Creating an Innovative Home Decor Shopping Experience: Planning, Developing, and Potential Impact of an E-commerce Marketplace for Home Décor in a Developing Country

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Abstract: This paper proposed a possible next-generation e-commerce "Home Décor Marketplace" system with web 3.0 capabilities to disrupt the traditional furniture and home décor retail market in developing countries like Pakistan. This project involves the development of a B2B and B2C furniture and home décor e-commerce marketplace application. The platform will allow manufacturers and retailers to list and sell their products directly to consumers as well as to other businesses. One of the main objectives of the project is to provide a convenient and efficient platform for both buyers and sellers in the furniture and home decor industry. The document describes the research work, analysis, design, and development of the platform. The proposed e-commerce marketplace has been developed based on market research. The application has been designed to be compatible with various platforms such as Web, iOS, and Android, utilizing the Google Flutter development tool. It is secured using user authentication, and the features have been carefully chosen to meet the market demands and requirements. This research paper will discuss all the technologies and tools used to build and implement an Innovative Home Decor Shopping Experience-based e-commerce platform.

Index Terms: NoSQL databases, software architecture, B2B, B2C, E-commerce, Marketplace, Dart programming, covid-19.

1. Introduction

Internet usage and E-commerce markets in developing countries like Pakistan are spreading rapidly and continuously. Now with the wide availability of the Internet, most of the population has easy access to it [1]. The Internet has become a platform for social networking and the exchange of goods and services. The continued development of information technology has opened new doors for entrepreneurs and businesses to efficiently develop and deliver goods and services in a short period [2]. With the globalization and advent of platform business models, e-commerce has grown exponentially over the past decade, and businesses are rapidly moving to the internet and allowing their customers to enjoy their services on personal computers and smartphone devices. The COVID-19 pandemic had a significant impact on small businesses, including those in the furniture market. Many small businesses were forced to temporarily close their doors or significantly reduce their operations due to lockdowns and social distancing measures. This resulted in a loss of revenue for small businesses, and some were unable to survive the financial strain. The need for an online marketplace has increased rapidly after the pandemic. It disrupted traditional business models and forced many companies to adapt in order to survive. The problem statement, objective, and scope are further elaborated in the subsequent subheadings, namely 1.1, 1.2, and 1.3. These sections provide a detailed discussion of the problem being addressed, the scope, and the specific objectives of the research.

1.1. Problem Statement

The conventional way of buying and selling home décor items and furniture requires a lot of effort and it is a time-consuming process. Traditional home décor and furniture businesses are often limited to a specific geographic location, meaning that sellers may only be able to reach a small number of potential customers. Customers may have to physically visit a traditional furniture marketplace to browse and purchase products, which can be inconvenient. The seller may only offer a limited selection of products, as they are only able to display what is physically present in the marketplace.

To the best of my knowledge, there is currently no home décor e-commerce marketplace exists in Pakistan where a consumer can buy from a wide assortment of brands on the same platform. In the context of that, there is a need for transformation of the home décor business, and an online B2B and B2C Marketplace is needed.

1.2. Scope

This software product is called Home décor – B2B and B2C marketplace. The product is developed for consumers who want to view and buy home decor items from multiple vendors at the same time and on a single application in a hassle-free way. Since the application is based on B2C and B2B, the application not only facilitates the consumers, but it will also allow different businesses to target and sell their products to other businesses.

The application will allow manufacturers or wholesalers to connect with retailers in order to trade products with each other. The sellers would be able to reach a larger audience, potentially leading to more competitive prices. Customers can shop for home decor and furniture from the comfort of their own homes at any time of day or night. The platform offers a wide variety of products from different sellers, giving customers more options to choose from.

The application will also aim to facilitate the discovery of new and unique products, as well as foster a sense of community among users. Overall, this project aims to disrupt the conventional furniture and home decor retail market by offering a digital marketplace that connects buyers and sellers in a more efficient and cost-effective manner. The platform has a messaging system that will allow a buyer to communicate with the seller.

1.3. Objective

The main objective of this project is to disrupt the current manual furniture business and provide a convenient and efficient platform for buyers and sellers to connect and conduct business with the same level of transparency and security. Some of the few objectives are mentioned below:

- Develop a multi-vendor home decor e-commerce platform with an attractive and visually appealing design built from scratch.
- Design the architecture and functionalities of this software product for Web, iOS, and Android.
- Setup the system and its server environment.
- Test the system's reliability in a real-world environment to see if it serves its purpose.

2. Methodology

2.1. Purpose of Research and Development

Recently, Pakistan has seen phenomenal growth in digital reach and literacy. Digital literacy has played a major role in the adoption of e-commerce in developing countries like Pakistan. Due to the increase in digital literacy, some major global investors have recently invested in the Pakistani e-commerce market. According to the annual Invest2Innovate report [3], the Pakistani e-commerce market raised USD 202M across 23 deals, and fintech raised $95M across 25 deals in 2021. A Pakistani-based startup PriceOye which sells a range of electronics products like smartphones, TVs, and home appliances recently raised around $7.9 million in seed funding [4].

Even though the e-commerce business is growing vastly, but home décor and furniture business are still not digitalized. Few businesses have online existence and sell products online but there is no e-commerce marketplace in Pakistan that offers a wider variety of products from different sellers on the same platform. The idea behind developing this B2B and B2C home décor e-commerce marketplace is to empower small businesses and increase their reach by allowing them to sell their products to a larger audience and facilitate buyers by providing them with a user-friendly platform where they can discover new and unique products.

2.2. Methodology Selection for The Development

There are a few things to keep in mind when deciding on a software development methodology. The time constraint, scope, risks, and objectives of the project are the main factors that should be considered before choosing the development methodology and all the approaches should be aligned with project goals and objectives. The platform "Home Décor Marketplace" is a smartphone and web-based application. For the development, we have used Agile methodology because of its flexibility, adaptability, and focus on continuous delivery. Agile emphasizes rapid prototyping and frequent iteration that is well-suited to the development of an e-commerce marketplace. In the fast-

paced and dynamic e-commerce industry, where customer preferences and market trends can shift rapidly, the ability to adapt quickly is crucial. With Agile, we have the ability to make frequent changes to the platform based on market needs even after project deployment.

For the development of our e-commerce marketplace, I implemented the Kanban framework of the agile methodology and utilized the Trello tool to manage and track our progress. Trello helped us organize and visualize our workflow, enabling us to easily see what tasks needed to be completed.

2.3. Framework and Development Tools

The best development tool for a project will depend on the specific needs and goals of the project. We have chosen Flutter for this project due to its efficiency, cost-effectiveness, and strong community support. Google Flutter is the best development tool for developing native apps for both Android and iOS using a single codebase. So, the user can access the system from any device. We have chosen the following technologies to develop this platform:

- Flutter SDK – for the development of the front-end of the platform.
- Firebase – for the database of the system.
- Git – to track changes.
- VS Code – IDE.

We have used Firebase because it allows real-time synchronization of data between the database and connected clients. This means that any updates to the database are instantly reflected on all connected devices, making it well-suited for applications that require real-time data updates. Firebase is based on a NoSQL database and can be accessed via RESTful web API. That database can easily be integrated into any system regardless of programming language. Fig.1 diagram represents the structure of the system where all the e-commerce data is stored in the Firebase database in JSON format. Flutter and Firebase are designed to handle scalability and high user loads, ensuring robust performance and reliability. This makes the e-commerce marketplace capable of accommodating a large number of concurrent users, high traffic volumes, and growing business demands while achieving research objectives.
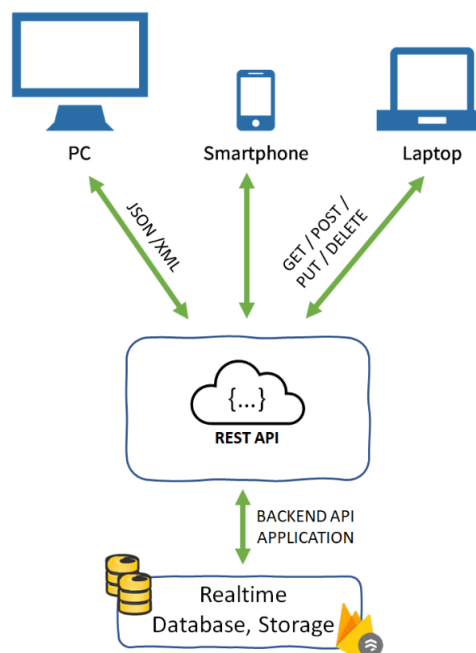

Fig. 1. Diagram of a home décor system

3. Literature Review

The rise of e-commerce has revolutionized the way people shop, providing a convenient and efficient way to browse and purchase products. E-commerce in Pakistan has seen significant growth in recent years, with marketplaces playing a key role in this growth. E-commerce marketplaces in Pakistan provide a convenient and efficient platform for buyers and sellers to connect and conduct business, increasing the reach of sellers and giving customers more choices. According to a report by ecommerceDB [5], Pakistan ranks 47th in the global eCommerce market, projected to generate approximately US$6,362.1 million in revenue by 2023. The Pakistani eCommerce sector is expected to witness a 4.9% growth in the same year, contributing to the worldwide growth rate of 17.0% in 2023. The major revenue contributors in the Pakistani E-commerce market are Electronics & Media (34.1%), followed by Furniture & Appliances (28.8%),

Fashion (20.4%), Food & Personal Care (10.6%), and Toys, Hobby & DIY (6.1%). E-commerce marketplaces like Daraz have emerged as significant players in the Pakistani market by providing a diverse array of products from numerous vendors. New technologies like Blockchain can help in E-commerce enablement for developing countries. [6]

In addition to traditional e-commerce marketplaces, the rise of social media has also contributed to the growth of e-commerce in Pakistan. Many small businesses in Pakistan are using social media platforms such as Facebook and Instagram to sell and promote their products directly to consumers [7]. The furniture and home décor industry has been greatly impacted by the rise of e-commerce, with marketplaces playing a key role in this shift. According to a report by Statista [8], In 2023, the global Furniture market is predicted to generate US$766.20bn in revenue, with an expected annual growth rate of 5.02% (CAGR 2023-2027). The largest segment in the market is Living Room Furniture, which is estimated to have a market volume of US$227.70bn in 2023. The United States generates the most revenue in the global market, with US$252.70bn expected in 2023. Leading companies in the home décor and furnishing industry in the United States include IKEA, Wayfair, and Bed Bath & Beyond [9]. In developing countries like Pakistan Textile and Home décor market has seen growth over the last few decades [10].

We visited and conducted a survey at Pakistan Lifestyle Furniture Expo which was held in Karachi from 30 September to 2 October 2022 [11]. More than 70 furniture and home decor brands participated in this expo [12]. The majority of the exhibitors do not have any online existence. There were very few individual brands that sell their products online.

- Interwood: Interwood has an online website where customers can purchase products. Interwood does not have a mobile application.
- Habitt: Similarly, Habitt is another brand that has a website where it sells its products directly to consumers.

There are many other brands like Apna Furniture, enzaHOME, IKONHOME, Home Interior, furniturehub, etc. that have online existence and sell products online. However, there is no such platform or marketplace where one can find products from multiple vendors, shops, or brands featured on the same platform. The home décor marketplace will bring businesses together and provide them with a B2B platform where retailers and sellers can conduct business online in one place. It will modernize the concept of home décor shopping as customers will have a platform to select from various brands/vendors. Moreover, our application will also help to bring discipline to the home décor industry since healthy competition at a single platform by many brands will bring prices down and improve quality and service. According to a study by World Bank, India has paved the way for a completely new experience in the home décor market for consumers after the trend of the e-commerce marketplace, and the Indian furniture industry is expected to grow 20% per annum over the next few years [13]. According to United Nations Industrial Development Organization survey report (UNIDO) [14], 90% of small and medium-sized businesses reported a negative impact on revenue during Covid-19. The Home décor online marketplace will empower SMEs and help them grow their business even in a situation like a lockdown. Distributed requirement engineering for the innovative home décor marketplace product could be performed with teams located at different locations [15].

The COVID-19 pandemic has increased the importance of e-commerce and encouraged many businesses to create an online retail space to stay afloat during the pandemic [16]. Meanwhile, many businesses suffered in Pakistan due to not having an online presence [17]. This home decor e-commerce marketplace will empower small businesses, give them an opportunity to create an online presence to compete in the market and help them grow their business and target new buyers. Home décor is the fastest-growing online industry with a total revenue reached to $415B worldwide and it is expected to reach $455.4B by 2025 [18]. Since there is no marketplace for home décor in Pakistan, this platform will have an early entrants' market-share advantage.

4. Proposed Framework for multi-vendor home decor e-commerce platform:

4.1. Core Functionalities of Product:

The proposed B2B and B2C home decor e-commerce marketplace framework offer several advancing features that cater to different scenarios and enhance the overall user experience. Some of these features and their applicable scenarios include:

- **Multiple Vendor Integration**: The framework enables multiple vendors to showcase home decor products on one platform, benefiting B2B scenarios by connecting manufacturers, wholesalers, and retailers. It provides diverse inventories for retailers, fostering trade relationships.
- **User Authentication and Security:** The framework includes user authentication mechanisms for secure transactions and data protection. It builds trust and safeguards sensitive information in both B2B and B2C scenarios.
- **Comprehensive Product Catalog:** The framework provides a comprehensive product catalog with a wide range of home decor items, including furniture, lighting, accessories, and more. It benefits both B2B and B2C scenarios by offering ample options for buyers, making it easy to find desired products.

- **Seamless Cross-Platform Compatibility:** The framework seamlessly supports multiple platforms (web, iOS, Android), ensuring convenient access for users. It enables customers to browse and shop for home decor items anytime, anywhere, regardless of their preferred devices.
- **Messaging System:** The framework includes a messaging system for direct communication between buyers and sellers, especially useful in B2B scenarios. Retailers can connect with manufacturers or wholesalers regarding product inquiries, customizations, bulk orders, and more.
- **Continuous Updates and Improvements:** The framework follows an Agile methodology, enabling frequent updates and improvements based on market needs and user feedback. It ensures that the platform stays current with the latest trends, technologies, and customer demands, leading to a continuously evolving and competitive marketplace.

The multi-vendor home decor e-commerce platform has an attractive and visually appealing design built from scratch. The application has the following types of users:

- **Customers**: People who purchase goods from the application.
- **Seller/Merchant**: A person who sells a product to another vendor or consumer.
- **Admin**: The admin is the person who approves vendors and deals with customers' queries.

All users are required to login to access the system. A vendor or merchant can open a shop on the platform and add, update, delete, and sell home decor items like furniture, paintings, wall decorations, planters, etc. products online. A user can search for and view a product on the platform by logging into the system and then purchasing an item.

Buyer: The Individual is the end user of the application. They can perform the following tasks:
- **Sign Up**: Customers can register from the home page of the application. The registration fields are as follows:
  - Name
  - Email Address
  - Password
  - Phone Number
- **Login**: The customer can login to the portal after a successful registration.
- **Buyer Profile:** A Buyer is a customer who can view and manage their profiles.
- **Search Product**:
  - Buyers can search for products on the application.
  - Buyers can browse for different products on the platform.
  - The customer can go to the specific products' details page on the application.
  - When a buyer clicks on a product, they will be redirected to the products details page where customers can select the quantity they want to order and add the product to the cart.
  - Buyers can add products to their wishlist.
- **Product Details**:
  - Description
  - Image
  - Price
  - Quantity
- **Shopping cart**: Buyers can see all the products that they have added to their cart but haven't completed the purchasing procedure.
- **Add More** will give clients an option to increase the quantity.
- **Delete** option will remove the product from a cart.
- **Place Order** will lead to Payment Process.
- **Continuing Shopping** allows users to be redirected back to the products section so that they can purchase more.
- **Message:** The message feature allows a buyer to communicate with the seller.
- **Review:** After making a purchase, the buyer has the option to leave a review and provide feedback on their experience with the product or service.

Vendors have a separate seller profile page through which they can add, update, and delete products in their shop accounts. The following features will be available to vendors:
  - Vendor's dashboard
  - Shop management
  - Order management
  - Product add, edit, and delete.
  - Buyer's information
  - Vendor profile
  - Analytics report

Admin can create a category and can add product types under each category. In addition to this, Admin shall have the following controls:

- o Vendors/retailers' shop approval management
- o Suspend vendor account.
- o Suspend the consumer account.
- o Analytics report dashboard
- o Logout

4.2. Project Detail:

This system is a robust and flexible e-commerce solution because it is developed using the Flutter framework. The system is B2B and B2C e-commerce marketplace and it is for people who want to view and buy home decor items from multiple vendors at the same time and on a single system. Fig.2 demonstrates the overview of the system.
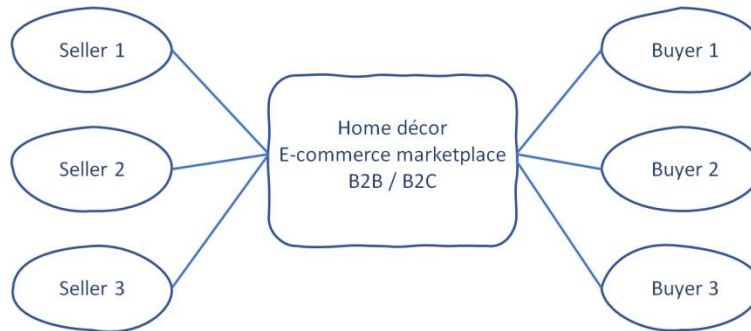
Fig. 2. Overview of the Home décor system

Fig.3 shows a component diagram of a home decor e-commerce platform. The diagram shows how each part of the system works together to make the system function properly. This diagram shows a white box view and helps us visualize how each component is connected to the other. A rectangular box represents a system component while a circle is called a port which is connected by lines called provided and required interfaces.
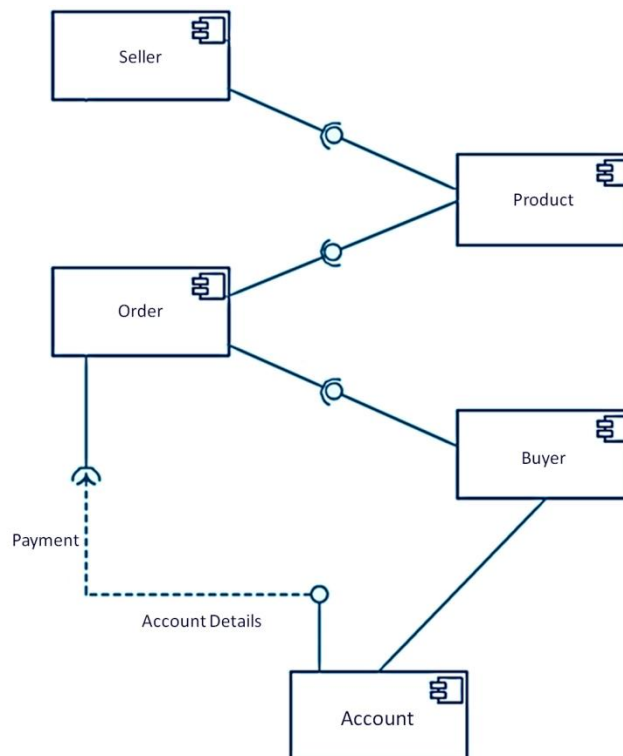
Fig. 3. Component Diagram for Home décor e-commerce platform.

4.3. Data flow diagram

Fig.4 displays a data flow diagram for the home décor marketplace, the diagram shows features and the flow of the data. The platform consists of three users as shown in a flow diagram, there are a customer account, a vendor account, and an admin account. A customer is a buyer who can register an account and then search, view, and purchase products. A vendor is a seller who can register an account and then create a product, manage products, proceed with orders, and check feedback. The system will have an admin account that can approve vendor accounts, delete customer/vendor accounts, and check feedback.
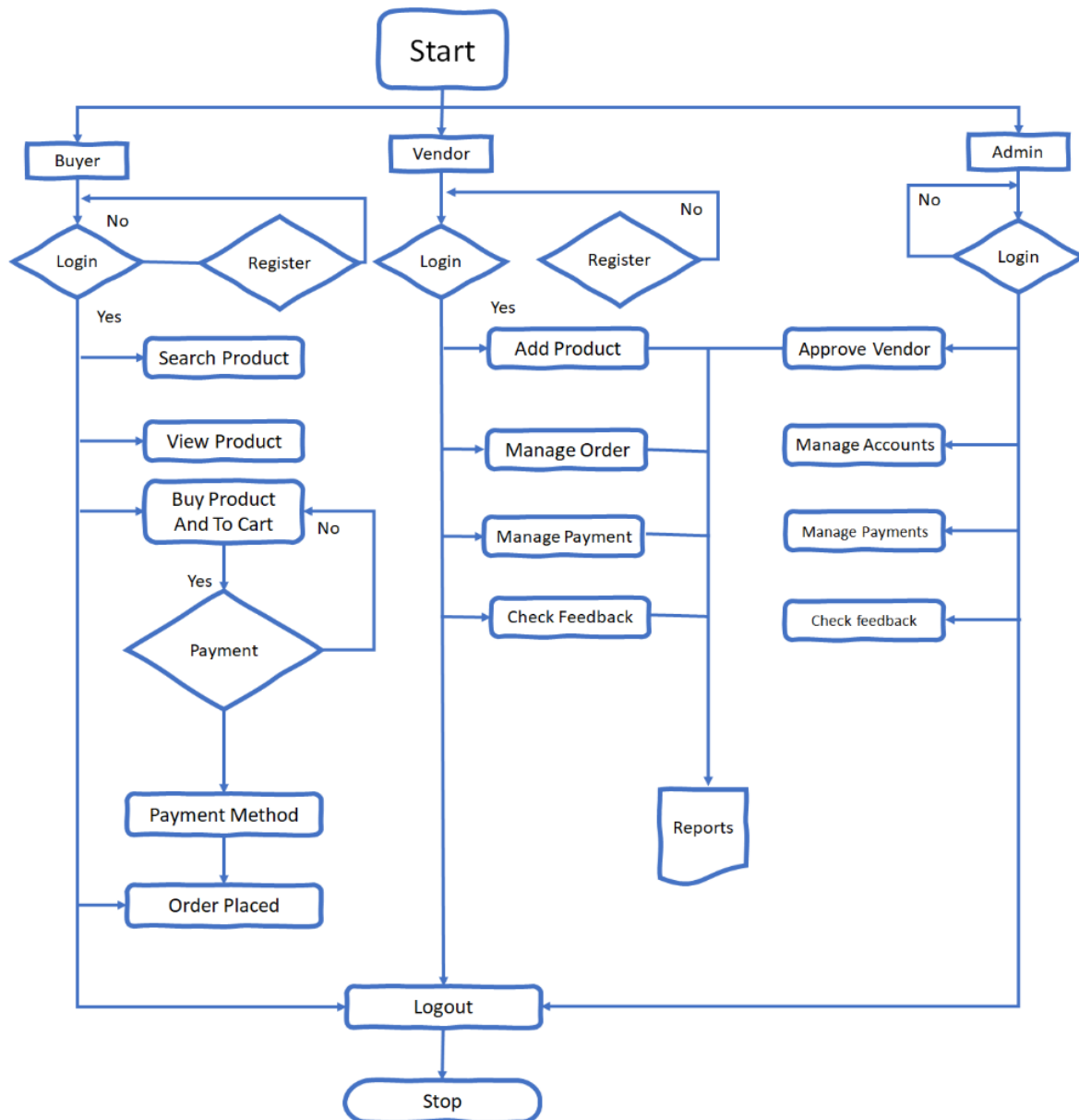
Fig. 4. Data flow diagram for home décor e-commerce platform.

4.4. Flow of System

4.4.1 Flash Screen, Signup, Login, and Login success page
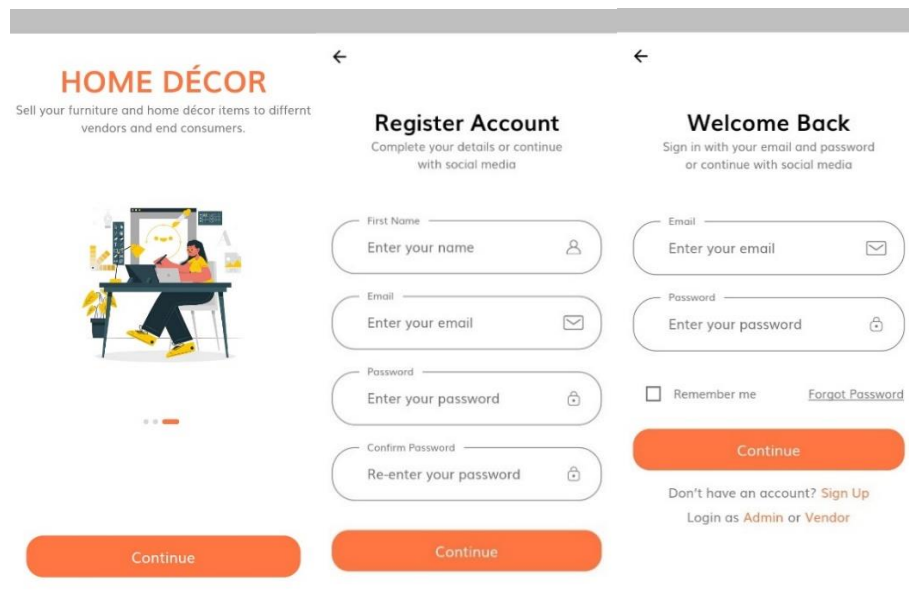
Fig. 5. Flash screen, signup, login, and login success page.

4.4.2   Main Screen, Category, and Products Page
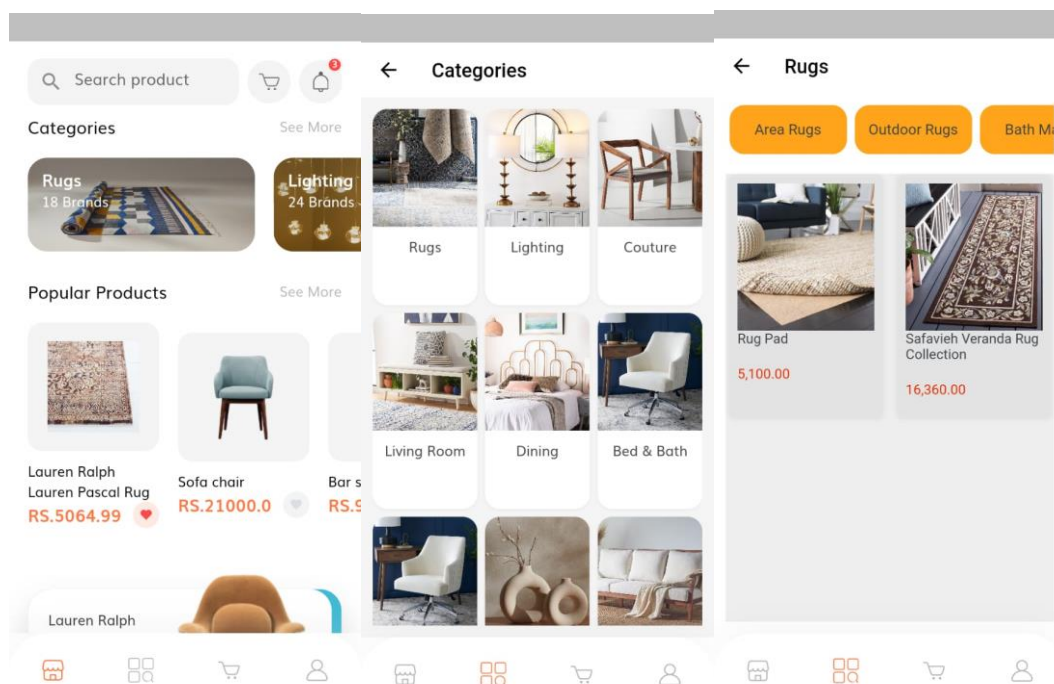
Fig. 6. Main screen, category, and products page.

4.4.3   Product Details, Shopping Cart, Wishlist Screen.
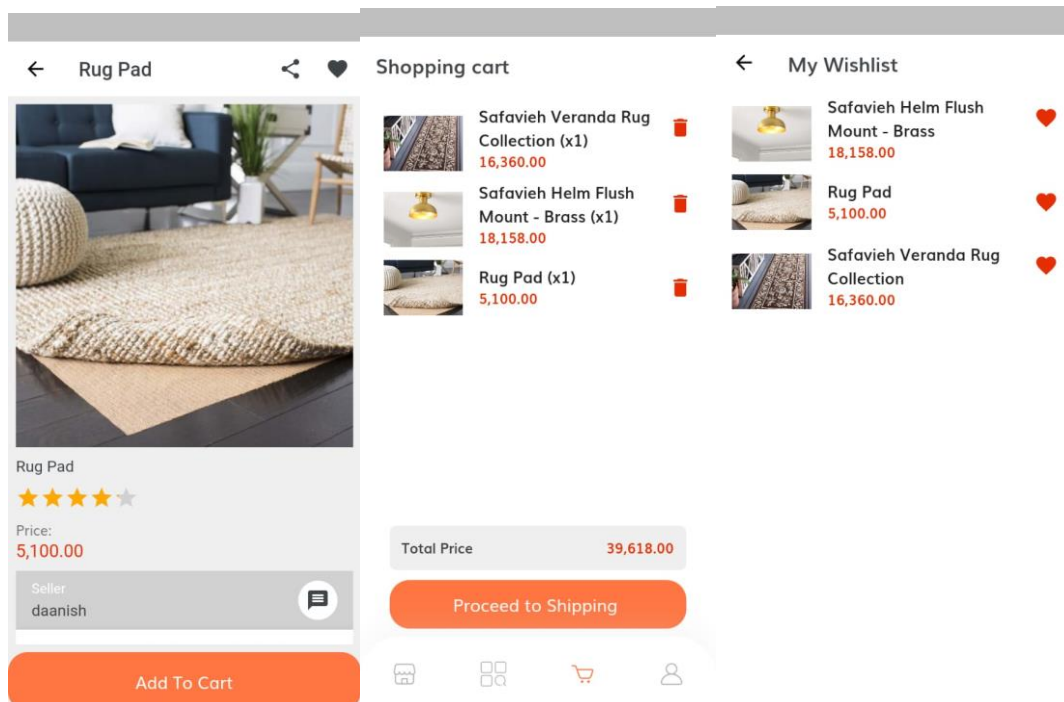
Fig. 7. Product details, shopping cart, Wishlist screen.
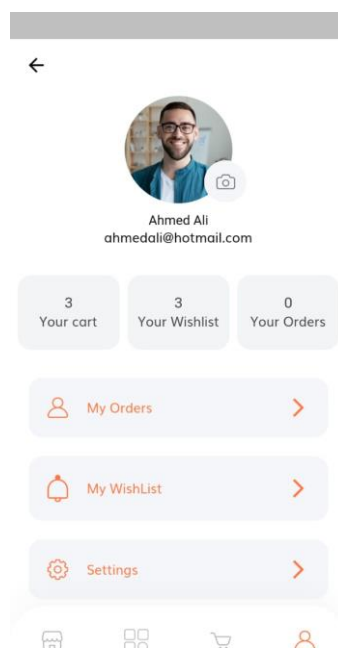
4.4.4 *Profile Screen.*

Fig. 8. Profile Screen.

5. Future Work

Buy now, pay later (BNPL) is emerging as a new payment method in Pakistan [19]. We shall also collaborate with financial institutions in the future to provide financing to customers for purchases from our platform. This will increase sales and customer base for our platform [20]. Augmented reality is one of the emerging technologies in the e-commerce sector as it has the potential to provide online consumers with very direct product information and interactive experience. [21]. Augmented reality and Web 3.0 Metaverse-related features help improve the interactive user experience of future users.

6. Conclusion

In conclusion, this research significantly advances e-commerce marketplaces in the home decor industry by proposing a B2B and B2C framework. It addresses market gaps, introduces innovative features, and enhances the overall user experience. Valuable insights from market research justify the work, tailoring the framework to meet specific demands. The development of a home decor e-commerce marketplace has the potential to revolutionize the way people shop for these products. The development of a home decor and furniture e-commerce marketplace represents a significant opportunity for both buyers and sellers in the industry. By leveraging the power of the internet, the marketplace has the potential to disrupt the traditional retail model and create new opportunities for growth and success for e-commerce in developing countries like Pakistan.

The proposed framework has multiple uses and potential extensions, serving as a foundation for further research and development in the e-commerce marketplace domain. It can inspire advancements in other industries as well. The framework's modular architecture allows for scalability and customization, enabling future enhancements and the incorporation of additional features based on specific business requirements.

In summary, this research contributes to the field by presenting a comprehensive B2B and B2C home decor e-commerce marketplace framework. It addresses market needs, ensures user satisfaction, and incorporates innovative features. The scientific justification, along with the potential uses and extensions, establishes the significance of this work in shaping the future of e-commerce marketplaces in the home decor industry.

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