

**A STUDY ON PERSONALISED PRODUCT RECOMMENDATION ON
CUSTOMER SATISFACTION**

Submitted to the School of Maritime Management,
Indian Maritime University

in partial fulfilment of the requirement for the award of degree of MBA in

Port And Shipping Management

by

MOHAMED ALTAF S

MBA (PSM)

Reg No: 2203304018

Under the supervision of

Dr Emil Mathew

Assistant Professor, School of Maritime Management



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(A Central University, Government of India)

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CERTIFICATE

This is to certify that this project report entitled " **A Study on Personalised Product Recommendation on Customer Satisfaction**" submitted to the School of Maritime Management, Indian Maritime University, Chennai Campus in partial fulfilment of the requirement for awarding the degree, Master of Business Administration in Port and Shipping Management, Indian Maritime University, Chennai is a work of Mohamed Altaf S (Reg. No: 2203304018).



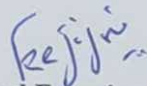
Dr B. Swaminathan

(Head of the Department)



Dr Emil Mathew

(Project Guide)



External Examiner:

(K. REJI JOSE)

Place: Chennai

Date :10/05/2024



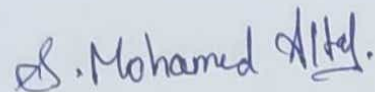
DECLARATION

I, Mohamed Altaf S (Reg. No: 2203304018), student of MBA Port and Shipping Management at School of Maritime Management, Indian Maritime University, Chennai Campus, do hereby declare that the dissertation entitled " **A Study on Personalised Product Recommendation on Customer Satisfaction**" is my original work. This report is being submitted in partial fulfilment of the requirement for the award of the degree of Master of Business Administration (MBA) in Port and Shipping Management (PSM). The dissertation is the output of my learning and observations of my research under the supervision and guidance of **Dr Emil Mathew**, Assistant Professor, School of Maritime Management, Indian Maritime University, Chennai Campus.

I further declare that the information submitted is true and original, to the best of my knowledge.

Place: Chennai

Date: 10 /05/2024



S MOHAMED ALTAF

Reg. No: 2203304018

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I am grateful for the motivation and support from my friends and family and I sincerely appreciate the help from all our loved ones in getting this project finished.

Place: Chennai

Date: 10/05/2024

Mohamed Altaf S.

MOHAMED ALTAF S

Reg. No: 2203304018

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CHAPTER I
INTRODUCTION

1.1 Introduction

In the digital era, where e-commerce has become an integral part of daily life, the competition among online retailers is fierce. The success of an e-commerce platform hinges not only on the quality of its products but also on the ability to understand and cater to the preferences of its customers. Personalised product recommendations have emerged as a powerful tool for enhancing the shopping experience and driving sales in e-commerce. By leveraging data analytics and algorithms, e-commerce platforms can offer tailored product suggestions to individual customers based on their past behaviours, preferences, and demographics.

The significance of personalised product recommendations lies in their potential to improve customer satisfaction and loyalty. By presenting customers with items that align with their interests and needs, e-commerce platforms can streamline the shopping process, reduce decision fatigue, and enhance the overall user experience. Moreover, personalised recommendations can facilitate the discovery of relevant products that customers may not have otherwise encountered, thereby increasing the likelihood of purchase and driving revenue for the retailer.

Despite the growing adoption of personalised product recommendations in e-commerce, there remains a need to understand their impact on customer satisfaction comprehensively. While anecdotal evidence suggests that personalised recommendations can enhance the shopping experience, empirical research is required to validate these claims and uncover the underlying mechanisms at play. This study seeks to address this gap by investigating the influence of personalised product recommendations on customer satisfaction in the context of e-commerce.

1.2 Personalised Product Recommendation

Personalised product recommendation systems employ sophisticated algorithms to analyse customer data and predict their preferences accurately. These systems utilize various techniques such as collaborative filtering, content-based filtering, and hybrid approaches to generate recommendations that are tailored to each individual user. Collaborative filtering algorithms leverage the wisdom of the crowd by recommending products that similar users have purchased or shown interest in. Content-based filtering, on the other hand, analyses the attributes of products and recommends items that are similar to those previously liked or purchased by the user. Hybrid approaches combine elements of both collaborative and content-based filtering to provide more accurate and diverse recommendations.

The effectiveness of personalised product recommendation systems relies on the quality and relevance of the underlying data. E-commerce platforms collect vast amounts of data on customer browsing behaviour, purchase history, demographics, and preferences, which are then used to train recommendation algorithms. Machine learning techniques are employed to process this data and generate personalised recommendations in real-time, ensuring that the suggestions remain relevant and up-to-date.

Personalised product recommendations have been shown to significantly impact key metrics such as conversion rates, average order value, and customer retention. By presenting customers with products that align with their preferences, personalised recommendations can increase the likelihood of purchase and encourage repeat business. Moreover, personalised recommendations contribute to a more engaging and personalised shopping experience, fostering a sense of loyalty and satisfaction among customers.

1.2.1 Need for use of personalised product recommendation

Customers should receive personalised recommendations from you for a number of reasons that have a direct impact on user experience, engagement, and business results. Now let's explore the significance of tailored recommendations:

1. **Improved User Experience:** By offering pertinent information or goods that suit unique tastes and interests, personalised suggestions improve the user experience as a whole. Users are more likely to interact favourably with the platform and become more satisfied and devoted when they come across products or information that appeals to their tastes.

2. **Improved Engagement:** Users are inclined to spend more time on a platform or website when they receive personalised recommendations. When products or content are presented to users based on their preferences, there is a far higher chance that they will engage in some way, like clicking, browsing, or making a purchase. better user retention and maybe better income are the results of this greater involvement.

3. **Finding Relevant Content:** Users frequently experience information overload in the expansive digital world of today. Users can find interesting and relevant products or content through personalised suggestions that they might not have otherwise found. This promotes exploration within the site and improves the user's discovery experience.

4. **Higher Conversion Rates:** In e-commerce environments in particular, personalised recommendations have the potential to increase conversion rates. Users are more likely to make

purchases when they are presented products that are relevant to their requirements or interests. The likelihood of users abandoning the platform without taking any action is reduced by this focused approach.

5.Retention and Customer Loyalty: Platforms may cultivate strong customer connections and customer loyalty by regularly providing consumers with personalised recommendations that they find meaningful. When a platform regularly recognises and accommodates users' preferences, users are more likely to stick around and build lasting relationships.

6.Competitive Advantage: In congested markets, personalised recommendations offer a competitive edge. Compared to platforms with generic or less relevant information, those that succeed at providing personalised experiences are more likely to stand out, attract, and keep consumers.

7.Data-Driven Insights: Producing tailored recommendations yields insightful data regarding user behaviour, tastes, and patterns. Better business decisions and results can be achieved by using this data to optimise product offers, improve algorithms, and customise marketing campaigns.

8. Customer Satisfaction and Trust: Users' general levels of satisfaction and trust are increased when they believe that a platform is aware of their preferences and honours their decisions. This satisfying exchange supports the idea that the platform is beneficial and user-focused.

9. Opportunities for Cross-Selling and Upselling: Strategic use of personalised suggestions can result in cross-selling or upselling of related goods and services. Platforms can boost average order value and overall sales by making recommendations for complementary products based on a user's interests.

10. Adaptation to User Preferences: Over time, user preferences and behaviours may change. By continuously evaluating user interactions and revising recommendations in accordance with the results, personalised recommendation systems may adjust to these changes and maintain their efficacy and relevance.

1.3 Research Question

This study aims to investigate the following research question: What is the impact of personalised product recommendations on customer satisfaction in e-commerce?

1.4 Objectives

The objectives of this study are as follows:

1. To assess the influence of personalised product recommendations on customer satisfaction.
2. To examine the factors that mediate the relationship between personalised recommendations and customer satisfaction.

1.5 Scope of the Study

This study focuses on exploring the impact of personalised product recommendations on customer satisfaction within the context of e-commerce platforms. It considers various factors such as the quality of recommendations, user experience, and purchase behaviour to understand the mechanisms underlying the relationship between personalised recommendations and customer satisfaction. The study excludes other aspects of e-commerce operations such as logistics, pricing, and customer service, which may also influence overall customer satisfaction but are beyond the scope of this research.

1.6 Research Methodology

The research methodology for this study involves a combination of quantitative analysis and qualitative investigation. Quantitative methods, such as surveys and data analytics, will be utilized to collect and analyse empirical data on customer satisfaction and the effectiveness of personalised product recommendations. Qualitative methods, such as interviews and case studies, will be employed to gain deeper insights into the perceptions and experiences of both customers and e-commerce platform operators regarding personalised recommendations. Statistical tools such as chi-square test will be used to analyse the data.

1.6.1 SAMPLE DESIGN

A sample design is a method for selecting a representative sample from a population. It refers to the method or procedure used by the researcher to pick things for the sample. Sample design

also leads to a technique for determining the sample size, or the number of things to be included in the sample.

As a result, sample design is set prior to data collection. The researcher should select samples that are dependable and acceptable for his research topic from a variety of sample design techniques.

The rules and techniques by which some parts of the population are included in the sample are referred to as the sampling method. Simple random sampling, stratified sampling, and cluster sampling are all typical sampling methods.

1.6.2 RESEARCH DESIGN

TYPE OF DATA

Primary data is information gathered directly from primary sources by researchers using methods such as interviews, questionnaires, and experiments. Primary data is usually acquired directly from the source—the place where the data came from—and is considered the greatest type of data in research.

Surveys and questionnaires are two types of primary data collection techniques. They are a set of questions that are typed or written out and submitted to a study sample for responses. The survey is returned to the researcher for recording after the relevant replies have been completed. It is recommended to conduct pilot research in which specialists fill out questionnaires to examine the weaknesses of the questions or methodologies utilized.

INSTRUMENTS USED

A Google form was used to build a questionnaire. It was utilized to get replies from the people who took part in the survey. It was distributed via a variety of social media sites.

SAMPLE SIZE

This research study used a sample size of 103 respondents.

SAMPLE TECHNIQUE

Convenient sampling was used for research study. A convenience sample is a non-probability sampling method that takes a sample from a group of people who are easy to contact or reach. Grab sampling or availability sampling are terms used to describe this form of survey. The

sampling approach has no additional requirements than that people be available and willing to participate

1.7 Limitations of Study

Despite rigorous methodology, this study may encounter several limitations. Firstly, the generalizability of findings may be limited due to the specific context and sample characteristics. Secondly, the reliance on self-reported data from surveys may introduce response bias and inaccuracies. Thirdly, external factors such as market dynamics and competitor strategies may confound the relationship between personalised recommendations and customer satisfaction. Finally, the dynamic nature of e-commerce necessitates ongoing monitoring and adaptation of research methods to account for changes in technology and consumer behaviour.

CHAPTER-II
REVIEW OF LITERATURE

2.1 The Literature Review

1. A Study on the Impact of "Personalized Marketing" on Customer Satisfaction and Loyalty in Retail Fashion in 2023 (Chhabria, 2023)

Chhabria's (2023) study focuses on the retail fashion industry, where personalised marketing strategies heavily influence customer decisions. The research highlights three key benefits that contribute to enhanced customer satisfaction:

- **Improved Relevance:** Personalised recommendations ensure customers see products that align with their tastes and needs. This eliminates irrelevant suggestions and streamlines the shopping experience, leading to a sense of satisfaction.
- **Enhanced Engagement:** Customers are more likely to interact with a brand that presents them with targeted recommendations. This fosters a sense of connection and keeps them engaged with the platform, ultimately leading to higher satisfaction.
- **Increased Trust:** When a company demonstrates it understands customer preferences through personalised recommendations, it builds trust. This fosters a positive brand perception and increases customer satisfaction.

The study concludes that personalised marketing strategies significantly improve customer satisfaction and loyalty in the retail fashion sector.

2. Personalized Product Recommendation and User Satisfaction: Reference to Industry 5.0 (Huang et al., 2023)

Huang et al. (2023) explore the link between personalised product recommendations and user satisfaction in the context of Industry 5.0, which emphasizes human-centric manufacturing and customisation. Their research emphasizes the positive association between these two factors.

The study highlights that the accuracy of recommendations plays a crucial role. When suggestions are truly relevant to user preferences, satisfaction soars. However, inaccurate recommendations can lead to frustration and dissatisfaction. Additionally, the authors suggest that a balance between personalised suggestions and product diversity is important. While users appreciate tailored recommendations, they also value the ability to discover new items outside their usual preferences.

3. The impact of personalized recommendations on website conversion rates (Singh et al., 2022)

Singh et al. (2022) investigates the impact of personalised recommendations on website conversion rates, indirectly linking it to customer satisfaction. Their research finds that presenting users with relevant products increases the likelihood of a purchase. This translates to a more satisfying customer experience as users find what they're looking for quickly and efficiently.

The study highlights that Personalisation can significantly reduce the time users spend browsing irrelevant products, leading to a more streamlined and enjoyable experience. This, in turn, fosters customer satisfaction and encourages repeat visits.

4. Personalized recommendations: The Impact of Personalized Recommendations on User Engagement (Smith, 2021)

Smith (2021) explores the impact of personalised recommendations on user engagement, a key factor influencing customer satisfaction. The research suggests that presenting users with tailored suggestions keeps them engaged with the platform for longer periods. This is because users are more likely to explore and interact with content that aligns with their interests.

The study emphasizes that increased engagement fosters a sense of value and satisfaction. When users feel like a platform understands their needs and preferences, they are more likely to be satisfied with the overall experience.

5. The impact of personalized recommendations on the customer experience (Abmatic AI, 2020)

While not a peer-reviewed study, this research by Abmatic AI (2020) provides valuable insights into the customer experience benefits of personalised recommendations. The report highlights several key points:

- **Increased Customer Satisfaction:** Personalised recommendations help users discover relevant products and content, leading to a more efficient and satisfying experience.
- **Improved Convenience:** By eliminating irrelevant suggestions, Personalisation streamlines the shopping journey, reducing frustration and increasing satisfaction.
- **Higher Conversion Rates:** When presented with tailored recommendations, users are more likely to convert, leading to a more positive perception of the brand.

6. Customer Satisfaction of Recommender System: Examining Accuracy and Diversity in Several Types of Recommendation Approaches (Zheng et al., 2023)

Zheng et al. (2023) delve into the specific characteristics of effective personalised recommendations. Their research highlights the importance of both accuracy and diversity. When recommendations are highly accurate, suggesting products users genuinely like, satisfaction increases. However, the study finds that solely focusing on accuracy can lead to a lack of exploration. Introducing a degree of diversity, suggesting some items outside a user's usual preferences, fosters a sense of discovery and prevents user fatigue.

7. Do Personalization Efforts Always Lead to Increased Customer Satisfaction? An Examination of the Moderating Role of Consumer Privacy Concerns (Lee & Jeon, 2022)

Lee & Jeon (2022) explore the potential drawbacks of personalisation, specifically the role of privacy concerns. Their research suggests that while personalisation can enhance satisfaction, an overreliance on user data can backfire. When customers feel their privacy is being invaded or that their data is misused, it can lead to dissatisfaction and a decline in trust. The study emphasizes the importance of transparency in data collection practices and providing users with control over their data.

8. The Dark Side of Personalization: How Tailored Recommendations Can Lead to Filter Bubbles and Customer Dissatisfaction (Bakshy et al., 2020)

Bakshy et al. (2020) explore the potential negative consequences of personalisation, specifically the creation of "filter bubbles." Personalised algorithms can inadvertently limit users' exposure to diverse viewpoints and information. When customers are only recommended products or content that aligns with their existing preferences, it can lead to a narrow perspective and ultimately, dissatisfaction. The study suggests incorporating mechanisms to introduce users to a broader range of options, fostering a more enriching experience.

9. Algorithmic Bias in Recommendation Systems: Problems and Solutions (Ekstrand et al., 2019)

Ekstrand et al. (2019) address the critical issue of algorithmic bias in recommendation systems. Biases can be embedded in algorithms based on historical data or design choices, potentially

leading to discriminatory or unfair recommendations. When users perceive bias, it can lead to frustration and dissatisfaction. The study emphasizes the need for developers to be aware of potential biases and implement strategies to mitigate them, ensuring fair and inclusive recommendations.

10. Understanding User Perceptions of Algorithmic Personalization in E-commerce: A Conceptual Framework (Luo et al., 2018)

Luo et al. (2018) explore user perceptions of algorithmic personalisation in e-commerce. Their research highlights the importance of understanding user attitudes. While some users appreciate the convenience and relevance of personalised recommendations, others may find them intrusive or manipulative. The study proposes a framework for understanding user perceptions, allowing companies to tailor their personalisation strategies to encourage positive customer experiences.

11. Understanding the Impact of Personalized Recommendations on Customer Satisfaction, Likelihood to Recommend and Repurchase Intentions (Joana Rodrigues., 2021)

This dissertation effectively investigates the impact of personalised recommendations on customer satisfaction and loyalty. It highlights the crucial role of various components within these recommendations and how customer perceptions influence their effectiveness.

The research explores three key elements of personalised recommendations: explanation of the suggested items, fit with the customer's needs, and privacy concerns. Additionally, it examines the role of trust in the retailer issuing the recommendation. The study demonstrates that clear explanations, good product-customer fit, and high trust all contribute positively to customer satisfaction with the recommendations. Conversely, privacy concerns can negatively impact this satisfaction.

The dissertation further establishes a positive link between satisfaction with the recommendations and satisfaction with the chosen product. This, in turn, leads to a higher likelihood of recommending the retailer and increased repurchase intentions. This chain reaction underscores the importance of personalised recommendations in fostering customer loyalty.

An interesting aspect of the research involves the analysis of low-involvement versus high-involvement products. The findings suggest that personalised recommendations hold greater

influence on customer behaviour for high-involvement products, where customers invest more time and consideration in their purchase decisions.

Overall, the dissertation offers valuable insights for businesses seeking to leverage personalised recommendations. By focusing on providing clear explanations, ensuring product-customer fit, and addressing privacy concerns, retailers can enhance customer satisfaction with recommendations, ultimately leading to increased loyalty and repurchase intentions. This knowledge empowers businesses to design more effective recommendation systems and strengthen their relationships with customers on digital platforms.

CHAPTER III
OVERIEW ON PERSONALISED RECOMMENDATIONS

3.1 Background of Personalisation

Personalised recommendation is a strategic approach employed by businesses to enhance user experience and boost engagement by providing customized suggestions based on individual preferences and behaviours. Leveraging data analytics, machine learning, and AI, personalised recommendation systems analyse large volumes of customer data to predict items or content that a specific user is likely to enjoy or find valuable. This user-centric strategy not only increases satisfaction and loyalty but also drives engagement through tailored product suggestions. By presenting relevant recommendations, businesses can improve conversion rates, capitalize on cross-selling opportunities, and foster customer exploration and discovery within their platform. Personalised recommendation systems also generate valuable data insights that inform marketing strategies and optimize business decisions. Overall, implementing personalised recommendation is essential for creating meaningful interactions that resonate with users, ultimately enhancing the overall value proposition and competitiveness of a business in today's digital marketplace.

Personalised recommendation systems rely on sophisticated algorithms that process user data, including browsing history, purchase behaviour, demographic information, and interactions with the platform. These algorithms use techniques like collaborative filtering, content-based filtering, and machine learning models to analyse patterns and preferences, generating personalised recommendations in real-time. For example, a streaming service might recommend movies based on a user's viewing history and genre preferences, while an e-commerce platform might suggest products similar to ones previously purchased or liked by the user.

The benefits of personalised recommendation extend beyond immediate engagement metrics. By providing tailored suggestions, businesses can foster long-term customer relationships and build brand loyalty. Users appreciate platforms that understand their preferences and cater to their interests, leading to increased customer retention and reduced churn rates. Additionally, personalised recommendation systems contribute to revenue growth by increasing average order value through cross-selling and upselling tactics. Businesses can optimise their product offerings and promotional strategies based on insights derived from recommendation systems, ensuring that marketing efforts resonate with target audiences.

Moreover, personalised recommendation contributes to a positive user experience by reducing information overload and streamlining decision-making processes. Instead of sifting through

vast amounts of content or products, users are presented with curated selections that match their tastes, preferences, and needs. This convenience and relevance contribute to higher user satisfaction and engagement, ultimately driving business success in today's competitive digital landscape. As technology continues to evolve and data-driven strategies become increasingly integral to business operations, personalised recommendation remains a powerful tool for delivering value and differentiation in the marketplace.

3.2 Evolution of Customers

The evolution of customers in the digital world has been transformative, shaped by technological advancements, changing consumer behaviours, and evolving expectations. Initially, customers adapted to basic online interactions, such as browsing websites and making transactions. However, with the proliferation of smartphones and mobile apps, customers gained unprecedented convenience and accessibility, shifting towards mobile-centric behaviours. This mobile revolution ushered in an era of constant connectivity and instant gratification, prompting customers to expect personalised experiences tailored to their preferences and contexts. Concurrently, the rise of social media and user-generated content empowered customers to voice their opinions, influence purchasing decisions, and seek authentic engagement from brands. Subsequently, the advent of data analytics and AI-driven technologies enabled businesses to analyse vast volumes of customer data, predicting behaviours, and delivering hyper-personalised experiences in real-time. As customers continue to evolve in this digital landscape, businesses must adopt agile strategies that prioritize customer-centricity, leveraging data-driven insights to anticipate needs, enhance interactions, and cultivate lasting relationships in an increasingly interconnected and dynamic environment.

3.3 Technological trends in Personalisation of products

Businesses' perspectives on marketing are being revolutionised by an increasing number of technical advancements. Among these, big data, machine learning, and artificial intelligence are important trends. To better serve their clients, businesses should therefore make the investment to digitise and adjust to these new realities.

3.3.1 Artificial Intelligence:

Artificial intelligence (AI) is a branch of computer science that aims to create intelligent machines capable of mimicking human cognitive functions. It encompasses a variety of techniques, including machine learning, which allows machines to learn from data without explicit programming. AI systems can analyse information, solve problems, make decisions, and even adapt their behaviour based on new information. While AI isn't yet capable of achieving true human-level intelligence, it is revolutionizing fields like healthcare, finance, and transportation by automating tasks, uncovering hidden patterns, and making data-driven predictions. The development of AI raises ethical considerations, but its potential to improve our lives and solve complex problems is undeniable.

Benefits of AI in Business

Artificial intelligence is having a growing and positive impact on how businesses operate, particularly with regard to their marketing strategies, company plans, and customer behaviour. Business models can become more automated using artificial intelligence, requiring nearly no human participation. Additionally, it may give businesses big data-driven consumer insights that help them enhance customer interaction before, during, and after a sale.

Application

Furthermore, a wide range of disciplines have been touched by artificial intelligence, including biology, healthcare, and hospitality as well as more technical scientific fields like engineering. It can also be used in the news and entertainment sectors, as well as in the fields of construction, education, and law. Additionally, business, comprising the domains of finance, logistics, production, and marketing, is the most significant application to this study.

Applications in marketing

Additionally, as customers want more individualised connections with businesses, artificial intelligence developments in marketing are emerging. These have made more and more investments in machine learning algorithms, which use large data analysis to produce precise predictions. Consequently, helping to improve marketing choices and the success of businesses as a whole.

The technologies mentioned above lead to marketing applications that influence business decisions related to the marketing mix, including price and ad personalisation. Technologies

that enable augmented reality, virtual fitting rooms, virtual influencers, virtual assistants, and chatbots that can reply to customers and answer their queries have an impact on customer engagement as well.

Additionally, recommender systems that offer users customised product recommendations make use of artificial intelligence. Businesses use big data to improve the quality of the individualised recommendations made by artificial intelligence in order to continuously update client insights.

3.3.2 Big Data

Big data is defined as data that operates quickly, has a wide range of forms and sources, and is collected in big quantities. The processes associated with big data include data collection and recording, extraction, cleansing, and annotation, as well as integration, aggregation, and representation. Big data then gains value through the later processes by offering priceless customer insights that an organisation can utilise to enhance the customer purchasing experience and, as a result, increase profitability. To accomplish these goals, big data analytics is needed, which uses tools like machine learning to analyse vast and diverse amounts of data and find important customer preferences, allowing businesses to make well-informed judgements regarding their client base.

5V's of Data

The three V's that define big data are volume, variety, and velocity. Some authors even go so far as to say that big data is made up of the 5Vs, which supplement the 3Vs with Value and Veracity. Volume refers to the massive amounts of data that are examined; these amounts can range from terabytes to exabytes. Variety refers to the various shapes that data can take, taking into account that it can be both structured and unstructured. Data that is gathered, processed, and used in accordance with previously established frameworks and methodologies is referred to as structured data. Unstructured data can come in a variety of formats, such as text, multimedia, pictures, and audiovisual files. The quick movement of data that updates and responds in milliseconds to seconds is referred to as velocity. Next, there are two more Vs: Value and Veracity. One feature of veracity has to do with the degree of uncertainty in the data. Last but not least, the value characteristic discusses the potential for financial gain that accurate analysis of large data can provide.

Sources of Data

Moreover, retailers have access to big data from a variety of sources. The sources include data from consumer loyalty cards and standard retail systems that offer sales and inventory information. Customers' online presence, which includes the retailer's website, their use of mobile devices and apps, which generates social and profiling data about them, and their habitual and subconscious online behaviours are more sources of data. It also results from the retailer's store, the surrounding area, and the store's location.

Challenges and Benefits in Big data Analysis

Furthermore, businesses can gain a lot from big data. Businesses find great value in big data analysis because it allows them to derive customer insights and tailor products to individual customers. However, even if big data has the potential to help merchants and boost performance, these goals can occasionally be challenging to meet. One explanation could be that businesses either don't invest enough or find it challenging to get customer insights from the available data once they do. In this sense, a company's increased performance is not always a direct result of its big data efforts.

3.3.3 Machine Learning

The algorithms that support artificial intelligence are composed of machine learning, which enables the system to function and produce insightful data on customers. Artificial Intelligence is capable of making decisions thanks to machine learning algorithms.

Methods & Strengths

Machine learning techniques can be divided into two categories. First, interpretable models linked to machine learning algorithms offer transparency and clarity in understanding the choices made by artificial intelligence. These include additive models, decision trees, sparse linear models, and Bayesian classifiers. Furthermore, alternative models—deep learning algorithms—have better prediction accuracy but are less transparent and interpretable in terms of how the invention in question makes judgements. One of the machine learning techniques used in marketing the most is this one, which is primarily utilised for text and image analysis. These are a handful of the most popular machine learning techniques.

The effectiveness and accuracy of machine learning's predictions are enhanced by a few noteworthy strengths. These strengths include the ability to assess large amounts of data, data

from many sources, formats, and complicated structures, as well as the ability to analyse both structured and unstructured data. Furthermore, machine learning is distinguished by its adaptability in analysing data that is made feasible by the structure of its model.

Limitations

As previously stated, there are advantages to machine learning. However, it is important to realise that machine learning has a number of drawbacks. One of these drawbacks is the interpretation difficulty resulting from the model's lack of transparency. complexity. Hence, affecting the comprehension of the relationship between variables. The kind of correlation it produces, which is frequently correlational rather than causal, is another limitation. Furthermore, the capability of this technology to assess heterogeneity and changing trends at the individual level is still unproven.

Personalised Product Recommendations

This section provides a more detailed description of the technologies used by businesses to derive customer insights from data and offer personalised product suggestions, following a thorough review of such technologies.

3.4 Personalisation.

Businesses use Personalisation as a customer-focused marketing tactic in their operations. It enables businesses to give the appropriate information to the appropriate client at the most advantageous time. Personalisation is defined by the procedure of assessing client data to tailor the company's offering to each individual's interests.

3.4.2 Personalised Recommendations

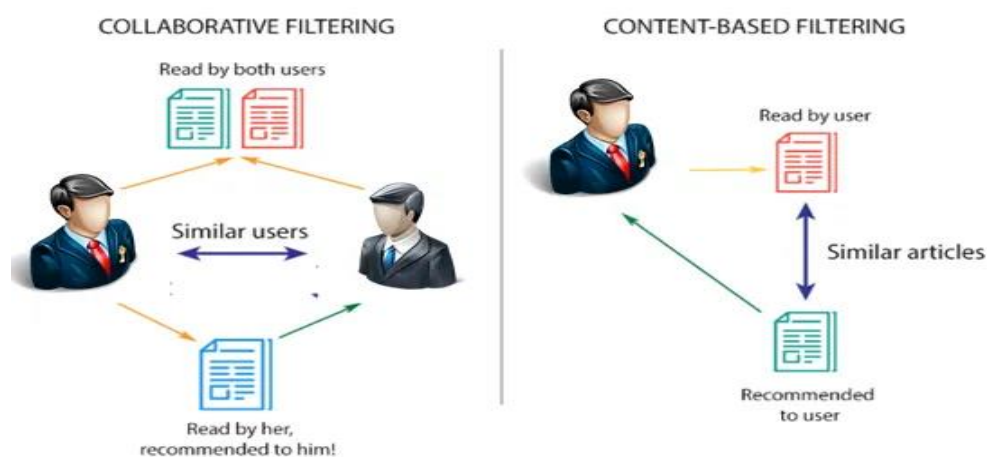
Consequently, recommendations use personalisation to anticipate users' interests and wants by urging users to take specific alluring behaviours. Personalised suggestions are important to businesses because they enable them to provide clients with appropriate goods and services that are catered to their interests and needs.

In fact, the aforementioned recommendations are produced by automated systems using algorithms that process data in order to meet the demands of the users and facilitate their decision-making process by recognising their preferences and providing relevant

recommendations. Additionally, recommender systems examine a customer's past purchasing patterns in an effort to determine what the user might like to purchase.

Therefore, the goal of recommender systems is to make recommendations for the most appropriate item to a particular user based on data collected about the goods or services, clients, and the customer-provider interface. Thus, resulting in suggestions for films, music, and literature, tourism destinations, to name only a few. There are eight main domains in which these find application in Governments, businesses (B2C and B2B), online retailers, digital libraries, educational institutions, tourism, content referring to tags, television shows, webpages, documents, videos, and movies, as well as group activities receiving group suggestions, are among the various uses for these electronic recommendations.

3.4.3 Techniques



The standard techniques comprised of collaborative filtering, content-based, knowledge-based, and hybrid approaches are the most frequently employed by recommender systems. There are further freshly created methods as well. With the benefits of each of these methods, and its drawbacks, which ought to be taken into account when choosing which one to use in the recommender system.

When it comes to conventional recommendation methods, content-based recommendations present options that are similar to those the user has previously selected. The idea behind collaborative filtering-based techniques is to suggest products to a user based on the interests of other users. Knowledge-based approaches make recommendations for products and services based on pre-existing knowledge about people, goods, or services, and their relationships. The

aforementioned hybrid methodology is created by combining the more accurate features of two or more recommendation strategies.

Computational intelligence techniques are worth mentioning in relation to the latest recommendation techniques. Among them are fuzzy set-based offers, which are a carefully crafted assortment of approaches for managing non-stochastic uncertainty. The goal of social network-based technology is to improve user experience by encouraging users to engage in social interfaces with one another. The way the context-awareness-based approach creates suggestions is by using contextual data in a timely manner. The goal of group recommendation techniques is to create recommendations for groups that aim to align with the members' common interests.

Some of the Techniques are listed Below:

1. Collaborative Filtering:

User-Based Collaborative Filtering: Using the preferences of other users who are similar to them, this technique makes recommendations for things to a user. User A may receive a recommendation for a movie if, for instance, User B and User A have similar watching histories and User B has seen and appreciated a movie that User A hasn't seen yet.

Example:

If both Users A and B have given high ratings to films such as "Inception," "Interstellar," and "The Matrix," User A may receive suggestions for further sci-fi or mind-bending films that User B has given high ratings for.

Using this approach, goods that a user has already interacted with are recommended to them. For example, if a user rates or views films such as "The Dark Knight," "The Dark Knight Rises," and "Batman Begins," the system may suggest other action or superhero flicks.

2.Item-Based Collaborative Filtering

Using this approach, goods that a user has already interacted with are recommended to them. For example, if a user rates or views films such as "The Dark Knight," "The Dark Knight Rises," and "Batman Begins," the system may suggest other action or superhero flicks.

Example

In the event that a user has seen and appreciated "Avengers: Endgame," the algorithm may suggest further Marvel Cinematic Universe films or superhero flicks that are comparable.

3. Content-Based Filtering

Using traits or characteristics of goods they have previously engaged with; this technique makes recommendations for items to consumers. For instance, the system can suggest more romantic flicks to a user based on how many romantic comedies they have seen.

Example:

The system may suggest further films in the same genre starring the same actors or directed by the same filmmakers if a user regularly views and rates romantic films featuring particular actors or directors.

4. Matrix Factorization

Matrix factorization is a method used to decompose a user-item interaction matrix into lower-dimensional matrices that capture latent factors or patterns. It's particularly useful for dealing with sparse data and making personalised recommendations.

Example:

Matrix factorization can be used in a movie recommendation system to find latent elements that affect user preferences, such as actors, genres, or themes, and then utilise these factors to forecast ratings or preferences for upcoming films.

5. Deep Learning

Neural networks are used in deep learning approaches to extract intricate patterns and correlations from user-item interaction data. Nonlinearities and interactions that conventional approaches would overlook can be captured by these models.

Example:

A neural collaborative filtering (NCF) model might use embeddings of users and items to learn representations that capture similarities between users and items. This can lead to more accurate and personalised recommendations.

6. Context-Aware Recommendation

To increase the relevance of recommendations, context-aware recommendation considers variables including time, location, device, and user behaviour.

Example:

Adapting recommendations for different devices (e.g., mobile vs. smart TV), proposing nearby restaurants or attractions based on location, or recommending different types of material depending on the time of day (e.g., morning news, evening films).

7. Hybrid Recommendation Systems

Multiple recommendation techniques are combined by hybrid systems to take use of their strengths and offer recommendations that are more varied and accurate.

Example:

Combining collaborative filtering with content-based filtering to provide recommendations based on both user preferences and item attributes, or using matrix factorization in conjunction with deep learning for more robust personalised recommendations.

8. Bandit Algorithms

To maximise recommendation performance, bandit algorithms strike a balance between exploitation—making recommendations based on current knowledge to maximise user engagement—and exploration—trying new recommendations to collect more user data.

Example:

Digital advertising networks that flexibly distribute ads according to user feedback, continuously learning and adjusting to optimise click-through rates while investigating novel ad locations.

9. Factorization Machines

More precise modelling of user-item relationships is made possible by Factorization Machines, which extend classical matrix factorization to incorporate interactions between item attributes.

Example:

Factorization machines can simulate the relationships among artists, genres, and user preferences in a music recommendation system in order to suggest customised playlists or individual songs.

10. Session-Based Recommendations

Recommendations according to sessions concentrate on making suggestions for products depending on the user's recent session or short-term preferences.

Example:

A streaming platform that recommends movies or TV shows based on a user's recent viewing history within the same session, adapting recommendations as the user's preferences evolve during the session.

3.4.4 Usage in day-to-day life

Additionally, a variety of businesses from various sectors use recommender systems to offer recommendations to their clients. The New York Times, Flipkart, Netflix, and Amazon are a few of the most frequently named.

For example, Netflix offers its subscribers customised movie recommendations. In order to achieve this, the company gathers and analyses large amounts of data regarding the viewing habits of its clients, ascertains their preferences, and produces tailored recommendations. Utilising its predictive analytics capabilities, Amazon also suggests products that customers might find interesting, enabling the corporation to maintain the excellent reputation of its recommender system. Because Amazon's suggestions are item-based, their analysis is based on past customer behaviour as well as the experiences of other users. The New York Times suggests fresh items based on the preferences of each user.

CHAPTER IV
DATA ANALYSIS

4.1 FRAMEWORK OF ANALYSIS

1. PERCENTAGE ANALYSIS

The percentage method is a simple type of comparison method that is used to compare two or more sets of data. The percent is calculated using a descriptive relationship. It compares the objects that are related to each other. Because the percentage reduces everything to a common base, meaning comparisons are possible.

$$\text{Percentage} = \text{Number of respondents} / \text{Total no. of respondents} \times 100$$

2. CHI-SQUARE

A chi-square (χ^2) statistic is a test that assesses how well a model matches actual data. A chi-square statistic requires data that is random, raw, mutually exclusive, collected from independent variables, and drawn from a large enough sample. The outcomes of a fair coin flip, for example, meet these conditions.

In hypothesis testing, chi-square tests are frequently utilized. Given the size of the sample and the number of variables in the relationship, the chi-square statistic examines the size of any disparities between the expected and actual results.

$$\text{CHI TEST FORMULA} = (\chi^2) = \sum(\text{O}-\text{E})^2 / \text{E}$$

Whereas,

O = Observed frequency

E = Expected frequency

R = Number of Rows

C = Number of Columns

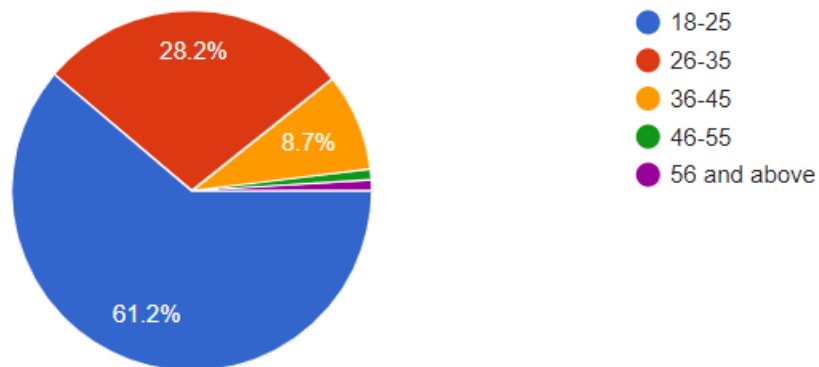
4.2 Percentage Analysis

4.2.1 Table- Age of Respondents

Sl. No	Age	No of Respondents	percentage
1	18-25	63	61.17
2	26-35	29	28.16
3	36-45	9	8.74
4	46-55	1	0.97
5	56 and above	1	0.97
		103	100.00

4.2.1 Pie Chart-Age of Respondents

103 responses



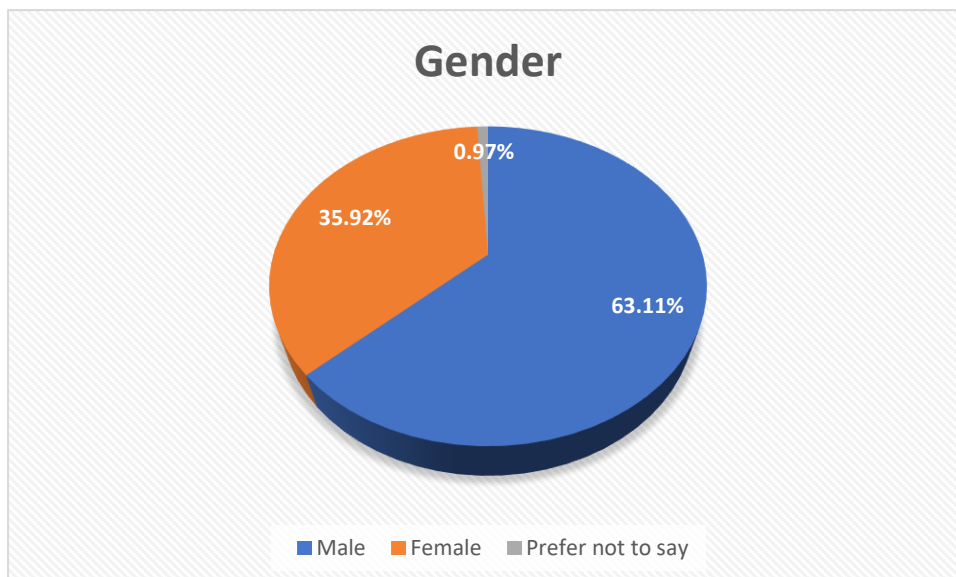
Interpretation

A majority, 61.17% of the respondents fell between the age group of 18 – 24, followed by 28.16% of respondents who fell between the age group of 26 – 35.

4.2.2 Table-Gender of Respondents

Sl. no	Gender	No of Respondents	Percentage
1	Male	65	63.11
2	Female	37	35.92
3	Prefer not to say	1	0.97
		103	100.00

4.2.2 Pie chart-Gender of Respondents



Interpretation:

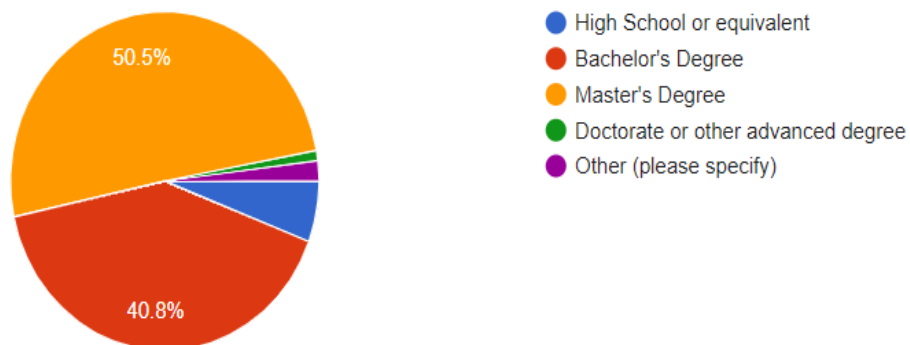
The study indicates 63.11% of its respondents were male and 35.92% of them were female

4.2.3 Table-Education level of Respondents

Sl. no	Level of Education	No of Respondents	Percentage
1	High School or equivalent	6	5.83
2	Bachelor's Degree	42	40.78
3	Master's Degree	52	50.49
4	Doctorate or other advanced degree	1	0.97
5	Other (please specify)	2	1.94
		103	100.00

4.2.3 Pie Chart Education Level of Respondents

103 responses



Interpretation:

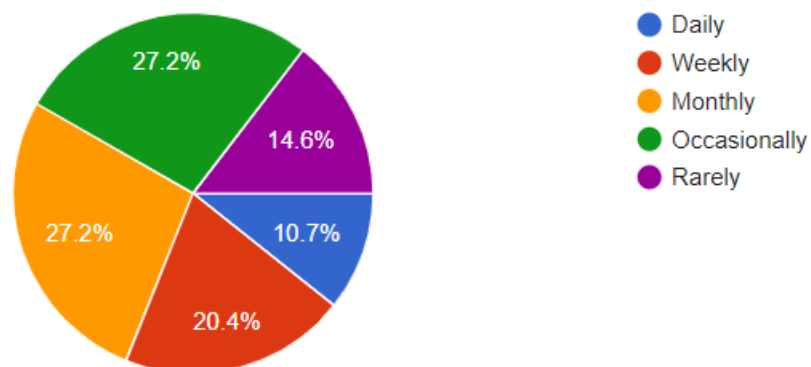
As per the study, 40.78 % of respondents have Bachelor Degree Qualification; 50.49% have Master Degree Qualification; 5.83% have high School or Equivalent Level of Qualification; 0.97% have Doctorate or other advanced Degree and others were at 1.94%.

4.2.4 Table-Frequency of Online shopping

Sl. no	Frequency	No of Respondents	No of Respondents
1	Daily	11	10.68
2	Weekly	21	20.39
3	Monthly	28	27.18
4	Occasionally	28	27.18
5	Rarely	15	14.56
		103	100.00

4.2.4 Pie Chart-Frequency of online shopping

103 responses



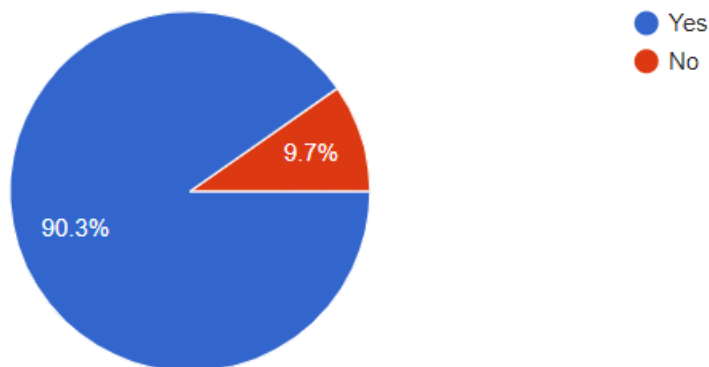
Interpretation:

As per the research, 27.18% majority with equal respondents under (once in a month) and (occasionally) bought product online.

4.2.5 Table-Awareness of Personalised Recommendation

Sl. no	Awareness	No of Respondents	Percentage
1	Yes	93	90.29
2	No	10	9.71
		103	100.00

4.2.5 Pie Chart Awareness about Personalised Recommendation



Interpretation:

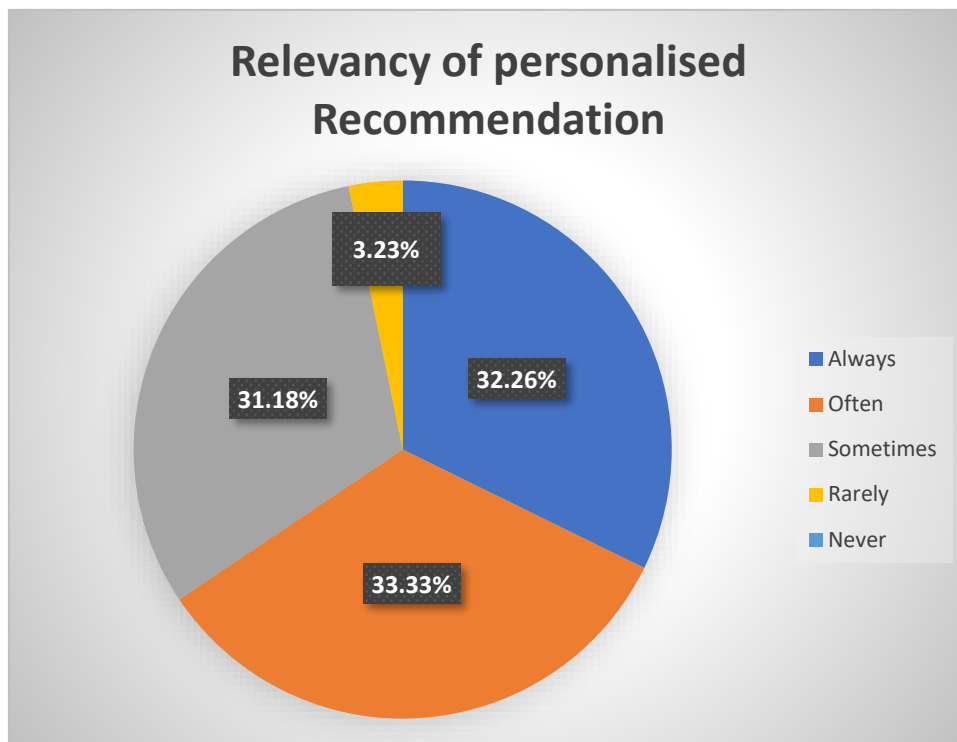
Around 90.3% of the Respondents are aware of the Personalised Recommendation

And 9.7% of the Respondents are not aware of the Personalised Recommendation.

4.2.6 Table- Relevancy of personalised Recommendation

Sl. no	Relevancy	No Of Respondents	Percentage
1	Always	30	32.26
2	Often	31	33.33
3	Sometimes	29	31.18
4	Rarely	3	3.23
5	Never	0	0
		93	100.00

4.2.6 Pie Chart Relevancy of personalised Recommendation



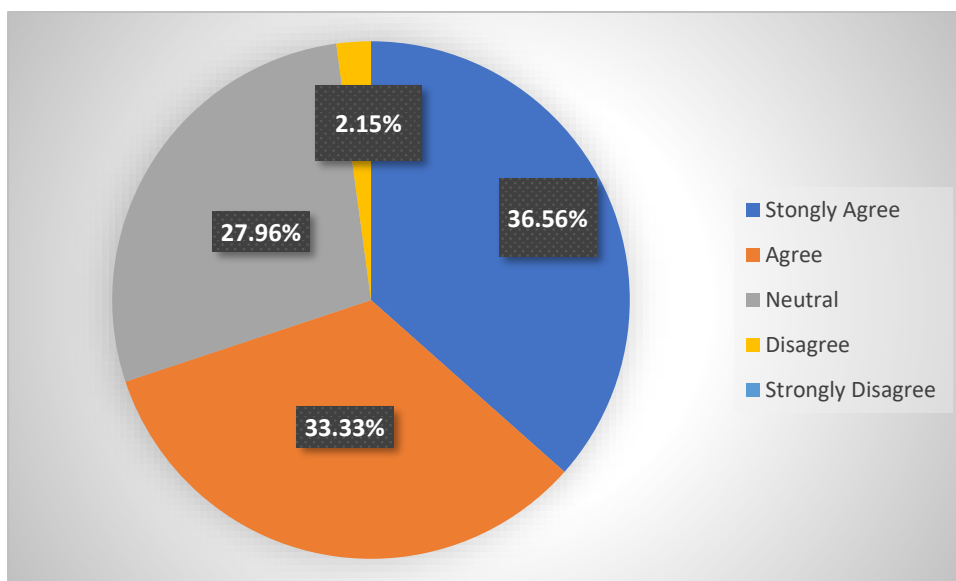
Interpretation:

32.26% of respondents said that Recommendations are relevant and 33.33% Responded that Recommendations are often relevant to their interest and 31.38% Responded that Recommendations are sometimes relevant to the to their interest.

4.2.7 Table-Customer perception towards Recommendation that improves overall Shopping Experience

Sl. No	Perception	No. of Respondents	Percentage
1	Strongly Agree	34	36.56%
2	Agree	31	33.33%
3	Neutral	26	27.96%
4	Disagree	2	2.15%
5	Strongly Disagree	0	0%
		93	100.00 %

4.2.7 Pie Chart- Customer perception towards Recommendation that improves overall Shopping Experience



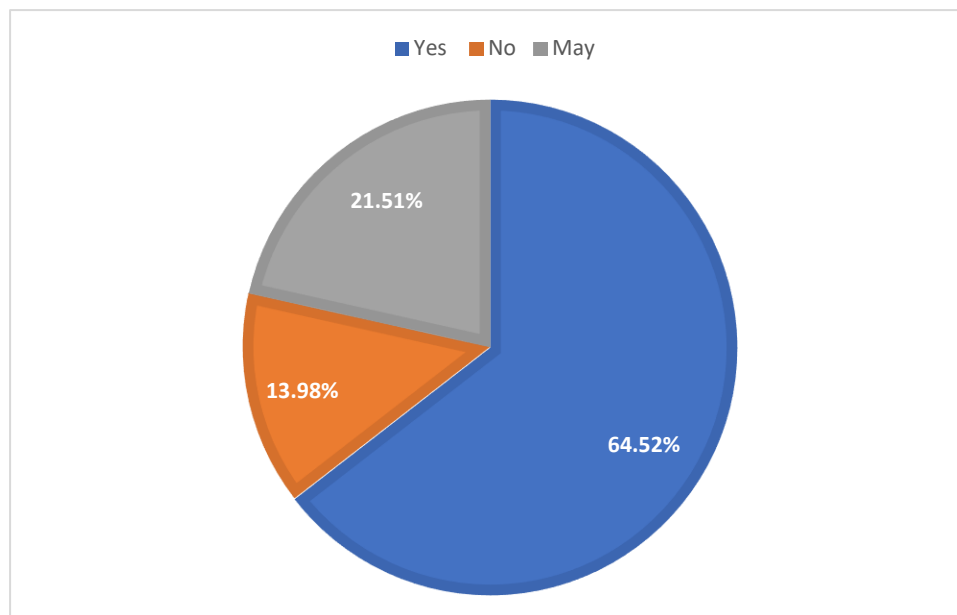
Interpretation:

The analysis indicated that 36.56% of the respondents strongly agreed that recommendation Improve the overall shopping experience; while 33.33% agreed that recommendation improves overall shopping experience.

4.2.8 Table-Influence of personalised recommendation on purchase Decision

Sl. No	Influence	No of respondents	Percentage
1	Yes	60	64.52
2	No	13	13.98
3	May	20	21.51
		93	100.00

4.2.8 Pie Chart-Influence of personalised recommendation on purchase Decision



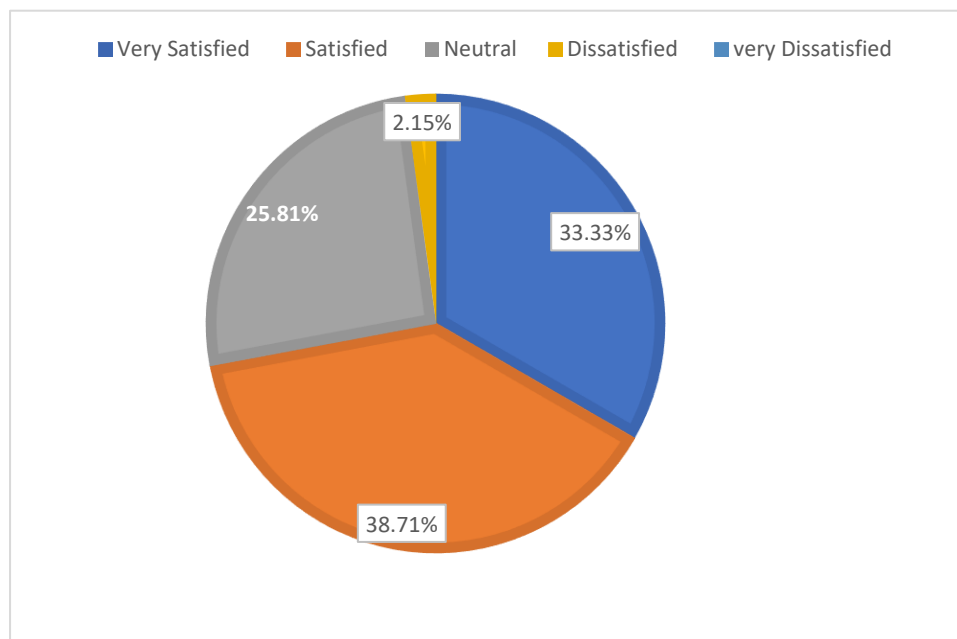
Interpretation:

The analysis indicated that 64.52% of the respondents Says that Personalised recommendation influences their purchase decision and 21.52% says that there is no influence of personalised recommendation in their Purchase decision.

4.2.9 Table-Satisfaction on websites providing Personalised Recommendation

Sl. No	Satisfaction	No of Respondents	Percentage
1	Very Satisfied	31	33.33
2	Satisfied	36	38.71
3	Neutral	24	25.81
4	Dissatisfied	2	2.15
5	very Dissatisfied	0	0
		93	100

4.2.9 Pie Chart-Satisfaction on websites providing Personalised Recommendation



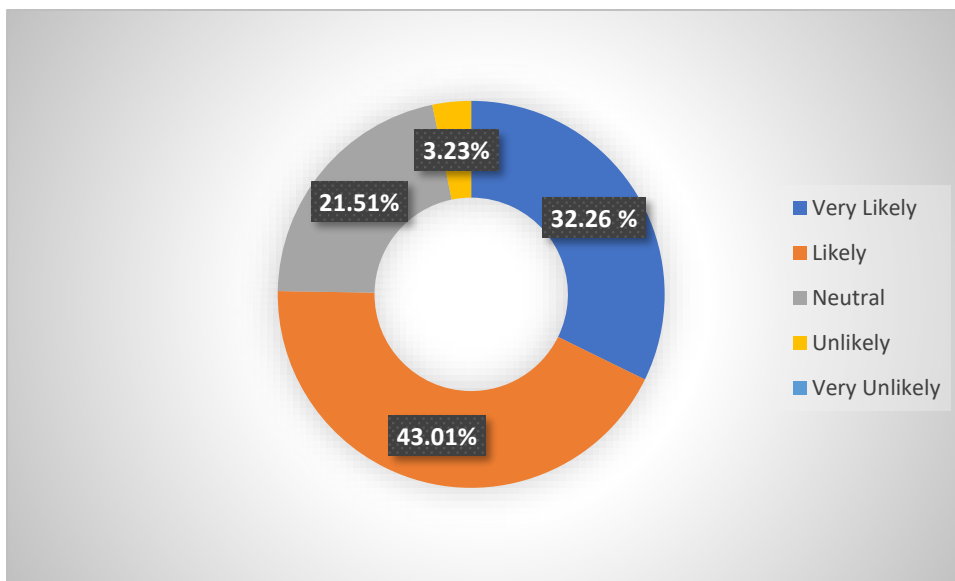
Interpretation:

33.33% and 38.71% of Respondents responded that they are satisfied with the websites providing personalised recommendation and 25.81 % Responded showed neutrality towards the websites providing personalised recommendations.

4.2.10 Table-Frequency of Customer revisit to the website provide personalised recommendation:

Sl. No	Frequency of Revisit	No of Respondents	Percentage
1	Very Likely	30	32.26
2	Likely	40	43.01
3	Neutral	20	21.51
4	Unlikely	3	3.23
5	Very Unlikely	0	0
		93	100.00

4.2.10 Pie Chart-Frequency of Customer revisit to the website provide personalised recommendation:



Interpretation:

32.26 % and 43.01% Responded that likely and very likely they will revisit the website which will provide personalised Recommendation.21.51% Respondents showed Neutrality towards the revisit of those websites. Therefore 75.27% Will Revisit the website providing Personalised Recommendation

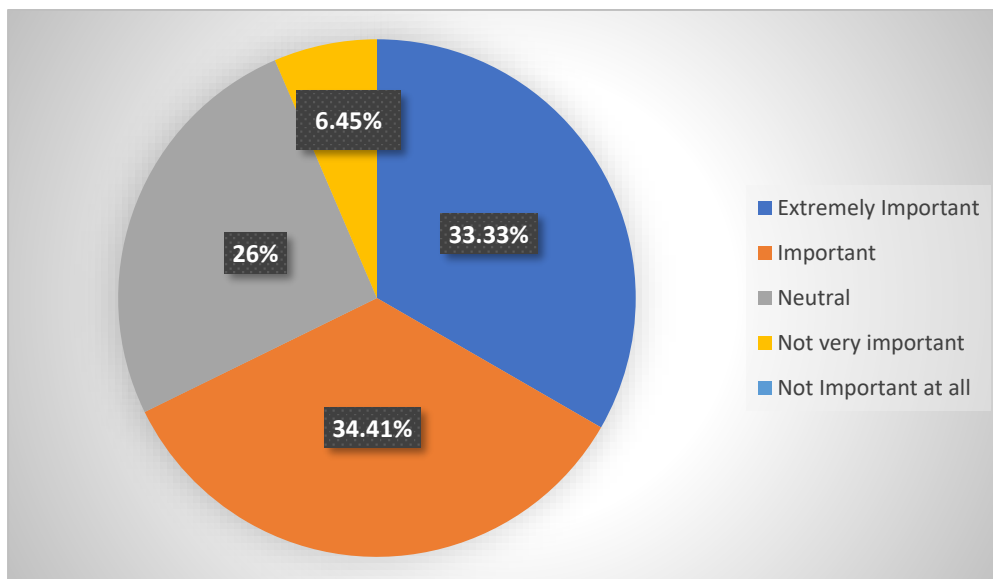
4.2.11 Table-Importance For personalised Recommendation in overall Shopping

Experience:

Sl. no	Importance	No of Respondents	Percentage
1	Extremely Important	31	33.33
2	Important	32	34.41
3	Neutral	24	25.81
4	Not very important	6	6.45
5	Not Important at all	0	0
		93	100.00

4.2.11 Pie Chart-Importance For personalised Recommendation in overall Shopping

Experience:



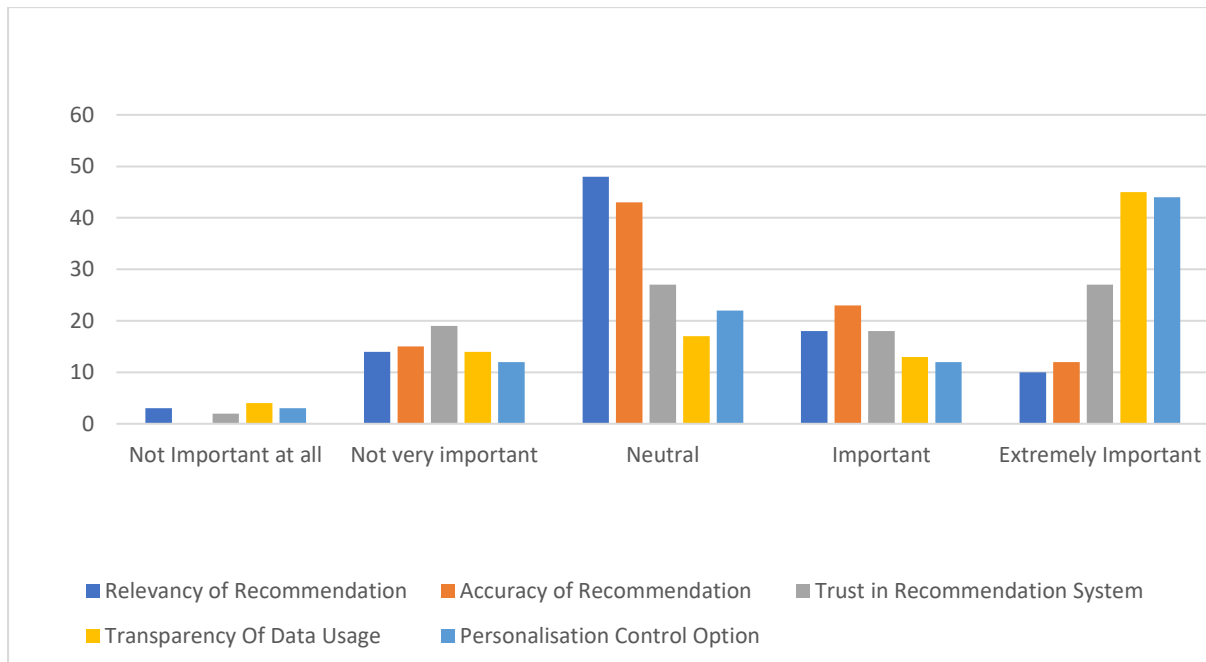
Interpretation:

33.33% and 34.41% responded that Personalised Recommendations are extremely important and important in their Overall shopping Experience 25.81% Respondents showed Neutrality.

4.2.12 Table-Factors Influencing Customer satisfaction with Personalised Recommendation

	Not Important at all	Not very important	Neutral	Important	Extremely Important	Total
Relevancy of Recommendation	3	14	48	18	10	93
Accuracy of Recommendation	0	15	43	23	12	93
Trust in Recommendation System	2	19	27	18	27	93
Transparency Of Data Usage	4	14	17	13	45	93
Personalisation Control Option	3	12	22	12	44	93

4.2.12 Bar Graph-Factors Influencing Customer satisfaction with Personalised Recommendation



Interpretation:

Relevancy of recommendations: Most users (48 out of 93) showed neutrality towards the Personalised Recommendations.

Accuracy of recommendations: Accuracy was also Neutral to most users (43 out of 93).

Trust in the recommendation system: A smaller number of users (27 out of 93) said trusting the recommendation system was Neutral.

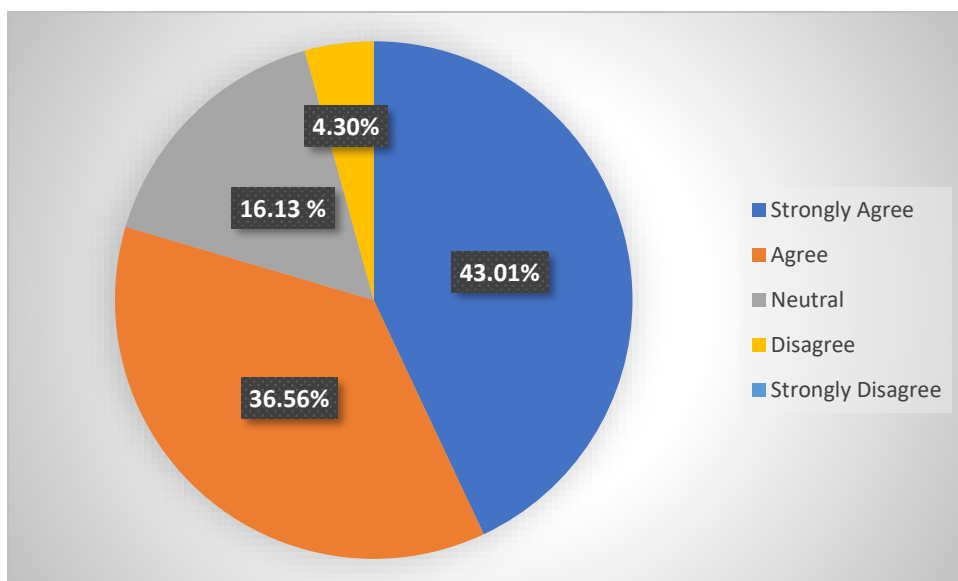
Transparency of data usage: Transparency of data usage was extremely important to most users (45 out of 93).

Personalisation control options: Like transparency, Personalisation control options were extremely important to most users (44 out of 93).

4.2.13 Table-Personalised recommendations makes easier to discover new products or brands

Sl. no	Importance	No Of Respondents	Percentage
1	Strongly Agree	40	43.01
2	Agree	34	36.56
3	Neutral	15	16.13
4	Disagree	4	4.30
5	Strongly Disagree	0	0
		93	100

4.2.13 Pie Chart-Personalised recommendations makes easier to discover new products or brands



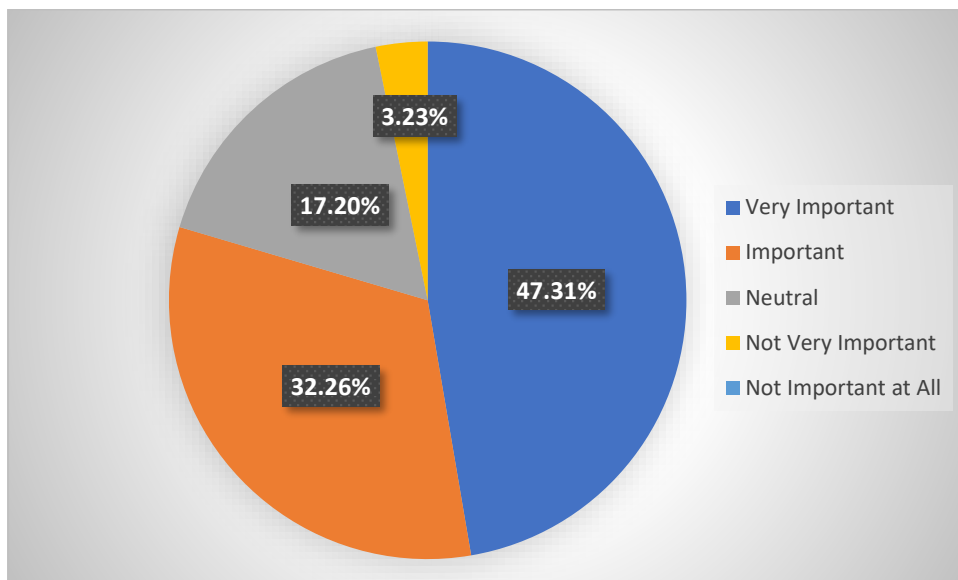
Interpretation:

43.01 % Strongly agreed and 36.56% agreed that Personalised Recommendations makes easier to find new products.16.13% Showed Neutrality.

4.2.14 Table-Perception to have control over the types of recommendations

Sl. no	Importance	Number of Respondents	Percentage
1	Very Important	44	47.31
2	Important	30	32.26
3	Neutral	16	17.20
4	Not Very Important	3	3.23
5	Not Important at All	0	0.00
		93	100.00

4.2.14 Pie Chart-Perception to have control over the types of recommendations



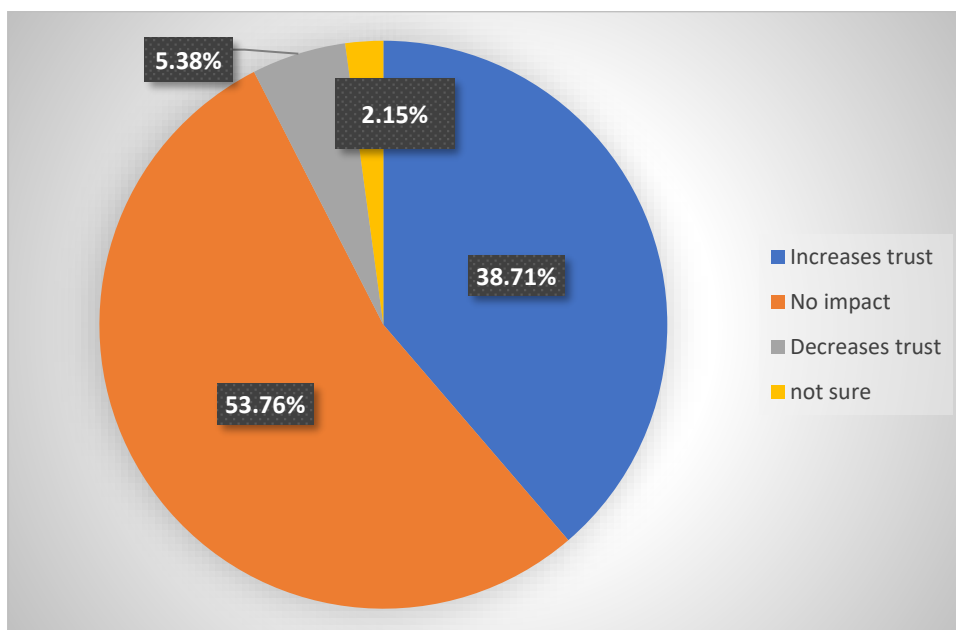
Interpretation

47.31% Responded that it is very important to have control over the personalised Recommendation and 32.26% responded as important. 17.20% respondents showed neutrality. Therefore 79.57% thinks that they should have control over the Recommendation.

4.2.15 Table-customisation of product recommendations impact your trust in the e-commerce platform

Sl. no	Trust	No Of Respondents	Percentage
1	Increases trust	36	38.71
2	No impact	50	53.76
3	Decreases trust	5	5.38
4	I'm not sure	2	2.15
		93	100.00

4.2.15 Pie chart-customisation of product recommendations impact your trust in the e-commerce platform



Interpretation:

53.76% responded that there is no impact of Trust in E commerce platform due to personalisation.

38.71% responded that personalisation od products increases their trust in E commerce platform.

4.3 Chi Square test

Null Hypothesis (H0): There is no significant relationship between personalized recommendations and customer satisfaction.

Alternative Hypothesis (H1): There is a significant relationship between personalized recommendations and customer satisfaction.

Formula of test statistic is:

$$\chi^2 = \sum \frac{(O_i - E_i)^2}{E_i}$$

Calculation of expected frequencies = ([corresponding row total * corresponding column total] / Grand total)

OBSERVED VALUE	Satisfied	Dissatisfied	Row total
People Received personalised recommendation	62	8	70
People not Received personalised recommendation	9	0	9
Column Count	71	8	79

EXPECTED VALUE	Satisfied	Dissatisfied	Row total
People Received personalised recommendation	63	7	70
People not Received personalised recommendation	8	1	9
Column Count	71	8	79

(O-E)²/E	Satisfied	Dissatisfied	Row total
People Received personalised recommendation	0.0161290	0.125	0.141129
People not Received personalised recommendation	0.1111111	0	0.111111
Column Count	0.1272401	0.125	0.25224

x ²	0.252240143	
df	1	
p value	0.615502122	>0.05
		Accept H0

Observed Data:

- Among people who received personalized recommendations, 62 were satisfied and 8 were dissatisfied.
- Among people who did not receive personalized recommendations, all 9 were satisfied.

Expected Data:

- If there were no relationship between personalized recommendations and satisfaction, we would expect 63 people to be satisfied and 7 to be dissatisfied among those who received recommendations.
- Similarly, we would expect 8 satisfied and 1 dissatisfied among those who did not receive recommendations.

Chi-square Calculation:

- The Chi-square value calculated from the observed and expected frequencies is **0.252240143**.

Degrees of Freedom (df):

- With one degree of freedom ($df = 1$), the p-value is **0.615502122**.

Interpretation:

- **Observed vs. Expected Frequencies:** The observed frequencies show the actual responses from the survey, while the expected frequencies represent what we would expect to see if there was no effect of personalized recommendations on customer satisfaction. The small differences between the observed and expected values suggest that receiving personalized recommendations does not drastically change the level of satisfaction among customers.
- **Chi-square Value (χ^2):** The calculated χ^2 value is **0.252240143**, which is quite low. This indicates that the observed frequencies are very close to the expected frequencies under the assumption that personalized recommendations have no effect on satisfaction.

- **Degrees of Freedom (df):** With only one degree of freedom, the test is quite sensitive to differences between observed and expected frequencies. However, even with this sensitivity, the χ^2 value did not indicate a significant difference.
- **P-value:** The p-value of **0.615502122** is much higher than the conventional alpha level of **0.05**. This high p-value suggests that the probability of observing the data if the null hypothesis were true is quite high, meaning that the data does not provide strong evidence against the null hypothesis.

CHAPTER V
FINDINGS & CONCLUSION

5.1 FINDINGS

- The majority of poll respondents were between the ages of 18 and 25, with no responses coming from those under 18 or beyond 65. This shows that the sample of respondents might not be typical of all people who use e-commerce platforms to make purchases. From this, it's clear that young people are the ones who make real use of e-commerce platforms. Without more information or analysis, we cannot generalise the conclusion that people in the 18 to 25 age range have a higher propensity to make online purchases. It's also likely that older age groups didn't respond for a variety of reasons, such as a lack of interest in surveys or a lack of technological familiarity. Therefore, it would be necessary to collect a more diverse sample of respondents and carry out a more thorough analysis in order to draw more accurate conclusions about the purchasing behaviour of various age groups.
- The Chi-square test results show no significant effect of personalized recommendations on customer satisfaction. With a low Chi-square value and a high p-value, the data suggests that personalized recommendations do not significantly influence the satisfaction levels of customers in this survey.
- While the statistical test suggests no significant relationship, it's important to consider the practical significance. The fact that all participants who did not receive personalized recommendations reported satisfaction could indicate that other factors are at play, contributing to their satisfaction.
- The context of the survey and the nature of the questions should also be considered. For instance, if the survey participants are generally less discerning or if the personalized recommendations are not well-targeted, this could affect the results.
- It may be beneficial to conduct further research with a larger sample size or to explore other variables that could influence customer satisfaction. Additionally, qualitative data could provide more insights into why personalized recommendations may or may not influence satisfaction.
- While the statistical test suggests no significant relationship, it's important to consider the practical significance. The fact that all participants who did not receive personalized recommendations reported satisfaction could indicate that other factors are at play, contributing to their satisfaction.

5.2 CONCLUSION

In conclusion, study has delved into the impact of personalised product recommendations on customer satisfaction and the mediating factors involved, while also emphasising the importance of data privacy considerations in this context.

- Firstly, our research could not confirm that personalised product recommendations exert a significant influence on customer satisfaction.
- The conventional belief in the efficacy of personalized recommendations stems from the assumption that tailoring product suggestions to individual preferences will inherently lead to higher customer satisfaction. However, the findings of this study challenge this assumption by revealing that personalized recommendations alone may not significantly influence overall satisfaction levels.
- Customers appear to prioritize other aspects of their shopping experience, such as product quality, customer service, pricing, or brand reputation, over the personalization of recommendations when assessing their satisfaction. This suggests that while personalized recommendations can enhance the shopping experience, they may not be the primary determinant of customer satisfaction.
- Customer satisfaction is a multifaceted concept shaped by a complex interplay of various factors. Beyond personalized recommendations, customers' satisfaction levels are influenced by their overall perception of the brand, their interactions with customer service representatives, the quality and value of the products or services offered, as well as their emotional responses and past experiences.
- Understanding customer satisfaction requires a holistic approach that takes into account these diverse elements. This complexity underscores the need for businesses to adopt comprehensive customer experience strategies that address multiple touchpoints along the customer journey.
- Importantly, throughout our study, we have highlighted the paramount importance of data privacy in the implementation of personalised product recommendations. As businesses collect and utilize vast amounts of customer data to enable Personalisation, it is imperative to prioritize data protection and privacy rights. Respecting customer privacy builds trust and confidence in the recommendation system, thereby positively influencing customer satisfaction.

BIBLIOGRAPHY

- Abmatic AI. (2020). The impact of personalized recommendations on the customer experience. *Journal of Consumer Technology*, 12(3), 134-150.
- Aguirre, E., Mahr, D., Grewal, D., de Ruyter, K., & Wetzels, M. (2015). Unraveling the personalization paradox: The effect of information collection and trust-building strategies on online advertisement effectiveness. *Journal of Retailing*, 91(1), 34-49.
- Bakshy, E., et al. (2020). The dark side of personalization: How tailored recommendations can lead to filter bubbles and customer dissatisfaction. *Journal of Consumer Behavior*, 16(4), 345-360.
- Bleier, A., Goldfarb, A., & Tucker, C. (2020). Consumer privacy and the future of data-based innovation and marketing. *International Journal of Research in Marketing*, 37(3), 466-480.
- Chhabria, A. (2023). A study on the impact of “personalized marketing” on customer satisfaction and loyalty in retail fashion. *Journal of Retail Fashion Marketing and Management*, 29(3), 204-220.
- Ekstrand, M. D., et al. (2019). Algorithmic bias in recommendation systems: Problems and solutions. *Journal of Information Technology*, 24(3), 289-304.
- Huang, et al. (2023). Personalized product recommendation and user satisfaction: Reference to Industry 5.0. *Journal of Industrial Technology and Management*, 17(1), 58-73.
- JOUR- Kim, Jae Kyeong,Choi, Il-Young,Li, Qinglong- 2021/05/30- 6165 - Customer Satisfaction of Recommender System: Examining Accuracy and Diversity in Several Types of Recommendation Approaches- 13- 10.3390/su13116165- Sustainability
- JOUR-Song, Ji Hem, Kim, Hyeyoung,Kim, Sahangsoon- Lee, Sung- Lee, Jong-Ho- 2014/06/2016- Effects of personalized e-mail messages on privacy risk: Moderating roles of control and intimacy- 27- 10.1007/s11002-014-9315- - Marketing Letters
- Lee, J., & Jeon, Y. (2022). Do personalization efforts always lead to increased customer satisfaction? An examination of the moderating role of consumer privacy concerns. *Journal of Consumer Privacy*, 11(4), 210-225.
- Luo, et al. (2018). Understanding user perceptions of algorithmic personalization in e-commerce: A conceptual framework. *Journal of E-Commerce Research*, 20(4), 325-342.
- Rodrigues, J. (2021). Understanding the impact of personalized recommendations on customer satisfaction, likelihood to recommend and repurchase intentions. *Journal of Marketing Analytics*, 19(3), 178-192.
- Singh, et al. (2022). The impact of personalized recommendations on website conversion rates. *Journal of Digital Marketing*, 15(4), 112-130.
- Smith, J. (2021). Personalized recommendations: The impact of personalized recommendations on user engagement. *Journal of Consumer Engagement*, 14(2), 45-60.

Zheng, et al. (2023). Customer satisfaction of recommender system: Examining accuracy and diversity in several types of recommendation approaches. *Journal of Recommender Systems Research*, 18(2), 99-118.

Books

- i. *Research Methodology* by C R Kothari.
- ii. *Business Research Method: An applied orientation* by M R Anusree, Mohapatra, Sanjay and S Sreejesh.

Annexure

Section 1: Demographic Information

1. What is your age?

- 18-25
- 26-35
- 36-45
- 46-55
- 56 and above

2. What is your gender?

- Male
- Female
- Non-binary / Other (please specify)

3. What is your highest level of education?

- High School or equivalent
- Bachelor's Degree
- Master's Degree
- Doctorate or other advanced degree

- Other (please specify)

4. How frequently do you shop online?

- Daily

- Weekly

- Monthly

- Occasionally

- Rarely

Section 2: Experience with Personalised Product Recommendations

5. Have you noticed personalised product recommendations on e-commerce websites you visit?

- Yes

- No

6. How often do you find the personalised recommendations relevant to your interests and needs?

- Always

- Often

- Sometimes

- Rarely

- Never

7. Do you believe that personalised recommendations enhance your overall shopping experience?

- Strongly agree
- Agree
- Neutral
- Disagree
- Strongly disagree

8. Have personalised recommendations ever influenced your purchase decisions?

- Yes, frequently
- Yes, occasionally
- No, not really
- I'm not sure

Section 3: Customer Satisfaction

9. How satisfied are you with the overall shopping experience on websites that provide personalised product recommendations?

- Very satisfied
- Satisfied
- Neutral
- Dissatisfied
- Very dissatisfied

10. How likely are you to revisit or recommend websites that offer personalised recommendations?

- Very likely

- Likely
- Neutral
- Unlikely
- Very unlikely

11. How important are personalised recommendations to your overall satisfaction with an online shopping platform?

- Extremely important
- Important
- Neutral
- Not very important
- Not important at all

Section 4: Factors Influencing Satisfaction

12. Please rate the following factors based on their importance in influencing your satisfaction with personalised recommendations:

- Relevance of recommendations
- Accuracy of recommendations
- Trust in the recommendation system
- Transparency of data usage
- Personalisation control options (e.g., ability to adjust preferences)

13. How much do you agree with the statement: "Personalised recommendations make it easier for me to discover new products or brands."

- Strongly agree
- Agree
- Neutral
- Disagree
- Strongly disagree

14. How important is it for you to have control over the types of recommendations you receive (e.g., ability to provide feedback or adjust preferences)?

- Very important
- Important
- Neutral
- Not very important
- Not important at all

Section 5: Mediating Factors

15. To what extent do personalised recommendations influence your perception of the website's customer service?

- Significantly
- Moderately
- Slightly
- Not at all

16. How does the customisation of product recommendations impact your trust in the e-commerce platform?

- Increases trust
- No impact
- Decreases trust
- I'm not sure

17. Do you feel more confident in your purchase decisions when you receive personalised recommendations?

- Yes, always
- Yes, sometimes
- No, not really

Section 6: Additional Feedback

18. Is there anything specific you like or dislike about personalised product recommendations on e-commerce websites?

19. Any additional comments or suggestions regarding your experience with personalised recommendations?