



Data-Driven Bridge For FMCG-Kirana Connectivity (Android-App)

Anugrah Nerkar^a, Omkar Salapurkar^b, Geetanjali Sharma^c

^a Student, Dept. of Computer Engineering, Pimpri Chinchwad College of Engineering, Pune 411044, India

^b Student, Dept. of Computer Engineering, Pimpri Chinchwad College of Engineering, Pune 411044, India

^c Assistant Professor, Dept. of Computer Engineering, Pimpri Chinchwad College of Engineering, Pune 411044, India

ABSTRACT

Kirana stores have emerged as indispensable pillars of the retail landscape, serving as cornerstones of neighborhood communities for decades, especially in India. They offer unmatched convenience, personalized service, and a deep understanding of local preferences. The problem lies in the lack of reliable channels for brands to effectively reach and communicate with millions of Kirana Stores, leading to suboptimal inventory management, missed marketing opportunities, and hindered business growth for both organizations. This paper provides some insights of the literature papers related to e-commerce and the retail industry. The goal of this paper is to bridge the gap between the FMCG brands and the Kirana stores connectivity through data driven technology (Android App).

Keywords: Kirana Stores, Community, FMCG Brands, Retailers

1. INTRODUCTION

Though there is continuous interaction between the FMCG brands and the local businesses, the process is not efficient. There is access to wrong information by local businesses, less profits generated, etc. The problem lies in the lack of reliable channels for brands to effectively reach and communicate with millions of Kirana stores, leading to suboptimal inventory management, missed marketing opportunities, and hindered business growth for both parties. Addressing the challenge of information asymmetry and fragmented communication in the retail ecosystem by establishing a technology-driven platform that enables seamless interaction between FMCG brands and Kirana stores. The goal is to empower local retail, close information gaps, boost efficiency, drive growth and strengthen communities.

2. NEED OF THE STUDY

Kirana store owners rely heavily on each other's recommendations, but there's currently no effective way for them to share insights about which products to stock and improve their stores. This lack of communication is hindering their ability to make informed decisions and better serve their customers. FMCG brands struggle to reach Kirana stores effectively, leading to suboptimal sales.

This hinders Kirana stores from capitalizing on advertising opportunities, impacting their revenue. Addressing this issue is crucial for the growth of both big companies and small stores.

3. PROPOSED SYSTEM

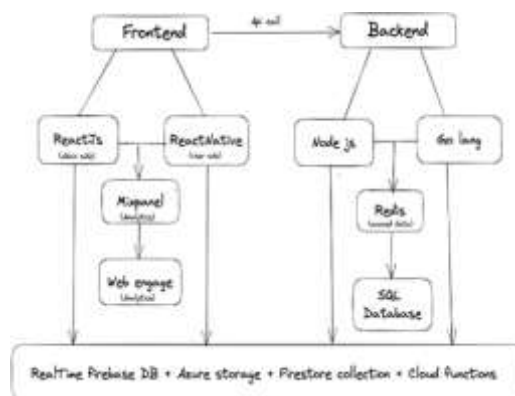


Fig. 1 – Block Diagram

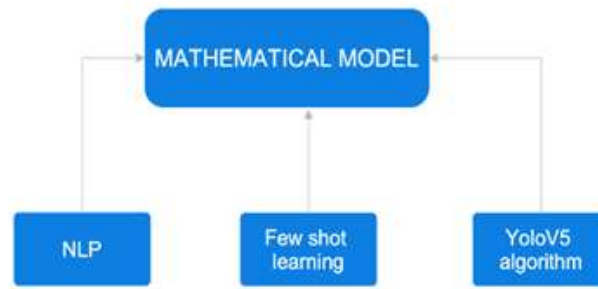


Fig. 2 - Mathematical Model

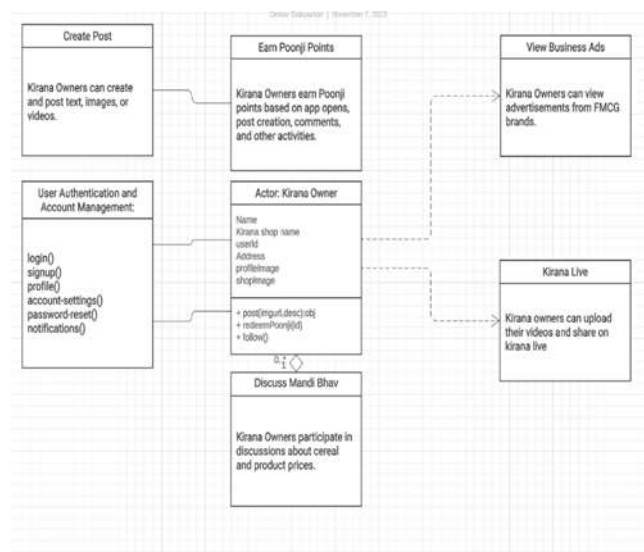


Fig. 3 – UML diagram

4. ALGORITHMS

4.1 Yolo for Brand Detection

YOLOv5 is employed to swiftly identify product brands in images uploaded by Kirana owners. Its aim is to enhance categorization by appending brand-specific hashtags to posts. This ensures users can effortlessly locate products from their preferred brands, optimizing the shopping experience

4.2 Few-Shot Learning for Recommendations

Few-shot learning tailors user experiences by rapidly adapting to evolving preferences based on user interactions. The goal here is to offer personalized video and post recommendations, boosting engagement and user retention. This algorithm learns from minimal data, ensuring accurate suggestions.

4.3 NLP for Brand Name Refinement

Natural Language Processing (NLP) refines brand hashtags generated by YOLOv5. Its purpose is to verify and improve brand references, matching detected brand names with precise keywords. This guarantees accurate post categorization, simplifying search for users and Kirana owners alike.

5. TOOLS AND TECHNOLOGY

5.1 Front End

React Native: Used for developing the mobile app's front-end, providing a cross-platform solution for Android devices.

5.2 Back-End

Node.js: Employed as the runtime environment for server-side scripting, ensuring efficient data processing and communication.

Golang: Utilized for specific back-end tasks, enhancing server performance.

5.3 Database

SQL: Employed for structured data storage and retrieval.

Firebase: Utilized for real-time database requirements and seamless data synchronization.

Redis: Used for caching to improve application performance.

Scilla: Employed for additional caching and enhancing database functionalities

5.4 Cloud Hosting

Microsoft Azure: Chosen for hosting both the front-end and back-end of the application, providing scalability and robust infrastructure.

Firebase Storage: Utilized for storing images and other multimedia assets.

5.5 AI and Algorithms

Yolov5 Algorithm: Integrated to detect product brands from images and generate corresponding brand tags.

Few-Shot Learning Algorithm: Implemented to enhance recommendation systems for content within the app.

Natural Language Processing (NLP): Used for brand name recognition based on the output of the Yolov5 algorithm.

5.6 Payment Gateways

Firebase Pay-as-You-Go: Employed to manage real-time database usage efficiently.

Integration with Local FMCG Markets: Integrated into the app for marketing and collaboration with local FMCG markets.

5.7 Other Tools

Lottie: Used for animation and illustrative purposes within the app's user interface (UI/UX).

Adobe Illustrator Pro Subscription: Utilized for graphic design and branding.

GitHub Copilot Subscription: Integrated for code generation, development assistance, and code quality.

GitHub: Employed for version control and collaboration among development teams.

6. METHODOLOGY

6.1 Requirement Gathering

Collaborate with stakeholders to define the app's goals, features, and functionalities. Gather specific requirements for each component, such as the product catalog, communication channel, Mandi Bhav tab, news tab, Poonji system, VIP Kirana community, reels section, and KYC verification section.

6.2 Planning

Create a detailed project plan outlining tasks, timelines, and resource allocation. Define sprints (time-boxed development cycles) for iterative development.

6.3 Design

Design the app's user interface (UI) to be intuitive, user-friendly, and aligned with your target audience's preferences. Design the database schema to store user data, product information, and activity logs.

6.4 Development

Develop the app in React Native, utilizing JavaScript, React Native framework, and required third-party libraries. Implement each functional component systematically, following the defined requirements.

6.5 Testing

Conduct comprehensive testing of each feature, ensuring they work as intended and are free from bugs. Perform user acceptance testing (UAT) to validate the app's usability and functionality.

6.6 Iteration and Refinement

Review the app's progress at the end of each sprint. Collect feedback from stakeholders, including Kirana store owners, FMCG brands, and potential users. Refine and improve features based on feedback received.

6.7 Integration and Deployment

Integrate different components and modules to create a cohesive app. Deploy the app to a staging environment for final testing before release.

6.8 User Training and Documentation

Provide user guides and documentation to help users navigate and utilize the app effectively. Offer training sessions to ensure Kirana store owners are familiar with the app's features. **Launch and Monitoring:** Launch the app on app stores, making it accessible to users. Monitor the app's performance, user engagement, and any issues that arise.

7. RESULTS AND DISCUSSION

7.1 Empowering Kirana Shop Owners

The app empowers Kirana shop owners by providing them with a digital platform to connect, share insights, and discuss industry-related matters. They can now access a wealth of information and network with peers.

7.2 Community Building

Kirana Club fosters a sense of community among Kirana shop owners. They can share experiences, challenges, and successes, thereby creating a tight-knit network that offers support and guidance.

7.3 Incentivizing Engagement

The introduction of the Poonji points system incentivizes user engagement. Kirana owners are rewarded for their active participation, such as posting, commenting, and interacting with the app, which encourages consistent use.

7.4 Direct Brand Communication

FMCG brands can directly advertise their products to Kirana shop owners. This facilitates communication and collaboration between brands and retailers, potentially leading to increased sales for both parties.

7.5 Price Insights (Mandi Bhav)

The "Mandi Bhav" tab offers Kirana shop owners a valuable resource for discussing product prices. This information can help them make informed decisions about purchasing stock, leading to cost savings.

7.6 User Data Insights

The app collects valuable user data that can be used for market research and analysis. This data can help FMCG brands better understand the needs and preferences of Kirana shop owners.

7.7 Brand Promotion

FMCG brands can enhance their visibility by advertising their products through the app. This platform offers a unique opportunity to promote their brands directly to a relevant audience.

7.8 Improved Decision-Making

Kirana shop owners can make more informed decisions about what products to stock, when to buy, and at what prices. This can lead to increased profitability and efficiency.

7.9 Enhanced User Experience

The app enhances the user experience by offering features like multimedia posts, direct brand communication, and a reward system. This keeps users engaged and satisfied.

7.10 Economic Impact

By fostering collaboration between Kirana shop owners and FMCG brands, the app can have a positive economic impact. Kirana stores may see increased sales, and FMCG brands can gain new distribution channels.

7.11 Data-Driven Marketing

For FMCG brands, the app offers insights into the preferences and behavior of Kirana shop owners. This data can be used for targeted marketing campaigns and product development.

7.12 Efficient Networking

The app streamlines networking within the Kirana shop industry. Shop owners can easily connect with peers and learn from their experiences.

7.13 Digital Transformation

Kirana Club contributes to the digital transformation of traditional Kirana shops, allowing them to compete in the modern market.

7.14 Knowledge Sharing

Knowledge sharing among Kirana shop owners can lead to the adoption of best practices and strategies, ultimately benefiting the industry as a whole.

7.15 User Loyalty

The Poonji reward system can enhance user loyalty, encouraging Kirana shop owners to remain active and engaged with the app.

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