E-sewa app for self-employed women

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Abstract—**Many women run their own businesses, such as Homemade Spices and Snacks. These people have a difficult time reaching out to customers. Their sales and marketing efforts are limited to word-of-mouth publicity and personal experiences. The project will include an e-commerce platform where women will be able to set up their presence online and conduct their business digitally. This innovative platform allows these women to register themselves and reach a large number of consumers. This application will enable the sellers to sell and advertise their products and it will provide them with monthly insights about their sales.**

Keywords E-commerce, Android studio, java, self-employment, user-centric design

I. INTRODUCTION

Small business owners, especially women, find it extremely difficult to properly sustain and scale their operations in the current market landscape. It was studied that while these people have the skills to run their businesses, they lack the means and resources to do so. Even if they have a really good product, there is a huge gap when it comes to the business side of it. There are a lot of things that these entrepreneurs need to take care of even after production. Order tracking, shipping, accounting, sales, marketing, etc. are major areas where the gap needs to be bridged. In most cases, there is no proper record of the orders placed, received or delivered. Most of these businesses make use of books to keep track of their business. While this may work on a small scale, it does not work when it comes to scaling the business. In a time when businesses are willing to spend unprecedented amounts of time, money, and energy on elaborate marketing and other business operations, Small and Medium Business (SMB) owners find it difficult to withstand the competition using their limited means. Women entrepreneurs specifically are subjected to a lot of social, economic, and cultural barriers that make it difficult for them to run fully functioning businesses.

This problem can be tackled by creating a platform where all these things are taken care of. The entrepreneur has to take care of the production. The business part of it can be streamlined for them. Moreover, it is important to give them a platform for them to list their products. Through such a platform, these entrepreneurs can look at other such entrepreneurs and be inspired. A platform where they can list, sell and track their products would really give them the boost that they require. One major challenge in this day and age is online competition. Even if the product is really good, it needs to be marketed and publicized properly. Without the right digital marketing, nobody would even know these businesses exist.

The proposed system aims to help new-age entrepreneurs like this by providing them with all the required marketing and retail assistance they need through one comprehensive e-Commerce application. The application aims towards moving beyond the traditional internet website tactics and helping women entrepreneurs do everything from marketing and listing to selling their products all on one easy-to-use platform. The platform would also allow for customer reviews (and admin management of the same) which can help these businesses build a credible online presence and interact with their customer community closely, thereby establishing themselves as a genuine, people-serving brand on the market. The platform would essentially help women-owned/led SMBs to find a credible consumer market that takes away the hassle of creative advertising, targeted marketing and payment gateway assistance and allow them to focus their limited time and efforts towards up-scaling operations.

II. LITERATURE REVIEW

In the research paper titled "Proposal and testing goals-guided interaction for occasional users" [1] written by Antonio L. Carrillo and Juan A. Falgueras have described an analysis of goals-guided Interaction, GGI, as the basis for a different approach. The paper tests and explores Goals Guided Interaction

as an interaction style. In this paper, the user isn't expected to have any prior knowledge about the system. They are guided on "what to do" and "how to do it" while completing the steps. It is conversational and sequential in nature. The research paper titled "E-business adoption costs and strategies for retail micro Businesses" [2] written by Marcia Mkansi adopted a case study methodology to empirically analyse the tactics used by e-retail microbusinesses to possibly advance their adoption of e-business. The Author noted the actual adoption costs and technologies Using organisational and environmental techniques to cut costs barrier, and how simultaneously pursuing the cost barrier reduces some adoption hurdles that are not related to costs.

In the research paper titled "Mobile Application for Productive Families Business" [3] written by Noura Hamad ALosaimi, Afaf Mohammed Tukka and Nahla Mohammed Elzein have addressed the reasons for productive families businesses, mainly handled by local women in Saudi Arabia facing difficulties in business growth. It gave insights into the use of an application that will help in assisting family businesses to get their product in the market effectively The research paper titled " A Framework for Analyzing and Developing Dashboard Templates for Small and Medium Enterprises" [4] written by Wasinee Noonpakdee, Thitiporn Khunkornsiri, Acharaphun Phothichai and Kriangsak Danaisawat outlines a methodology for evaluating and creating dashboard templates for small and medium-sized businesses (SMEs) in order to efficiently analyse and visualise data. Three different UI interfaces were created each displaying a different aspect of sales and customers. The author proposed a solution that is an effective dashboard that provides an easy and understandable UI that displays the sales, goals and stock in graphical form.

In the research paper titled "Gender, small firm ownership, and credit access: some insights from India" [5] written by Kausik Chaudhuri, Subash Sasidharan, Rajesh Seethamma, Natarajan Raj using a large dataset on MSME in India, the paper investigates if the gender of the owner influences firm performance and financing access from institutional sources. When compared to enterprises owned by males, the study discovers a considerable underperformance in the size, growth, and efficiency of female-owned firms. The academic work It implies that closing the performance difference between male-and female-owned businesses could be accomplished in part by addressing gender discrimination in the small business lending market.

The research paper titled "An Empirical Study of UI Implementations in Android Applications" [6] written by Mian Wan, Negarsadat Abolhassani, Ali Alotaibi and William G. J. Halfond focuses on Automated UI analyses. Automated UI analyses such as crawlers are often not complete. They cannot keep up with the changing development stages. While doing the analysis, it was observed that for the dynamic analysis, Monkey was employed. For the manual analysis, jadx was used to analyse and decompose the Java source code of APK files. The research paper titled "An analysis of the balance between security and utility of mobile applications" [7] written

by Nimmi K.and B. Janet proposes that there must be a balance between security and utility in an application. If utility is preferred then there is a compromise made on security. The author suggests that a proper balance should be created between utility and security features as per the requirement of the application and states that users prefer applications that provide better utility over security.

In the research paper titled "The using of Object-Oriented Method to Developing Android Application for Mapping Distribution of MSMEs (Micro, Small Medium Enterprises)" [8] written by Addin Aditya addresses the issue of Small businesses lacking the information technology capabilities which can be used for marketing purposes. It proposes the idea of developing an application on android covering user and customer requirements, which will help the business owner to sell their product and will provide them information on where their product demand is more.

The research paper titled "The Impact of Integration on Application Success and Customer Satisfaction in Mobile Device Platforms" [9] written by Benedict Bender proposes the integration of Applications to work with other independent applications. An analysis of multiple applications was conducted in which it was observed that applications that have more integration are more successful than nonintegrated applications.

III. PROPOSED SYSTEM

The proposed system is a multi-module, multi-user application that acts as a comprehensive marketplace for women entrepreneurs. Sellers are allowed to make their accounts on the system - which are then verified by the system admin - and set up their seller identity. They can then list items on the platform which will be displayed with a complete meta-description and price and a shareable link that be used to access the specific product page. The other user type that the application allows for is 'buyer'. Buyers can browse through products using search keywords and place orders according to their wishes. The entire application is designed using an interactive, easy-to-use UI built entirely through android studio.

IV. DETAILED ARCHITECTURE

The application has been developed in native android. It was seen that almost all of the small business owners are android users. Applications that are developed in native prove to be faster and more reliable. Additionally, the application will have access to the user's camera and address book. Keeping this in mind, it was decided that developing the application for the android platform would be more efficient and effective. Later, as the scale of the project increases, the application can be developed for other platforms as well. The application has mainly two parts to it -

- The User-Interface
- The Database

A. The User-Interface

The interface has been designed keeping in mind that the users aren't very technologically savvy. The application has a simple UI that gives direct access to key elements and features. The interface is designed to comply with the rules of UX design. Firstly, while most applications overwhelm the users with excess functionalities, in this application the focus is on keeping it simple and user-friendly for the users. The users have the freedom to navigate through the application easily. Wherever possible, the system mirrors real-world language and concepts. As the target users are small entrepreneurs who do not have access to technology, the application is made to resemble the flows that they're already aware of. The application makes use of the principle of "recognition rather than recall". Here the user doesn't have to remember everything about the application. Instead, they can follow their instinct while navigating through the application. Consistency and standards are maintained as much as possible. The colours and elements are made to be consistent throughout the application. The contrast in the colours ensures better visibility for users. The font size and colour have also been chosen in such a way that promotes readability. Interface flow for Seller and buyer is as shown in Fig. 1 and Fig. 2.

Flow for Seller:
Install application
Option to choose between being a buyer or seller
Select Seller option
Start onboarding
Enter shop details
Add products
Go to the dashboard
View analytics based on the products sold

Flow for Buyer:
Install application
Option to choose between being a buyer or seller
Select Buyer option
Browse through the multiple products listed by the sellers
Add items to the cart
Enter address details
Place order
Track the order
Receive the order

B. The Database

For creating applications, Android Studio includes its own integrated database. The Firebase console is used by the application to store and access all application data. Each user's information is saved in the application. All of the items are kept as JSON objects. In Firebase, the database is a cloud-hosted tree as opposed to the SQL database, which uses tables and records to hold those details. When new data is added to the JSON tree, it is transformed into a node with a key in the preexisting JSON structure.

The proposed application makes use of the Firebase real-time database. The real-time database is hosted on the cloud. It is a cloud-hosted database. One major advantage of using
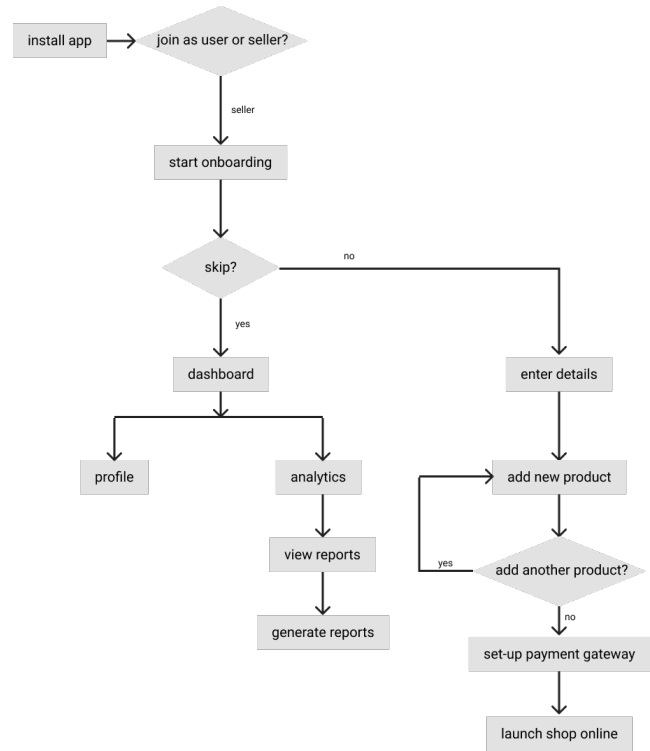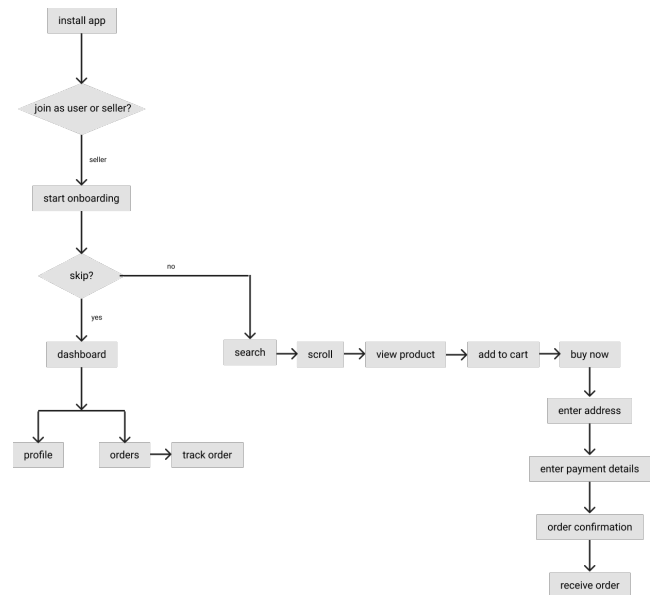

Fig. 1. Flowchart for Seller

Fig. 2. Flowchart for Buyer

the real-time database is that it works in offline mode. Any system can use the data when offline and all the new data gets synchronized automatically when the connection is restored. Because the Firebase Realtime Database SDK retains the data to disc, the Firebase applications continue to function even while they are offline. Another major advantage of using Firebase is that it is easily scalable. Authentication is streamlined with Firebase Authentication on the application and users are authenticated across the database instances. Further, it provides access control to users. Firebase Realtime Database Rules that are specific to each database instance can be used to limit who has access to the data in the database. Fig.3 represents UML diagram for database structure.
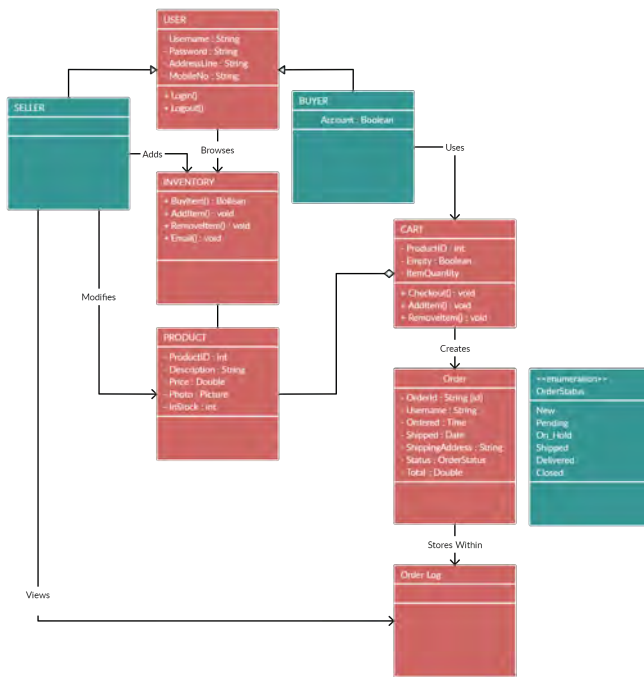

Fig. 4. First page after the user opens the application

Fig. 5. Create User page

Fig. 3. UML diagram for Database Structure

V. METHODOLOGY

Two main user flows have been implemented in the application.

A. App UI Design

Once the user opens the application, they can log in with their user id as shown in Fig. 4.

If the user doesn't have an account they can create one by entering the details as displayed Fig. 5.

There are two main user flows in the application- the Seller and the Buyer.

1) Seller Module: The functioning follows the following sequence for the seller.

- The seller can log in to the application with their credential as shown in Fig. 6
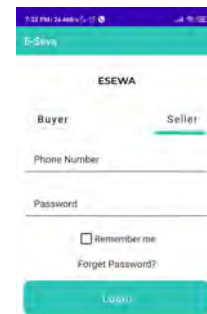- After logging in, the seller can add new products under their name.

Fig. 6. Log in page for seller

- While adding the products, the seller will mention the product category, price and description.
- After all the above steps are executed, the seller will set up a payment gateway and publish the product on the application.
- Once the product is published and the seller gets an order, they can regularly update the status of the received order on their screen.

2) Buyer Module:

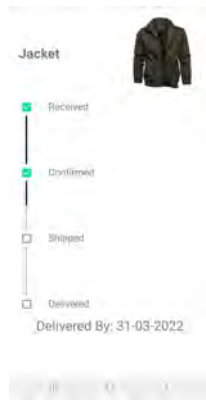- A buyer can log in to the application with their credentials

Fig. 7. Status of the product by Seller
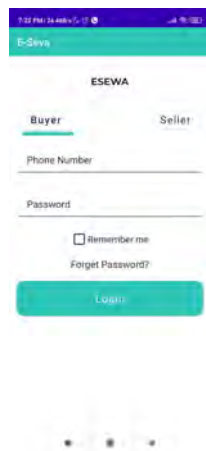
as shown in Fig. 8.

Fig. 8. Log in page for Buyer

- After logging in, the buyer can scroll through the application for products and can filter them according to their type Fig. 9.

Fig. 9. Products displayed for Buyer

- If the buyer wishes to buy some product, they can add it to the cart and then checkout.

- At the time of checkout, the buyer can make the payment and complete the checkout process as shown in Fig. 10 and Fig. 11.

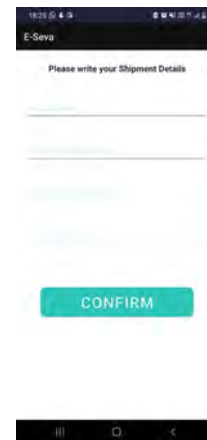Fig. 10. Product summary at the time of checkout for Buyer

Fig. 11. Shipment the details for buyer

- Once the order is placed, the buyer can check the status of shipping on the application.

B. Social Media Integration

The application is intended to be a platform where small business owners can come forward to publish and promote their products and their business. To do this, one key feature that has been integrated is to send a direct link to customers on WhatsApp. The seller can share a direct link to their customers or potential customers and boost their business. To do this, the application makes use of the intent and intent filters. An Intent is a messaging object you can use to request an action from another application component. The instance the user clicks on the share button, the intent takes the user to WhatsApp. This sharing option isn't limited to WhatsApp only. The seller can use this link to share it with potential customers on various platforms.

VI. Results and Discussion

After development, the application was used by 3 women who have small businesses. The feedback given by them was that the app had simple interface that was easy to use. Adding new products in their account along with the product details, uploading images and adding a description of the product is very easy.

They recommended a feature that would allow them to access analytics regarding their orders and products. This feature that has been added to the app and the users now can track their progress with this feature.

VII. Conclusion

Thus, in this paper, the problems small business owners face concerning building and managing their businesses have been discussed. A system that aims to tackle this problem has been proposed here. A single e-commerce platform where entrepreneurs can manage their business. This platform will have an option to integrate with social media to make marketing easy.

VIII. Future Scope

At the moment, the application is in the testing phase. Once development is complete, the application can be handed over to NGOs and organisations that can use it to further promote small businesses. We have been in collaboration with one such NGO. The application will be developed further to match their exact requirements.

Acknowledgement

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