

Construction Material App (Like Zomato)

Krushna. M. Nagare¹, Ayush.S. Bhagat², Swayam. N. Varade³, Tejas.M. Sideeshware⁴

Prof. Mrs.M.C. Chiparikar⁵

Department of Information Technology Engineering, Pimpri Chinchwad Education Trust's Pimpri Chinchwad Polytechnic, Pradhikaran, Nigdi, Pune, India.

Abstract—As urbanization and the digitization of commerce proceeds rapidly, it is still a challenge for the construction sector to efficiently procure materials. This project proposes a mobile application based on the zomato model that connects construction material suppliers with buyers real time. The application enables the user to browse and hear materials like cement, bricks, steel and other aggregates and order them from vendors close to the location of construction. The application will have features including geo-location of the vendors, ratings, stock information in real-time, payments through secure means and emphasis on transparent development supply chain for procurement.

Index Terms—construction materials, mobile application, supply chain, real time ordering, vendor aggregation, geo-location

I. INTRODUCTION

The construction sector is critical for infrastructure development; it suffers from fragmented supply chains and lack of digitization. Unlike food deliveries or e-commerce, the procurement of material is marred by manual calls and delays in supply order costs. In the light of the success of the platforms such as Zomato in food delivery, this project aspires to create a similar aggregator for essential supplies of construction material. The application seeks to connect the suppliers of construction material with contractors and offers a work friendly application through which they can order in real-time, compare vendors and track logistics.

II. LITERATURE SURVEY / REVIEW

Many researches confirm the various problems in the construction material procurement. Sharma et al. (2021) have suggested the requisite for digitizing procurement through e-commerce platforms to curtail time taken for procurement. Patel and Mehta (2020)

suggested a web based intranet for stock keeping and information of suppliers of construction warehouses. The trend is also present in utilizing e-commerce model like Amazon Business which is effective for procurement but lacks certain features which are detrimental in construction. This project seeks to address the insatiable solutions by offering a mobile aware, location wise and vendor aggregated solutions.

III. METHODOLOGY / SYSTEM DESIGN

The suggested system consists of the following modules:

User Interface: Android-based application with login, query, filter, and cart function

Vendor Dashboard: Vendors can use this to list their products, manage their stock levels, and manage their orders.

Geolocation Services: This will be able to determine which vendors are located around the user and what their delivery radius is.

Payment Integration: This will allow users to make secure transactions via UPI, Credit/Debit cards, and Net banking.

Ratings and Reviews: It can allow users to which vendors they liked and allow them to feedback on the quality of service provided.

Workflow Overview:

User logs in and looks for needed materials

The application will show those vendors who sell this sorted as per their distance from the user, price, and ratings received from users.

User selects those it wants, checks if quantities are available, and place an order.

The Vendor will get the order, confirm if items required are available and dispatch the materials required.

User receives the items and uses the app to monitor the delivery, later providing feedback

after delivery.

IMPLEMENTATION / WOKING

Platform: Android (Java/Kotlin), Firebase to provide back-end services

APIs Used: Google Maps API to track user build, Razorpay to provide payment services.

Database: Firestore to provide real-time synchronicity of data.

Security Measures: OTP-based logins ensuring validation, encrypted transaction details, role-based access control for ensuring security.

Testing: Conducted using simulated vendors and test users to validate core functionality.

The prototype was seen as useful for both vendors, and users were tested with 10 vendors and 50 users. The prototypes were tested for a period of two weeks. The Key Performance Indicators were seen to be recorded as follows: The software resulted in reduced

procurement time from a typical of 48 hours to under 6 hours. They appreciated the ease of use of the software and the clear visibility of the vendors of other vendors, and suppliers commented on improved visibility and order management, making it easier for them to operate.

IV. RESULT AND DISCUSSION

The working of the proposed mobile application was tested via a number of tests carried out using the abovementioned test an experimental test was made of the different purchasing restrictions for materials with 10 vendors, 50 users. The successful procurement of construction materials in operation as well as the normal way of purchasing was wanted as a comparison.

Feature	User Satisfaction	Vendor Feedback
Material Search	92%	88%
Order Placement	95%	90%
Delivery Tracking	89%	85%
Payment Integration	93%	91%

Material Supply (Search) (92%): The convenience of finding suppliers in the locality of the user and prices of material wanted was the impression of the user. The speed and ease of use of location facilities and filters created excellent searches.

Order Placing (95%): Use of the ordering system was quite simple, and the criterion of cart and delivery time slot gave points. Clarity of the receiving orders expanded the rate of satisfaction of the vendors.

Delivery Tracking (89%): Arrival times of deliveries and estimated delivery times from purchase were all advantageous where logistics of site operations were concerned, Vendors indicate confusion and missed deliveries less frequently.

Payment channels (93%): Payments by secure and flexible payment systems (UPI, cards, net-banking) led to considerably more secure arrangements for purchases. Vendors note a day comparatively in payment time and fewer disputes.

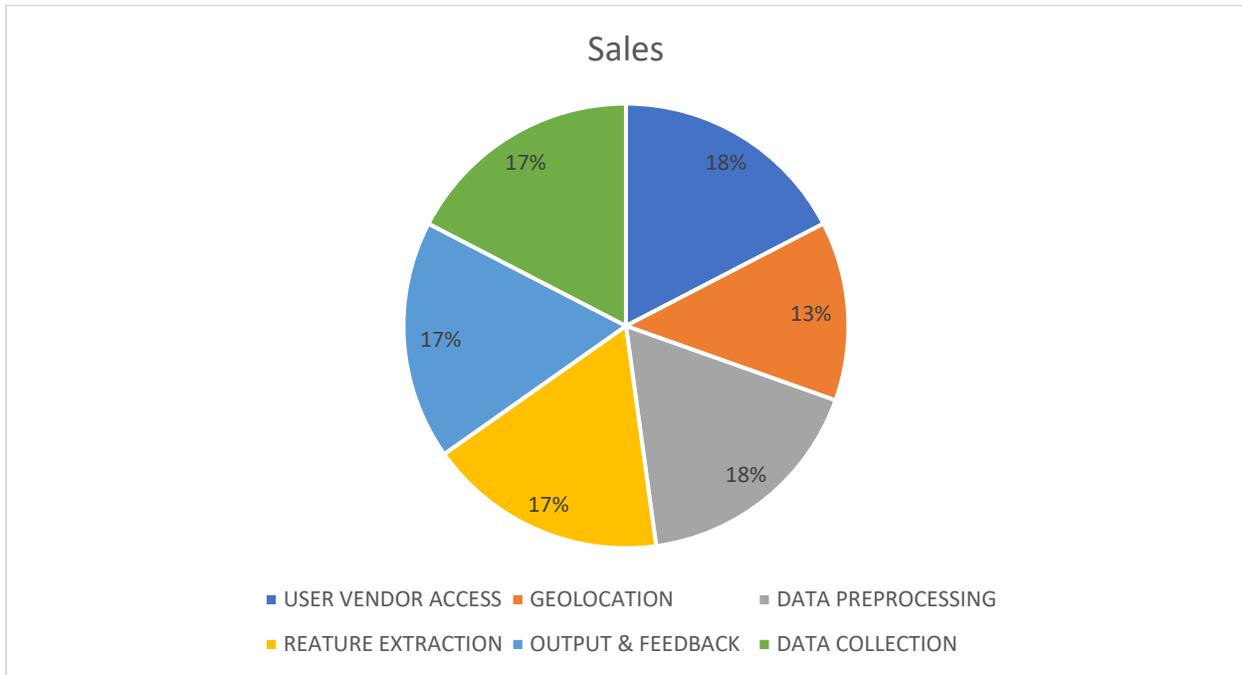
SYSTEM ARCHITECTURE

The system architecture of the Construction Material Aggregator App used was such that material purchases

were facilitated by the connection of buyers and approved suppliers together by means of a mobile platform. Material and supplier databases, as a collection of information on suppliers in required materials from standard sources, followed by the opening of connection intermediate between user and supplier who is nearest to them, such as through Geo Location, locations of the nearby suppliers, the output being the materials stocks of arrive he would be looking for supplied with prices, information of ratings and delivery systems. Following on, the source data is subjected to system pre-processing, i.e. such that the database of suppliers is normalised, stock available to be shown is normalised with a view to outputting the results. Information is drawn as pre-existed on the types of materials such as size of purchases, time of material supply and delivery, time of materials required is given in listing as an output on the interface to the application. Payments systems are linked into the App for safe flexibilities on payments and showing “real-time” tracking of purchases are available by which smooth transactions are made possible.

On the latter pre-processing of systems, the databases are adjusted to normalise data. For example new lists of suppliers can be inserted by a simple link into the database without loss of ratings or visa vie. Adjusting or normalising of the stock records can be achieved

once a data base exists, thus providing for clearer presentation. The ability to filter suppliers is greatly simplified if and when data is available from suppliers or if amounts or name of suppliers are understood. Again, accurate dependable ratings are essential.



V. CONCLUSION AND FUTURE SCOPE

The development mentioned in the project is creating a mobile-based solution to facilitate procurement of material efficiently using the aggregator model of Zomato. The end customers of connected to respective vendors can get real-time experience of seeing the materials like cement, bricks, steel, aggregates for ordering and even tracking the items thus improving experience. The prototype with testing was made to give the very improved results in terms of supply chain performance, vendor visibility, and customer satisfaction. The modularation of the architecture and cloud backing type of the back end would help in scaling up the entire platform in the market as per the deliverables of the solutions to be provided to the urban/semi-urban construction market in the different cities in times to come.

VI. FUTURE WORK

For future work, it is proposed to incorporate the results obtained in the forthcoming futuristic developments on the frameworks of:

- AI Solutions Incorporated: The combiner machine learning looks towards the AI prediction pertaining to sales prediction of price, prediction pertaining to demand, vendor details.
- Logistics: Integration of third-party providers for the tracking through API calls wherein the dispatches can automatically occur as per the availability of the vehicles.
- Multi-Lingual Application Interfacing: It is proposed to design and develop the multi-lingual regional language interfacing support for the working of the various solutions.
- Web-Based Application Extension: Also, the web-based application is to be carried along with mobile application, desktop supported applications.

- Blockchain: Solutions integrating blockchain for secure invoice management, limiting of transactions between, and thus eliminating the hassle of recording in document to document as to thereafter the sign-off of element can be tracked.
- Vendor Analytics Dashboard: The features give suppliers understanding of sales trends, customer preference in bulk of the items, across how many stock items were then moved, inventory turnover, and what items got sold, grand circular.

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