networking sites. The manner in which e-commerce companies employ data-driven insights to improve the quality of their client's experiences can be exceedingly difficult to execute when they are confronted with challenges such as poor data quality, security issues, and customer attrition. Customer experience is a key factor that influences customer satisfaction, loyalty, and profitability in the ecommerce industry. However,

many ecommerce firms face challenges in delivering a consistent and personalized customer experience across different channels and touchpoints. Moreover, traditional methods of measuring customer experience, such as surveys and ratings, are often unreliable and incomplete, as they fail to capture the emotional and behavioural aspects of customers. Therefore, there is a need for ecommerce firms to leverage the data analytics and artificial intelligence to gain deeper and real-time insights into customer preferences, needs, and feedback. To be more specific, the impact that data-driven insights have on the decisions that e-commerce companies and their customers make regarding pricing, promotion, and product design. By using data-driven insights, ecommerce firms can improve their decision making, optimize their marketing strategies, and enhance their customer experience.

1.11 Research Objectives

- To Identify the need of data driven insights in E-commerce firm.
- To find out the factors that influence the usage of data driven insight tools in E-commerce firm.
- To identify the key drivers of customer experience and how they can be improved using data-driven insights.
- To analyze the need of the customers through the data-driven insights and how it creates the impact on the performance of the E-commerce firm.
- To find out the impact of data-driven insights on customer experience in e-commerce firm.

1.12 Purpose of Research

The purpose of this study is to present to improve the conditions of customer experiences of E-commerce firms. On this basis, the hierarchy of importance of data-driven insights for customer experience in E-commerce quality was proposed. Enormous amounts of information are exposed to analytics and other computations in order to show patterns and trends in the data as well as specific relationships in the data, therefore data-driven insights play a crucial role in transforming this data into meaningful information. Data-driven insights have the potential to strategically transform E-commerce businesses in the upcoming years. A successful E-commerce sector now relies heavily on data-driven insights, which have swiftly become a key component. In this study, the author also showed several factors influencing the customer to prefer E-commerce. The study provides data-driven insights to improve customer experience in e-commerce firms.

1.13 Significance of the Study

Data-driven insights can help E-commerce firms create more value for their customers and themselves by leveraging the wealth of data available from various sources and channels. The manner that consumers have altered their buying habits over the past ten years has undergone a drastic adjustment. Customer experiences are valuable to E-commerce. It can also help the firm to Reach the target audience by using data to customize their offerings and messages according to customer preferences and behaviours. The significance of this study can be summarized as it gives a factual decision support system to an E-commerce firm for customer experience classification and develops a new Predictive model for target marketing using statistical techniques. In this way, the research helps the firm to gain a competitive advantage by using data to innovate and differentiate their products and services from others in the market.

1.14 Research Questions and Sub questions.

Q1: What are the different factors that influence the usage of data driven insight tools in E-commerce firm?

Q1.1: Does the knowledge level of the employees influence the usage of data driven insight tools in E-commerce firm?

Q1.2: Does the technological factors of the firm influence the usage of data driven insight tools in E-commerce firm?

Q2: What are the key drivers of the customer experience and how they can be improved using data-driven insights?

Q2.1: Does the Promotion strategies of the firm is improved by using data-driven insights?

Q2.2: Does the customer service (After sale services) provided by the firm is improved by using data-driven insights?

Q3: Does the need of the customer is clearly defined and analyze through the data-driven insights and how it creates the impact on the performance of the E-commerce firm?

Q3.1: Does the Customer preference is known through the data-driven insights and impact on the performance of the E-commerce firm?

Q4: Does the experience of customers are affected by the data-driven insights?

Q4.1: Does the understanding of the need of the customer through the data-driven insights can improve customer satisfaction?

CHAPTER 2

LITERATURE

REVIEW

2. LITERATURE REVIEW

2.1 Overview

Raw facts that indicate the qualities of a thing or an event are referred to as data. A large number of e-commerce businesses rely on Big Data generated real-time insights that help them make more profitable business choices. It is increasingly essential for businesses to get important business insights by evaluating vast amounts of diverse data. “High volume, high veracity, high velocity, and high diversity” data might assist businesses in discovering enormous potential value. Businesses may either update their product innovation knowledge and abilities (exploration competence) or expand their current processes, knowledge, and skills (exploitation competency) to increase their innovation competency (Ghasemaghaei, M. & Calic, G. 2019).

In the chapter, the study investigated past studies that have focused on the same criteria as our own. The theoretical foundations of the current investigation are found in the literature evaluation. A review of literature means looking back at previously conducted research to see what may be learned about the topic “Data-driven insights to improve customer experience in e-commerce firms.” Searching for relevant articles and other sources is integral to any literature study. The reviews provide light on previously understood concepts and allow the researcher to take ideas for the ongoing investigation. In contrast, a literature review is a written piece that evaluates the quality of many distinct research outputs (such as encyclopaedias, scholarly articles, research journals, reports, magazines, and online resources) produced by experts in the field.

2.2 Reviews of Literature

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Wiggins, A. (2007) demonstrated Return on Investment (ROI), marketers and executives often resort to web analytics, the technique of analyzing web traffic. The biggest potential of web analytics was to enhance the online customer experience, even if it was important for demonstrating ROI. The use of web analytics to assess the online customer experience was encouraged by growing interest in web analytics in general, although sharing analytics data across organizational units was still

uncommon in business. A deeper and more complicated user experience design may develop when analytics data has been shared with the design team.

Rodden, K., et al. (2010) observed that more and more goods and services were made available online, and there were new possibilities and problems for evaluating the customer experience on a wide scale. User-centred metrics for online applications that may be used to monitor progress toward significant goals and guide product decisions were in high demand. In this point, the author outlined the HEART framework for user-centred metrics and a method for converting product objectives into metrics. The study provided concrete examples of how product teams have used HEART measurements to make choices that were both data-driven and user-centred. They were optimistic that teams from other firms may be able to reuse or modify the framework and process as they have been generalized to a sufficient number of the products produced by the firm. Additionally, the study was believed to promote a greater study of metrics based on extensive behavioural data.

Kumar, A. (2010) found that an internal web analytics tool called Yahoo! Digits was created to deliver data-driven insights for Yahoo! products. The study discussed the fundamentals of digital design, including scalable UI architecture, personalization, and insight-driven information design. It also emphasized how Digits was assisting designers in better comprehending their products and consumers. Along with other qualitative techniques like user testing, user research, ethnography, etc., data analysis may be used to assess the effectiveness of designs and provide design insights. The study's discussion of the data-driven design largely described two keyways to utilize data: as a support for a known problem, where data was utilized to demonstrate and/or comprehend the scope of a known problem. Another was to generate insights by data analysis, which the study refers to as data-driven insight. To determine customer demographics, engagement, consumer insights,

competitive benchmarking, etc., the data may be utilized. The study discussed the use of the fundamental analytics concepts of metric, dimension, and friend's metric for data-driven insights. Additionally, it emphasized how Digits offered "context-driven" information design and functionality to assist in delivering data-based insights instantly.

Hernandez, B., et al. (2010) examined consumer perceptions that lead to online purchases while assessing the moderating impact of the e-purchasing experience. The author established a distinction between two groups: (1) prospective online customers who were thinking about making their first purchase, and (2) seasoned online customers who have already made at least one transaction and were considering making more. The preconceptions that lead people to make their first online purchase may not be the same ones that prompt them to make further purchases. The study's findings demonstrated that customer behaviour was variable because of shifting perceptions brought on by prior e-commerce experiences. While the effect of the Internet experience was constant for all users, the connections between views of e-commerce fluctuated as a result of the shopping experience. The ramifications were particularly interesting for e-commerce firms whose business models rely on the actions of e-customer behaviour.

Kumar, V., et al. (2013) examined the goal of the study to offer insights into the advantages of "data-driven services marketing" and to present a conceptual framework for how to combine established and emerging sources of customer data with their metrics. To analyze marketing ROI and direct future marketing expenditure, it has been examined to "link data and metrics to strategic and tactical business insights and to include a number of KPIs into a forward-looking dashboard." Modern sources of marketing data were divided into conventional, digital, and neurophysiological after a thorough literature review and synthesis. The merits and drawbacks of each form of data were

discussed, and the benefits of combining data from several sources were suggested. The results highlighted the significance of data and its unrealized potential for guiding tactical and strategic marketing choices. Future obstacles were highlighted, such as top management support, moral issues, and the development of data and analytical capacities.

Jia, L., et al. (2015) examined the capabilities of data-driven decision-making (DDDM). Whereas firms were attempting to become more data-driven and improved the effectiveness of their decision-making since people live in the age of big data. The authors evaluated the available studies and discussed the four conceptualization strategies of unrelated, unidirectional, entangled, and mixed capabilities. Then, using the process-based entanglement method, the author explained "the DDDM process and provided a multi-dimension construct of DDDM" capacity. "The data governance capability, data analytics capacity, insight exploitation capability, performance management capability, and integration capability" were all combined to produce the DDDM capability. The discussion also included consequences for academia and management.

Bilgihan A. et al. (2015) stated that growth in M-commerce and electronic commerce technologies, as well as the growing usage of social media and mobile devices businesses, were able to increase the experiences of the customer in shopping and their engagement with marketers anytime and anywhere, the buyer wanted to. The study draws from related work on consumer behaviour in online contexts to construct a conceptual model for a unified online customer experience. Results showed that the unified online customer experience is preceded by factors including ease of use, hedonic, perceived utility, simply finding the Web site or app, functional features, personalization, social interactions, perceived enjoyment, and multi-device compatibility. The results of a captivating

online consumer experience include engagement of the brand," positive word of mouth", and repeat business.

Ghandour, A. (2015) examined those investments in big data analytics were rising among online firms. Firms were able to enhance their merchandising, marketing, customer retention, and every other facet of their firm since it not only enables them to acquire deeper insights into consumer behaviour and market trends but also enables them to make more accurate judgments. Nevertheless, a variety of problems may occur, particularly if the Big Data infrastructure did not perform at its peak and important intelligence and information were delayed or unavailable. The primary goal of the study was to offer a reference architecture as the ideal choice for online firms while also examining the benefits and challenges of using big data analytics. The reference architecture served as the foundation from which it was possible to combine different technologies to create the best possible solution for each circumstance that was unique to the customer.

Zhou, K., et al. (2016) observed that with the constant "use of sensors, wireless transmission, network connectivity, and cloud computing technologies" in the energy industry, large volumes of data were accumulating. The author provided a thorough analysis of "big data-driven smart energy management" to realize the potential of energy big data and acquire insights to accomplish smart energy management. First, the author discussed the origins and features of big data in the energy sector. A process paradigm for "big data-driven smart energy management" was also put out. Then, using the smart grid as the study backdrop, the author offered an in-depth analysis of "big data analytics for smart energy management." It was covered from four main perspectives, including "demand side management (DSM), microgrid and renewable energy management, asset management, and collaborative operation." Then, an analysis and discussion of the industrial growth

of “big data-driven smart energy management” followed. Finally, the author highlighted the difficulties associated with “big data-driven smart energy management” in terms of “IT infrastructure, data collection, and governance, data integration and sharing, processing and analysis, security and privacy, and specialists.”

Chien, C. F., et al. (2016) developed a new product to attract customer's attention and generate a favourable emotional response to increasing customer satisfaction, visual aesthetics was a crucial design element. For product designers to increase customer happiness, it was essential to understand customer preferences in terms of “product visual aesthetics” and the elements impacting “user experience (UX),” whereas little research has been conducted to determine the connection between a product's visual aesthetic qualities and the UX response. The study intended to provide a structure for “data-driven product design that captured product visual aesthetics and user experience” in order to efficiently find the valuable design principles from customer preferences to customer reaction. An actual investigation was conducted in collaboration with a top electronics manufacturing service (EMS) provider in order to verify the suggested framework. The deduced guidelines may help designers create notebooks with appealing visuals and create marketing plans for appropriate consumer demographics. The outcomes have shown the practical viability of the suggested framework, which has been used in this firm.

Zhang, X., et al. (2016) evaluated a customer's behaviour, objectives, needs, desires, and frustrations “User experience (UX)” study groups using a user-centric design approach employ personas to better identify a user's workflow. These authors integrated workflow information from “surveys, self-reports, interviews, and user observation” to develop target personas. Although the information was difficult to get, only covers a small number of replies, was unrelated to user

behaviour, and became obsolete as soon as a persona's processes changed. The author provided a "quantitative bottom-up data-driven method" for persona creation to solve these constraints. The author first immediately integrated customer behaviour through clicks obtained automatically from telemetry data connected to the real product usage in the field; as the information gathering was automated it was also cost-effective. Finally, the author generated five sample personas using mixed models, a statistical method that takes into account these clustering operations; updating the mixed model guarantees that these personas stay up to date. To confirm that workflows and persona objectives accurately reflect real product usage, the author further verified these personas using the product's user behaviour specialists.

Kalia, P. et al. (2017) examined those sales from businesses to consumers (B2C) had reached $1.92 trillion globally. To sustain and improve their operations, businesses are implementing modern communication and information technology every day. In a cutthroat market, attracting new consumers was becoming difficult. As a result, keeping existing clients were crucial for survival. Higher customer satisfaction had been linked to future profitability, repeat business, and good word of mouth, according to studies.

Male, A. (2018) stated that the research aimed to comprehend the variables affecting customers' decisions of purchasing online and how these variables impacted customer satisfaction. According to the research, consumers who shop online wanted clear information about the products and services consumers are purchasing. Consumers also value convenience, time savings, security, and timely delivery. Online shoppers were not drawn to offers featuring the catchphrase "Attractive offers".

Alotaibi, K. et al. (2018) claimed that the study used a modified version of the "American Consumer Satisfaction Index model" to assess the level of satisfaction of the customer with Saudi Arabia's e-commerce system. According to the findings, customer satisfaction with the e-commerce system is primarily determined by the quality of the e-commerce service, especially among Saudi Arabian online shoppers who have more concerns about the e-commerce service, particularly those related to confidentiality and transaction method.

Mijac, T., et al. (2018) found that marketing has made extensive utilization of the idea of personas, which stand in for the main target segments of a service, product, website, or brand. Personas have employed a lot in the design and development of digital services these days. But while creating realistic personas, designers, and developers often make the following mistakes and face these problems. Specifically, personas may sometimes be created using irrelevant data (such as a statistically unimportant dataset), or they can be created using assumptions, inadequate examinations, or most often intuitively. Personas cannot be modified simply after they have been formed, which was another problem. The employ of big data technologies to tackle these problems has enormous potential. It allowed for the analysis of vast volumes of data to reveal genuine user behaviour patterns that improve corporate choices. The study examined the potential for creating data-driven online personas based on actual user data, intending to reduce the time required for data gathering compared to existing approaches and facilitating simpler updates. A dataset from an e-business website was used to show the preliminary investigation. The study findings demonstrated the enormous potential of creating data-driven online personas based only on interactions between actual users and a website store, but also on several problems that have been found throughout the process.

Ghasemaghaei, M. & Calic, G. (2019) developed around the principles of organizational "learning theory and gestalt insight learning theory," the author gathered information from "middle and top-level managers to examine the effects of each big data attribute (including data volume, velocity, variety, and veracity) on firm innovation competence (i.e., exploitation competency and exploration competency), negotiated through data-driven insight generation (i.e., descriptive insight, predictive insight, and prescriptive insight)." The study concluded that although data variety, veracity, and velocity improve the creation of data-driven insights, data amount has little bearing on this process. The post hoc analysis's findings also showed that although prescriptive insight did not affect innovation competence, descriptive and predictive insight both increase it. These findings provided innovative and interesting theoretical and practical insights.

Shanmuganathan, M. (2019) looked at the repositioned shared services paradigm as "Integrated Business Services (IBS)," which changed the operational and organizational structure of shared services towards a "functional-based and process-driven service delivery philosophy." The explanation for integrating services and data-driven firm's models is to comprehend the big data phenomenon in terms of how data must be treated in relation to data collection, analysis, and customer behaviour patterns as well as a perceived value proposition to enhance services using IBS models. Researchers have found that IBS was a development of business servitization that integrates service and technology to provide customers with a much higher value. In addition, a case study for an Italian bank resembling UniCredit was conducted based on literature and the IBS model to determine the extent to which they have created their firm lines and service lines to offer "multi-service with data-driven insights, utilizing the same resources, networks, and customers."

Sundstrom, M. (2019) stated that despite the fact that modern e-commerce retailing practices exhibit an understanding of how to gather and oversee large data, e-commerce struggles with the organizational mindset to concentrate on data-driven innovation. The author of this viewpoint study examined an action-research study conducted by a Swedish e-commerce retailer, discussed how to shift one's perspective to emphasize data-driven innovation, and highlighted the outcomes of such a change. The author explained how data analytics improved new processes and sparked an environment of data-driven decision-making inside e-commerce firms while demystifying the rather difficult notion of data-driven innovation within those companies with rich empirical data. The study revealed that by using socio-technical resources as well as creativity and teamwork, the atmosphere may be transformed.

Gajewska, T. et al. (2019) suggested that the study enabled both the development of a company's strategy and the understanding of opinions and expectations regarding the caliber of services offered in the study area. Reliability continues to be the greatest significant gauge of the calibres of services of e-commerce (weighting 14 0.34). However, there is a 0.20 difference in opinion that stands out when compared to Berry and Parasuraman's team's tangible elements index scores. The study’s goal was to give the findings of surveys on the subject of the calibre of e-commerce services. The standards for e-commerce service quality were determined. On this foundation, a hierarchy of the standards for the quality of e-commerce service that had been chosen was suggested. Customers appreciated the guarantee/safety component the greatest, as seen by a contrast between the unweighted results and Servqual weighted. Therefore, it is reasonable to assume that customers viewed e-commerce services as more trustworthy and reliable, as evidenced by the rising trends in the projections for e-commerce services in Poland.

Vasić, N. et al. (2019) found that several factors directly influenced how satisfied online shoppers were. This problem was particularly important for less developed economies because there is less online shopping in such countries. To increase participation in online commerce, it was critical to explore and analyze the relationship between customer happiness and a variety of factors. The study suggested a model that determined the impact of particular online purchase parameters on the degree of consumer satisfaction in the Serbian market. Customer satisfaction in online buying in the Serbian market directly depends on the factors of security, information accessibility, shipping, quality, pricing, and time, according to the acquired result analysis, which supported the fundamental research hypotheses.

Abumalloh, R. et al. (2020) stated that due to its versatility and user-friendliness for both consumers and service providers, e-commerce was increasingly playing a significant role in the global economic system. To effectively direct customers to view other products offered by e-commerce portals, recommender systems are included in the majority of contemporary e-commerce websites. Depending on the consumers' current activities or preferences listed in their profiles, these things were matched with their interests. Most recommender systems had been created to take that feature into account since service providers are more concerned with customers' long-term behaviour and, specifically, customer loyalty (which directly affects the long-term performance of e-commerce websites). Through an e-commerce recommender agent, the study looked into the key elements that contributed to female online shoppers developing brand loyalty. The development, introduction, and analysis of a new paradigm for enhancing e-commerce consumer loyalty through recommender systems are discussed. One may highlight study outcomes and comprehend research constructs based on the significance of the findings, which will aid in more efficient recommender system management.

Camilleri, M. A. (2020) recognized that recent technical developments were transforming how businesses gather, analyze, and share data from specific customers' online behaviours. As a consequence, the contribution assessed critically the most current developments in "big data analytics and programmatic advertising." The use of blockchain, a distributed ledger technology that permits secure, verifiable transactions between market participants, was also made clear. The findings showed that service providers were increasingly adopting "data-driven technologies, such as programmatic advertising tools, to target and retarget customers" on the Internet or via mobile devices. As a result of their frequent refusal to allow marketers to monitor them and provide them with adverts, people, and organizations were nonetheless becoming more conscious of data privacy problems. The study offered a theoretical framework that explains how, why, where, and when professionals collect, analyze, and distribute data. All things considered; it appeared data-driven technologies were enabling organizations' customer-centric marketing.

Deligiannis, A. & Argyriou, C. (2020) discussed that customer churn, or the loss of current customers, is one of the key objectives of customer relationship management. The study presented a prototype method to calculate a constantly updated indication of the likelihood that an existing customer would stop making purchases from a subscription commerce firm. The inquiry was primarily concerned with the situation of recurring customers of subscription commerce items that need to be replaced or restocked regularly. The goal was to assist marketers in taking focused, proactive retention measures by grouping dependable consumers into units with comparable anticipated churn risks. The suggested technique uses historical "purchase transaction data and subscription-based business logic to recalculate" the chance of churn for each client regularly. The author outlined each step-in detail, including data collecting, feature engineering, and algorithm design. The performance of the algorithm was also assessed, and the findings are based on a pilot

test that was conducted on an online retailer of consumables. The findings indicated that independent of the risk category to which they belong, the suggested algorithm has a strong potential to capture the purchase intents of regular customers.

Gawankar, S. A., et al. (2020) examined by using digital technologies like the "Internet of things and big data analytics," conventional retail supply chains have been converted into "data-driven supply chains known as Retail 4.0." "These big data-driven retail supply chains" have the benefit of offering better goods and services while improving the purchasing experience for customers. The retail sector in India was extremely competitive and keen to change to a retail 4.0 environment. Since the literature on big data in the supply chain has mostly focused on applications in the industrial sectors, an additional study was required to determine how big data-driven retail supply networks impact supply chain performance. Hence, the objective of the study was to ascertain how the Indian retailing 4.0 scenario was affecting the current supply chain performance indicators and how it has impacted organizational performance. For retail supply chain professionals considering BDA expenditures, the study's results provide useful insights. The governmental structure was used as a moderating factor in the study. The results were provided together with managerial implications and potential areas for further study.

Awan, U., et al. (2021) stated that "big data analytics (BDA)" was a ground-breaking strategy for wise decision-making in firms that has the potential to significantly alter and promote "the circular economy (CE)." Although recognizing the allowing role of data-driven insights for supporting decision-making and, subsequently, improving CE performance, has received little emphasis in the present literature on BDA capabilities. The author claimed that firms use "data-driven insights, business intelligence and analytics (BI&A), and BDA" capacity to drive decision-making quality.

The link between BDA capacity and CE performance was experimentally researched in the study, and it also looked at how data-driven insights serve as a mediator in the interaction between BDA capabilities and decision-making. “Partially least squares structural equation modelling” was used to examine the data. The outcome showed that BI&A and BDA abilities have a favourable relationship with decision-making quality. When the creator used insights derived from data, the impact was amplified. The findings showed that BDA's ability promotes the quality of decisions made in firms and that data-driven insights did not mitigate this connection. Through data-driven insights, BI&A was linked to high-quality decision-making. These results provided crucial information to managers since they may serve as a model for creating data-driven insights using the CE paradigm in firms.

Cao, P. (2021) emphasized that firms have given Big Data an increasing amount of significance since 2012 in the age of exploding data. To achieve a competitive edge, firms use big data analytics to make data-driven choices in various areas of the firm. The study primarily analysed the ways that e-commerce firms utilize big data analytics to increase customer acquisition and retention and offered a workable methodology for doing so based on a case study of Walmart. Additionally, it highlighted the drawbacks and issues with employing big data in the last part to remind businesses to do so. It was important to note that while Walmart was primarily studied in the study because of its inherent benefits of having easy access to a wealth of internal customer data, the conclusion, framework, and approach can be applied to other kinds of firms. In addition, it has been noted that some firms were still having difficulty integrating big data analytics into their ecosystem during the pandemic that was forcing businesses to transfer their operations online to survive. The study might offer some motivation for such businesses to utilize big data technology.

Hadiantini, R. & Hendrayati, H. (2021) found that e-commerce was a firm idea that used the Internet to conduct transactions and was implemented digitally to ease corporate and personal interactions. E-commerce refers to the distribution, sale, purchasing, promotion, and repair of a product conducted using an electronic system, namely the Internet. Indonesia has an extremely competitive e-commerce market since many foreign e-commerce firms also compete and want to dominate Indonesia. The importance of "customer value, customer experience, user experience, brand image, pricing, productivity, service quality, and trust" in customer happiness would be classified in the study. Descriptive analysis was used in the study to identify the variables that influence how satisfied customers have been with their online purchasing experiences. The method utilized in the study was the cross-section strategy, in which each study was only conducted once, and the variable is only measured using fleeting observations or for a certain length of time. The study focused on participants who had made an online purchase via e-commerce, either directly through the website or a mobile application. The findings of the data analysis demonstrated that there were factors that have a major impact on customer satisfaction. "User experience, customer experience, promotion, service quality, brand image, customer value, trust, and pricing" all contribute to the amount of influence attained. "User experience has a 15.3% effect, customer experiences a 13.9%, promotion a 7.5%, service quality a 27.6%, brand image a 27.4%, customer value an 18.4%, trust a 10.15 and pricing a 1.2%."

Mishra, S. J., et al. (2021) stated that online shopping, sometimes known as e-shopping, is a kind of electronic commerce that enables users of various web browsers to make direct purchases of products and services from sellers on the Internet. The development of Internet purchasing has made it possible to provide businesses with a competitive edge. Online shopping has become more popular over the years, mostly because consumers find it convenient and can do it from the comfort of their

homes or places of employment. Thus, the study investigated how satisfied customers are with FLIPKART's online purchasing experience. The study focused on the preferences, satisfaction levels, and issues facing Flipkart's online retailers. Primary data were the foundation of the study. The samples for the investigation were chosen using the random sampling approach. The study's results were helpful for determining the degree of customer satisfaction based on the goods and websites that consumers have used. The study was conducted with the use of a standardized questionnaire. In the study, the author sought to understand the factors that influence people's decisions about using Flipkart as well as whether the respondents were aware of the company's cutting-edge deals and services.

Najdawi, A. & Karan Patkuri, S. (2021) found an updated perspective of the business intelligence process in general and how the operational data were turned into useful insights to improve business process design and gain strategic competitive advantage. The present study evaluated earlier research on adopting and putting into practice data-driven techniques for wise decision-making utilizing “cutting-edge technologies including Applied Artificial Intelligence,” Machine Learning, and Big Data Analytics. The contribution of the study was an updated conceptual framework of the contemporary business intelligence process built with the use of idea-mapping software. Such a conceptual framework provided a new perspective on upcoming research initiatives in this field and assist BI professionals and firms in planning, developing, and putting into practice big data strategies to outperform their rivals in decision-making and creativity. The study also examined the process of making intelligent business choices, as well as the numerous tools and methods that may be employed.

Painuly, S., et al. (2021) analysed the impact of internet apps has changed significantly over the last few years, as has the number of data created by all of them in various sorts, enormous quantities, and complexity, as well as a sizeable amount of organized and unstructured data identified as big data. Big data is the term used to describe vast volumes of data that have undergone analysis and many computations in an effort to identify patterns, trends, and particular links. The conversion of the data into useful knowledge required big data analytics. Big data analytics fundamentally changed e-commerce applications in the next years. A successful e-commerce management system now requires the utilization of big data analytics, which has fast become essential. The study's main objective was to examine big data, problems, and difficulties while also examining several Big Data technologies.

Reddy, J. M. & Prasad, S. V. A. V. (2021) found that the e-commerce sector is a dynamic one, due to the quickly evolving technology. E-commerce was essential to commercial practices in the exchange of goods and services. It offered exceptional advantages for the commercial development of the nation's economy. For the purpose of extracting relevant information from larger databases, e-commerce firms were spending a lot of money on data analytics. The e-commerce firm needed data-driven business analytics to analyze changing consumer preferences and market trends. Data analytics' use in e-commerce has aided the industry's development and advancement. To analyze and anticipate industry trends and gain a competitive advantage, e-commerce analytics was developed. E-commerce may also provide some significant obstacles in addition to its advantages. The study emphasized the value that data analytics was thought to have for the e-commerce firm in terms of gaining a competitive edge.

Sarker, I. H. (2021) stated that in the present “age of the Fourth Industrial Revolution (Industry 4.0 or 4IR), there was a plethora of data available in the digital world, including Internet of Things (IoT) data, business data, health data, mobile data, urban data, security data, and many more.” Making informed decisions may be achieved in a variety of application fields by obtaining knowledge or practical insights from this data. “Advanced analytics methods, such as machine learning models, may provide insightful information or a deeper comprehension of data in the area of data science, making the computer process autonomous and intelligent.” In the study, the author provided a thorough understanding of Data Science that includes numerous sorts of cutting-edge analytics techniques that may be utilized to enhance an application's intelligence and capabilities via wise decision-making in diverse situations. Additionally, the author discussed and summarized “possible real-world application fields, including business, healthcare, cybersecurity, urban and rural data science, and more, by using data-driven smart computing and decision-making.” Finally, based on this, the author identified the difficulties and probable future avenues for the study. As a whole, the objective of the study was to provide academics, decision-makers, and application developers with references on data science and advanced analytics, especially from the perspective of data-driven solutions to issues that arise in the real world.

Shankar, A., & Behl, A. (2021) examined how consumers of mobile wallet (m-wallet) systems perceive them, utilizing a data-driven mixed-method approach. To investigate the main factors influencing customers' experiences with the m-wallet platform, qualitative research utilizing 4789 customer evaluations was conducted. To further confirm the results of the exploratory investigation, answers were gathered using an online survey. The findings revealed that the main factors influencing customers' experience on m-wallet platforms were “interaction, privacy and security, convenience, and contact.” The study's results add to the body of knowledge on mobile payments

by examining crucial elements affecting customer satisfaction in the context of mobile wallets. The study's results have the potential to help advertisers in enhancing the customer experience on m-wallet systems.

Suh, T., et al. (2021) stated that practitioners and academics require a deeper knowledge of advertising impacts in ecologically valid contexts due to the increased integration of digital technologies into advertising and e-commerce. In order to evaluate various forms of visual attention for location-based advertising in a digital marketing setting, the in-market study focused on gender disparities. The study utilized a data-driven scientific method to show how gender disparities may be used to analyze how consumers see various advertising materials and what they prefer. According to the findings, gender relations were intricate. On the one hand, the study demonstrated that female consumers were more likely to react to gaze signals and pay attention to location-based advertising if other people were looking at the advertisement. However, compared to female consumers, men shoppers exhibit longer remaining and focus periods. The author observed that gender was still a significant component in determining the first visual attention to promotional information in place-based advertising, even though some detailed findings are ambiguous.

Tsagkias, M., et al. (2021) viewed that academic study in the eCommerce space has gained impetus with the quick uptake of online commerce. Although there were still a number of key research hurdles, ranging from traditional eCommerce search issues like “matching textual searches to multi-modal documents and ranking optimization for two-sided markets to human-computer interaction (HCI) and recommender systems for browsing and discovery.” “Understanding consumer behaviour, encouraging engagement, and enhancing product discovery and conversion” were all

impacted by these study fields. In the study, the author outlined the difficulties and research prospects for enhancing the shopping experience on eCommerce sites.

Wang, X., et al. (2021) discussed that one of the most crucial tools for advancing smart customization is big data. Manufacturers may provide on-demand and customized items due to access to data from many sources. whereas the study on smart customization has prioritized data produced from the real world rather than virtual models. Physical data was restricted by what has already happened, making it difficult to identify fresh opportunities to increase consumer happiness. To accomplish this merging of real and virtual things, a new technique called digital twin was developed. The process became more flexible, adaptive, and predictive when a digital twin was included in the model of existing data-driven smart customization. In the study, a novel paradigm for data-driven smart customization using digital twins was presented. All stakeholders' enhanced participation in the customization process was the goal of the new framework. The effectiveness of the suggested framework was shown through a case study of the elevator sector.

Xu, X., et al. (2021) examined the position of "collection and delivery points (CDPs)," which were influenced by data on customer demand, and was crucial for online merchants. The optimization of collecting and delivery locations for online merchants required new models that integrate with consumer behaviour data analysis, while a prior study on delivery point optimization has not included customer behaviour data. The author created two facility location models based on the estimated findings in order to optimize the locations of the unattended and attended CDPs to save costs. The degree of customer service and location costs were quantitatively analysed by the numerical trials. The study findings may also help online merchants in choosing the best CDPs by balancing the degree of customer service and the overall logistics cost. The study makes two

interesting contributions: (i) to examine actual customer behaviour data and discover that the gradient increasing trees algorithm performs better than the other four algorithms when assessing customers' purchase probabilities, and (ii) to suggest a novel data-driven approach that combines "data mining models and facility location models to identify CDP locations for online retailers."

Ye, Y. & Yang, X. (2021) declared that in the data-rich world of today, "decision-makers" may utilize not only "external explanatory variables (i.e., features)" but also demand observations to address the newsvendor issue without utilizing the "traditional demand distribution assumption," which has been gaining attention and resulting in "so-called new data-driven approaches." The research provided an enhanced new data-driven approach grounded on "Sample Average Approximation and the nonparametric machine learning" methodology to oversee the newsvendor issue with target service level limitation that was experienced by the front distribution centre of e-commerce firms. The performances achieved by the methodology and those implemented by other widely used approaches are then compared via numerical tests established on the actual dataset of a big e-commerce firm. The study discovered that, particularly when the target service level is higher than 80%, the approach can reduce surplus inventory levels while achieving higher service levels, which offered useful guidance for the front distribution centre inventory decision of the e-commerce firm in the big data environment.

Sharma, G. (2021) claimed that online shopping was the act of customers transacting with a vendor face-to-face and directly to buy products, services, etc. online. The main goal was to research elements that affect customer satisfaction with online shopping in the Kathmandu valley as well as to gauge satisfaction levels. The majority of respondents fell within the 18 to 24 age range, with 69% of all respondents being men and the majority of respondents having bachelor's degrees. The

majority of respondents (53.5%) were Hindu, and more (56% of them) came from nuclear families. With a p-value of 0.05, it was determined that criteria such as family type, religion, monthly income, and level of education were statistically significant when compared to internet purchasing. Of all respondents, 63% were very satisfied with their online purchasing experiences, while 37% were just moderately satisfied. The products that different age groups and genders like should be taken into account by online retailers. Quality items, quick delivery, and a simple return policy are all things those online retailers should prioritize to maximize customer happiness.

Ratih, H. et al. (2021) claimed that the term “e-commerce” refers to a business model that utilizes the internet to carry out transactions and is used digitally to facilitate interactions between firms and customers. E-commerce is the term used to describe the online distribution, sale, purchase, advertising, and service of a product. According to their respective relevance, the value of a customer, experience of the customer, experience of the user, brand recognition, pricing, profitability, quality of service, as well as faith in customer satisfaction were all categorized. The results of the data analysis showed that several variables significantly affect consumer satisfaction. Brand image, promotion, service quality, customer experience, User experience, customer value, trust, and price all contribute to the amount of influence attained. The result suggested that internet shoppers place a high value on the services consumers received.

Frederick, D. P. (2022) examined the pleasure of customers with online purchasing and their understanding of the issues customers encountered. According to the study's findings, customer satisfaction was influenced by perceived value, service quality, and system quality. However, according to the IPMA study, service quality still needed improvement. According to the study's

findings, customer satisfaction was influenced by perceived value, service quality, and system quality. However, according to an IPMA study, service quality had to be improved.

Al-Ayed, S. (2022) claimed that the future of global trade lies in e-commerce and online purchasing, making it even more crucial to develop and keep client loyalty in these marketplaces. The study attempted to identify factors affecting the value of online trade in the Saudi setting. The study has also investigated how these characteristics affect the loyalty of E-customers. The findings demonstrated that the factors—Care, Character, Choice, Convenience, Customization, and Cultivation—had a favourable effect on fostering E-customer loyalty. In general, e-commerce was seen as a pioneer in commercial organizations today, as evidenced by its expanding market share and increasing profitability due to its concentration on e-loyalty customers. E-commerce is essentially considered a leader in modern business enterprises, as seen by its developing market share and increasing earnings thanks to its concentration on E-loyalty customers. The author concluded that a variety of electronic possibilities, including personalization, interpersonal engagement, agriculture, sponsorship, community, choice, and personality, influenced how devoted customers behaved online. Values in the perception of e-commerce are among the factors that the current study and other investigations both confirmed**.**

Kui, X. (2022) viewed that the emergence of the big data age has sparked a profound wave of change across a wide range of industries. Enterprises have come under tremendous pressure due to the exponential expansion of data, which has also sparked the emergence of data-driven business. Processing, analyzing, and mining large data were the fundamental capabilities of e-commerce information systems. The study looked at the characteristics of big data in e-commerce, in-depth analysed the connection between e-commerce and big data analysis and then talked about the

relevance and importance of big data analysis in e-commerce impact. The study focused on how big data analysis may advance e-commerce marketing. The study focused on the platform's core technology and the accompanying data analysis process modules as it presents the design concepts and plans for a full practice platform for e-commerce big data analysis. The study also emphasized elaborating on the e-commerce big data index system. The big data-driven e-commerce operation may be enhanced, as well as the effectiveness and performance, via a study on the index system of the analysis of e-commerce big data. To offer a resource for fostering the growth of e-commerce against the backdrop of big data, the study's last section focused on specific application strategies of big data analysis in e-commerce.

Sazu, M. H. (2022) examined that big data was a competitive advantage, according to the literature, which enhanced a company's entire performance. E-commerce firms were utilizing the tools provided by the growth of big data (BD) to interact with consumers more, provide better goods, and innovate more in order to gain a competitive edge. Nevertheless, earlier empirical investigations produced contrasting findings. To investigate how BD and BD analytics capacity affect innovation outcomes in e-commerce enterprises, the author developed a model based on the capital-based viewpoint and the firm's inertia concept. The author demonstrated a trade-off between BD and BD analytics capabilities, in which the ideal balance of BD relies on the degree of BD analytics capability. The more effective BD analytics is in moderating the effect of BD on gross margin and sales growth, the greater this benefit will be. BD and sales innovation were related in an inverted U pattern for U.S. innovation tasks. When significant data capital was little, boosting big data analytics capacity enhances sales innovation and gross margin up to a certain degree for Asian innovation jobs.

Valdez Mendia, J. M. & Flores-Cuautle, J. D. J. A. (2022) found that physical and digital touchpoints for connecting with consumers were combined in today's omnichannel business concepts. A hyper-personalization organizational strategy was implemented with the dual goals of increasing the number of customers feeling such experiences and delivering individualized experiences. The firm's ability to gather and customize consumer data was necessary for a hyper-personalization plan. For this to happen, a hyper-personalization approach needs four components: a database, choices, design, and distribution. While accurate customer identification was necessary for customer master data management, true customer insight can only be obtained when three different forms of customer data were collected: "identity, contact ability, and traceability (I, C, T)," which satisfied the first need of a hyper-strategy. When real-time touchpoints were connected to a customer, the study aimed to highlight the advantages for all of the customers who may benefit from a hyper-personalization plan. Integrating the three forms of consumer data with master data management.

Vu, H. T. M., et al. (2022) determined how chatbot characteristics affect the customer experience in e-commerce. Through chatbots, artificial intelligence (AI) has transformed the e-commerce experience and provided new avenues for firm communication with consumers. To investigate the effects of usability, responsiveness, perceived trust, accessibility, and empathy on customer satisfaction, a quantitative method was used. Regression analysis was used by SPSS to evaluate empirical data that was gathered via an online survey. The findings show that usability, perceived trust, and empathy have considerable beneficial impacts on customer satisfaction, opening the door for more studies to further the field's understanding. The study also offered managers, chatbot designers, and customer service departments useful tips for raising customer happiness and upgrading chatbots.

Mandura, E. (2023) developed a data-driven marketing plan for the e-commerce shoe brand Lovidovi Shoes. A performance improvement was described by the firm as a rise in sales when discussing their digital marketing activities. Despite studies into general best practices for effective Facebook Business advertising, since every firm was different and internal research was still the only sure way to get the greatest results. To find the ideal audience and ad settings, data gathered over a seven-year period was first consolidated, and then it was examined using programs like Power BI and Python. Through testing, conclusions drawn from the initial data were revised and improved. The outcome showed that the most effective advertisements targeted a group of women of various ages. With the highest sales volume and lowest cost per purchase, Bosnia and Herzegovina was the brand's most successful market. The finest reactions come from Facebook and Instagram's feed placement, and the white sneakers category's items were the top sales. The advertisements produced as part of this project performed much better than average by corporate standards and below average by industry norms. The organization has been inspired to use its data more and better as a result of this effort, which created a straightforward manual on how to start shifting toward data-driven marketing strategies on a limited budget.

Sharma, D., et al. (2023) found that the use of "big data analytics in e-commerce" has gained popularity in the modern world. Despite its increasing significance, the idea of "big data analytics in e-commerce" has not been properly explored, which limits the field's ability to progress theoretically and practically. E-commerce businesses have become more data-driven and have been making better business choices with the help of data science. By reviewing prior studies on the topic, the study evaluated the effects of "big data analytics and data science on the e-commerce firm." The study provided an analytical framework that looks at the definitional components, "unique characteristics, types, business values, and challenges of big data analytics" from the perspective of

e-commerce. The study also opened the discussion for potential future study prospects and emphasized the need for further study in the fields of theory and practice. As a whole, the study's conclusions combine many big data analytics techniques to provide a fuller knowledge of the presentations in the e-commerce firm.

Literature Review Summary

Author Name	**Technique Used**	**Outcome**
Anil Bilgihan. Jay Kandampully & Tingting Christina Zhang (2015)	By combining existing research on consumer behaviour and e-commerce	Results found that criteria such as ease of locating the website or app, usability, perceived utility, hedonic and functional features, enjoyment, personalization, social interactions, and multi-device compatibility precede the unified online customer experience. A compelling online consumer experience generates brand engagement, positive word-of-mouth, and repeat business.
Prateek Kalia, Navdeep kaur & Tejinderpal Singh (2017)	This paper integrated diverse studies to provide a conceptual basis for understanding the research.	Study concluded that increased future profitability, repeat business, plus good word of mouth is all positively correlated with higher customer satisfaction. Numerous studies have been done to understand contentment

		and how it relates to other ideas. This paper combines these various studies to offer a conceptual framework for comprehending current research.
Ankit Male (2018)	Percentage Analysis and Chi Square tests	Results showed that somehow the investigation may be very useful for companies intending to enter or develop into the online purchasing arena.
Alotaibi Khalid, Ook Lee, Minkyong Choi, Jongchang Ahn (2018).	Bartlett's Test of Sphericity and Kaiser-Meyer-Olkin	Outcomes from the study were, Saudi Arabian online shoppers asserted that the quality of the e-commerce service is the most important determinant of customer satisfaction with the e-commerce system, as Saudi Arabian online shoppers are more concerned with the e-commerce service, particularly in terms of confidentiality and transaction method.
Nebojša Vasić, Milorad Kilibarda& Tanja Kaurin (2019)	Confirmatory factor analysis (CFA)& Partial Least Squares (PLS)	In the Serbian market, the following factors directly affect customer satisfaction with online shopping: security, information accessibility, shipping, product quality, cost, and turnaround time.

Teresa Gajewska, Dominik Zimon, Grzegorz Kaczor& Peter Madzík (2019)	Bivariate correlation	As a result, it is reasonable to assume that customers will view e-commerce services as more trustworthy and reliable over time. This expectation is supported by the rising trends in e-commerce service forecasts.
Rabab Ali Abumalloh, Othman Ibrahim & Mehrbakhsh Nilashi (2020)	Factor analysis, path analysis, multiple regression analysis, and Robust Methodology.	The results showed that, the development, introduction, and analysis of a new paradigm for enhancing e-commerce consumer loyalty through recommender systems are discussed. One may highlight study outcomes and comprehend research constructs based on the significance of the findings, which will aid in more efficient recommender system management
Gajendra Sharma (2021)	Face-to-face interviews were conducted as part of the data-gathering process using a structured questionnaire. One sociodemographic question asks about gender, age, profession, education,	The products that a variety of ages and genders like should be taken into account by online retailers. Online retailers should put more of an emphasis on offering high-quality goods, quick shipping, and a simple return process because these factors will help users be more satisfied.

	religion, and monthly income. Client anticipations Satisfaction level; as well as Likert scale.	
Ratih Hadiantini, Silalahi & H Hendrayati (2021)	SPSS	The results of the data analysis showed that several variables significantly affect consumer happiness. Brand image, promotion, service quality, customer experience, User experience , customer value, trust, and price all contribute to the amount of influence attained. The result showed that online shoppers highly value the services provided
Dr. Somabhusana Janakiballav Mishra, Prof. Debasish Rout, Dr. Sushree Sangita Ray& Dr. Ranjan Kumar Kantha (2021)	Chi-square test	Outcomes stated that the opinion of the customers differs concerning all the factors. Opinions are not the same for online shopping concerning different factors considered for online shopping.
Dsouza, Prima Frederick, (2022)	IPMA analysis and measurement and structural	According to the study's findings, customer satisfaction is influenced by perceived value, service quality, and

	models were developed as statistical techniques.	system quality. However, according to the IPMA study, service quality still needs improvement.
Sura Al-Ayed (2022)	Pearson's correlation coefficients,	Results showed that a variety of electronic possibilities, including personalization, interpersonal engagement, agriculture, sponsorship, community, choice, and personality, influenced how devoted customers behaved online. Values in the perception of e-commerce are among the factors that the current study and other investigations both confirmed.

2.3 Research Gap

To fill the gap left by most authors skipping over some crucial parts of the current study in earlier studies, the study is focusing on data-driven insights to enhance the customer experience in e-commerce firms. However, previous studies were creating a conceptual framework regarding a truly united online shopping experience. Key elements that shape online customer loyalty, which also covered certain factors like user experience, customer experience, brand recognition, price, productivity, service quality, as well as confidence. The author emphasizes that the current study has not been carried out in India. So, with the help of data-driven insights, the e-commerce firm to improve the customer experience. Hence careful study is essential in this regard.

CHAPTER 3

RESEARCH METHODOLOGY

3. RESEARCH METHODOLOGY

3.1 Overview

The term “Research Methodology” pertains to the scientific and methodological strategies employed to get current study findings and advancements, which are afterward utilized to evaluate the credibility of assertions. The investigation of a problem, concern, or matter involves the utilization of the most up-to-date research following the scientific method. In common parlance, the term “research” commonly denotes the process of investigating and acquiring knowledge. The primary objective of the real search is to acquire knowledge through comprehensive inquiry, assessment, juxtaposition, and empirical exploration. Research is fundamentally a systematic approach to identifying a resolution to a problem.

The research technique employed in this study, titled “Data-driven insights for enhancing customer experience in an e-commerce organization,” will concentrate on the systematic methodology employed to collect, analyze, and interpret pertinent data to improve the customer experience. The study starts by delineating the research plan, which may encompass a combination of quantitative and qualitative methodologies to ensure a full understanding. The subsequent section provides a comprehensive overview of the data-gathering procedure, encompassing several sources of data, such as customer comments, transaction records, and website interactions.

The focus will be on the utilization of data analysis tools, including statistical analysis and data mining, to detect patterns and trends that provide significant insights into client preferences and behaviour. The study further examines ethical aspects and implements data privacy safeguards to ensure compliance with legal requirements and the protection of consumers' privacy rights. By utilizing data-driven insights, companies in the e-commerce industry can make well-informed decisions and execute focused plans to enhance the consumer

experience. This ultimately leads to increased happiness, loyalty, and overall business expansion. The focus of this chapter revolves around the analysis of the study, including the researcher's technique and framework employed to develop the findings. Furthermore, the current study outlines the research approach utilized. The current chapter offers a comprehensive examination of the essential elements of research, encompassing research methodology and tactics, alongside the research investigation's aims and hypotheses.

3.2 Operational Terms

i. Customer Buying Behavior

Consumer purchasing behaviour encompasses the many steps undertaken by customers, both in physical and digital environments, before purchasing a particular product or service. This procedure may involve utilizing search engines, interacting with social media posts, or engaging in many other activities. Understanding this process is of great importance for organizations as it enables them to effectively customize their marketing campaigns based on prior successful consumer-influencing marketing endeavours.

ii. Customer’s Experience

Customer experience encompasses all aspects of an organization's offering, such as customer care quality, marketing, packaging, goods and services, features, usability, and dependability. However, a limited number of individuals accountable for these actions have not thoroughly contemplated the collective impact of their respective choices on the overall customer experience. To the degree that individuals contemplate this matter, they own distinct conceptions regarding the definition of customer experience, and there is no higher-ranking authority overseeing the collective endeavours.

iii. Customers

A customer refers to an individual or organization that engages in the acquisition, utilization, or purchase of a product or service while possessing the ability to exercise discretion in selecting among a range of available commodities and providers. The primary objective of any commercial company is to effectively engage consumers or clients and incentivize them to make purchases of the products or services being offered. Additionally, they make efforts to incentivize individuals to maintain their patronage.

iv. Data

In a broad sense, data refers to discrete units of information that are collected and interpreted for a specific objective. The value of data to both computers and people is contingent upon its adherence to a specified formatting standard. Data can manifest in several formats, including electronic memory containing bits and bytes, physical records in the form of numbers or text on paper, or cognitive representations within an individual's mind. Since the advent of computers, individuals have employed the term “data” to denote computerized information, which is then communicated or stored.

v. Data-driven Insights

Data-driven insights pertain to the utilization of data and analytical techniques to educate and guide decision-making processes within the realm of marketing. The process entails the examination of substantial quantities of data to discern patterns, trends, and valuable insights that can facilitate the formulation of well-informed judgments. Through the process of data analysis, marketers can discern client pain points, preferences, and purchasing behaviours, enabling them to customize their marketing campaigns accordingly to address these specific requirements. Moreover, the utilization of data-driven insights serves as a foundation for evaluating the efficacy of marketing efforts.

vi. E-Commerce

Electronic commerce, or e-commerce, refers to commercial transactions carried out by organizations and individuals using the Internet for the exchange of products and services. E-commerce covers various market sectors and can be conducted via a variety of electronic devices such as desktops, laptops, mobile phones, and other smart gadgets. Consumers can easily access a variety of items and services, including music, literature, air travel, stock investing, and online banking, through e-commerce transactions. Hence, it is commonly seen as an extremely disruptive innovation.

vii. Purchase Intention

Purchase intent, alternatively referred to as buyer intent pertains to the degree to which individuals are inclined and willing to engage in the purchase of a specific product or service from a particular entity within a defined timeframe, often spanning a duration of 6 to 12 months. The concept of purchase intent facilitates the process of making effective selections in several domains of your organization. Additionally, this facilitates the identification of areas on which salespeople should concentrate their efforts. Selling products or services to clients who lack the intention to make a purchase might pose significant challenges in fulfilling the offer.

3.3 Need of the study

The significance of the exploratory research titled “Data-driven insights to enhance the customer experience in E-commerce” lies in its ability to provide valuable insights into how data-driven techniques may effectively increase customer happiness and foster loyalty within the highly competitive E-commerce industry. E-commerce enterprises may efficiently satisfy client expectations by discerning customer preferences, behaviour patterns, and pain spots, enabling them to customize their offers and services accordingly. The objective of this study is to provide managerial insights, ethical data practices, and appropriate metrics for evaluating customer experience enhancements. The purpose is to assist decision-makers in formulating customer-centric strategies that promote corporate development and increased profitability. Furthermore, this phenomenon has the potential to generate novel avenues for study, enabling deeper exploration of the effects of data-driven insights on consumer happiness and loyalty within the context of E-commerce.

3.4 Conceptual Framework

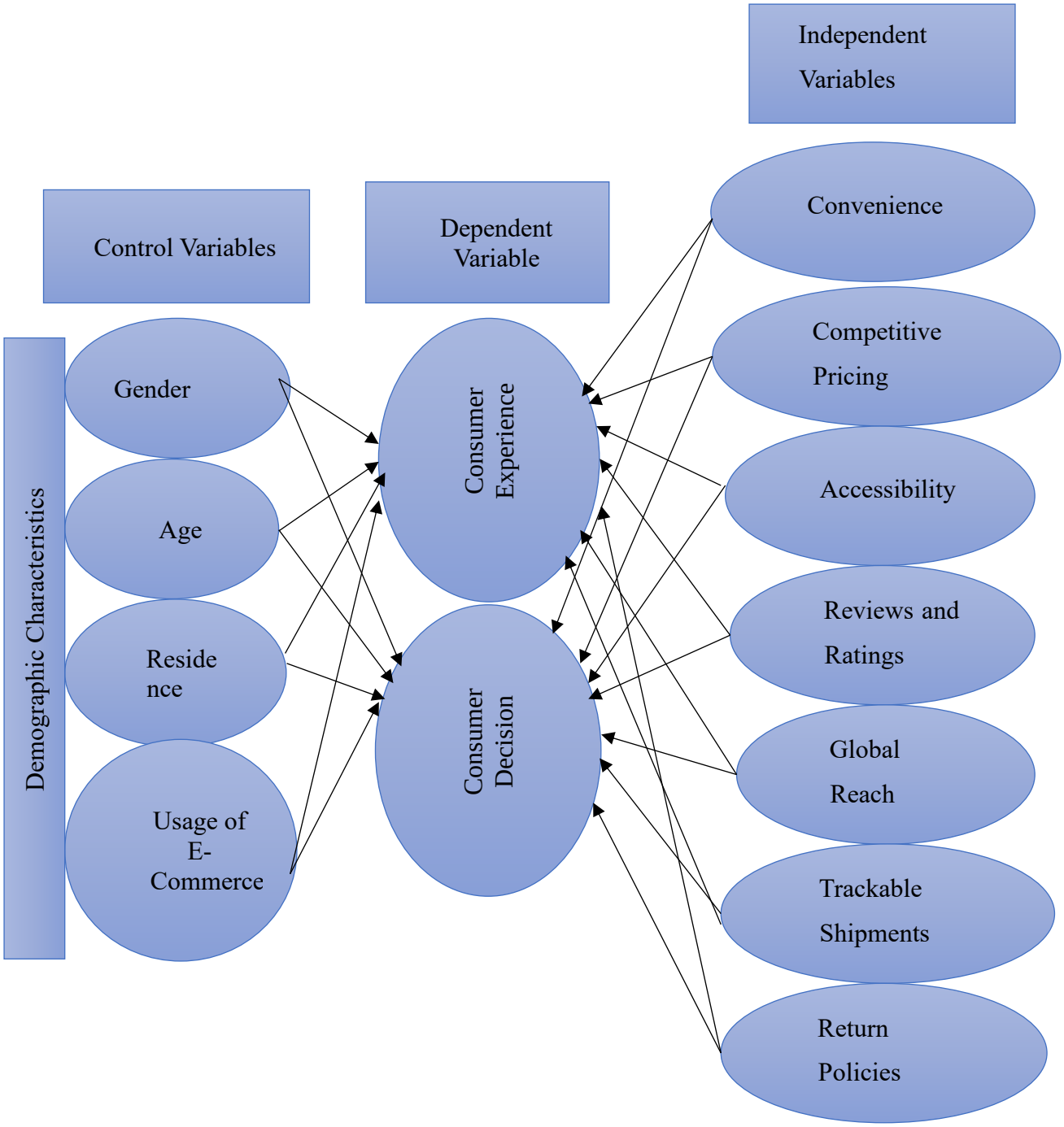

Figure 3.1: Conceptual Framework

Source: Created by the Author

3.5 Variables of the study

i. Independent Variable

The phrase “independent variable” possesses a meaning that aligns neatly with its phonetic representation. The variable in question remains constant, unaffected by the direct influence of the other elements under consideration. For example, age may be considered as an independent variable. Additional elements do not exert any influence on an individual's age. In reality, the objective is to establish a correlation between variables to examine the impact of the “independent variable” on the other variables, commonly referred to as the “dependent variables”. In this study, Convenience, Competitive Pricing, Accessibility, User Reviews and Ratings, Global Reach, Trackable Shipments, and Return Policies are some independent variables.

ii. Dependent Variable

The term “dependent variable” refers to a variable that is reliant on other factors, whereas an “independent variable” is a variable that is not influenced by other factors. It is a phenomenon that is subject to the effect of several circumstances. To establish a correlation between two variables, it is often important to ascertain the factors that exert an impact on the fluctuations of the dependent variable. This study's two dependent variables are Consumer Experience and Consumer Decision.

iii. Control Variable

A control variable refers to a variable or element that remains consistent and unchanged during an experiment or research study, to evaluate the correlation between several variables. Given its constant nature, namely its unchanging condition, this characteristic facilitates the ability of researchers and scientists to conduct experiments and get a deeper comprehension of the

correlation between various factors. A control variable is a factor that is implemented to maintain fairness and prevent bias in the comparison of test findings. The study incorporates control factors such as demographic characteristics, including gender, age, residence, and usage of e-commerce.

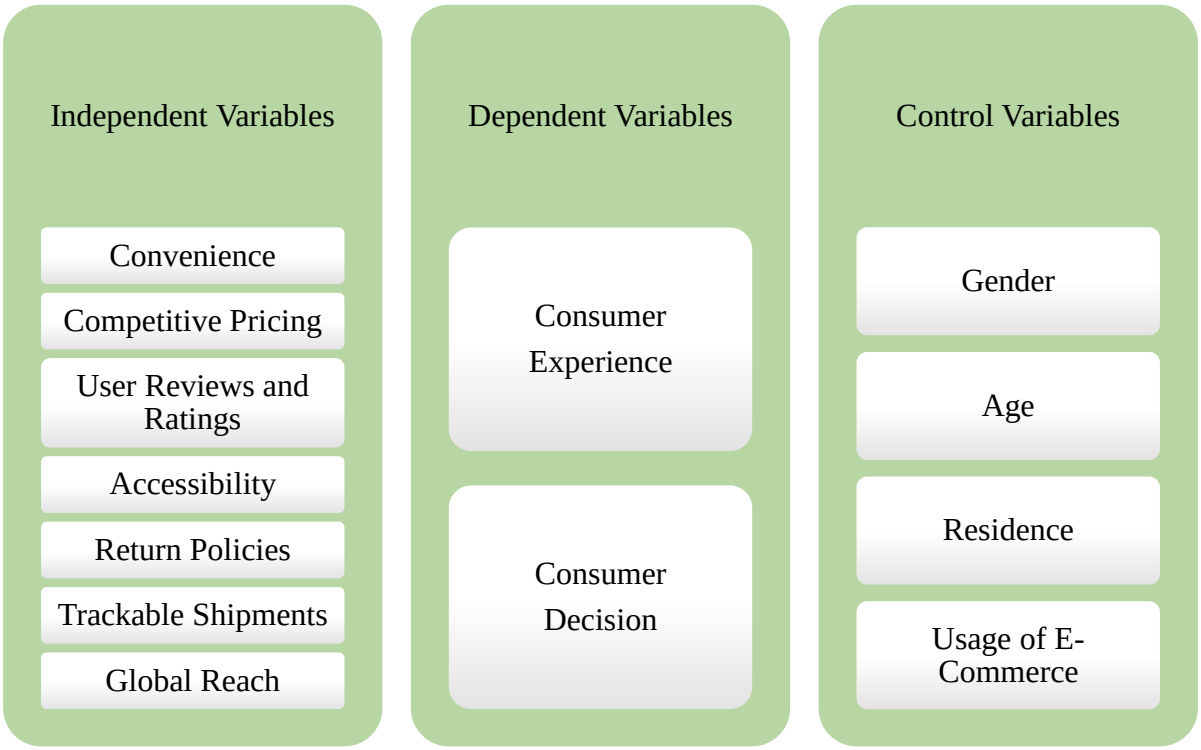

Figure 3.2: Variables of the Study

Source: Created by the Author

3.6 The hypothesis of the study

H1: Convenience, Competitive pricing, Accessibility, User Reviews, Ratings, Global reach, and Trackable shipments and Return policies influence the customer experience in the E-commerce industry.

H2: Gender, Age, Residence, and usage of E-commerce created a significant and distinct impact on customer experience in the E-commerce industry.

H3: challenges encountered by consumers while shopping through E-commerce websites created a negative impact on customer experience.

H4: Price, variety of Product selection**,** and Fast shipping on consumer decision to make a purchase online.

H5: There is a significant relationship between customer support and customer experience.

3.7 Research Methodology

A mixed-methods approach is used as the technique for the investigation. First, data from 300 respondents who are Indian users of E-commerce will be gathered using a practical sample technique. A survey will be conducted to gather information on a variety of customer experience factors, such as website usability, product satisfaction, and customer assistance. To provide context and industry trends relevant to customer experience in E-commerce, secondary data will also be gathered from books, journals, articles, reports, magazines, and newspapers. To examine patterns and relationships, both main and secondary data will be exposed to a variety of statistical tests, including ANOVA, Mean, Standard Deviation, Regression, and Correlation. The research intends to use data-driven insights to improve the consumer

experience in e-commerce while providing useful suggestions for e-commerce businesses to successfully cater to a variety of demographic and socioeconomic groups.

3.7.1 Study Area

This research takes India as its study region and focuses on the country's various demographic and socioeconomic groupings. The research tries to comprehend how various segments of the Indian population interact with online purchasing platforms by examining data-driven insights related to consumer experience in E-commerce. For E-commerce companies to efficiently respond to the demands of a broad client base in India, the research will examine trends, preferences, and issues experienced by various demographic and socioeconomic groups. This will provide insightful information about these groups' behaviours and challenges.

3.7.2 Targeted Population

The study's target audience consists of Indian customers who participate in online commerce. This target market was chosen because e-commerce businesses must understand the interests, behaviours, and experiences of this group of customers to improve their services and offers. The customer experience has a direct influence on consumers in the e-commerce space, who stand for the platforms' end users. To improve user experience, enhance consumer contentment, and promote business success in the fiercely competitive Indian e-commerce sector, data-driven insights from this particular group will be analysed.

3.7.3 Sample of the study

About 300 participants make up the study's sample size. This sample size has been set to guarantee sufficient representation of India's different socioeconomic and demographic consumer groups who shop online. With 300 participants, the research may collect a diverse variety of viewpoints and actions, giving enough information for thorough data analysis and insights. Furthermore, this sample size finds a compromise between maintaining statistical significance and feasibility in terms of data collection and processing, making it a useful and effective method to gain insightful results on the target audience of E-commerce customers.

3.7.4 Sampling Technique

For convenience and effectiveness, data from 300 respondents in the research were collected via convenient sampling. The simplicity, accessibility, and affordability of this sampling technique led to its selection. Convenient sampling enables researchers to quickly get data from readily accessible respondents, such as those accessible through internet platforms or local settings when time and resources are restricted.

3.8 Collection of Data

A survey questionnaire sent to chosen respondents to collect primary data for the study. A variety of consumer experiences in e-commerce areas, including website usability, product satisfaction, customer service, and overall happiness with the online buying experience, will be captured through the survey's questions.

The research will include secondary data in addition to primary data from a variety of sources, including books, journals, articles from reliable websites, reports, magazines, and newspapers.

The primary data gathered through the survey will benefit greatly from the secondary data that will be added to it. It will provide background information, viewpoints from the past, industry trends, and professional opinions about customer experience in e-commerce. The study will ensure a thorough and well-rounded examination of data-driven insights by merging primary and secondary data, which will aid in the formulation of practical strategies for improving customer experience in the e-commerce industry.

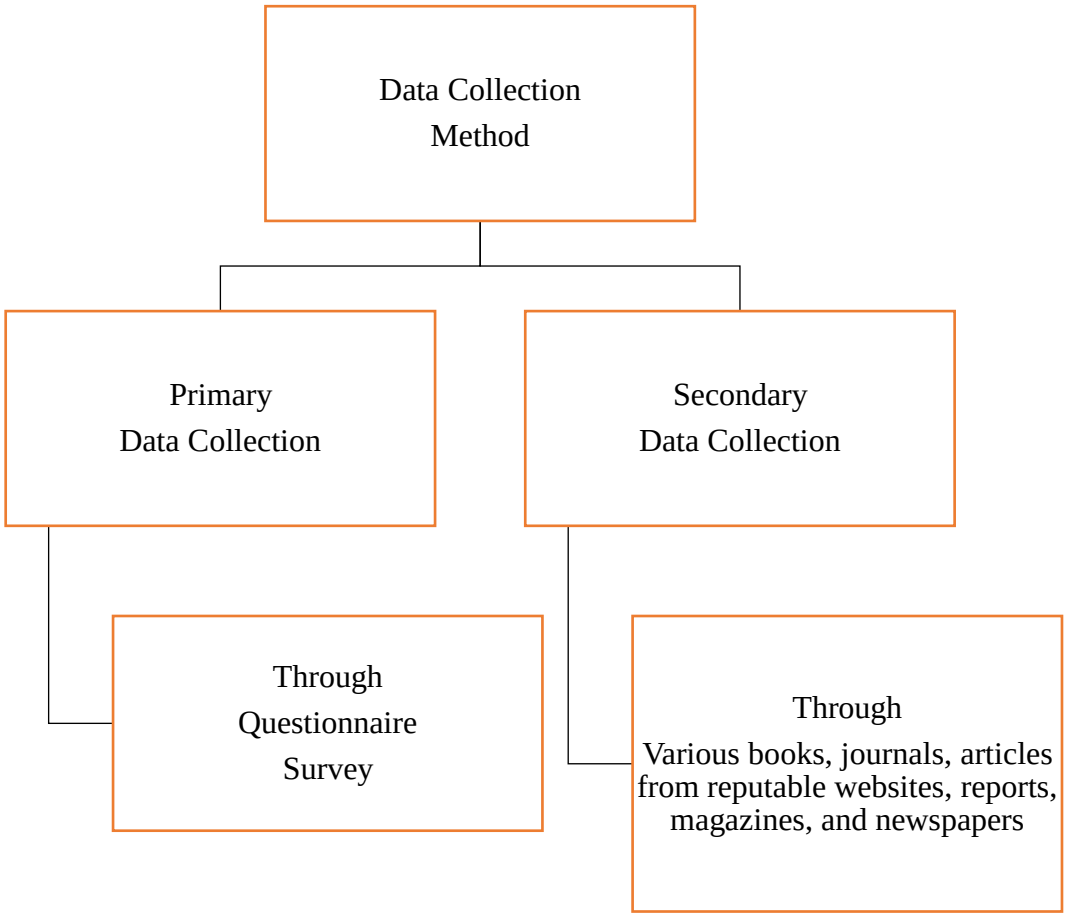

Figure 3.3: Data Collection Method

Source: Created by the Author

3.9 Statistical Tools

Statistics play a crucial role in enhancing the credibility and legitimacy of a study. In the scenario when two research articles are compared, one lacks statistical analysis while the other incorporates statistical methods to support its claims. Moreover, Descriptive Statistics can convey a substantial amount of information while utilizing a concise vocabulary. Frequently, researchers encounter challenges in deriving a basic truth from a particular assemblage of data. Conclusions may only be drawn from the current information after conducting a thorough statistical analysis. However, the process of doing statistical analysis is a multifaceted endeavour. Statistical techniques are employed in this context. The utilization of statistical methodologies in research endeavours provides researchers with the means to substantiate their assertions, comprehend extensive datasets, graphically represent complex information, and succinctly describe numerous subjects within a limited timeframe.

- **Excel**

Excel is a statistical software program that possesses a combination of user-friendly features and advanced capabilities, rendering it one of the most complex options now accessible. The software provides users with the capability to store data in a structured fashion, namely organized into rows and columns, sometimes referred to as a tabular format. Furthermore, there are other approaches available for interacting with your data. The data may be effectively organized and filtered through the utilization of specific robust formulas. The most notable feature of Excel is its pivot tables. One might potentially obtain novel perspectives by manipulating the data, and pivot tables serve as a valuable tool for achieving this objective.

- **SPSS**

In the realm of statistical packaging tools, SPSS (Statistical Packages for Social Science) is widely recognized as the prevailing industry standard. There exist several uses of SPSS that may be classified as derivatives of data processing and storage. One method is referred to as interactive batching, while the other is referred to as noninteractive batching. Both of these technologies fall under the area of batch processing.

- **Python**

Python is an interpreted, object-oriented, high-level programming language with dynamic semantics. Its high-level built-in data structures, combined with dynamic typing and dynamic binding, make it very attractive for Rapid Application Development, as well as for use as a scripting or glue language to connect existing components together. Python supports modules and packages, which encourages program modularity and code reuse.

The researcher made use of Excel, SPSS, and Python to analyze the data that had been acquired and collected for the study's aims. As a result, the researcher was able to move on with the investigation's goals.

3.10 Statistical Techniques

Testing is a technique that is frequently used to evaluate the evidence for a hypothesis and allow extrapolations from sample data. ANOVA, T-Test, Mean, Standard Deviation, Regression, and Correlation are among the statistical tests used. With the use of these tests, researchers may examine and decipher data, find important connections between variables, and make predictions about the entire population from which the sample was taken. Each test has a distinct function in establishing the importance of results and offers useful information for making decisions and doing more study.

- **ANOVA**

Analysis of Variance (ANOVA) is a statistical technique that employs a specific mathematical formula to examine the extent to which the means or averages of distinct groups exhibit variation from each other. The utilization of this method is prevalent throughout diverse contexts to ascertain the presence of substantial disparities among the means of different groups.

- **Mean**

To obtain an accurate computation of the average value of a database, one may divide the sum of all stored values by the total count of values in the database. This allows individuals to evaluate their progress at the midpoint of their journey and make necessary preparations based on this assessment. This method is advantageous to employ in scenarios when the values encompassed within the dataset exhibit limited diversity.

$$\mathrm{m} = \frac{\text{Sum of the terms}}{\text{number of terms}}$$

- **Standard Deviation**

The standard deviation (SD) is a statistical metric used to quantify the extent to which individual data points depart from the mean value. The numerical value in question is ascertained by the utilization of a variable referred to as the variance inside the computational process. The computation of the standard deviation entails the extraction of the square root of the variance, followed by the multiplication of this result by the variance associated with each data point. This calculation will get the standard deviation. The dispersion of data is more pronounced as data points deviate further from the mean; hence, a substantial standard deviation indicates such a scenario in the dataset.

$$\sigma = \sqrt{\frac{\Sigma(x_i - \mu)^2}{N}}$$

- **Pearson's Coefficient of Correlation**

The Pearson coefficient may be conceptualized as a quantitative indicator of the strength of the relationship between two variables that are assessed using the same measurement scale. This phenomenon occurs because both variables are measured using the same scale, which might be either interval or ratio in nature. Pearson coefficients facilitate the visual depiction of the magnitude of the association between two consecutive variables. Furthermore, these coefficients may be utilized to signify the correlation that exists between two consecutive variables.

$$r = \frac{\Sigma(x_i - \overline{x})\,(y_i - \overline{y})}{\sqrt{\Sigma(x_i - \overline{x})^2 \Sigma(y_i - \overline{y})^2}}$$

- **Regression**

The statistical methodology known as regression can be employed to construct a correlation between two variables and examine the reciprocal influence, they exert on each other. The formula establishes a correlation between two variables. The utilization of this strategy is frequently employed to forecast future trends and events.

$$Y_i = f(X_i, \beta) + e_i$$

Y_i = Dependent Variable

f = Function

X_i = Independent Variable

β = Unknown Parameters

e_i = Error Terms

CHAPTER 4

DATA ANALYSIS AND INTERPRETATION

4. DATA ANALYSIS AND INTERPRETATION

4.1 Demographic profile of the Respondents

Table 4.1: Gender of Respondents

Gender					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Female	128	41.3	41.3	41.3
	Male	181	58.4	58.4	99.7
	Prefer not to say	1	.3	.3	100.0
	Total	310	100.0	100.0	

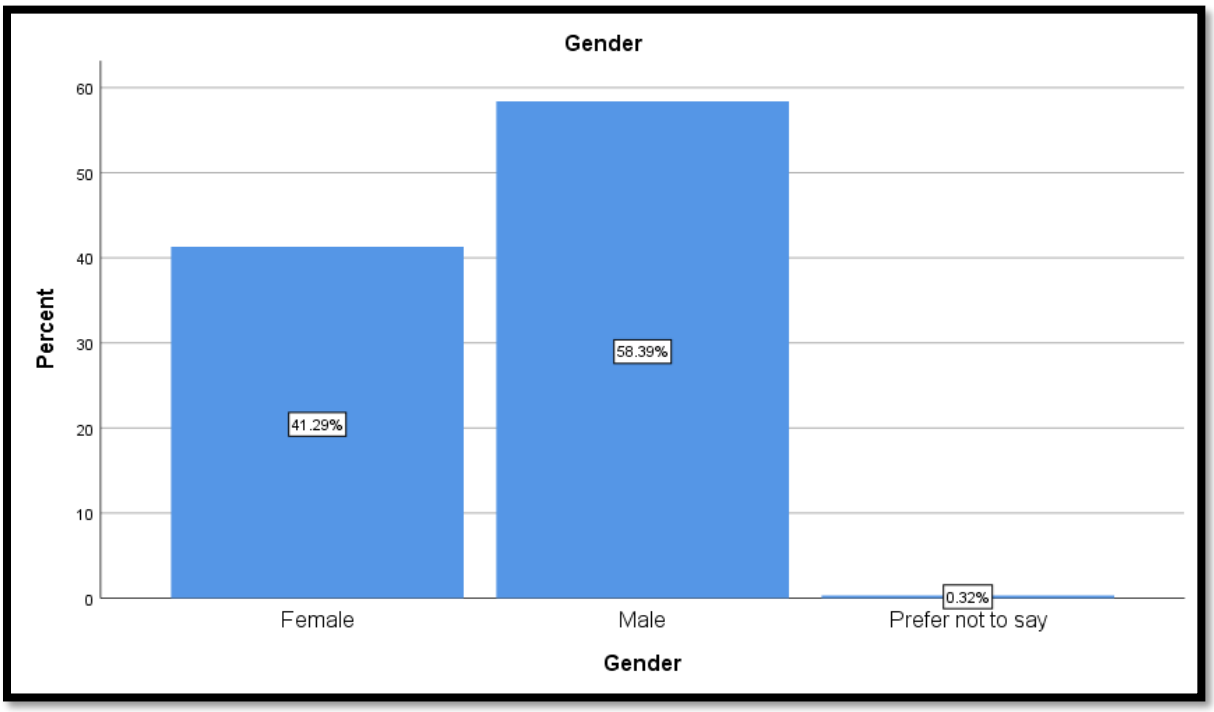

Figure 4.1: Gender of Respondents

Table 4.1 and Figure 4.1 focus on the gender distribution of 310 respondents. Almost all of them are males, making up 58.4% (181 respondents) of the sample size while females represent 41.3% (128 respondents). As well, only a few preferred not to disclose their sexual orientations 0.3% out of the total (310). It therefore means that nearly 99.7% identified themselves as either men or women and only about 0.3% did not show what sex they belong to.

Table 4.2: Age of the Respondents

Age					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Under 25 years	92	29.7	29.7	29.7
	25-34 years	142	45.8	45.8	75.5
	35-44 years	54	17.4	17.4	92.9
	45-54 years	20	6.5	6.5	99.4
	55 or older	2	.6	.6	100.0
	Total	310	100.0	100.0	

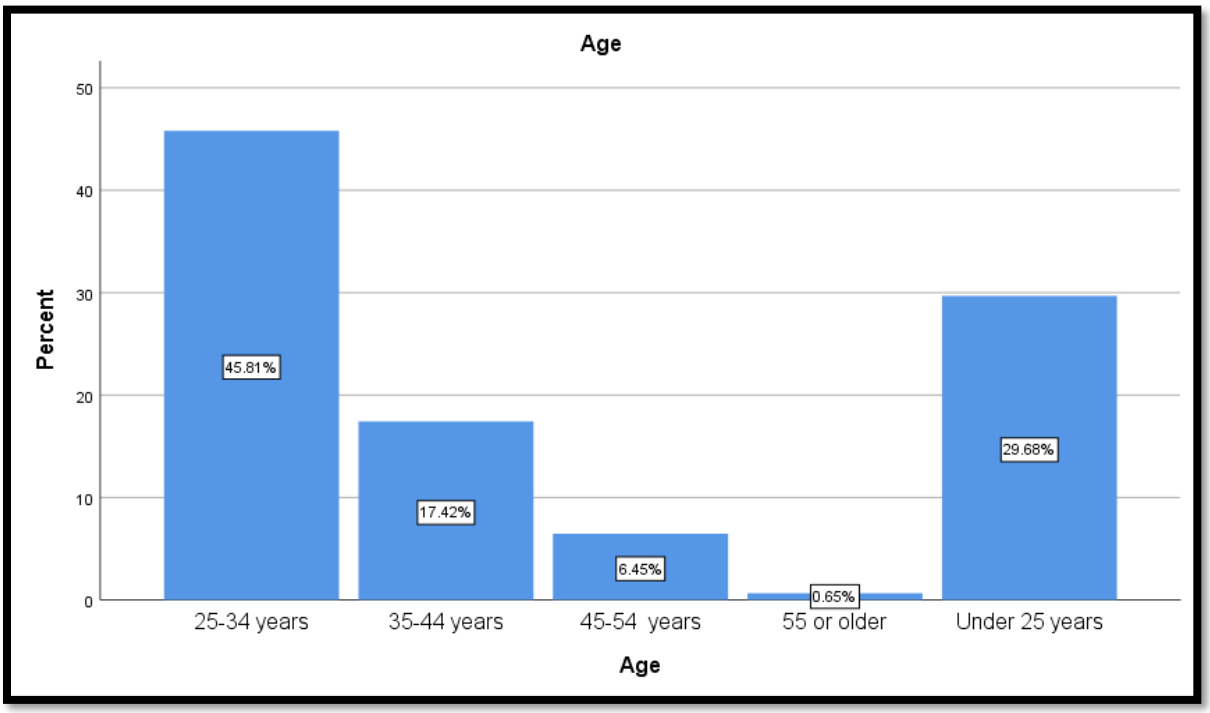

Figure 4.2: Age of the Respondents

Table 4.2 and Figure 4.2 offers insights into the age distribution within a sample of 310 individuals. The majority of participants fall under the age category of 25-34 years, comprising 45.8% of the total sample. Following this, individuals under 25 years constitute 29.7%, while those aged 35-44 years and 45-54 years represent 17.4% and 6.5%, respectively. The smallest proportion is found in the 55 or older age group, accounting for only 0.6% of the sample. The cumulative percentages reveal that approximately 75.5% of the participants are aged 34 years or younger, and nearly 92.9% are aged 44 years or younger.

Table 4.3: Employment Status of the Respondents

Employment status					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Student	60	19.4	19.4	19.4
	Employed /Self Employed	232	74.8	74.8	94.2
	Retired	4	1.3	1.3	95.5
	Unemployed	14	4.5	4.5	100.0
	Total	310	100.0	100.0	

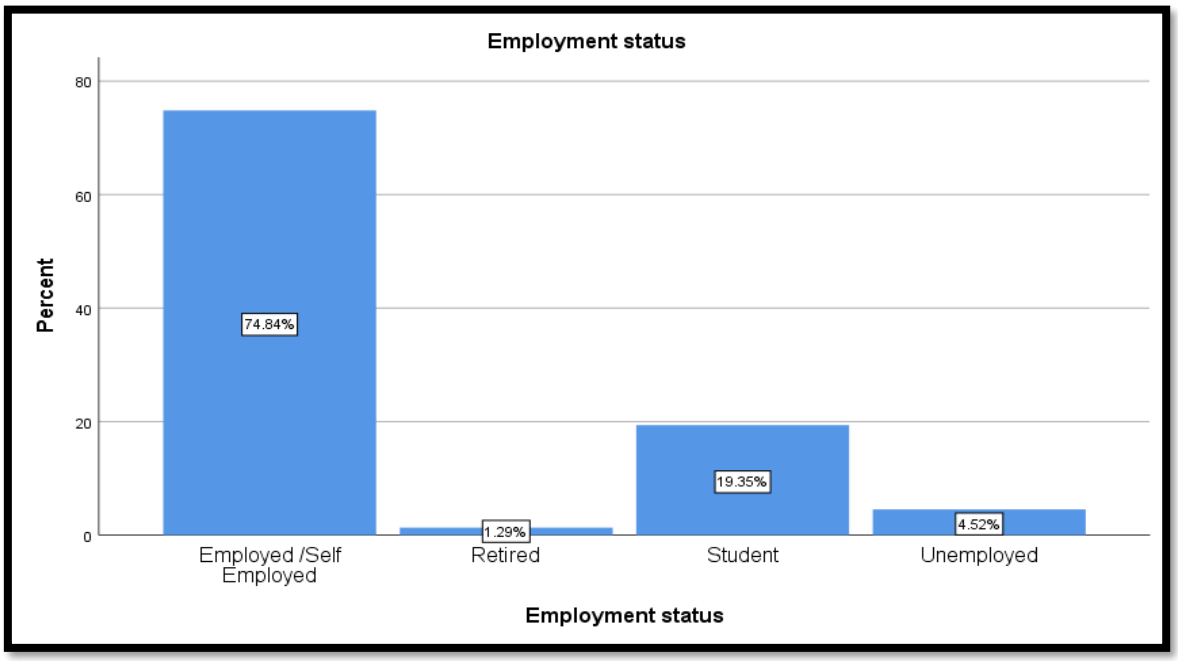

Figure 4.3: Employment Status of the Respondents

The given Table 4.3 and Figure 4.3 outline the employment situation of a sample of 310 respondents. The majority, representing 74.8% are employed or self-employed. The student's category has a proportion of 19.4% which is highly represented as well. Retirees make up a minor part (1.3%) while unemployed is 4.5%. According to the cumulative percentages, 94.2% of these people are either students or working, while 95.5% include retired people. The remaining portion (4.5%) refers to those who are not working today. Through this distribution, it can be observed that most people in the sample are either workers or students except for a smaller number who have already retired from work and even fewer who may be jobless at present time.

Table 4.4: Tier of city of the Respondents

What tier of city do you currently reside in?					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Tier 1 (Metropolitan city with a high population and advanced infrastructure)	190	61.3	61.3	61.3
	Tier 2 (Large city with significant commercial and cultural centres)	69	22.3	22.3	83.6
	Tier 3 (Mid-sized city with developing infrastructure and amenities)	35	11.3	11.3	94.9
	Tier 4 (Small town or city with basic infrastructure)	10	3.2	3.2	98.1
	Rural Area (Village or Countryside)	6	1.9	1.9	100.0
	Total	310	100.0	100.0	

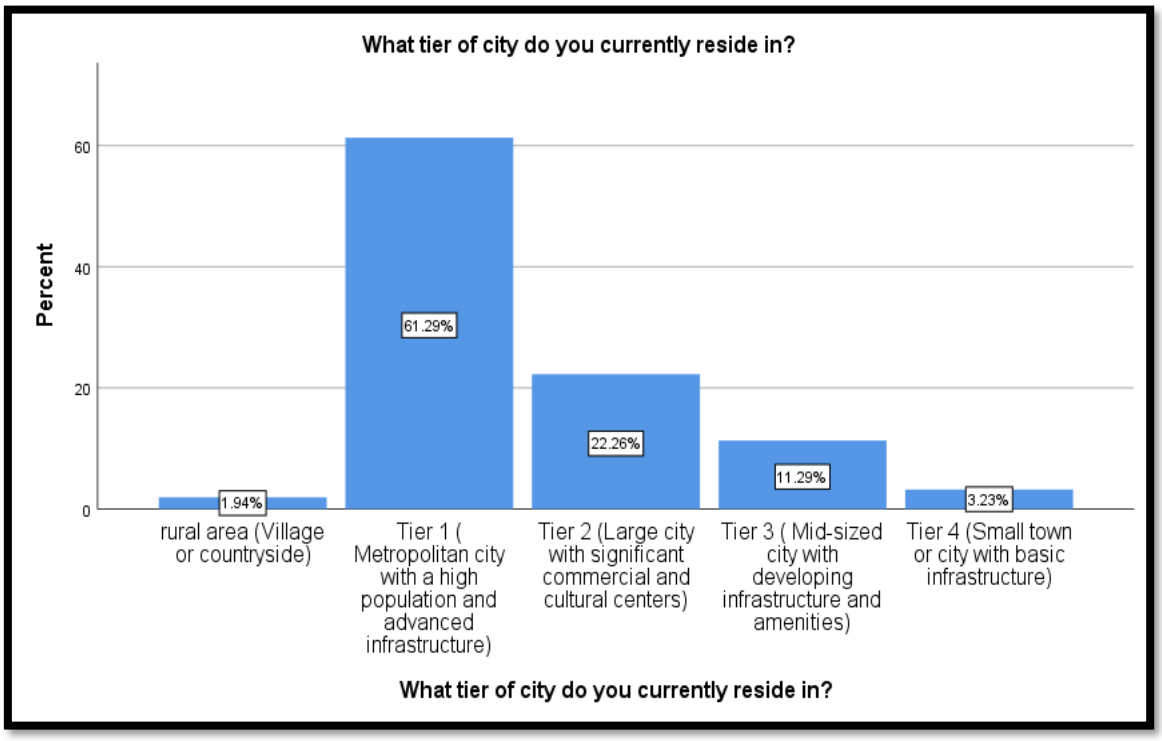

Figure 4.4: Tier of city of the Respondents

Table 4.4 and Figure 4.4 gives a summary of the tier distribution among households forming a sample of 310 respondents. Most respondents, which represent 61.3%, currently live in Tier 1 cities having a high population density and well-developed infrastructure. The second largest proportion occupies 22.3% who reside in Tier 2 cities which are big urban centers with lots of commerce and cultural centers. In Addition to this,11.3% of respondents live in Tier 3 cities described as developing medium-sized towns whereas a smaller percentage of them, approximately 3.2%, inhabit small towns or those with basic infrastructure called T4 cities. A smaller fraction of just 1.9% lives in rural places like villages or countryside regions only giving meager countable numbers for such remote places. The total percentages indicate that most people are living either in urban environments which account for up to 83.6% or else combined with any T4 locations to make a total near to 98.1%.

Table 4.5: E-commerce usage

How frequently do you use E-commerce to purchase a product?					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Never	4	1.3	1.3	1.3
	Not often (2-3 times in a month)	137	44.2	44.2	45.5
	Often (1-2 times a week)	115	37.1	37.1	82.6
	Very Often (3+ times a week)	54	17.4	17.4	100.0
	Total	310	100.0	100.0	

Figure 4.5: E-commerce usage

Table 4.5 and Figure 4.5 comprises of how often people use E-commerce for product purchases, across a sample of 310 individuals. A tiny proportion, 1.3%, never goes for E-commerce when shopping. On the other hand, almost half (44.2%) does not frequently utilize E-commerce by making purchase only about 2-3 times monthly. Moreover, 37.1% of respondents use E-commerce often and do it once or twice per week while 17.4% utilizes it frequently and makes purchases at least three times in a week. Collectively summed percentages affirm that among participants who were surveyed using online questionnaires, approximately 82.6% are frequent shoppers on the internet which indicates that habits die hard, and they have become used to buying things from web-based stores in both high numbers and on a regular basis.

4.2 Objectives and Results

➢ Objective 1

To identify the key factors influencing customer experience in the E-commerce industry

Objective 1 aims to determine the critical elements and variables that significantly impact the overall customer experience in the E-commerce sector. The following factors are considered in the regression test: Convenience, Competitive pricing, Accessibility, User Reviews, Ratings, Global reach, and Trackable shipments and Return policies. The aim of this objective is to understand how each of these factors influences customer experience. A linear regression analysis is performed to quantify the impact of various factors on customer experience. The following results were obtained:

- **Convenience**

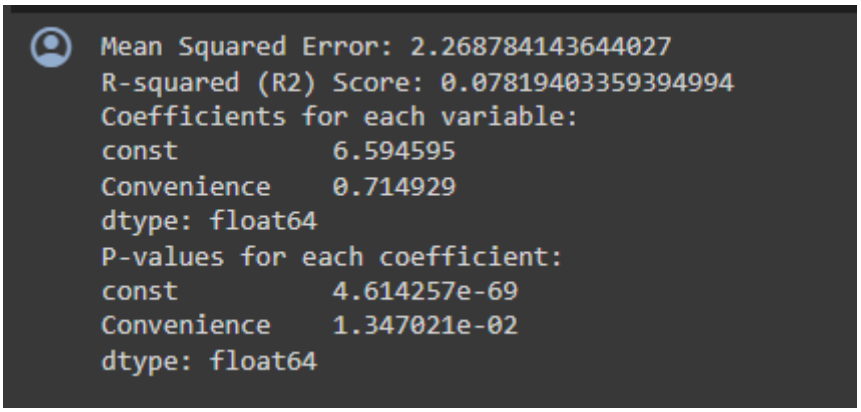

Figure 4.6: Descriptive Statistics values

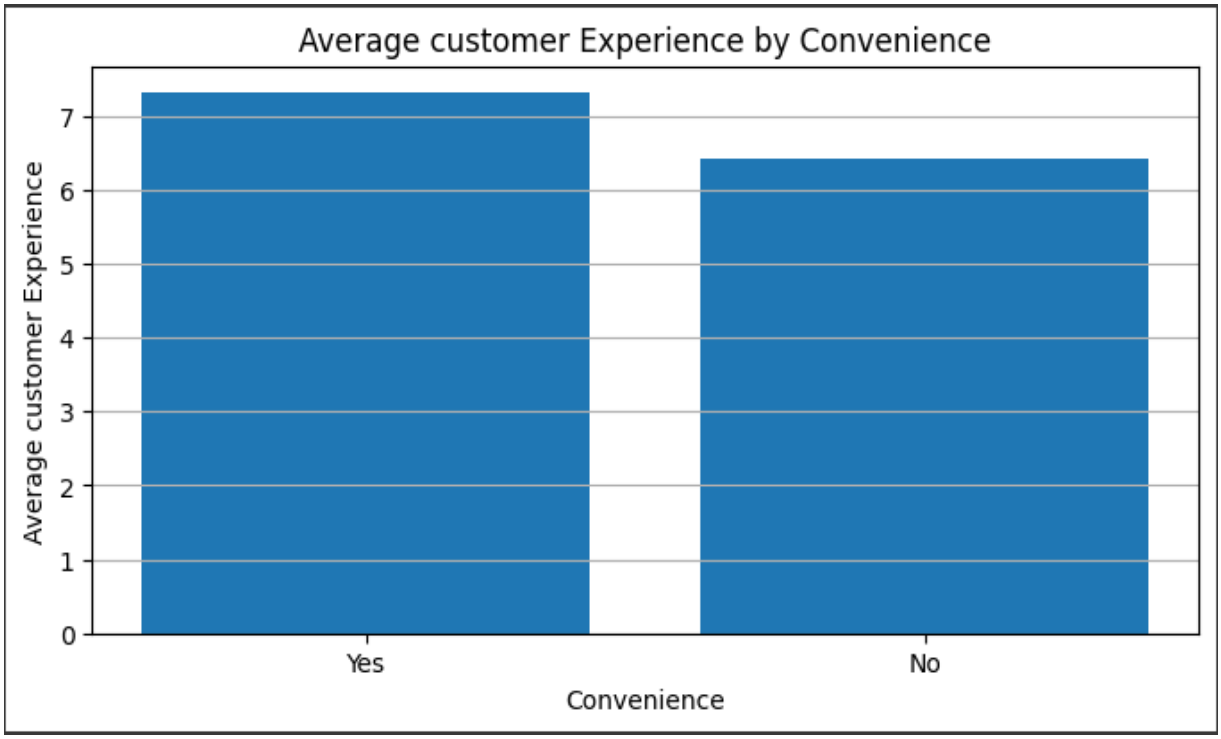

Figure 4.7: Average customer experience by Convenience

The convenience variable was used to predict customer experience using the linear regression model. The performance of the model was assessed by calculating the mean squared error (MSE) and r-squared score (R2). MSE is defined as an average of squared differences between predicted and actual values of customer experience. This analysis found an MSE value of 2.26. The R2 score represents the proportion of the variance in customer experience that can be explained by the chosen factors. In this case, the R2 score was approximately 0.078. The coefficients reveal that 'Convenience' has a positive impact (0.71) on 'customer experience,' and its p-value (0.013) is statistically significant, indicating its relevance in predicting the outcome. There is a statistically significant relationship between "Convenience and customer experience" (p-value < 0.05). It suggests that the level of convenience offered by the E-commerce platform has a meaningful impact on customer experience.

The bar graph displays the average customer experience, ranging from 1 to 8 on the y-axis, based on different categories of 'Convenience.' The x-axis distinguishes between 'No' and

'Yes' for 'Convenience,' with specific average values assigned to each category. The bar corresponding to 'Yes' Convenience is positioned at 7.4 on the y-axis, representing the average customer experience level when Convenience is offered. The bar corresponding to 'No' Convenience is positioned at 6.4 on the y-axis, indicating the average customer experience level when Convenience is not present.

- **Competitive Pricing**

```
Mean Squared Error: 2.4722685142352114
R-squared (R2) Score: -0.0044815736941288264
Coefficients for each variable:
const                  6.797872
Competitive pricing    0.653108
dtype: float64
P-values for each coefficient:
const                  3.905436e-112
Competitive pricing     2.057353e-03
dtype: float64
```

Figure 4.8: Descriptive Statistics values

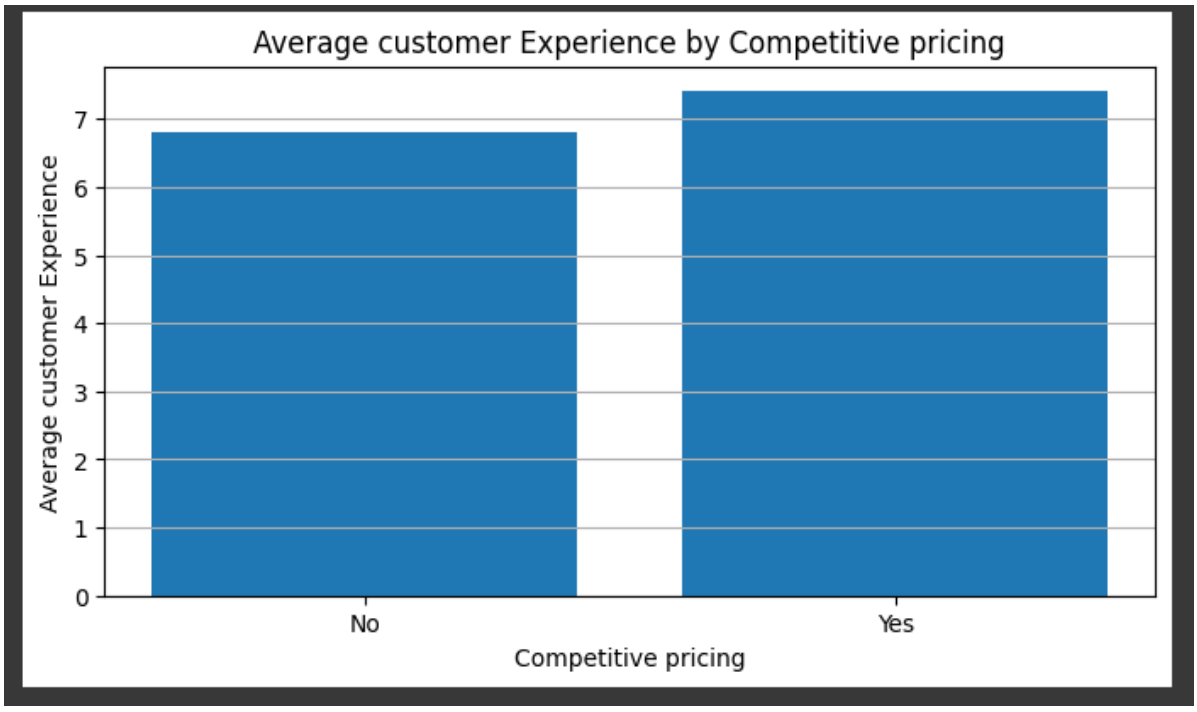

Figure 4.9: Average customer experience by Competitive pricing

The linear regression model was applied to predict 'customer experience' based on the 'Competitive pricing' variable. The model's performance was assessed using Mean Squared Error (MSE) and R-squared (R2) Score. However, the model's performance is suboptimal, as evidenced by a Mean Squared Error (MSE) of 2.47 and a negative R-squared (R2) Score of -0.0045. The MSE indicates the average squared difference between predicted and actual values, while the negative R2 Score suggests that the model does not effectively explain the variability in 'customer experience'. Examining the coefficients, 'Competitive pricing' has a positive impact (0.653) on 'customer experience,' and its p-value (0.002) is statistically significant, indicating its relevance in predicting the outcome despite the model's overall limitations. There is a statistically significant relationship between "Competitive Pricing and customer experience" (p-value < 0.05). It suggests that the Competitive Pricing offered by the E-commerce platform has a meaningful impact on customer experience.

The bar graph displays the average customer experience, ranging from 1 to 8 on the y-axis, based on different categories of 'Competitive Pricing.' The x-axis distinguishes between 'No' and 'Yes' for 'Competitive Pricing,' with specific average values assigned to each category. **'Yes'** Competitive Pricing (labelled as 7.5): The bar corresponding to 'Yes' Competitive Pricing is positioned at 7.5 on the y-axis, representing the average customer experience level when competitive pricing is offered. **'No'** Competitive Pricing (labelled as 6.8): The bar corresponding to 'No' Competitive Pricing is positioned at 6.8 on the y-axis, indicating the average customer experience level when competitive pricing is not present.

- **Accessibility**

```
Mean Squared Error: 2.2824668072130994
R-squared (R2) Score: 0.07263477360457093
Coefficients for each variable:
const            6.939130
Accessibility    0.492688
dtype: float64
P-values for each coefficient:
const            7.697980e-123
Accessibility     1.735172e-02
dtype: float64
```

Figure 4.10: Descriptive Statistics values

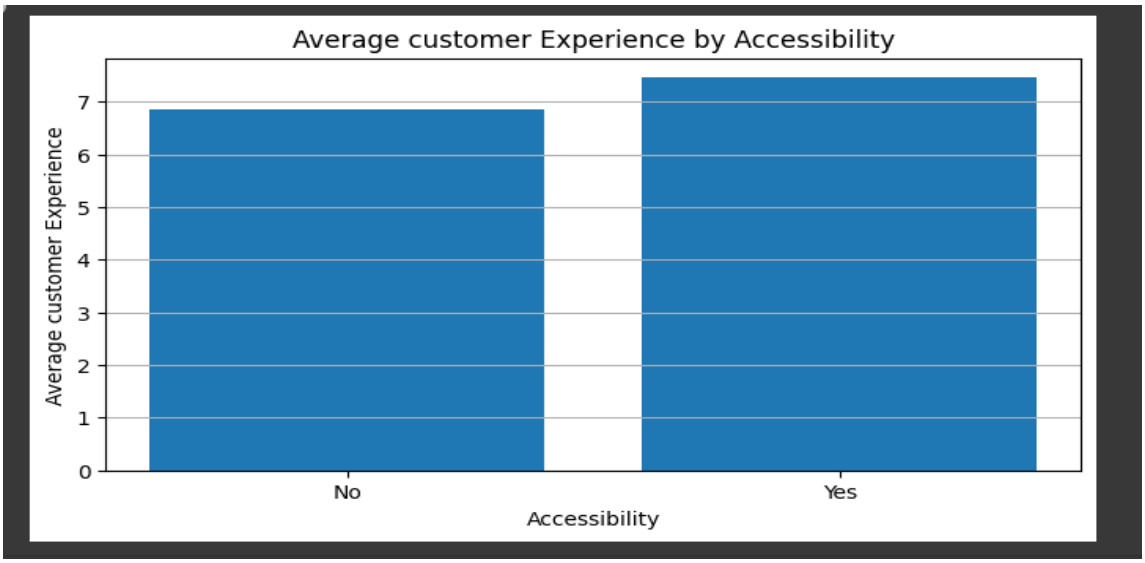

Figure 4.11: Average customer experience by Accessibility

The linear regression model was applied to predict 'customer experience' based on the 'Accessibility' variable. The model's performance is characterized by a Mean Squared Error (MSE) of approximately 2.28 and an R-squared (R2) Score of 0.073. The MSE represents the average squared difference between predicted and actual values, while the R2 Score indicates the proportion of variability in 'customer experience' explained by the model. The coefficients show that 'Accessibility' has a positive impact (0.493) on 'customer experience,' and its p-value

(0.017) is statistically significant, suggesting its relevance in predicting the outcome. There is a statistically significant relationship between "Accessibility and customer experience" (p-value < 0.05). This indicates that ensuring ease of access to the platform can positively influence customer satisfaction.

The bar graph presents the relationship between 'Accessibility' and the average customer experience, with labels ranging from 1 to 7 on the y-axis. The x-axis distinguishes between 'No' and 'Yes' categories for 'Accessibility.' The bar corresponding to 'Yes' Accessibility is positioned at 7.5 on the y-axis. This signifies those customers who have access to the 'Accessibility' feature report a higher customer experience level, approximately 7.5. The bar corresponding to 'No' Accessibility is positioned at 6.8 on the y-axis. This indicates that customers who do not have access to the 'Accessibility' feature report a customer experience level of around 6.8.

- **User Review and Ratings**

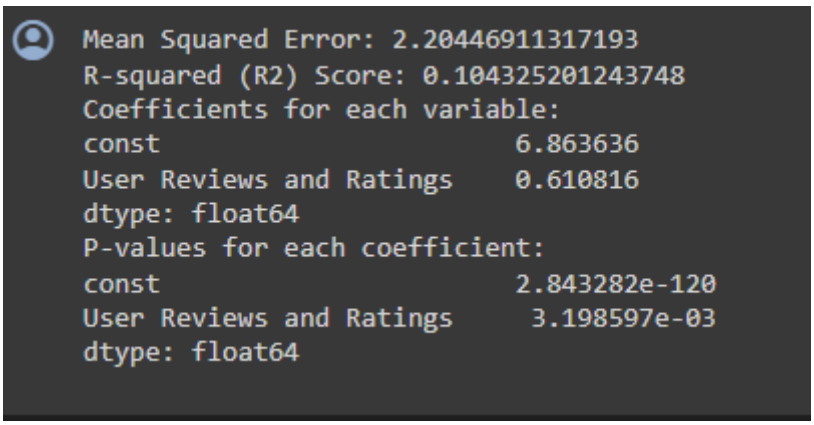

Figure 4.12: Descriptive Statistics values

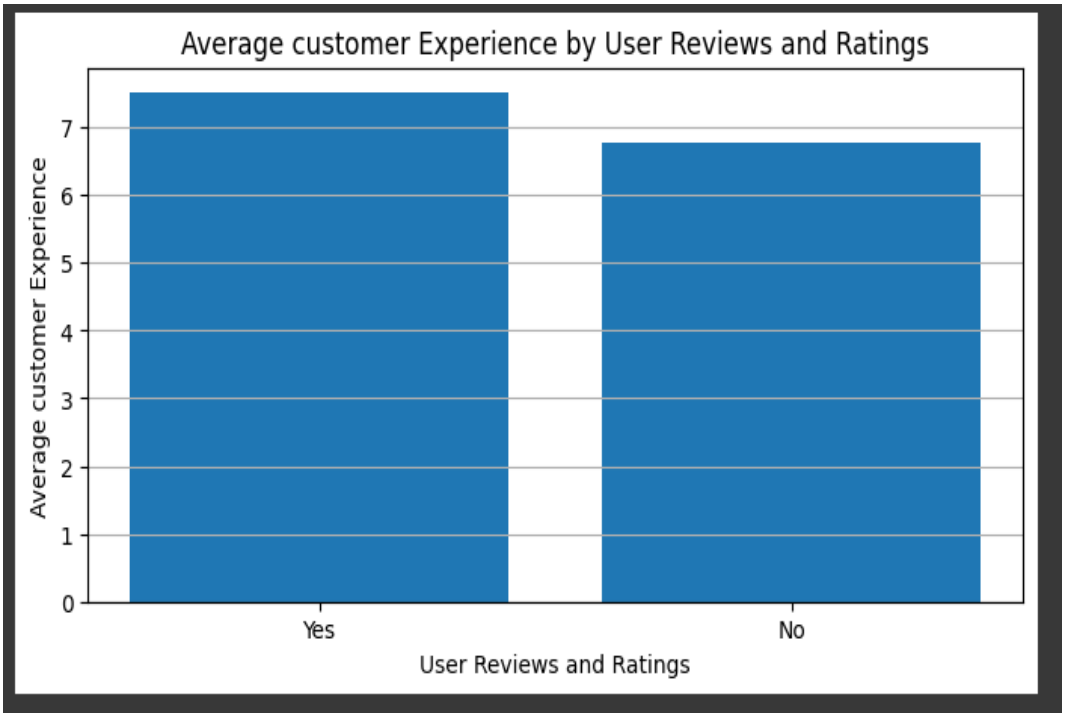

Figure 4.13: Average customer experience by User reviews and ratings

The user review and ratings variable are used to predict customer experience using the linear regression model. The performance of the model has assessed by calculating the mean squared error (MSE) and r-squared score (R2). The score of Mean Squared Error (MSE) is 2.20 and an R-squared (R2) Score is 0.104. MSE is defined as an average of squared differences between predicted and actual values of customer experience, while the R2 Score indicates the proportion of variability in 'customer experience' explained by the model. The coefficients reveal that 'User Reviews and Ratings' has a positive impact (0.611) on 'customer experience,' and its p-value (0.003) is statistically significant, suggesting its relevance in predicting the outcome. There is a statistically significant relationship between "User Reviews and Ratings and customer experience" (p-value < 0.01). High user reviews and ratings tend to correlate with better customer experiences.

The bar graph illustrates the average customer experience, ranging from 1 to 8 on the y-axis, categorized by the presence or absence of 'User Reviews and Ratings.' The x-axis distinguishes between 'Yes' and 'No,' with specific average values assigned to each category. **'Yes'** (labelled as 7.6): The bar corresponding to 'Yes' is positioned at 7.6 on the y-axis, representing the average customer experience level for instances where user reviews and ratings are present. **'No'** (labelled as 6.8): The bar corresponding to 'No' is positioned at 6.8 on the y-axis, indicating the average customer experience level for instances where user reviews and ratings are not present.

- **Global Reach**

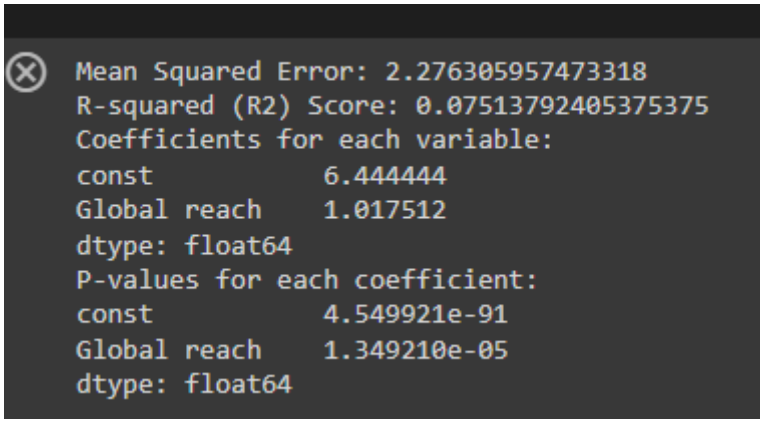

Figure 4.14: Descriptive Statistics values

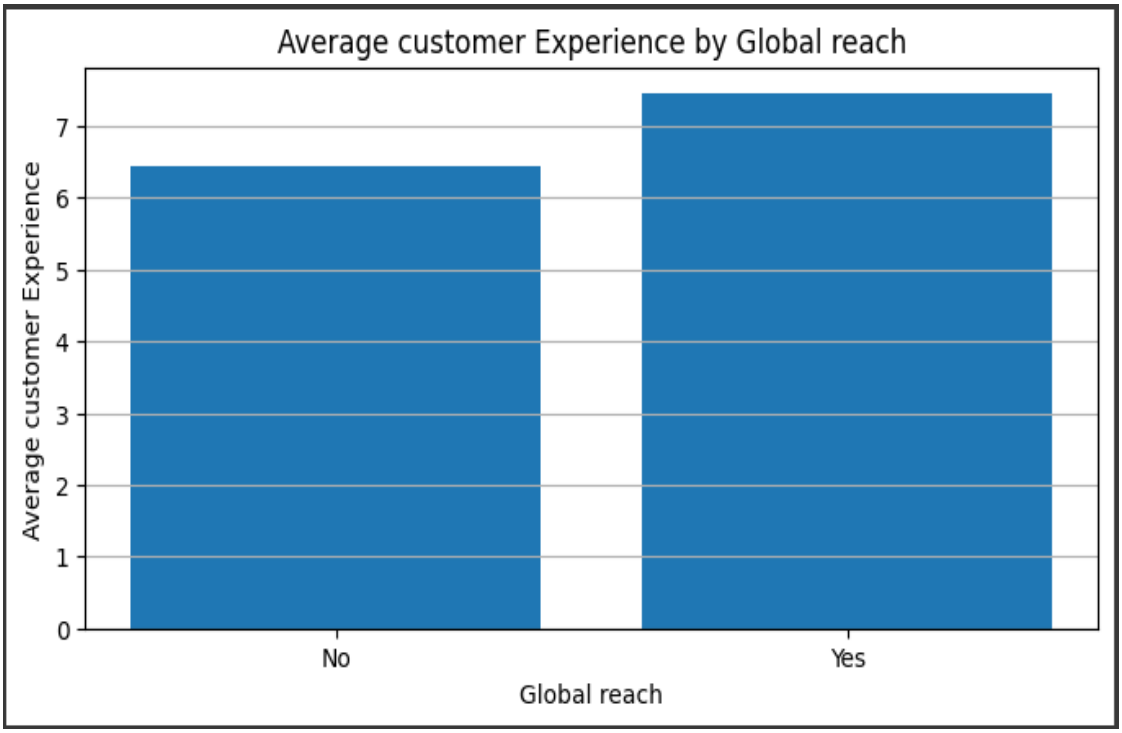

Figure 4.15: Average customer experience by Global reach

To forecast consumer satisfaction with a product or service, a linear regression approach makes use of the Global Reach variable. The model's performance was evaluated by determining the r-squared score (R2) and mean squared error (MSE). Both the Mean Squared Error (MSE) and the R-squared Score (R2) are 2.28 and 0.075, respectively. Average squared discrepancies between anticipated and actual customer experience values are known as the mean squared error (MSE), and the R2 Score shows how much of the variability in "customer experience" can be attributed to the model. The coefficients reveal that 'Global reach' has a substantial positive impact (1.018) on 'customer experience,' and its p-value (0.0000135) is statistically significant. This suggests that 'Global reach' is a relevant and influential factor in predicting the outcome of 'customer experience.' There is a highly significant relationship between "Global reach" and "customer experience" (p-value < 0.05). Expanding the platform's global reach appears to have a substantial positive impact on customer satisfaction.

The bar graph displays the average customer experience, ranging from 1 to 8 on the y-axis, based on different categories of ‘Global reach’. The x-axis distinguishes between 'No' and 'Yes' for ' Global reach,' with specific average values assigned to each category. 'Yes' Global reach (labelled as 7.5): The bar corresponding to 'Yes' Global reach is positioned at 7.5 on the y-axis, representing the average customer experience level when Global reach is offered. 'No' Global reach (labelled as 6.5): The bar corresponding to 'No' Global reach is positioned at 6.4 on the y-axis, indicating the average customer experience level when Global reach is not present.

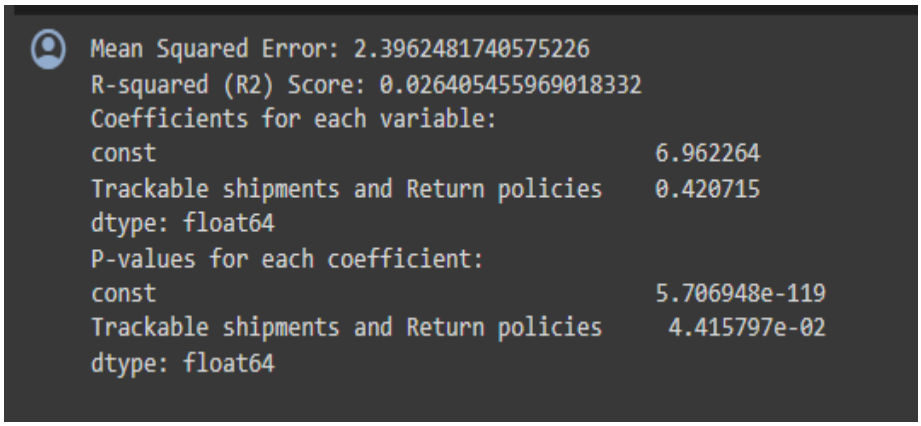

Figure 4.16: Descriptive Statistics values

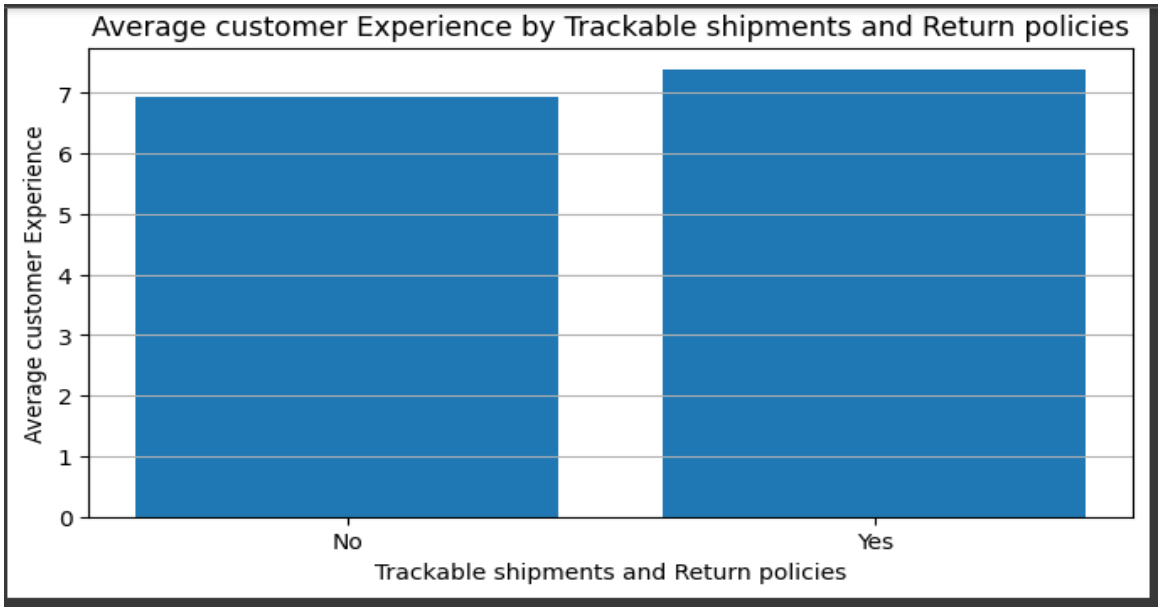

Figure 4.17: Average customer experience by Trackable shipments and return policies.

The linear regression model focused on predicting 'customer experience' based on the 'Trackable shipments and Return policies' variable. An R-squared (R2) Score of 0.026 and a Mean Squared Error (MSE) of about 2.40 define the model's performance. There are two measures of model performance: the mean squared error (MSE) and the coefficient of determination (R2), which show what percentage of variation in "customer experience" can be attributed to the model. The coefficients reveal that 'Trackable shipments and Return policies' has a positive impact (0.421) on 'customer experience,' and its p-value (0.044) is statistically significant. This suggests that 'Trackable shipments and Return policies' is a relevant factor in predicting the outcome of 'customer experience,' although the overall explanatory power of the model is limited based on the R2 Score.

The bar graph displays the average customer experience, ranging from 1 to 8 on the y-axis, based on different categories of ' Trackable shipments and Return policies ' The x-axis distinguishes between 'No' and 'Yes' for ' Trackable shipments and Return policies,' with specific average values assigned to each category. 'Yes' Trackable shipments and Return

policies (labelled as 7.5): The bar corresponding to 'Yes' Trackable shipments and Return policies is positioned at 7.5 on the y-axis, representing the average customer experience level when Trackable shipments and Return policies is offered. 'No' Trackable shipments and Return policies (labelled as 6.9): The bar corresponding to 'No' Trackable shipments and Return policies is positioned at 6.4 on the y-axis, indicating the average customer experience level when Trackable shipments and Return policies is not present.

➢ Objective 2

To assess the impact of demographic characteristics of consumers on customer experience such as Gender, Age, Residence, and usage of E-commerce.

The analysis has been conducted using Analysis of Variance (ANOVA) tests which aims to examine the impact of different demographic variables on 'customer experience.'

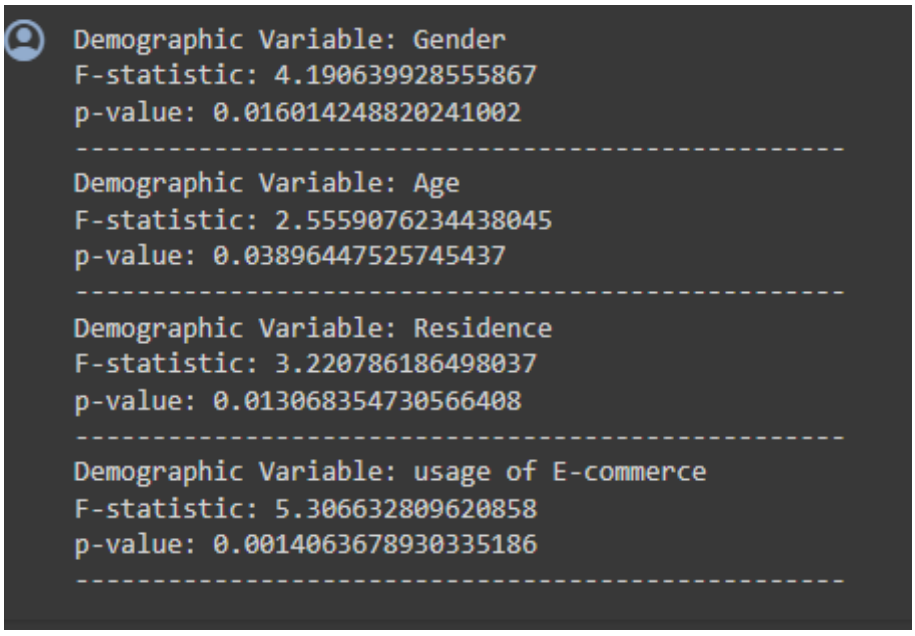

Figure 4.18: Impact of demographic characteristics of consumers on customer experience

i) The demographic variable of gender has an estimated F-statistic of 4.19 and a p-value of 0.016. This suggests that there exists a statistically significant variation in the customer experience ratings among distinct gender groups. Put differently, it seems that gender plays a significant part in the consumer experience. As a result, the "customer experience" rankings of the various gender groups varied statistically.

ii) The demographic variable of Age has an estimated F-statistic of 2.555 and a p-value of 0.038. This implies that there exists a statistically significant variation in the customer experience ratings between age groups. Customer experience seems to be significantly influenced by age. As a result, the "customer experience" ratings throughout the various age groups varied statistically.

iii) The demographic variable of Residence has an estimated F-statistic of 3.220 and a p-value of 0.013. This implies that there exists a statistically significant variation in the customer experience ratings of different residences. Customer experience seems to be significantly influenced by residence. As a result, the "customer experience" ratings throughout the various residences varied statistically.

iv) The demographic variable of the usage of E-commerce has an estimated F-statistic of 5.306 and a p-value of 0.001. This implies that there exists a statistically significant variation in the customer experience ratings of usage of e-commerce. Customer experience seems to be significantly influenced by the usage of e-commerce. As a result, the "customer experience" ratings throughout the usage of e-commerce varied statistically.

v) Based on the ANOVA test results, the p-values for each demographic variable are below the conventional significance level of 0.05, indicating that these variables have a statistically significant impact on 'customer experience.' The F-statistics further support the evidence of differences in 'customer experience' across different categories within each demographic

variable. Hence, all of the demographic characteristics (Gender, Age, Residence, and usage of E-commerce) exhibit strong or statistically significant associations with customer experience. Therefore, it appears that customer experience in the E-commerce industry is influenced by these demographic variables.

➢ Objective 3

To analyze the impact of challenges encountered by consumers while shopping through an E-commerce website on customer experience.

The linear regression model focuses on predicting 'customer experience' based on the variable 'challenges encountered by consumers.'

```
Mean Squared Error: 2.3254869718441147
R-squared (R2) Score: 0.055155700267542906
Coefficient for "challenges encountered by consumers": const                                    6.962264
Trackable shipments and Return policies    0.420715
dtype: float64
P-value for "challenges encountered by consumers": 0.0032913761273969822
```

Figure 4.19: Descriptive Statistics values

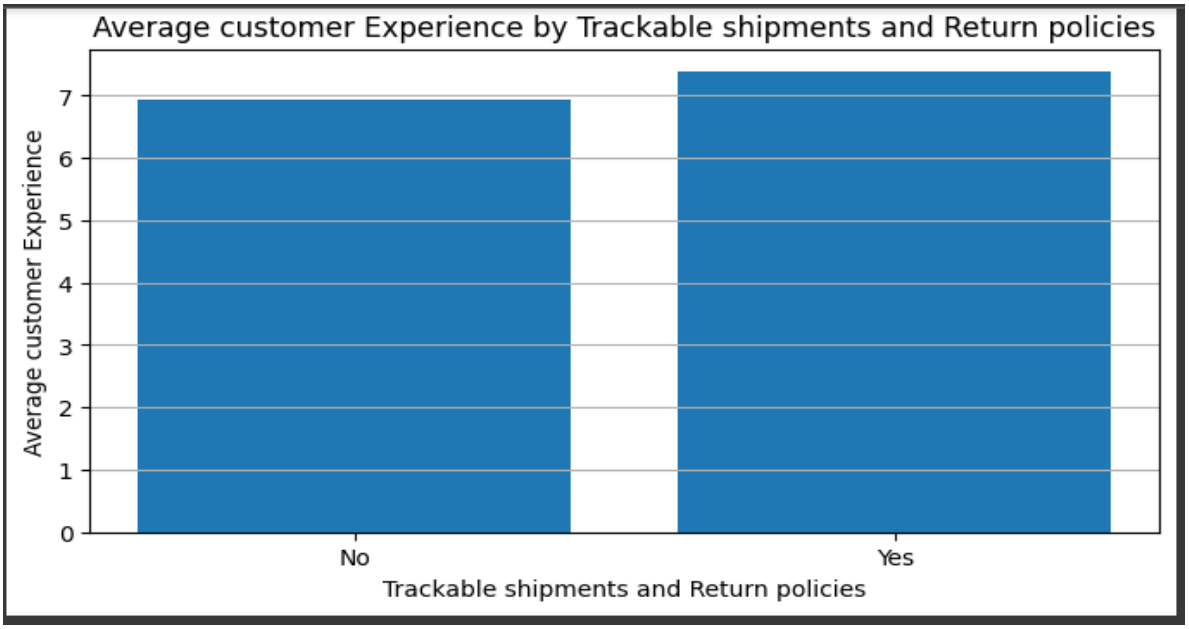

Figure 4.20: Average customer experience by Trackable shipments and return policies.

The bar graph displays the average customer experience, ranging from 1 to 8 on the y-axis, based on different categories of 'Trackable shipments and Return policies'. The x-axis distinguishes between 'No' and 'Yes' for 'Trackable shipments and Return policies,' with specific average values assigned to each category. 'No' Trackable shipments and Return policies (labelled as 6.9): The bar corresponding to 'No' Trackable shipments and Return policies is positioned at 6.4 on the y-axis, indicating the average customer experience level when Trackable shipments and Return policies is not present. 'Yes' Trackable shipments and Return policies (labelled as 7.5): The bar corresponding to 'Yes' Trackable shipments and Return policies is positioned at 7.5 on the y-axis, representing the average customer experience level when Trackable shipments and Return policies is offered.

The model explains approximately 5.5% of the variability in 'customer experience,' and the Mean Squared Error represents the average squared difference between predicted and actual values. The MSE value is 2.32. The positive coefficient suggests that an increase in challenges

encountered by consumers is associated with a higher 'customer experience.' The low p-value (0.0033) indicates that this relationship is statistically significant, implying that the variable 'challenges encountered by consumers' is relevant in predicting 'customer experience.

- **Objective 4**

To explore the factors that influence consumer decision to make a purchase online.

```
Mean Squared Error: 4.392886225488546
R-squared (R2) Score: 0.47532144386098774
Coefficients for each variable:
Price: Coefficient=1.602074774143129, P-value=2.16820536436282e-06
variety of Product selection: Coefficient=1.9831214091057605, P-value=3.1970281753453733e-12
Fast shipping: Coefficient=2.599767507278285, P-value=2.9408110264181215e-18
```

Figure 4.21: Descriptive Statistics values

The linear regression model aimed to predict 'Consumer decision' based on the variables 'Price,' 'variety of Product selection,' and 'Fast shipping.' The model explains approximately 47.5% of the variability in 'Consumer decision.' The Mean Squared Error represents the average squared difference between predicted and actual values. The MSE value is 4.392. A lower MSE indicates that the model's predictions are closer to the actual decisions, suggesting a relatively good fit for the data.

The R2 score is approximately 0.475. The R2 score represents the proportion of the variance in consumer decisions that can be explained by the independent variables (Price, variety of Product selection, and Fast shipping). In this case, the R2 score indicates that these variables collectively explain approximately 47.5% of the variation in consumer decisions, suggesting a moderate level of explanatory power.

All three variables 'Price,' 'Variety of Product selection,' and 'Fast shipping' have statistically significant coefficients with low p-values. This suggests that each of these factors significantly influences 'Consumer decision,' and the positive coefficients indicate a positive impact on the outcome.

The coefficient for "Price" is approximately 1.602. This positive coefficient suggests that an increase in the perceived competitiveness of prices is associated with a higher likelihood of consumers making online purchases. The "variety of Product selection" coefficient is around 1.983. This positive correlation suggests that a larger selection of items offered online is linked to a higher probability of customers making purchases online. "Fast shipping" has a coefficient of about 2.600. This positive coefficient implies that customers are more likely to make online purchases when there are faster delivery choices available.

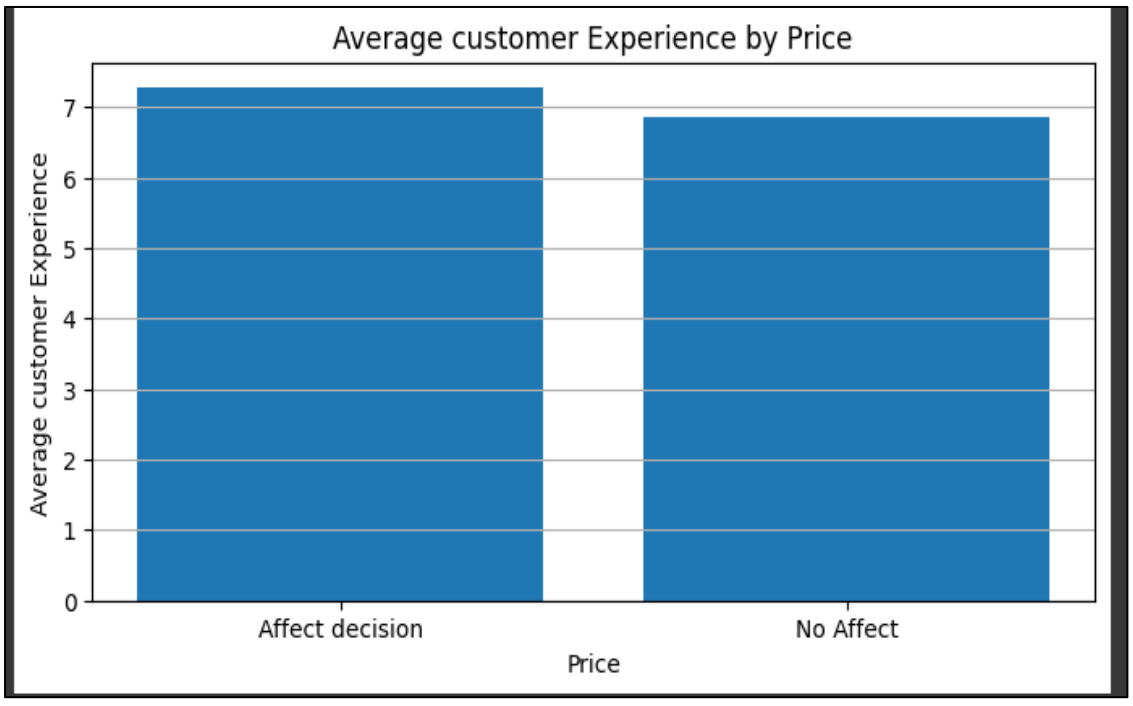

Figure 4.22: Average customer experience by Price

The bar graph shows an average consumer experience depending on how much 'Price' influences decisions, with values varying from 1 to 8 on the y-axis. Two categories, "Affect Decision" and "No Affect," are distinguished by the x-axis, with distinct average values allocated to each group. Price influences respondents' judgments on average, as indicated by the bar that corresponds to 'Affect Decision', which is located at 7.4 on the y-axis. The 'No Affect' bar, which represents the average consumer satisfaction level for respondents whose choices are not influenced by price, is placed at 6.8 on the y-axis.

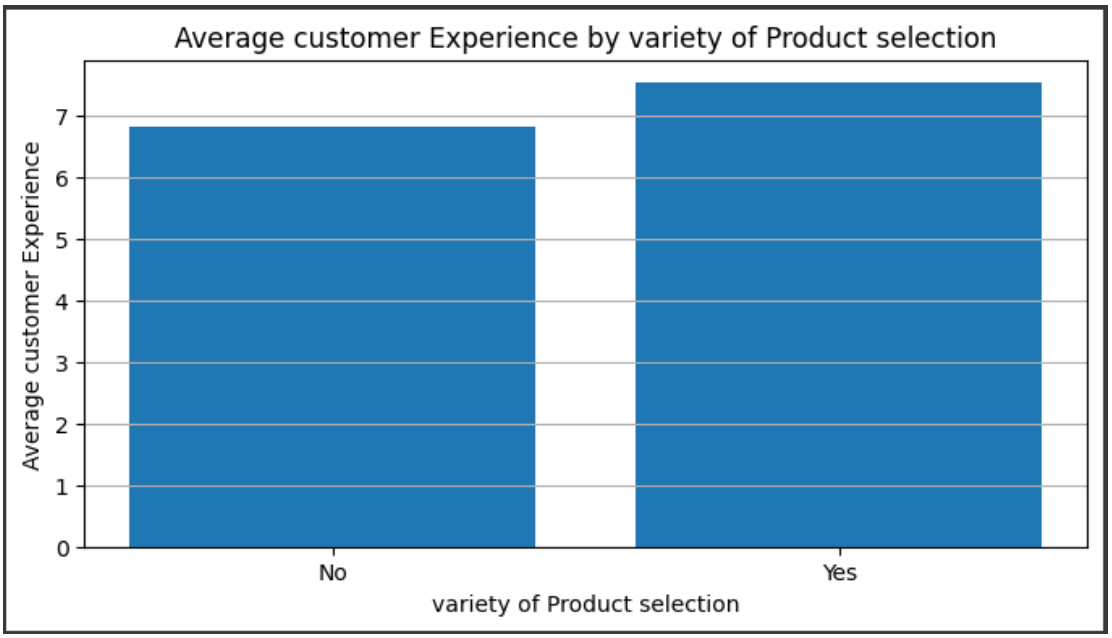

Figure 4.23: Average customer experience by variety of product selection

The bar graph shows the typical customer experience based on several categories of "variety of Product selection," with a y-axis ranging from 1 to 8. For "variety of Product selection," the x-axis displays "Yes" and "No," with distinct average values allocated to each category. The bar corresponding to 'No' variety of Product selection at 6.8 on the y-axis, indicating the average customer experience level when variety of Product selection is not present. The bar

corresponding to 'Yes' variety of Product selection at 7.5 on the y-axis, representing the average customer experience level when variety of Product selection is offered.

Figure 4.24: Average customer experience by Fast shipping

The bar graph displays the average customer experience, ranging from 1 to 8 on the y-axis, based on different categories of **Fast shipping**.' The x-axis distinguishes between 'No' and 'Yes' for **Fast shipping**,' with specific average values assigned to each category. The bar corresponding to 'Yes' **Fast shipping** is positioned at 7.5 on the y-axis, representing the average customer experience level when **Fast shipping** is offered. The bar corresponding to 'No' **Fast shipping** is positioned at 6.8 on the y-axis, indicating the average customer experience level when **Fast shipping** is not present.

➢ Objective 5

To investigate the correlation between customer support and customer experience.

```
Pearson Correlation Coefficient between Customer Support and Customer Experience: 0.45419915167962305
P-value: 3.917765934841853e-17
```

Figure 4.25: Correlations table

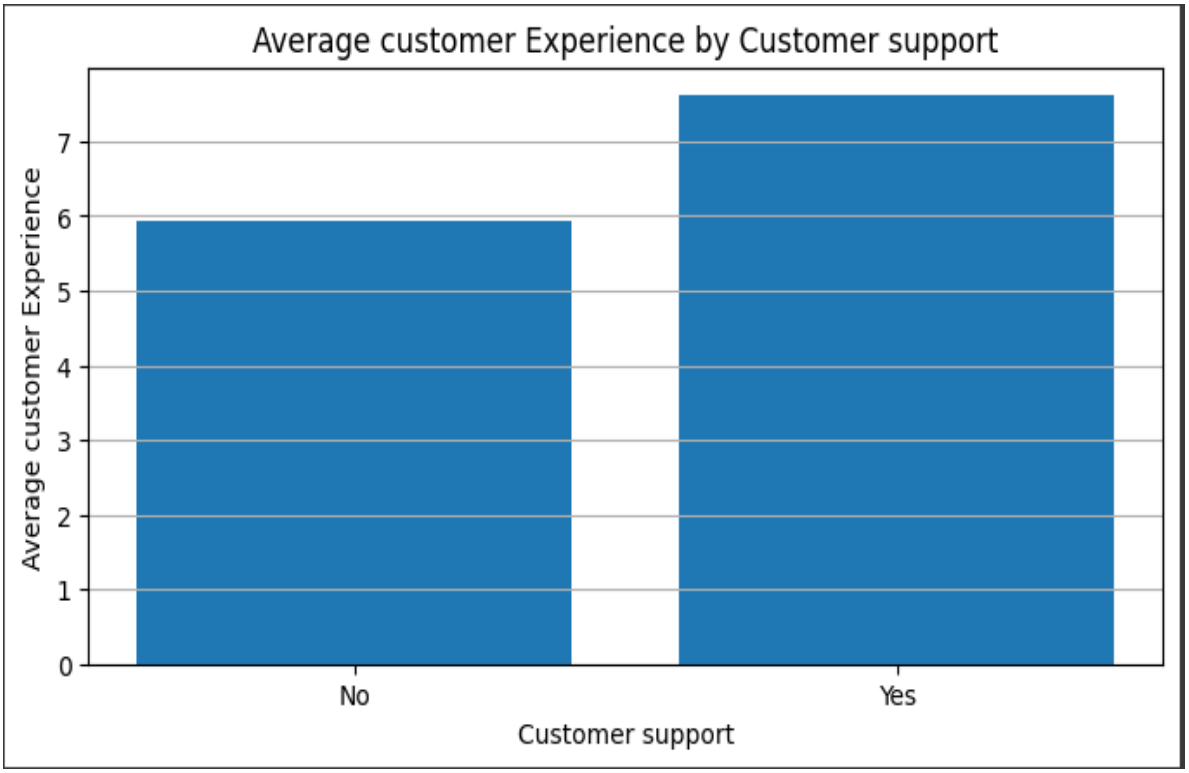

Figure 4.26: Average customer experience by Customer support

The Pearson correlation coefficient between 'Customer Support' and 'Customer Experience' is approximately 0.454. This positive correlation indicates a moderate linear relationship between the two variables: as one variable increases, the other tends to increase as well. This correlation coefficient suggests that there is a discernible relationship between the perceived quality of customer support services and the overall customer experience. More specifically, as the level of customer support improves, there is a tendency for customer experiences to become more positive.

However, it's important to emphasize that correlation does not establish causation. While this analysis demonstrates an association between customer support and customer experience, it does not prove that improving customer support directly causes better customer experiences. Other unmeasured factors may also influence customer experiences. Nonetheless, this finding underscores the importance of customer support in the E-commerce sector. Investing in and enhancing customer support services may lead to an improved perception of the overall customer experience.

The p-value associated with this correlation is very small (3.92e-17), suggesting that the correlation is statistically significant. Therefore, there is evidence to support the idea that there is a meaningful relationship between 'Customer Support' and 'Customer Experience,' and the correlation is not likely due to random chance.

The bar graph displays the average customer experience, ranging from 1 to 8 on the y-axis, based on different categories of ' Customer support' The x-axis distinguishes between 'No' and 'Yes' for ' Customer support,' with specific average values assigned to each category. 'Yes' Customer support (labelled as 7.6): The bar corresponding to 'Yes' Customer support is positioned at 7.6 on the y-axis, representing the average customer experience level when Customer support is offered. 'No' Customer support (labelled as 5.9): The bar corresponding to 'No' Customer support is positioned at 6.4 on the y-axis, indicating the average customer experience level when Customer support is not present.

CHAPTER 5

CONCLUSION

5. CONCLUSION

5.1 Overview

A concise and comprehensive summary of the most significant findings, insights, and implications that were generated from the study is presented in the conclusion chapter. It emphasizes the importance of the research problem while providing a complete summary of the contributions that the study has made to the area. A reflective analysis of the research excursion is presented in the conclusion. The analysis includes a reiteration of the impact that the research journey had on the current knowledge base and an outline of potential pathways for future study in the topic area. The conclusion chapter summarizes the most important findings and implications that were generated from the in-depth investigation of the topic "Data-driven insights to improve customer experience in e-commerce firms."

The importance of the study cannot be overstated in the quickly changing environment of e-commerce, where the quality of the customer experience is a critical factor in determining the level of success or failure. The study examines important aspects of customer behaviour and preferences, including analyzing how convenience, competitive pricing, accessibility, user reviews, global reach, and other factors affect the overall customer experience in e-commerce. The integration of quantitative and qualitative data analysis methods offers a comprehensive comprehension of the complexities involved in influencing customer choices and contentment. The study emphasizes the importance of using data-driven insights to customize strategies for tailored customer experiences. This helps to build customer loyalty and achieve optimum profitability in the extremely competitive e-commerce industry. The study provides significant insights and helpful suggestions that e-commerce companies can use to improve their customer-centric approach, ensuring a long-lasting and successful presence in the ever-changing digital marketplace.

5.2 Summary of the Chapters

Chapter 1

The introduction chapter offered a thorough examination of the research context, with a specific emphasis on utilizing data-driven insights to improve customer experience in the field of e-commerce. The study explored multiple stages and categories of data-driven insights, emphasizing their advantages in enhancing customer satisfaction and loyalty. In addition, the chapter examined the classification of e-commerce, highlighting the importance of customer experience in this sector of e-commerce. The study also covered efficient methodologies for gathering significant customer experience data, encompassing surveys, ratings, social listening, and analytics. In addition, the chapter emphasized the significance of quantifying and examining customer experience insights in order to monitor the performance of e-commerce. The chapter concluded by explaining how data-driven insights may be effectively used to customize consumer experiences, forecast market fluctuations, enhance support, strengthen brand loyalty, and make well-informed decisions in the constantly changing e-commerce environment. The study's scope, research challenge, aims, and importance are clearly defined, providing a foundation for future investigation in subsequent chapters.

Chapter 2

In summary, the literature review chapter presented a thorough integration of relevant studies conducted between 2023 and 2007. It provided valuable perspectives on different aspects of data-driven insights and their influence on customer experience within e-commerce businesses. The reviews explored, how consumer perceptions affect online purchases and evaluated how e-purchasing experiences can moderate this impact. It explored the execution of data-driven

marketing strategies, the value of client loyalty in online marketplaces, and the importance of customer identification for the effective management of master data. The chapter additionally examined the impact of chatbot attributes, the revolutionary potential of big data analytics and blockchain technology, and the significance of product visual aesthetics in improving user experience. Moreover, it illuminated the concept of utilizing data to manage energy efficiently and highlighted the potential of data-driven decision-making. This chapter established the foundation for the current study by pinpointing topics that required further investigation, thus identifying a research gap.

Chapter 3

In a nutshell, the research methodology chapter presented an effective and comprehensive strategy for examining data-driven insights that might improve the consumer experience in e-commerce companies. The study was built upon a strong foundation by providing explicit definitions of operational concepts. The study is necessary to emphasize the significance of utilizing data-driven insights to enhance the consumer experience in the e-commerce industry. The conceptual framework outlined fundamental variables, encompassing independent variables like convenience and competitive price, as well as dependent variables like consumer experience and decision-making. The utilization of a mixed-methods strategy, which encompassed the gathering of both primary and secondary data, was accurately depicted. The study specifically examined Indian consumers who engage in e-commerce, with a sample size of 310 respondents chosen through convenient sampling. The methodology used a range of statistical techniques, such as ANOVA, T-Test, and regression, to examine the data and derive significant insights. This study approach established the framework for a thorough inquiry that

seeks to offer significant suggestions for e-commerce enterprises targeting various demographic and socioeconomic segments.

Chapter 4

In summary, the chapter on data analysis and interpretation presented the demographic profile of the respondents in a methodical manner, offering insights into their gender, age, work status, city tier, and usage of e-commerce. The findings, classified according to the research objectives, explore the crucial aspects that impact customer experience in the field of e-commerce. Objective 1, of the study examined the aspects of convenience, competitive pricing, accessibility, user reviews and ratings, and global reach. The subsequent objectives contributed to a thorough comprehension of the aspects that influence consumer decision-making and overall experience. The chapter utilized statistical methodologies such as linear regression, correlation, and ANOVA to examine and evaluate the gathered data. This analysis provided vital insights into the intricacies of customer preferences and behaviour within the e-commerce domain. These findings provided a basis for the following chapters, enabling a detailed discussion and the creation of data-driven recommendations to improve customer experience in e-commerce businesses.

5.3 Summary of the findings

5.3.1 Findings based on the demographic profile of the respondents

The demographic profile of respondents comprises the following factors:

i. Gender of the respondents

The findings indicated that most of the respondents were males, making up 58.4% (181 respondents) of the sample size while females represented 41.3% (128 respondents). As well, only a few preferred not to disclose their sexual orientations 0.3% out of the total (310).

ii. Age of the respondents

The findings indicated that out of 310 respondents, the majority of participants fell under the age category of 25-34 years, comprising 45.8% of the total sample, while the smallest proportion was found in the 55 or older age group, accounting for only 0.6% of the sample.

iii. Employment Status of the Respondents

The findings indicated that out of 310 respondents, the majority, representing 74.8%, were employed or self-employed, whereas the retirees made up a minor part (1.3%).

iv. Tier of city of the Respondents

The findings indicated that out of 310 respondents, most respondents represented 61.3%, lived in Tier 1 cities having a high population density and well-developed infrastructure, on the contrary, constituting the smallest portion, approximately 3.2%, inhabited small towns or those with basic infrastructure called T4 cities.

v. E-commerce usage to purchase a product.

The findings indicated that out of 310 respondents, the smallest proportion, 1.3%, never goes for E-commerce when shopping. On the other hand, almost half (44.2%) (the largest portion) did not frequently utilize E-commerce by making a purchase only about 2-3 times monthly.

5.3.2 Findings based on the objectives

i) Objective 1: To identify the key factors influencing customer experience in the E-commerce industry.

Objective 1 aims to determine the critical elements and variables that significantly impact the overall customer experience in the E-commerce sector. The following factors are considered in the regression test: Convenience, Competitive pricing, Accessibility, User Reviews, Ratings, Global reach, and Trackable shipments and Return policies. The following results were obtained:

- **Convenience**

The findings indicated that there was a statistically significant relationship between convenience and customer experience, i.e., its p-value is 0.013, where (p-value < 0.05).

- **Competitive Pricing**

The findings indicated that there was a statistically significant relationship between competitive Pricing and customer experience, i.e., its p-value is 0.002, where (p-value < 0.05).

- **Accessibility**

The findings indicated that there was a statistically significant relationship between accessibility and customer experience, i.e., its p-value is 0.017, where (p-value < 0.05).

- **User Review and Ratings**

The findings indicated that there was a statistically significant relationship between, user reviews and ratings and customer experience, i.e., its p-value is 0.003, where (p-value < 0.01).

- **Global Reach**

The findings indicated that there was a highly statistically significant relationship between, global reach and customer experience, i.e., its p-value is 0.0000135, where (p-value < 0.05).

- **Trackable shipments and return policies.**

The findings indicated that there was a highly statistically significant relationship between, Trackable shipments and return policies and customer experience, i.e., its p-value is 0.044, where (p-value < 0.05).

ii) Objective 2: To assess the impact of demographic characteristics of consumers on customer experience such as Gender, Age, Residence, and usage of E-commerce.

- The demographic variable of gender had an estimated F-statistic of 4.19 and a p-value of 0.016. This suggested that there existed a statistically significant variation in the customer experience ratings among distinct gender groups.
- The demographic variable of Age had an estimated F-statistic of 2.555 and a p-value of 0.038. This implied that there existed a statistically significant variation in the customer experience ratings between age groups.
- The demographic variable of Residence had an estimated F-statistic of 3.220 and a p-value of 0.013. This implied that there existed a statistically significant variation in the customer experience ratings of different residences.

- The demographic variable of the usage of E-commerce had an estimated F-statistic of 5.306 and a p-value of 0.001. This implied that there existed a statistically significant variation in the customer experience ratings of usage of e-commerce.
- Based on the ANOVA test results, and the F-statistics, all of the demographic characteristics (Gender, Age, Residence, and usage of E-commerce) exhibited strong or statistically significant associations with customer experience.

iii) Objective 3: To analyze the impact of challenges encountered by consumers while shopping through an E-commerce website on customer experience.

The findings indicated that the positive coefficient suggested that an increase in challenges encountered by consumers was associated with a higher 'customer experience.' The low p-value (0.0033) indicated that this relationship was statistically significant, implying that the variable 'challenges encountered by consumers' were relevant in predicting 'customer experience.'

iv) Objective 4: To explore the factors that influence consumer decision to make a purchase online.

The findings indicated that all three variables 'Price,' 'Variety of Product selection,' and 'Fast shipping' had statistically significant coefficients with low p-values. This suggested that each of these factors significantly influences 'Consumer decision,' and the positive coefficients indicated a positive impact on the outcome.

v) **Objective 5: To investigate the correlation between customer support and customer experience.**

The findings indicated that the Pearson correlation coefficient between 'Customer Support' and 'Customer Experience' was approximately 0.454. The positive correlation indicated a moderate linear relationship between the two variables. This correlation coefficient suggested that there was a discernible relationship between the perceived quality of customer support services and the overall customer experience.

5.4 Results Based on Hypothesis

H1: Convenience, Competitive pricing, Accessibility, User Reviews, Ratings, Global reach, and Trackable shipments and Return policies influence the customer experience in the E-commerce industry.

The results suggested that Convenience, competitive pricing, accessibility, user reviews and ratings, global reach, and trackable shipments all demonstrated positive impacts on customer experience, with statistically significant p-values indicating their relevance in predicting outcomes. These findings highlighted the importance of various aspects such as convenience, pricing competitiveness, accessibility, user feedback, global presence, and reliable shipment tracking in shaping customer satisfaction. Hence, the above hypothesis (H1) is accepted.

H2: Gender, Age, Residence, and usage of E-commerce created a significant and distinct impact on customer experience in the E-commerce industry.

Based on the ANOVA test results, the p-values for each demographic variable were below the conventional significance level of 0.05, indicating that these variables had a statistically

significant impact on 'customer experience. All the demographic characteristics (Gender, Age, Residence, and usage of E-commerce) exhibited strong or statistically significant associations with customer experience. Therefore, the above hypothesis (H2) is Accepted.

H3: Challenges encountered by consumers while shopping through E-commerce websites created a negative impact on customer experience.

The positive coefficient suggested that an increase in challenges encountered by consumers is associated with a higher 'customer experience.' The low p-value (0.0033) indicated that this relationship is statistically significant, implying that the variable 'challenges encountered by consumers' are relevant in predicting customer experience'. Therefore, the above hypothesis (H3) is Accepted.

H4: Price, variety of Product selection**,** and Fast shipping on consumer decision to make a purchase online.

The R2 score of approximately 0.475 indicated that the independent variables (Price, variety of Product selection, and Fast shipping) collectively explain around 47.5% of the variation in consumer decisions. This suggested a moderate level of explanatory power, implying that almost half of the variability in consumer decisions can be attributed to these variables. Hence, the above hypothesis (H4) is accepted.

H5: There is a significant relationship between customer support and customer experience.

The Pearson correlation coefficient between 'Customer Support' and 'Customer Experience' was approximately 0.454. This correlation coefficient suggested that there was a discernible relationship between the perceived quality of customer support services and the overall customer experience. Hence, the above hypothesis (H5) is accepted.

5.5 Implications of the Study

a) **Business Strategy Enhancement:** E-commerce companies can utilize data-driven insights to optimize their business strategy, prioritizing aspects such as ease, affordability, accessibility, and worldwide expansion. This allows organizations to better synchronize their offerings with client preferences.

b) **Customer-centric techniques:** The study suggests that e-commerce enterprises should use customer-centric techniques, which involve personalizing services based on assessed data. Gaining comprehension of user evaluations and ratings facilitates the resolution of consumer concerns, ultimately augmenting contentment and fostering loyalty.

c) **Operational Efficiency:** Through the utilization of data-driven insights, companies can enhance their operational effectiveness, streamline procedures, and enhance overall efficiency. This encompasses focused marketing initiatives, customized client engagements, and enhanced supply chain administration.

d) **Competitive Advantage:** Implementing data-driven initiatives gives e-commerce enterprises a competitive advantage. Gaining insight into consumer behavior, tastes, and expectations enables the creation of distinctive value propositions and a more captivating online buying experience.

e) **Strategic Decision-making:** The study highlights the significance of employing data analysis to make sound decisions strategically. This approach can be utilized by e-commerce companies to forecast market fluctuations, monitor performance, and optimize omnichannel integration.

f) **Academic Advancements:** The study enhances academic knowledge by providing valuable insights into the practical utilization of data-driven information in the e-commerce industry. It provides opportunities for more investigation and inquiry at the crossroads of data science and customer experience.

The study encourages innovation in the e-commerce sector, urging companies to investigate future technologies and trends including artificial intelligence, big data analytics, and blockchain to enhance customer experience with greater efficiency.

5.6 Limitations of the Study

a) The study's dependence on a particular sample size may restrict the applicability of findings to the wider e-commerce sector.

b) Concentrating on a specific geographical area, such as India, may limit the relevance of observations to a broader global context.

c) The efficacy of the study relies on the precision of the gathered data, and any flaws or biases in the data can undermine the soundness of the conclusions.

d) The study presupposes a specific degree of technological infrastructure and data accessibility, which may result in the exclusion of companies with low resources or outdated systems.

e) The study could be impacted by temporal considerations, as consumer preferences and industry trends are prone to fluctuation over time.

f) The study's dependence on quantitative data may disregard subtle qualitative components of consumer experience that could offer significant insights.

g) The study presupposes uniformity in client choices, perhaps disregarding heterogeneous consumer segments with distinct wants and expectations.

5.7 Recommendations

a) **Invest in Advanced Analytics:** To fully leverage the potential of big data and obtain a more profound understanding of customer behavior and preferences, it is crucial for e-commerce companies to prioritize investing in advanced analytics technologies.

b) **Strategies for Tailoring to Individual Preferences:** Utilize individual consumer data to implement customized marketing strategies and product recommendations, hence improving the overall shopping experience and boosting customer happiness.

c) **Perpetual surveillance and adjustment:** Implement systems for ongoing surveillance of customer input and market trends, enabling companies to promptly adjust to evolving preferences and expectations.

d) **Improve the User Interface (UI) and User Experience (UX):** Consistently evaluate and enhance the user interface and user experience of e-commerce platforms to guarantee a smooth and pleasurable purchasing encounter, hence enhancing client loyalty.

e) **Deploy AI and Chatbots:** Incorporate artificial intelligence and chatbot technology to deliver immediate customer assistance, enhancing promptness and efficiently resolving concerns.

f) **Measures to Ensure Data Security:** Emphasize the implementation of strong data security protocols to establish and sustain consumer confidence, guaranteeing the safe management of confidential data.

g) **Omnichannel Integration:** Create and optimize omnichannel strategy to deliver a unified and seamless shopping experience across several platforms and channels.

h) **Programs to educate customers:** Inform clients about the advantages of utilizing data-driven personalization and motivate them to actively engage in offering feedback, cultivating a cooperative partnership.

i) **Workers' Training:** Provide regular training sessions to customer support workers on how to effectively utilize data-driven insights in order to gain a deeper understanding of customer needs and improve the responsiveness of the support system.

j) **Continuously compare performance against industry leaders:** Regularly assess and evaluate performance against industry leaders and competitors to remain knowledgeable about evolving trends, technologies, and best practices in data-driven customer experience initiatives.

5.8 Future Research Directions

a) **Advanced Technologies Integration:** Future research can explore the incorporation of nascent technologies, such as augmented reality (AR) and virtual reality (VR), to augment the customer experience in e-commerce platforms.

b) **Cross-Cultural Analysis:** Investigating how data-driven insights can be customized to various cultural contexts and consumer behaviors might offer significant knowledge for global e-commerce companies aiming to reach multiple markets.

c) **Ethical Considerations:** It is crucial to examine the ethical considerations of massive data collection and utilization in e-commerce. Potential research endeavors may investigate

conceptual frameworks for implementing ethical data practices that safeguard consumer privacy while simultaneously enhancing user experience.

d) **Long-Term Customer Loyalty:** Analyzing the enduring effects of data-driven initiatives on customer loyalty and retention can yield valuable insights into the maintenance of customer happiness and the long-term efficacy of individualized approaches.

e) **Omnichannel Integration:** Future research might prioritize the seamless integration of data-driven insights across many channels, such as mobile apps, social media, and physical stores, to guarantee a unified and consistent customer experience.

f) **Dynamic Market Analysis:** Examining the ability of real-time data analysis to adjust to dynamic market fluctuations and external influences, enabling e-commerce companies to proactively respond to changes in customer preferences and industry trends.

g) **AI-Powered Personalization:** Investigating the potential of artificial intelligence in delivering highly tailored suggestions and experiences and studying customer perception and response to interactions driven by AI.

h) **Predictive Analytics for Product Trends:** The study might investigate the application of predictive analytics in detecting and addressing emerging product trends. This would enable e-commerce companies to anticipate market desires and provide cutting-edge products.

i) **Comparative Analysis:** Conducting comparative analyses across diverse e-commerce platforms can yield valuable insights into the variable efficacy of data-driven tactics, providing standards for optimal practices in the sector.

j) **User empowerment:** Exploring methods to enhance user empowerment in managing and personalizing their data-sharing preferences and experiences inside e-commerce platforms, while maintaining a harmonious equilibrium between personalization and user autonomy.

These future research directions offer an opportunity to enhance our comprehension of the developing terrain of data-driven knowledge in e-commerce, offering useful insights for researchers, industry professionals, and regulators.

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APPENDIX A (SURVEY QUESTIONNAIRE)

About Study: The survey's goal is to collect information regarding E-commerce users' customer experiences and what their customer experience requirements are before making a purchase choice. Your replies will assist us in understanding how to make Data-Driven decisions to improve customer experience and identify areas for improvement. Please select the appropriate option or leave a brief comment.

1. Gender
   - Male
   - Female
   - Non-binary
   - Prefer not to say!

2. Age
   - Under 25
   - 25-34
   - 35-45
   - 45-54
   - 55 or older

3. Employment Status
   - Employed/Self-employed
   - Unemployed
   - Student
   - Retired

4. What tier of city do you currently reside in?

- Tier 1 (Metropolitan city with a high population and advanced infrastructure)
- Tier 2 (Large city with significant commercial and cultural centers)
- Tier 3 (Mid-sized city with developing infrastructure and amenities)
- Tier 4 (Small town or city with basic infrastructure)
- Rural area (Village or countryside)

5. Which is your most preferred method for shopping products like Clothing and Fashion, electronic gadgets, beauty and personal care products, Books, Health and wellness etc.

- Online (via the Internet)
- Offline (Visit the store)
- I don't shop (Someone else does it for me)

6. How frequently do you use E-commerce to purchase a product?

- Not often (~ 2-3 times in a month)
- Often (~ 1-2 times per week)
- Very often (~ 3+ times per week)
- Never

7. According to you, what does customer experience mean when you purchase from e-commerce website? Select all that apply.

- Website design and ease of navigation
- Product Information and Presentation
- Customer support (Pre and Post purchase)
- User Reviews and social proof

- Seamless website experience
- Continuous improvement
- Others (Please specify)

8. How important is the customer experience on an e-commerce website to you, if all the factors are met like best price, desired product, and low shipping cost.

- Extremely important
- Moderately important
- Slightly important
- Not important at all

9. Why do you prefer E-commerce over offline purchases? Select all that apply!

- Convenience
- Competitive pricing
- Accessibility and Global reach
- User Reviews and Ratings
- Personalization and Recommendation
- Ease of Comparison shopping
- 24/7 Availability
- Trackable shipments and Return Policies

10. What factors influence your decision to make a purchase online? (Select all that apply)

- Price
- Product selection
- Customer reviews
- Convenience
- Fast shipping
- Trustworthiness of the retailer

11. Which of the following challenges do you frequently encounter when shopping in E-commerce website? (Select all that apply)

- Difficulty in finding the desired products.
- Unclear product descriptions or images
- Lack of trust in product quality
- Slow website loading speed
- Unreliable website performance during payments
- Inadequate Customer support

Others (Please specify)

12. How important is customer support representative knowledge (Pre and Post purchase) influence your purchase decisions?

- Extremely important
- Moderately important
- Slightly important
- Not important at all

13. How accurate are product recommendations, discounts or promotions based on your browsing and purchase history on the E-commerce website that you purchase.

- Very inaccurate
- Somewhat inaccurate
- Neutral
- Somewhat accurate
- Very accurate

14. Have you made a purchase based on the personalized product recommendations, discounts, or promotions you received?

- Yes, multiple times.
- Yes, once.
- No, but I have considered it.
- No, the recommendations were not appealing.
- No, I prefer to make my own product choices.

15. Would you like the option to customize or adjust the personalized product recommendations, discounts or promotions based on your preferences?

- Yes, I would like that option.
- No, I prefer to rely on the website's algorithms.
- I'm not sure.

16. According to you, what is the Top priority for the success of any E-commerce website.

- Customer Experience
- Pricing
- Product

Others (Please specify)