

Android-based Mobile Application Development to Connect Local Vendors with Customers

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Abstract— The COVID-19 pandemic has significantly impacted small companies, especially neighborhood retailers and vendors. To support these vendors and promote local products, we developed an Android-based mobile application named DigitalVikreta. The aim of this research paper is to elucidate the evolution and characteristics of DigitalVikreta, and explore its potential effects on the economy. Our research involved a review of existing literature on mobile applications, as well as a survey of local vendors and consumers to identify their needs and preferences. DigitalVikreta provides a platform for local vendors to showcase their products and connect with potential customers. The application includes features such as online ordering, delivery tracking, and customer reviews. We believe that DigitalVikreta has the potential to benefit both local vendors and consumers, by increasing access to local products and boosting the local economy. Our research suggests that this application can be a valuable tool for local vendors and sellers in the current economic climate.

Keywords—Android-based mobile application, Local Vendors, DigitalVikreta, Small businesses, Online ordering, Delivery tracking, Customer reviews, Local economy, Technological advancement.

I. INTRODUCTION

The Indian e-commerce industry has experienced tremendous growth in recent years and is poised for continued expansion. According to projections, the market is projected to increase by 21.5% and reach \$74.8 billion in 2022. This growth is expected to continue in the coming years, with the market estimated to reach US\$ 188 billion by 2025 and US\$ 350 billion by 2030. The rise of e-commerce has transformed the way businesses operate in India, providing them with access to a rapidly growing consumer base. A key factor driving this growth is the increase in internet and smartphone penetration in the country, with approximately 830 million internet connections recorded in 2021. This growth is largely attributable to the 'Digital India' program, which has encouraged the adoption of digital technologies across the country. The majority of these connections, around 55%, were in urban areas, with wireless connections accounting for 97% of these. Given these trends, it is evident that the Indian e-commerce market presents significant opportunities for businesses to expand their reach and tap into a rapidly growing consumer base. The Indian government has recently introduced the Open Network for Digital Commerce (ONDC) scheme, which aims to transform the digital commerce landscape in the country.

Despite its innovative nature, however, the ONDC model has been criticized for certain flaws that may hinder its ability to achieve its ultimate goal of creating an inclusive digital commerce ecosystem. One of the key objectives of the ONDC scheme is to bring neighbourhood retailers into the digital commerce fold. While this is a laudable goal, some experts have pointed out that the model may be too complex and expensive for small retailers to adopt. Additionally, there are concerns around the potential monopolistic tendencies of larger players in the ecosystem, which could further marginalize smaller retailers. To fully realize the potential of the ONDC scheme, these issues must be addressed and resolved in a timely and effective manner. So for our project we are developing a system for the local vendors of the specific area to sell their products from their shop to the local people of that area. Our system will have the advantage that it will make the delivery of the project in a short span of time after ordering the product as the shop is in that area from where the customer is ordering the product. So our project comes under the ONDC scheme and Digital India campaign proposed by the government of India.

The COVID-19 pandemic has disrupted economies and social structures worldwide, leaving many small businesses struggling to survive. Among these businesses, local vendors and sellers have been hit particularly hard. With limited resources and online presence, these vendors face challenges in reaching potential customers and competing with larger retailers. To support local vendors and promote local products, we developed an Android-based mobile application named DigitalVikreta. The application aims to connect local vendors with potential customers and improve their reach, profitability, and efficiency.

This research paper aims to outline the progress and attributes of DigitalVikreta, and investigate its potential influence on the local economy. We begin by reviewing the literature on mobile applications and their role in promoting small businesses. We then describe the development process of DigitalVikreta, including the identification of user needs, the selection of features, and the design of the user interface. We also provide a detailed description of the application's features, such as online ordering, delivery tracking, and customer reviews, and explain how they can benefit local vendors and consumers.

In addition to describing the development and features of DigitalVikreta, we also assess the potential impact of the application on the local economy. We review the literature on the economic benefits of supporting local businesses and

provide a preliminary analysis of the potential economic impact of DigitalVikreta. Finally, we discuss the challenges and limitations of the application, as well as its potential for further development and expansion.

Overall, this research paper presents DigitalVikreta as a promising tool for supporting local vendors and promoting local products. We argue that the application has the potential to improve the economic well-being of local communities and create new opportunities for small businesses.

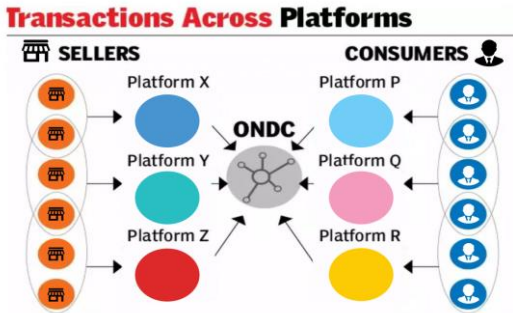


Figure 1. Online network for Digital Commerce

II. PROBLEM STATEMENT AND OBJECTIVE

A. Problem Statement

Over the years, online shopping has emerged as a popular trend among Indian consumers. With the convenience of browsing and purchasing products from the comfort of their homes, many consumers are opting for this form of shopping. However, while online shopping offers several benefits to consumers, it poses challenges for traditional retailers. In addition to competing with each other, retailers now have to compete with e-commerce websites that have a distinct advantage. This shift towards online shopping is also concerning for local retailers, who are struggling to keep up with the changing market dynamics. As retailers offer more discounts to attract customers, their profit margins have declined, resulting in job losses in the industry. This is a worrying trend, and local retailers are grappling with ways to stay relevant in the face of increasing competition from online shopping platforms. While online shopping is here to stay, it is important for policymakers to ensure that local retailers are not left behind in this rapidly changing landscape. If this problem exists for the next few years, as these e-commerce companies' strategy is going to be to set up warehouses in major cities in India to make their products affordable and fast to deliver, it will have adverse effects on these local retailers. As these big companies set up their warehouses in these cities there's no room for these local vendors to spread up their small businesses. This project will work to address these problems of these local vendors. We will provide these vendors to basically take their business on an online platform which will help them tackle this warehouse architecture. We will provide them all facilities which existing systems have such as creating categories, enlisting products, providing a delivery person. This will reduce the advantage of these tech giants over these local vendors. Apart from that we will keep the advantage of the local vendors intact. And this advantage is after sales help. We have seen if a product is not as expected, these tech companies are unable to solve

issues of the customer sometimes. As in our system, if the seller is from the same location as the customer, the customer will be able to meet with the seller in case of any wrong products.

B. Objectives:

- Platform for local vendors: Our team has created an application that offers a platform for local vendors to vend their products to customers.
- Our platform provides a user-friendly and convenient interface for local customers to purchase products from local vendors. Customers can easily browse and buy products according to their comfort, without having to wait in a queue at the physical shop.
- The system allows for flexible refund or exchange of products in case of receiving a defective product from a local vendor. As customers purchase products directly from local shops, they can easily approach the vendor for a replacement or refund in case of a defect.
- Our team is developing an ecommerce platform that aims to reduce shipping time and cost by facilitating local customers to buy products directly from local sellers. By enabling this direct transaction, we can significantly reduce the need for costly shipping and expedite the time it takes for the customer to receive their purchased items.

III. RELATED WORK

There are many examples of research for providing platform and increase efficiency of street vendors using latest technological advancements. Therefore, before describing our methodology we have overview of the related projects that aim for the connection between local vendors and their customers.

- Government of India proposed in [11] Amid the COVID-19 pandemic, the countrywide lockdown caused a substantial decline in revenue for street vendors, eventually resulting in the shutdown of their enterprises. The impact was felt more by unregistered and vulnerable vendors, who were mostly on their own without any certificate to vend. To address this issue, In July 2020, the Indian Government initiated the "Pradhan Mantri Street Vendor's Atmanirbhar Nidhi Yojana (PM-SVA Nidhi)" as a response. This program provides a unique microcredit initiative to street vendors, which includes an unsecured loan of Rs 10,000 (ten thousand) as working capital to revive their vending operations and safeguard their means of living. The program also aims to promote entrepreneurship and self-reliance among street vendors. With this initiative, the government hopes to mitigate the negative effects of the pandemic on the livelihoods of street vendors and help them get back on their feet.
- Bhowmik, S.K. (2007) proposed in [12] Local vendors have long been struggling to receive the appropriate value for their products, often facing exploitation and a lack of bargaining power in the marketplace. As the informal sector continues to expand, street vending has become one of the simplest methods for people to work in the urban unemployed sector, which is anticipated to result in an increase in street

sellers in the near future. However, the situation is not entirely bleak. A study has revealed that in areas where trade unions are functioning effectively, street vendors experience comparatively better conditions. The research examines the role of collective bargaining in facilitating social dialogue among street vendors in Mumbai, who constitute one of the most underprivileged segments of the urban working-class. The International Labour Organization (ILO) recognizes the importance of collective bargaining and promoting social dialogue to address the collective demands of workers. Collective bargaining not only serves as a means of achieving other objectives, but it also fosters the right of workers to decent working conditions. Despite the advantages of collective bargaining, the study finds that the rate of unionization among Mumbai's vendors remains low. This highlights the need for greater awareness and support for unionization efforts among street vendors. By empowering street vendors with the necessary skills and knowledge to engage in collective bargaining, they can better advocate for their rights and improve their working conditions. This, in turn, can have a favourable effect on the country's larger informal sector and add to its economic growth.

- Y. Jae Geol proposed in [1] that the manual stock management system used by local sellers has often proved to be inefficient, as updating stock after every sale can be a daunting task. To address this problem, an Android app has been introduced to enable online shopping for locally-produced goods. Local vendors are seen by the suggested mobile application as both sellers and buyers, with the purpose of assisting them in vending their products directly to consumers without relying on any intermediary platforms. This research paper endeavors to offer an economical and user-friendly online shopping platform for local and small-scale enterprises that were most affected by the COVID-19 pandemic. With this system, vendors can compare prices with the market and sell their products accordingly. Additionally, the app will have a location tracker that will help consumers find the nearest vendor to them, thus saving them both time and money. The primary objective of this system is to help local sellers improve their business by providing them with an efficient platform to connect with customers and sell their goods. Furthermore, this system will also help to promote local businesses, which can have a positive impact on the overall economy of the region.

- Android App to Link Farmers to Retailers and the Food Processing Sector [4], Farmers face numerous challenges when selling their products, including limited access to markets, uncertain demand, and price volatility. To help address these issues, our application provides a single platform for farmers, food processing industries, and consumers to come together and exchange goods at fair prices. The application streamlines the agriculture business by providing a well-organized and transparent market. One of the major challenges farmers face is getting a fair price for their crops, which is why the application compares prices from multiple sources to ensure farmers get the best return. The application also helps food processing industries to get the necessary supply of raw materials, while at the same time benefiting the consumers with high-quality products.

Farmers can market their goods directly to consumers and the food processing industry with the aid of mobile internet, eliminating the need for intermediaries and ensuring a fair price for both the farmer and the buyer. This app can revolutionize the agricultural sector by creating a more efficient, transparent, and equitable marketplace for all parties involved.

- Sharit K.Bhowmik in [8] proposed that Hawkers play a vital role in providing affordable goods to urban poor, yet they often face harassment and eviction by authorities. Instead of viewing them as a problem, they should be recognized as a profession and included in urban planning. This recognition would bring benefits to both the hawkers and municipalities. Municipalities would be able to collect fees and taxes from hawkers, which would provide additional revenue. For example, in Imphal, the municipality charges fees for garbage collection, sweeping, and license fees. In other cities, these fees could amount to several hundred crores of rupees annually. Additionally, recognition of hawking as a profession would provide hawkers with a right to their profession and access to loans from public institutions, reducing the hold of moneylenders over them. This would also reduce the stranglehold of corrupt officials, policemen, and gangsters over them. The informal sector, which includes street vendors and hawkers, is a significant contributor to the economy, but it is often neglected by policymakers. The recognition of hawkers as a profession would bring them into the formal sector and help to promote inclusive growth.

- Needz App: The Needz app is one of the applications based on the ONDC scheme. This android application provides a unique opportunity for local retailers and vendors to reach out to their local customers through an online shopping platform. The Android app provides a platform for local vendors to register themselves as both sellers and buyers, and transact directly with consumers by vending or purchasing their locally-produced goods and products, eliminating the requirement for a third-party platform. The aim of this application is to support local vendors, especially during the Pandemic COVID-19, which has significantly impacted small-scale businesses. The app's provision of an economical online shopping platform for vending locally produced goods in the vendor's area will empower them to compete with the market and sell their products at competitive prices. The app features a location tracker that helps consumers find the nearest vendor to them, saving both time and money. With this feature, consumers can quickly locate and purchase products from local vendors, thereby promoting the growth of small-scale businesses in the local community. By encouraging consumers to buy local, the app promotes sustainable practices that reduce the carbon footprint associated with the transportation of goods over long distances. Furthermore, this app creates an avenue for vendors to establish a direct communication with their customers, enhancing customer satisfaction, and loyalty. Ultimately, the Android App will help to promote the growth of the local economy by empowering local vendors and increasing the access of consumers to locally sourced products.

IV. PROPOSED METHODOLOGY

The software should provide facilities to customers as well as the vendors. While getting logged in (same for both customer and seller), we will collect all the information of the users and also location will be collected. Customers will be shown sellers and their products only under some threshold location distance. For now, any user will be able to create a store facility to its account. The seller user will be able to create categories and will be able to put all products he wishes to add in those categories. The seller user will be able to allocate a delivery person to their shop and provide his information. As soon as a delivery is placed for this shop's product, information will be shared with the delivery person's email id. From the customer point of view, he will be able to see all the categories and stores around his location he has provided. He will be able to order any product from these stores. Information about the seller (and delivery person) and the customer will be shared as soon as the order is made.

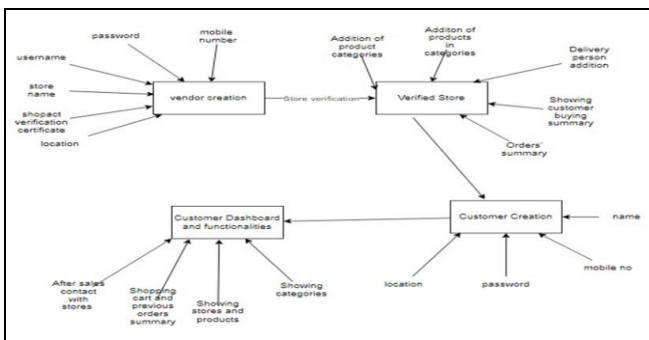


Figure 2: Functional Block Diagram

Retailers and small business owners are finding it difficult to compete with internet shopping. These vendors are losing a lot of their customers due to these online tech giants playing a price game, home delivery of their products, good online app/website experience, large number of product categories at one place. There are various products in the market such as amazon and flipkart (providing a vast range of products), zepto (providing fast delivery for groceries), grofers (same as zepto). But these websites use central warehouses for their products in only big cities. Though with the help of these warehouses (they don't need local vendors and no need of going through the whole market cycle of retailers) they can manage prices really well, but it is creating problems for local vendors. Our unique proposition is we will give these local vendors to enter into this online marketplace.

This app will make it easy for local vendors to make these things available to them as well. While we will provide them functionalities like online shopping apps as stated above, we will let them take the best thing they provide to customers i.e. after sales management. We have seen how many times online websites, when they have some fault in a product after sale, don't provide good service to customers. As our app provides information about the sellers, customers can easily contact them for any queries or concerns they may have, making the buying experience more transparent and reliable.

A. Store Side Email Login:

Upon completion of the initial email verification process for the store owner, the verified user is redirected to the store verification stage; and if the store is already verified, they are directed to the dashboard.

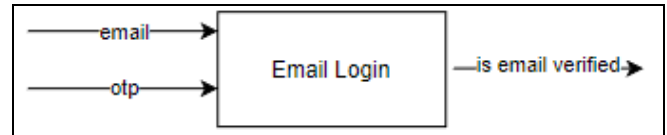


Figure 3: Modular Diagram, Email Login

B. Store Verification:

After collecting the store information for verification, the system validates the provided information and if it is correct, the user is directed to the dashboard.



Figure 4: Modular Diagram, Store Verification

C. Store Side Product Addition:

After collecting the product information, it is stored in a database, and the user is then redirected to the dashboard. The products are then updated to reflect any new changes made by the user.

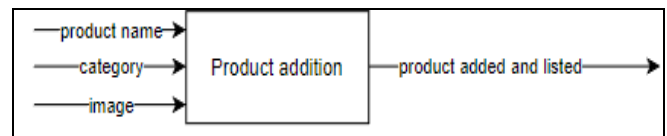


Figure 5: Modular Diagram, Product Addition

D. Customer Side Login:

Customer information is collected and verified, after which it is updated in the database and reflected on the dashboard for further use.

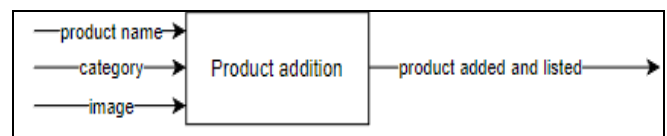


Figure 6: Modular Diagram, Customer Login

E. Customer Dashboard:

We collect various customer preferences and use them to tailor the products displayed on the platform to their liking. By utilizing this information, we are able to provide users with products that match their interests and are located in their vicinity.

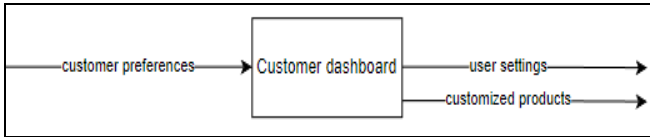


Figure 7: Modular Diagram, Customer Dashboard

F. Algorithm and Process Design akes

- To access the store side of our application, the store owner must first log in and verify all the necessary legal documents of their shop.
- Once the legal documents are verified, the store owner will have the ability to add the products available in the shop to our platform. Additionally, our application will assist the store owner in managing the stock available in the shop.
- Customers can access the customer side of our application after completing the login process.
- One of the inputs required at the login page is the pin code.
- The input of pin code at the login page enables the algorithm of the application to locate the local vendors closest to the customer's location.
- All the inputs provided by the customers and store owners are stored in the database and the backend coordinates the communication between the two sides of the application.
- Here is an illustration that presents the overall flow of our application:

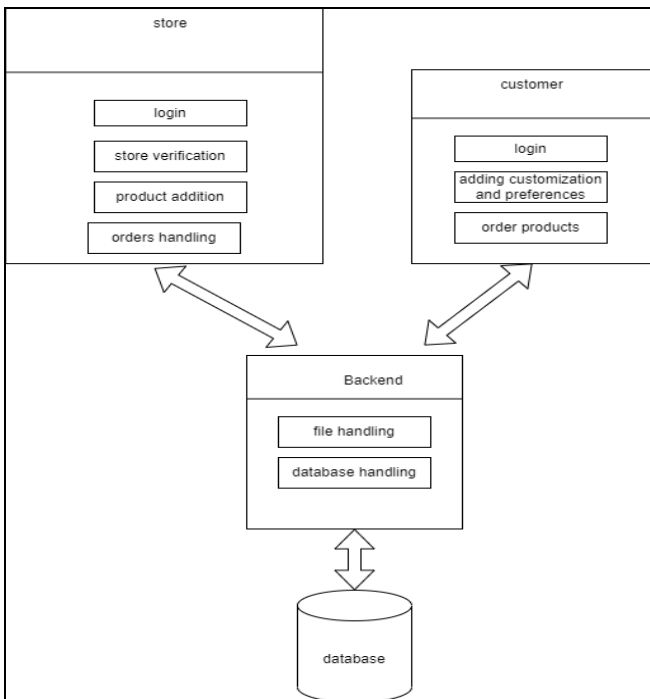


Figure 8: Process Diagram

V. RESULTS AND EVALUATION

The experiments conducted pertain to the unique features supplied by this solution. The paramount of which was its low processing requirement and its easy-going load put on systems having low specifications. We are able to

store the user data into the database very fast and smoothly. Store owners can verify their store and then make different products available. Customers can login and see different products across the city and order.

This android-based application uses open-source front-end JavaScript library: React, for building user interfaces of the application. Data processing and management of data in the application like pin code, store details, customer detail and prioritizing of product is implemented using NodeJS and MySQL for storing Datasets.

Flow of the application:

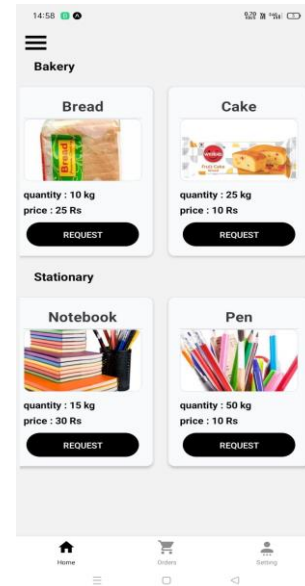


Figure 9: Customer Dashboard

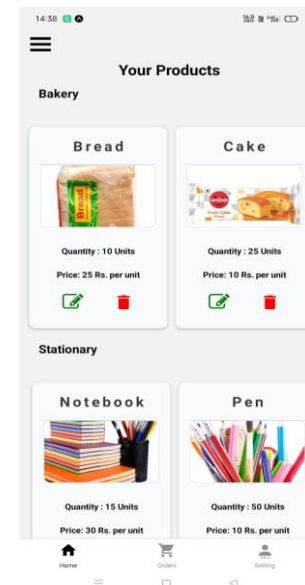


Figure 10: Seller Dashboard

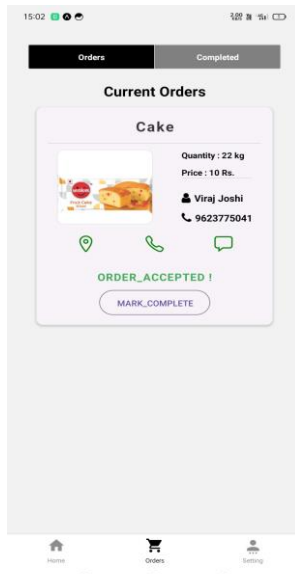


Figure 11: Order Screen



Figure 12: Analysis screen

VI. CONCLUSION

The local market of the world has been disrupted by online tech giants like amazon, flipkart etc. The local shop owners have experienced a dip in their earnings in these years. Even during lockdown all these local vendors had a big set down because of no online availability of their products and customers' big inclination towards online shopping. So, our project will try to solve all these issues

like playing price games, home delivery of their products, good online app/website experience, and a large number of product categories at one place. As well as, we will use their biggest advantage that is after sales management.

The creation of a scalable mobile application with a three-tier architecture for m-commerce and e-commerce is the main topic of this paper. The authors analyzed several existing frameworks and applications in the market to gather software requirements for their project. The application was designed to take advantage of mature commerce business processes, utilizing MySQL and NodeJS in the back-end. A two-sided interface was created for customers and local vendors or sellers, each with their own separate interface. The authors advise concentrating future study on automating the record-keeping procedure for sellers and creating demand-supply analysis graphical representations on the seller interface. Additionally, they suggest implementing discounts for customers in the same pin code area. The authors also propose using the same requirements to develop a hybrid web application for the front-end. Overall, this paper presents a comprehensive approach to developing a mobile commerce application that could benefit both customers and sellers.

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