DISCOVERING THE SECRETS OF A MOBILE E-COMMERCE APP OVER A WEBSITE

Shubham B Barman[1], Yash P Purohit[2], Deepak S Yadav[3] , Singh Devashish B. Bharatiya[4] ,

Prof. Ramesh V Shahabade[5]

[12345] *Department of Computer Engineering, Terna Engineering College, Nerul*

Abstract - The current culture prefers jobs that can be completed quickly and easily. E-commerce companies have created mobile applications to meet the needs of the community. This study focuses on the development of mobile business applications over traditional eCommerce desktop websites. Building trust is the hardest phase for any business. Despite the emergence of new innovation and e-commerce technologies, the problem of trust is unresolved. This paper focuses on the secrets of attracting customers, gaining their trust, and retaining their loyalty in mobile applications.

Key Words: E-commerce, mobile applications, innovation, technologies, trust, development

1.INTRODUCTION

During the 2020 pandemic, social distancing and various other safety precautions have severely hampered local businesses. [2]On the other hand, the E-Commerce industry has proven to be successful in attracting a huge number of customers. According to a report, the volume of e-commerce orders in India increased by 36 percent in the fourth quarter of 2020. According to "BUSINESS STANDARDS," the E-Commerce industry of India will grow from demand created by Coronavirus pandemics to 84% to $ 111 billion by 2024..

[1]Electronic transactions are unavoidable in today's global marketplace. Electronic commerce (e-commerce) is a result of information technology advancement in which business transactions are no longer done conventionally, with the contents being direct buyers with sellers. [3]A system that caters to buyers online via a network of computer networks represents search sellers. When a transaction is completed, the buyer communicates with a system that "represents" the seller.

[1]This study looks into the opportunities made available by mobile phone Internet access. Faster wireless networking standards enable wireless devices to run more e-commerce applications, allowing for greater access to mobile commerce (m-commerce). M-commerce is defined as a "subset of e-commerce in which mobile devices and their network connection medium are used to buy, sell, and promote goods, services, and information." [2]The emergence of wireless technology and the mobile industry has given the mobile industry a significant boost. Smartphones and other mobile devices have grown in popularity in India over the years. As a result, an E-commerce website by itself cannot assist in the expansion of an online business. [1]With almost every family in India owning a smartphone, an e-commerce app can help us connect our online business with them.

[2]E-commerce via mobile apps not only captures the attention of users due to smartphone devices but also allows them to purchase products from anywhere and at any time. In this regard, mobile e-commerce application development is a critical factor in the growth of e-commerce among consumers. [3]The technical characteristics of devices and corresponding applications, as well as Internet access capabilities, determine the level of acceptance and development of e-commerce. Processing power, display and device size, mobile internet coverage, standardization, and device quality are just a few of the important factors that determine the level of use of mobile commerce, and thus its development.

2. Aim and Objective

A mobile app is no longer a perk, but a necessity to stay competitive in E-commerce. The main goal now is to design a user interface that is both straightforward and appealing. The requirement does not end there; the mobile app must also support multiple pages. In the app, user navigation should be simple, obvious, and unambiguous. [1]The user interface should be visually pleasing, with graphic elements that are very accurate in terms of clarity. A mobile app is used by any form of an individual in a community. [4]Both literate and illiterate people now use smartphones. Older people who aren't tech-savvy also have cell phones, so making a good first impression is critical to attract more customers ,building trust and staying ahead in the competition.

3. Scope

Artificial intelligence , chatbots , etc. are encouraged on both the app and the website, highlighting recent technical advancements in E-commerce. The user interface and user experience are the only technical

differences between a website and an app. Whatever happens in Ecommerce, this is the one reality that will never change. New technologies will emerge and vanish, but the UI and UX fight between websites and apps will continue. As a result, in this paper, we will concentrate on user interface, appearance, and user experience rather than artificial intelligence, machine learning, and so on in ecommerce apps.

4. Literature Survey

From industry to leisure, from history to communication and technology, as well as shopping and travel, the internet has altered many facets of society. With the aid of technological advancement, this modern medium of communication has created new ways of doing business. When wireless and internet technology is used, e-commerce is the modern way of shopping and doing business. Companies have been able to reach customers in more varied ways thanks to mobile devices with widespread Internet connectivity, maintaining strong market penetration.

In paper [1] **E-commerce Smartphone Application,**

The paper's literature review provides insight into the need for e-commerce applications and why traditional websites are ineffective on mobile devices. User-based interfaces for mobile devices, m-loyalty, architecture, and other essential characteristics of mobile applications are discussed in this paper. Other research questions revolve around why native mobile apps are favoured over mobile websites.

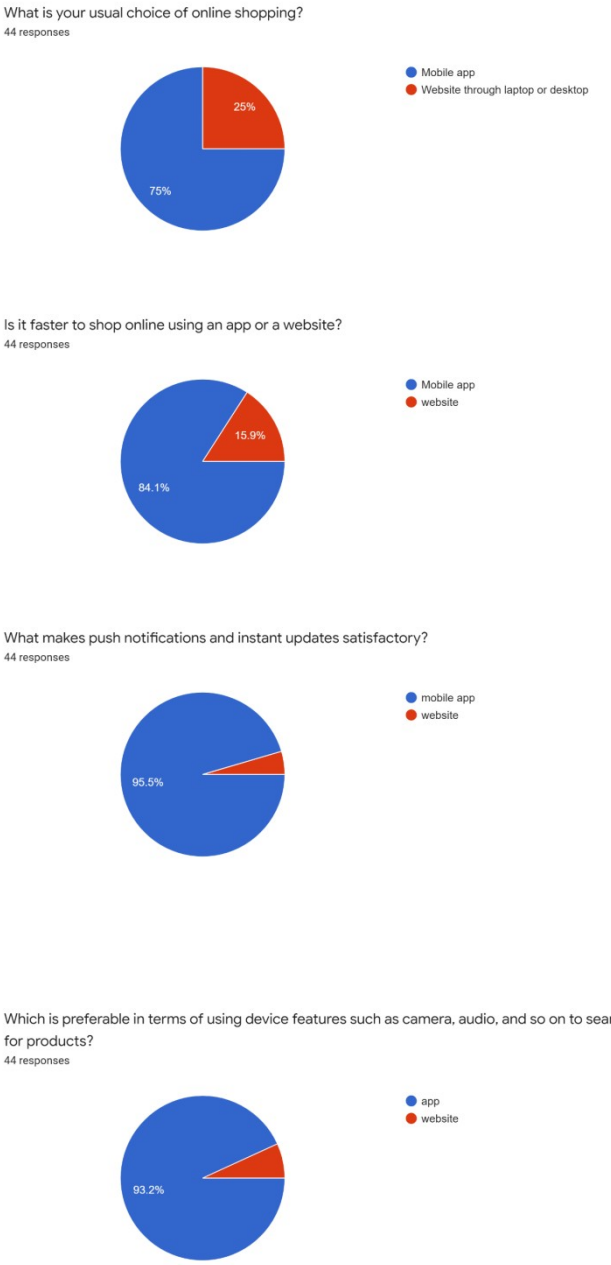
In paper [2] **Survey on Development of Android Based Mobile App for Prestashop E-Commerce Shopping Cart**

The paper's literature review provides insight into the application's implementation and response time. The authors created an Android-based mobile app for the Prestashop E-Commerce Shopping Cart, which provides a basic understanding of how to implement the app and key aspects of creating an e-commerce app.

In paper [3] **Design Aesthetics Leading to M-Loyalty in Mobile Commerce**

The paper's literature review discusses the importance of providing a basic user interface and how it relates to mobile loyalty. If the user interface is straightforward. The application's users will spend more time with it. Users are more likely to show e-loyal behaviour if they can quickly locate the product they are searching for and if the architecture of a website meets their expectations.

5. Survey



6.Methodology

Customers can view and purchase goods online in the same way that they do in traditional stores, thanks to eCommerce. The process is the shortcut; Trade on the internet. Customers can use an online platform to view and purchase products on the e-commerce platform. When an order is placed, the goods are delivered to the customer's door. The e-commerce enterprise's core is the business platform. There are numerous platforms, each with its own set of advantages and disadvantages.

Ecommerce Desktop website:

This was the first platform type to start an online company. A website that is normally accessible through all browsers is present on this Platform. By visiting websites, customers can inspect product pictures and view product-related videos on a large screen. All information is shown on a single page, and the page expands to accommodate further information as the customer scrolls down. Ribbons are also used on websites to display information that seeks to convey a wide range of options.

Ecommerce Hybrid app

A mobile app is superior to a mobile website in terms of speed. A hybrid mobile app is compatible with all mobile operating systems. The cost of production is lower than that of a native app. The main drawback is that it is slower than native apps, and the design principles used in these apps are undermined due to the conflict between Android and iOS design principles.

Ecommerce Native app

Native apps are created specifically for a particular operating system. It is faster than any eCommerce website that can be accessed from a mobile device. When compared to hybrid apps, native apps have a higher development cost. The design principles used are in accordance with the operating system's design principles. When opposed to desktop apps, the Mobile app offers a more robust notification system.

7.Proposed System

The direction taken by a typical user on a website or app to complete a task is referred to as user flow. The user flow has been built so that the user can quickly navigate through all of the features of all applications without getting lost.

When the user first launches the app, he will be prompted to sign in or log in and skip. Users can select the option that best meets their interests. The home screen is the first screen that the user sees, and it displays the trending deal, upcoming product advertisements, and Offers of the day. Furthermore, users can navigate through various product categories using the icons displayed on the dashboard. This page can be effectively used to show products that the seller would like customers to buy. Aside from that, showing advertisement on this page can be achieved very effectively.

The customer will add the product they want to purchase to their "Cart" section. A user's "cart" is a page that allows them to purchase several items in one transaction. This is an important page because, without it, user workloads would skyrocket; a system without "cart" expects the user to complete the atomic transaction for each product they buy. If the consumer has to purchase hundreds or thousands of items at once, this is highly inconvenient. The consumer can lose interest and exit the app if there is no "cart." As a consequence, "cart" is an important part of the application, it is the page that lists all of the items cached in the "cart section" is referred to as "My cart" in our app. Similar to the "cart" section, there is a "wish-list" section that allows customers to add products they like and want to buy in the future. This section is important because it saves the customer time from searching and filtering from the product listing page, adding the product into the "cart" section, and directly checking out.

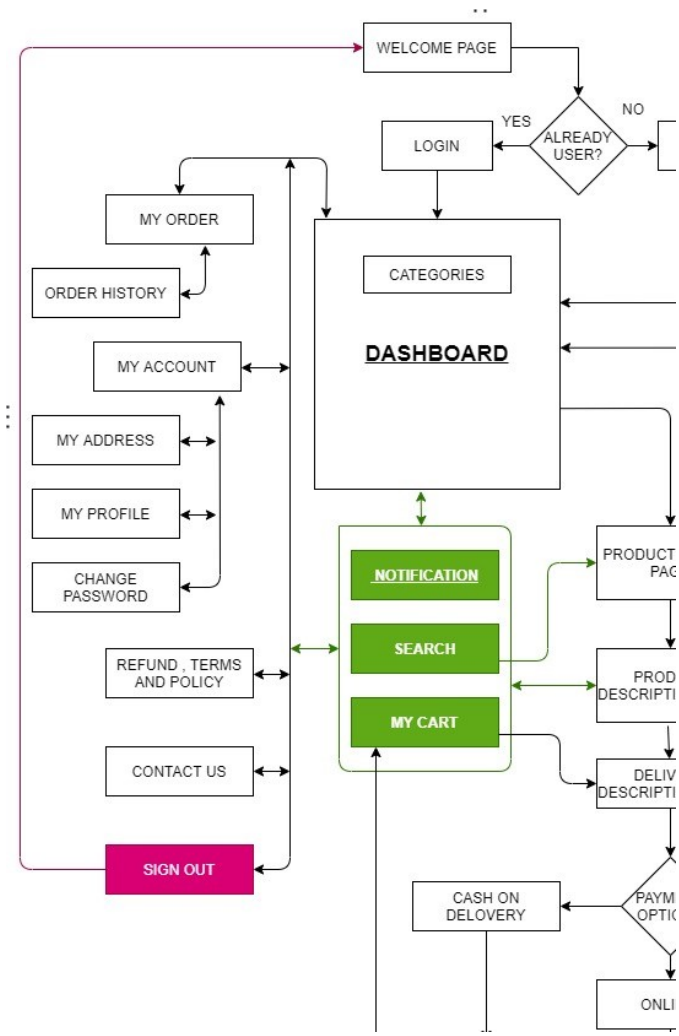


Fig -1: User Flow Diagram

The most important aspect of application design is determining whether or not users will be able to quickly find what they are looking for. As a result, we must

include a product listing page and a product description page. The product displayed via the product listing page must be sorted in a specific manner, such as ascending or descending in price, brand, feature, and so on. When the listing is complete, every user anticipates the description page of a specific product. The template for the product listing page and product description page should be the same throughout because consistency is what every user expects. It should not appear that one product description page is different from another; the information represented on these pages must be different, but the style in which the information is displayed must be consistent.

Aside from all these pages, many static pages aren't as important as product listing pages or carts, but an app is incomplete without them. Static pages, such as "terms and conditions," "privacy policy," "refund and return," "Profile pages," "My Profile," "order history," and so on, contain important information for the user that is not required for the order transaction but is useful for the user's convenience. As a result, it should be included for a better user experience and satisfaction. When comparing all the features of all the pages, we see that it is a customer's main responsibility to find the necessary product and checkout. You can quickly search through a search bar using the "My cart" page on the product list pages while selecting. To find your product, you can use the search menu. Accordingly, the two pages are currently available from any user page. This is possible by showing the icons for "Product Listing" and "My Cart" on each page to link the current pages with product list pages and cart list pages.

All eCommerce applications should support UPI, net banking, and other payment methods. Flexible acceptance of offline-paid cash-on-delivery should be encouraged as well. Payment can be made online. When the invoice is finished, the entire order should be saved on the app, and the app should support invoice downloads.

Finally, if we include human error functionality in our design, the user should be able to explore more. For example, if a user clicks on the sign-out page, the app should not be immediately signed out; instead, a message should be displayed to assist the user in unwinding if this is done incorrectly. More importantly, if a user incorrectly selects a product to checkout, the app must assist in removing that product from the cart or avoiding checking out for that particular product; this reduces the user's annexation and allows customers to easily explore the products within the application.

8. System Architecture

A system architecture is a conceptual model that describes the structure, actions, and other perspectives of a system. A systematic definition and representation of a system that is organized in such a way that it can be used to reason about the system's mechanisms and behavior are known as an architecture description. The System Architecture is divided into two parts, the Front-end, and the Back-end.

We use XML and Java programming to construct a layout for an application's front-end. Constraint Layout, Linear Layout, Frame Layout, and Coordinate Layout are the layouts we use. Text-View , Edit-Test, Image-View, Button, Image-Button, and Floating Action Button are some of the controls we use.

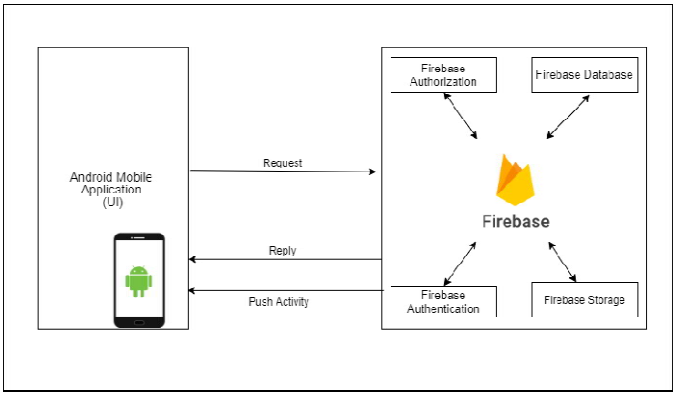


Fig -2: System Diagram

We use the commonly used Firebase for our back-end app. Firestore Database, Authentication, and Firebase Storage are all available in real-time. Login and Sign Up users use Firebase Authentication, which offers Firebase-auth, which includes all authentication functions and is compatible with Google, Firebase, and other services. We use the ViewModel Class to fetch data from the Firestore Database, where we built Adapter and Model for various fields. For data transmission, we use Firebase Instances and the user's current Id. To store and retrieve data from the database, we used a Map and a List. To load an image from the database, we use the Glide function, which is open source and available on GitHub.

9.Data Model

We've established a one-to-many partnership between the buyer and the product, as well as the buyer and seller and the goods and seller. Customers can buy a wide range of items from the seller. Buyers can see all of the sellers selling the same product, and sellers can sell different goods to multiple customers. Even though the current system is intended for a single seller, the database is built to serve many sellers in the future, with each seller having their personalized selling price for a specific product. When the framework supports multiple sellers, users can place orders for multiple goods from

multiple sellers at the same time. They may also cancel the entire order or a particular product order placed with a specific seller.

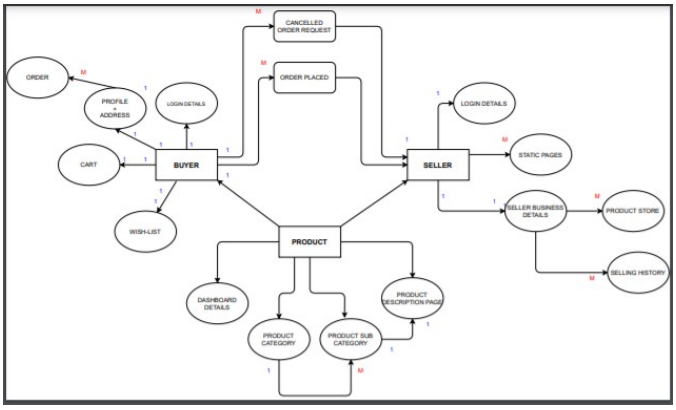


Fig -3: Entity relationship Diagram

We used Firebase for the backend, which includes Firebase cloud storage and the Firestore database. All data is stored in a key-value pair in the FireStore database, which is a NoSQL Collection - document style DataBase. We developed a data model that allows the platform to support multiple sellers. To store data in Firebase, first, construct a document to hold the key-value pair. To do so, we must first create a collection in the root collection. From the root collection, we have five collections: "User," "Categories," "items," "static pages," and "seller." Several documents may be stored in a single collection. A single document may also contain several collections. Firebase cloud storage can also assist with image and video storage, which can then be retrieved as tokens in the form of links.

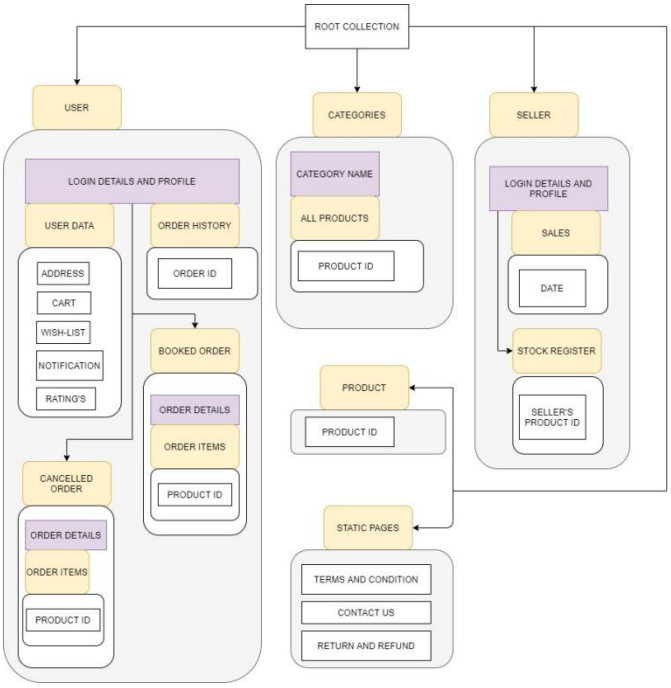


Fig -4: Data Model Diagram

10. CONCLUSIONS

E-commerce with a website is constrained in terms of scalability and usability. Since the majority of the population does not own a desktop or laptop computer, websites are not scalable; however, almost every Indian family now owns at least one smartphone in 2021. Furthermore, despite technological advancements in cloud computing and internet websites limiting the use of this functionality, users cannot shop online using a laptop from anywhere at any time. On the other hand, a mobile program fixes all of the above problems. The most striking advantage of mobile E-Commerce is its convenience. Apps on mobile devices have a smooth experience and are accessible with a single tap. They store vital data that can be accessed both online and offline, allowing users to consume information easily while retaining a consistent experience. The ability to code a mobile application to use different features of a native device is an added bonus. They can use features like the camera to scan PFDs, QR and Bar codes, and NFC to make payments Notifications can be accessed more quickly on a smartphone app than on a website since we can see the message immediately in the mobile app, which is not true on a website.

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