

Automated Inventory Management System

A Project Submitted

SICSR

by

Aabhas Basnet (19030122116)
Mohd. Alibhai Taha (19030122092)
Kushagra Goyal (19030122031)

*Under the guidance of
Dr. Sarika Sharma*

SYMBIOSIS INSTITUTE OF COMPUTER STUDIES AND RESEARCH,
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Introduction

Before we introduce AIMS, let's consider the scenario of a small scale retailer, for every item, they have to

1. Sell the product
2. Restock the Product
3. Know the status of the product
4. Track Shipments
5. Receive Payments
6. Manage Accounts
7. Review Customer Details

You can imagine how tiresome this would be and that's where "AIMS" comes in, AIMS i.e. Automated Inventory Management System helps integrate all these features into one application.

AIMS will provide you with:

1. real-time statistical information about the sales of each product
2. automatic updation of stock information with each purchase order
3. warning whenever stock level reaches a certain low
4. Tracking movement of every order that you place

AIMS will help you optimize purchases by looking at multiple options available for you in the Supply Chain, and inventory levels and get critical insights about your businesses anytime, AIMS will allow you to say goodbye to your all inventory hurdles

This system is particularly made for the unorganized retail sector of India. This includes the kirana stores/ general stores/mom & pop stores. These stores are available throughout India and they are a major part of the retail sector of India

This app was built taking into account their needs to help them survive. These small stores often lack the capacity, labor and time to carry out inventory management. This app was built to help them simplify this issue of inventory management in their stores

This application is built for all kinds of retail businesses but our primary focus for this app has been the small scale unorganized retail sector of India

Existing Systems:

1. Zoho Inventory Management Software

With Zoho Inventory, you can expand your business while also streamlining your inventory management. Using a single inventory management software, you can manage multi-channel orders, warehouses, packaging, and shipping, track inventory, and integrate with a variety of other applications.

The strengths of this system are

- i. Built for SME's
- ii. Designed specifically for inventory control
- iii. Supports all platforms (IOS, Android, Mac, Windows, Web)

The Limitations of this system are:

- i. not at all affordable for SME's, starts at \$208.32 per organization
- ii. Zoho is an Australian Inventory Management Software and as such there is very limited support for Indian Businesses
- iii. Zoho doesn't take into account Indian products and as such it would be a very painful process for the user to add all Indian Products to his store
- iv. Zoho isn't partnered with local Indian sales channels such as Amazon India, Flipkart etc. It works with international partners such as Amazon AU, Shopify, Ebay

2. Oracle NetSuite ERP

Oracle NetSuite ERP is the world's most popular cloud ERP, offering a single centralized interface in the cloud for all back-office processes like accounting, CRM, and ecommerce.

The strengths of this system are:

- i. Integrates accounting, CRM, ecommerce, inventory into one UI

- ii. World-standard for ERP
- iii. Requirement specific pricing
- iv. Supports all platforms (IOS, Android, Mac, Windows, Web)

Limitations:

- i. Overly complicated UI
- ii. It takes a learning curve and training to fully understand how the app works
- iii. It's not specifically designed for Inventory
- iv. Lacks Support for Indian businesses, Indian Products and Indian Sales Channels

3. Vyapar - Accounting & Invoicing

Vyapar is the most user-friendly GST-compliant accounting, invoicing, and inventory management platform available. It's designed specifically for businesspeople, so you won't have to spend time studying it. And if you don't know much about accounting, you should start handling your company online the same way you did before. Vyapar is the best accounting software for small businesses. You will use it to keep track of invoices/receipts, budgets, purchases, inventory, and customers. Furthermore, its GST compatibility allows you to build and exchange GST-compliant invoices, tally them, produce detailed financial records, automatically measure taxes, and file GST tax returns.

The strengths of this system are:

- 1. Built for Indian businesses
- 2. also includes accounting features
- 3. doesn't require a learning curve and training
- 4. GST Compliance

The limitations of this system are:

- 1. Overly expensive for SME's, \$55.54 per device per year
- 2. Not specifically designed for inventory
- 3. Lacks support for IOS, Mac and API's

AIMS strengths in relation to these systems

- 1. AIMS is built in India so it has full support for Indian business
- 2. AIMS is built taking into account Indian products and Indian retail businesses so users would have a preconfigured list of items to choose from
- 3. AIMS is partnered with local Indian sales channels
- 4. AIMS is specifically designed for inventory systems
- 5. AIMS includes support for all platforms
- 6. AIMS has a relatively low learning curve and takes very basic training to learn
- 7. Designed to be Affordable for small businesses

Literature Review

Research suggests that even though there has been a boom in the development of malls and large-scale stores, General stores are still the most preferred method of retailing for consumers. We can classify retailing in India into 2 major groups i.e. the organized sector which consists of the malls and the large stores, and the unorganized sector which is the general stores, vendors and hawkers. The Business operations of an organized sector business is mostly technical, they have technology for planning inventory, sales and all the other aspects of a business. However, the unorganized sector barely employs any technology in their operations. They operate on a much smaller scale to their local customers in a specific region. [1]

Statistical data from the cities of India show retailing is the 2nd highest occupation in India after farming [2]. The Indian retail sector had an estimated value of USD 800 billion in 2018. 91% of the Indian retail sector is Unorganized retail while the other 9% is the organized retail sector. [1] This shows we have greater potential for equitable development by advancing the unorganized retail sector of India. The world record for the largest retail density for every 100 people is held by India.

Our main focus when developing this app was to target the unorganized retail sector of India. It is evident from the above data that the unorganized retail sector is a major part of the retail industry in India. Given the nature of retail goods, they tend to be easily perishable which is why managing and holding inventory has been a particularly difficult challenge for these businesses. This is why managing inventory was our main focus with this application.

It was also discovered that their connections with the surrounding communities provide them with information about customer preferences and other product specifications. They increase their interaction with the social groups by associating themselves with local activities. Research shows if these retailers work together, they could form a retail partnership which gives them the benefit of providing better services and engagement with their customers. [5]

Research data suggests that traditional unorganized retailers i.e. the kirana stores are facing a lot of competition from organized retailers such as big bazaar in India. The general problems that they face are:

- 1) The appearance of their shops aren't attractive to customers and they cannot afford renovation
- 2) They are heavily in debt
- 3) Difficult to source good quality labor which is why Labor mostly involves family.

These traders do not wish to be employees, their preferred goal is to run their own stores despite all these hurdles. We need to encourage such entrepreneurship skill through competitive strategies to help these businesses survive in the market. The work of Nabati Ray, Graham Clarke, and Paul Waley has many of these strategies well defined. [6]

We need these businesses to have cooperation and mutual association amongst each other. We highly encourage this with our inventory system. If we were to build a network of these small-scale retailers. They could use competitive strategies for all their products. This would give them a strong fighting chance against malls and big outlets. This will help them overcome their issues and help them survive longer in the market. Even for consumers, strategies like these will benefit them as they will be able to get cheaper products from their nearest convenience at these stores

We aim to make retailing "smarter" by creating a network of retailers who are using our application. This network will allow them to communicate together, share useful insights and form retail partnerships. These partnerships and integration of businesses is important because it helps businesses work as a collective, it will help them share experiences and develop ideas. This is how cities and countries become "smarter".

4. Problem Formulation:

I. Objectives of Proposed System

- 1. To provide user with a software application that provides customer-based user-interface which saves the user's time to manage stocks.**

On average, Inventories account for 90 percent of a company's working capital. Therefore, it is important for a business to plan on how to handle and manage the stocks and money invested in it. This includes planning of purchasing, handling, storing, and accounting. To make this most efficient and easy we have introduced an automated inventory management system which helps company reduce their stress to manage their inventories.

- 2. To make handling inventory cheaper.**

¹ Keeping track of inventory, updating documents, and using the same data to track earnings, demands, and revenues are all critical for a business. However, for a small company or freshly founded company, it is extremely difficult for them to maintain all these activities due many hazards such as costs, lack of experience and knowledge. AIMS is free to download and will provide unlimited service until the user's device is connected to the application and its server. Therefore, AIMS helps new and small business owners to manage and understand the inventory management very well and fast.

3. Maintain a steady flow of goods and inventory.

AIMS ensures that performance does not suffer through periods where the company's commodity is in high demand. As this application focuses on J-I-T (Just-In-Time) management strategy to keep the stock volume under pressure. This aids the organization in maintaining the supply of goods in sufficient quantities anywhere they are required.

4. Reduce the cost of production.

AIMS aids in the management of manufacturing costs, allowing it to contribute to the reduction of production costs. This further aids the manufacturing unit in ensuring high-quality products at fair costs.

5. Assist in the keeping of inventory records in a structured manner.

AIMS manages all the information about the inventories on a systematic manner. This will assist businesses in reducing stock buying overlap. It further protects the organization from depreciation, pilferage, thievery, and losses.

6. And keep the stock volume constant.

AIMS aids in the tracking and monitoring of a company's stock so that supplies can be optimized and managed without wasting time and resources. This helps to prevent overstock or understock and maintains the stock level and make stability in stock price.

7. To educate about inventory management.

AIMS not only focuses on managing tasks for inventory but also focuses on educating the new or small business owners about how important and what is inventory management. It provides basic knowledge on raw materials, work in progress inventories, finished goods and MRO (maintenance, repair, operation) goods. This will help small business to conduct inventory management that makes the businesses the opportunity to keep up with demand and profits

8. To connect supplier, manufacturers, vendors throughout the globe to increase tough and fair competition.

Any user can make an account just by using their cell phone number and some personal information. After the account is created, the software allows to connect the person with users throughout the world. This allows tough completion between suppliers and buyers which further allows best price to be settled for the stock materials.

9. To promote sustainable inventory management.

In traditional stock management techniques, people used pen and papers to record data and information about the inventories. This led towards massive production and use of papers for different industries and businesses. Then use of different RFID tags and readers revolutionized the management techniques. This also led to production of huge amount of RFID tags and readers which is dangerous to the environment as well. Therefore, AIMS is a mobile based application that uses camera scanner to read and scan which saves huge cost on having extra device just to do the same tasks. In addition, recording data and storing does not require papers and is much reliable to be safe for permanent. These data also do not require any physical space to store as well.

II. Feasibility study of AIMS

1. Technological Practicality:

Project AIMS is a fully functional smartphone application. The following are the key technologies and resources needed to establish AIMS:

- **Bubble:** Bubble Group has created a visual programming language, a no-code creation tool, and an application platform as a service that allows non-technical people to create web applications without having to type code.
- **MySQL**
- Diagram drawing tool
- **InVision** (Wire framing Tool)

Most of the listed software are freely available. The technical skills required to build the application with the aid of the following technologies takes time and practice to acquire.

The members of the project groups are well aware and skilled in different technologies listed above. A perfect teamwork can lead to a complete package of skills to develop the targeted software.

The application can be hosted in a digital software distribution platform such as app stores and play stores. This application is not open source. The bandwidth required for this application is low because it has very less incorporation with any multimedia aspects.

Therefore, we can conclude that AIMS possible in a technological point of view.

2. Resources and time availability:

The AIMS project needs the following resources:

- Coding system: Portable or regular desktop
- Programming tools: All are freely available except Bubble with low development cost
- Programmers: Group Individuals
- Hosting platform: Freely available

Time allocated and required to complete the project:

- Planning the design: 2 days
- Designs and Diagrams: 2 days
- Coding the application: 4 weeks
- Testing and corrections: 2 weeks
- Documentation: 3 days

Total Time estimated is 7 weeks or 1 and a half month. Therefore, AIMS has required resource and time feasibility.

3. Economic Feasibility

The financial cost of the project is very low or none at all. The main cost is the time, efforts and skills invested by the members to develop the application. In details, only bubble is the technical tool that requires payment to use. It has a subscription-based cost where the users can create unlimited software using their skills. Therefore, we can conclude that the cost for this application is very low or almost none. There are very few other insignificant costs associated while creating this application. Such as, electricity.

Therefore, AIMS is economically feasible.

4. Operational Feasibility

AIMS is a mobile-based application that will reduce the effort of businesses to manage its inventories with very less interactions with the software. It is very easy to set and use. It will suggest the users with optimum solutions which helps businesses to apply the JIT (Just-In-Time) management system perfectly.

Its design is clear and simple and user interactive. It is not complex to use as the current software available for inventory management systems in the markets.

Its estimated size is less than 10 MB, and its other downloads requirements are also very low. This makes this app available in any android or IOS phones very easily. This app will take very less time to download. This means this app will be easily accessed by anyone.

5. Possibility from a sociological and lawful standpoint

AIMS makes use of open-source programming software and offers a free inventory management system that can be used by thousands of retailers, manufacturers, and businesses.

The system is not open source. As bubble is used to build the application, which is a non-code development platform and it does not provide the code to the user or allows the code to be used as open source.

In conclusion, we can estimate that AIMS is a successful application and it will give a tough competition while compared to software that are available for inventory management. AIMS basically focuses on stock management in a general and simple manner. AIMS is technically, operationally, economically resource and time feasible which makes us conclude that project AIMS is feasible to be started and completed.

H/W and S/W Requirements:

The minimum requirements are:

OS: Android 7 OR IOS 10

RAM: 1GB

Storage: Between 850 MB and 1.2 GB

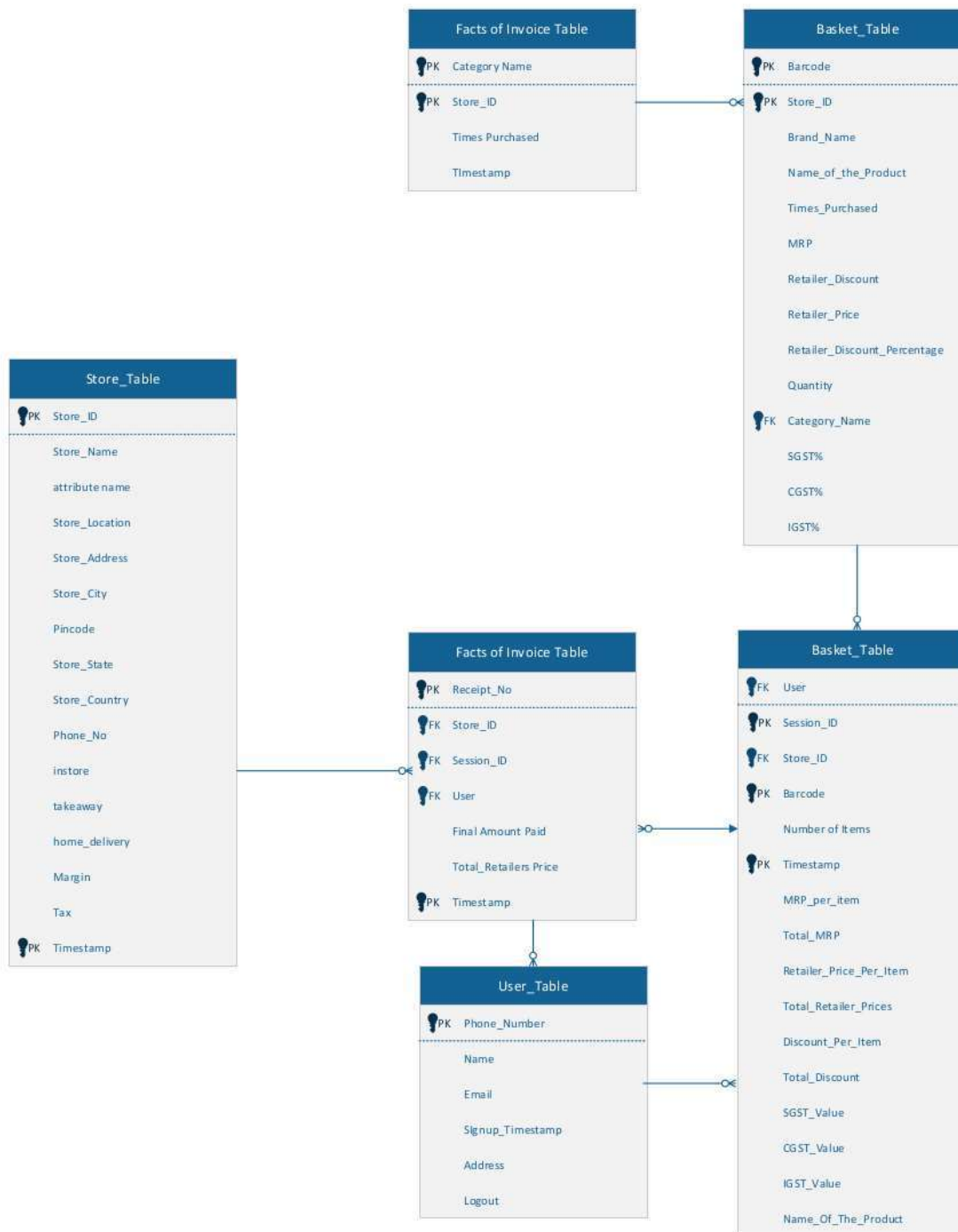
Processor: Intel Atom® Processor Z2520 1.2 GH

Video: 1280 x 800 pixels or higher on a 10-inch device

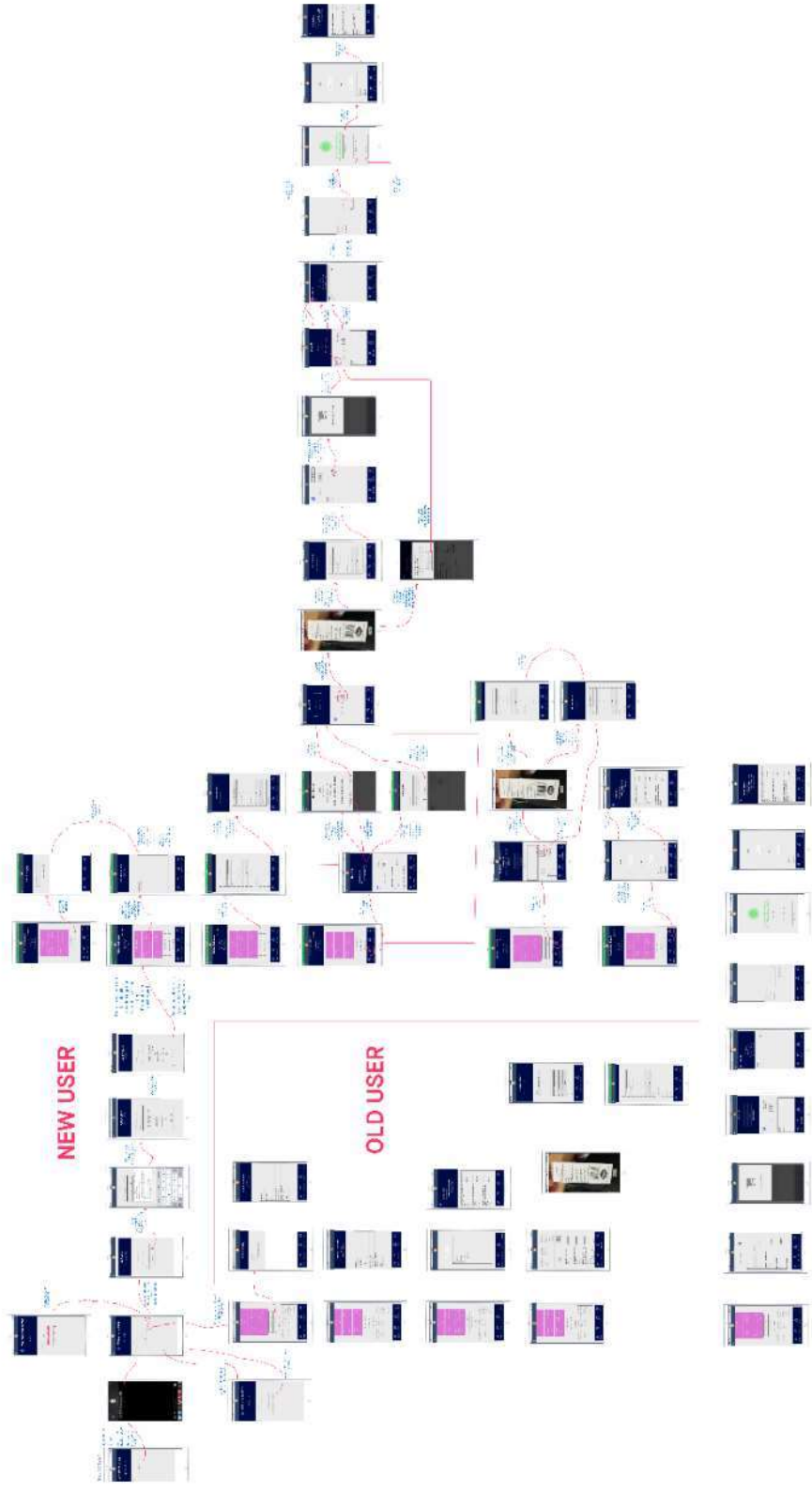
Hardware: Camera required for scanner function

Browser/Internet: The application is designed to work online, a high-speed internet connection is recommended

Dimensional Model of Databases used in AIMS



MINI PROJECT USE-CASE DIAGRAM



Use-Case

The link to the diagram:

<https://kushagragoyal711243.invisionapp.com/freehand/Mini-Project-Use-Case-Flow-xqEQwOcxE>

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