

Tribhuvan University

**Institute of Science and Technology**

**A Final Year Project Proposal**

On

**“Expenses Tracker with Inventory Management system”**

Submitted To:

Department of Computer Science and

Information Technology

**Ambition College:**

Shreeyantra College , Damak , Jhapa

***In Partial fulfilment of the requirements***

***For the Bachelors of Science and Computer Science***

***and Information Technology***

**Submitted by:**

Sushil Pandey

Bipul Mani Dahal

Khesayhang Limbu

**Under the supervision of**

Mr. …………………………….

September 30, 2024

**Abstract**

An **Expenses Tracker with Inventory Management System App** provides a seamless way to manage both financial activities and inventory control within a single platform. The app enables users to track their expenses by categorizing spending into various segments such as operational costs, purchases, and overheads. This allows users to monitor cash flow, identify spending patterns, and ensure that financial resources are being allocated efficiently.

On the inventory side, the system ensures proper stock control, tracking inventory levels, movements, and automatically updating stock

counts when purchases or sales are made. This reduces manual errors and ensures that users always have an accurate picture of their inventory status. By combining expense tracking with inventory management, the app helps users balance their budgets and stock efficiently, providing real-time updates on financial performance and stock availability and ARIMA for prediction .

The integration of these two features allows users to generate detailed reports that highlight overall financial health, profitability, and inventory turnover rates. This holistic approach not only aids in cost reduction but also enhances decision-making by offering valuable insights into both the financial and operational aspects of a business. The app serves as a critical tool for optimizing operations, improving resource management, and maximizing profitability.

Keyword : mobile , expenses , inventory ,ARIMA

Table of Contents

[1. Introduction 4](#_Toc178624596)

[2. Problem Statement 5](#_Toc178624597)

[3. Objectives 5](#_Toc178624598)

[4. Methodology 6](#_Toc178624599)

[a) Requirement Identification 6](#_Toc178624600)

[b) Feasibility Study : 6](#_Toc178624601)

[i. Technical : 6](#_Toc178624602)

[ii. Operational : 7](#_Toc178624603)

[iii. Economic : 7](#_Toc178624604)

[iv. Schedule 7](#_Toc178624605)

[5. Expected Outcomes 7](#_Toc178624607)

[6. References 8](#_Toc178624608)

1. **Introduction**

An **Expense Tracker and Inventory Management System** is a comprehensive software solution designed to help individuals and businesses manage their financial transactions and inventory in an integrated manner. This system enables users to record, track, and analyze their expenses, providing insights into spending patterns and helping to control financial outflows. At the same time, the inventory management component ensures that stock levels are monitored, tracked, and maintained efficiently, reducing the chances of overstocking or stockouts.

By combining these two functionalities, the system offers a holistic approach to resource management, improving operational efficiency and financial oversight. With features like automated reporting, real-time data updates, and analytical tools, the system enhances decision-making and aids in cost control and inventory optimization. Whether for personal use or business purposes, an expense tracker with inventory management ensures better financial health and smoother operational workflows.

1. **Problem Statement**

Businesses, especially small and medium enterprises (SMEs), and individuals often struggle with:

* Lack of real-time visibility into income, expenses, and inventory levels.
* Time-consuming and error-prone manual tracking.
* Disorganized financial data leading to poor financial planning and decision-making.
* Inability to generate timely financial and inventory reports.
* Difficulty managing cash flow due to insufficient tracking of sales, purchases, and inventory stock.

1. **Objectives**

The primary objective of this system is to simplify the management of both finances and inventory. The key goals are:

1. **Automated Income and Expense Tracking:** To track all income sources and expenses in real-time, helping users monitor their financial health.
2. **Inventory Management:** To manage inventory levels efficiently by tracking stock movements (purchases, sales, and stock returns), preventing overstocking or stockouts.
3. **Financial Reporting:** To generate detailed financial reports including profit and loss statements, cash flow reports, and expense breakdowns.
4. **Budgeting and Goal Setting:** To enable users to set financial goals and budgets, with the system tracking progress and alerting users when they are off course.
5. **User-Friendly Interface:** To create a user-friendly and accessible platform suitable for businesses of all sizes, and for individuals with minimal financial expertise.
6. **Methodology**

The system will be developed using agile project management principles with iterative development cycles. The following phases will guide the process:

1. **Requirement** **Identification**

The requirement identification phase is a critical step in developing an Expense Tracker and Inventory Management System App. During this phase, the needs, challenges, and expectations of users are gathered to define the scope and features of the system. The process involves understanding both functional and non-functional requirements to ensure the app addresses the key problems faced by its intended users.

* 1. **Literature Review :**

Research indicates a growing trend towards utilizing advanced technologies to improve expenditure and inventory management

**Data Analytics and Machine Learning**: Leveraging data analytics helps organizations forecast demand and optimize inventory levels. Machine learning algorithms can analyze spending patterns and provide insights for future budgeting (**Nguyen et al., 2022**).

* 1. **Study of Existing System:**

**PocketGuard** : Simple tool to show how much “spendable” money is left after bills. Provides savings suggestions and bill tracking. Free with a premium option.

**Personal Capital**: Investment-focused with budgeting tools. Tracks net worth, expenses, and investments. Free financial tools, paid wealth management services.

**EveryDollar**: Zero-based budgeting tool with manual entry in the free version; bank syncing available in the paid version. Designed for debt payoff and budgeting.

**Spendee**: Visual expense tracker with custom categories and shared wallets. Offers clear financial insights with charts. Free with premium features.

**Karobar**: karobar app manage all your business accounting from your mobile easily. It also maintain your business inventory easily with Karobar app and know how your stocks are performing.

* 1. **Requirement** **Analysis** :

This step ensures that the system meets both functional and technical expectations by breaking down what users require and how the app will deliver those features effectively.

Functional Requirements:

* + - 1. **Expense Tracking**: Users can record, categorize, and track expenses in real time.
      2. **Inventory Management**: Monitor stock levels, update inventory, and receive low-stock alerts.
      3. **Reporting**: Generate financial reports and inventory summaries (e.g., profit, expense, stock levels).
      4. **Integration**: Automatically update inventory when purchases are made as expenses.
      5. **User Roles**: Role-based access control for admins, employees, or users with different permissions.

Non-Functional Requirement:

1. **Performance**: The app must handle large data volumes efficiently without lag.
2. **Scalability**: It should accommodate increasing users and data as the business grows.
3. **Usability**: The interface should be intuitive, responsive, and accessible on web and mobile platforms.
4. **Security**: Implement secure login, encryption, and regular data backups.
5. **Reliability**: The system should have minimal downtime and ensure data integrity.
6. **Feasibility Study** : Feasibility analysis, in simple words is an analysis and evaluation of a proposed project to ensure if it is technically, economically and operationally feasible. As the name suggests, a feasibility analysis is a study of the viability of an idea. It focuses on answering the essential question of “should this proposed project idea be proceeded?”
   1. **Technical** :

The project is technically feasible; complies with current technology, including both the hardware and the software. All the technical requirements for this project are listed below:

• Mobile phone

• High speed internet (recommended) This application is supported by almost all latest mobile phone can be operated offline as well as online but some feature is accessible when connected to the internet

* 1. **Operational** : This project can be conducted with a minimum human resource. Three developers are working in the project which is more than enough manpower required for this project. This project aims to create a

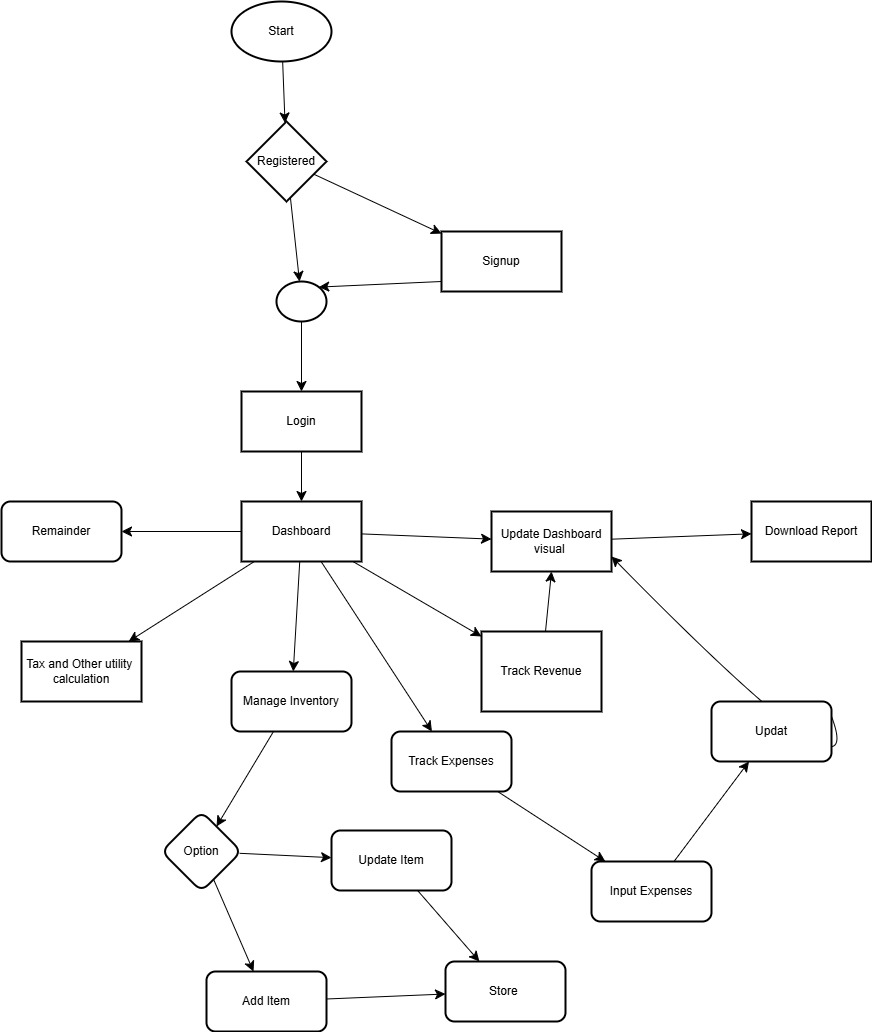
Interactive and responsive UI with latest integration of Artificial Technology .

* 1. **Economic** : The project to be developed is very cost effective because the project will be using react native as frontend and Django on the backend which are popular and etc. which are freely available to download and use So, the project can be considered economical feasible for the time being. In order to create our own wallet we need to get permission from the higher authority (Nepal Rastriya Bank ) as well as partnership with locals banks
  2. **Schedule** : Agile methodology usually focuses on iterative cycles and flexibility, the Gantt chart can still offer a visual representation of major milestones, task progress, and deadlines. Here's how you might structure it for your project . As per our assumption we need total around 44 days which is listed below

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Task** | **Tasks** | **Start Date** | **End Date** | **Duration** | **Milestones** |
| **1** | Planning & Setup | 10/1/2024 | 10/3/2024 | 2 | Infrastructure, requirements, tech stack decisions |
| **2** | User Authentication & Setup | 10/3/2024 | 10/8/2024 | 5 | User authentication (login, registration, roles) |
| **3** | Expense Tracking Module | 10/8/2024 | 10/11/2024 | 3 | Expense CRUD, filters, database setup |
| **4** | Inventory Management Module | 10/11/2024 | 10/17/2024 | 6 | Inventory CRUD, linking with expenses |
| **5** | Reporting & Analytics | 10/17/2024 | 10/25/2024 | 8 | Expense and inventory reports, basic charts |
| **6** | Notifications & Alerts | 10/25/2024 | 10/28/2024 | 3 | User alerts for low stock, high expenses, etc. |
| **7** | UI/UX Enhancements | 10/28/2024 | 11/2/2024 | 5 | Improve design, usability testing, mobile responsiveness |
| **8** | Integration of different AI model | 11/2/2024 | 11/10/2024 | 8 | For further user enhancement and making simple . |
| **9** | Deployment & Post-Release | 11/10/2024 | 14-Nov | 4 | Deployment to production, user feedback cycle |

**Gantt Chart :**

**Flow Chart**



**Important Algorithm:**

ARIMA (Autoregressive Integrated Moving Average) is a widely used statistical method for time series forecasting, particularly useful for predicting profit or loss in financial applications. ARIMA is effective in capturing trends, seasonality, and patterns from historical data, allowing businesses to forecast future revenue and expenses, and ultimately determine whether they will generate a profit or face a loss.

**How ARIMA Works for Profit or Loss Prediction**

ARIMA focuses on time-dependent data, making it suitable for financial forecasting, where past performance influences future outcomes. It is based on three components:

1. AutoRegression (AR): This part uses the relationship between a time series' current value and its previous values. For example, the current month's expenses or revenue might be related to the values from previous months.
2. Integrated (I): This component handles non-stationary data by differencing the series, essentially subtracting previous values to stabilize the data. It helps in removing trends from the data to make the time series more predictable.
3. Moving Average (MA): The moving average part of ARIMA uses the residuals (errors) from past predictions to predict future values. This helps refine predictions by accounting for the deviation between actual and forecasted values.

**Steps to Predict Profit or Loss Using ARIMA**

1. Data Collection: Collect historical data on revenue and expenses over a period (daily, weekly, monthly).
2. Data Preparation:
   * Make the data stationary by differencing if necessary, so that ARIMA can model it accurately.
   * Remove any trends or seasonal patterns that may distort the prediction.
3. Modeling Revenue and Expenses:
   * Fit ARIMA to Revenue Data: Use ARIMA to predict future revenues based on historical sales patterns. ARIMA can detect seasonal sales peaks and trends in income, which help forecast future earnings.
   * Fit ARIMA to Expense Data: Similarly, fit ARIMA to your historical expenses (e.g., operational costs, inventory, and fixed costs) to forecast future spending.
4. Calculate Profit or Loss:
   * Once you have predictions for both revenue and expenses, the next step is to calculate profit or loss: ***Predicted Profit/Loss=Predicted Revenue−Predicted Expenses***
   * If the predicted revenue is greater than expenses, it indicates a profit. If expenses exceed revenue, it suggests a loss.
5. Evaluate the Model: After fitting the ARIMA model, evaluate its accuracy using historical data. Cross-validation can be performed by comparing the predicted profit/loss against actual outcome
6. **Expected Outcomes**

By the end of the project, we expect to deliver a fully functional **Expenses Tracker with Inventory Management System** that provides:

* Real-time, accurate tracking of income and expenses.
* Comprehensive inventory control with stock tracking and reporting.
* Detailed financial reports and analysis for better decision-making.
* A simple, user-friendly interface accessible on mobile platforms.

1. **References**

**[1]**  OpenAI. 2024. *ChatGPT*. <https://www.openai.com/chatgpt>.

**[2]** Nguyen, A., Tran, B., & Pham, C. (2022). Data analytics and machine learning for inventory management. *Journal of Big Data*