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# Madhav Institute of Technology and Science



## Electrical Engineering Department

### Branch – Internet of Things

### Skill - Based Project Report File

### Inventory Management System

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# Contents

# ABSTRACT

An inventory management system is a software tool designed to help businesses track and manage their inventory levels efficiently. The system provides real-time insights into inventory levels, sales trends, and order fulfillment, enabling businesses to optimize their inventory management strategies.

The abstract for an inventory management system describes the system's features, project details, and codes and implementation. It includes a description of the system's architecture, including its hardware and software components, and how it integrates with other business systems. The abstract also highlights the system's key features, such as inventory tracking, stock management, order processing, and reporting.

The benefits of an inventory management system are discussed, including reduced costs, improved efficiency, and enhanced customer satisfaction. The abstract concludes by highlighting the importance of an inventory management system in today's fast-paced business environment, where companies must stay competitive and responsive to customers' needs.

# INTRODUCTION

Inventory management is a critical aspect of any business that deals with products or materials. Efficient inventory management can help businesses optimize their operations and reduce costs, while poor inventory management can lead to stockouts, excess inventory, and ultimately, decreased profitability. To overcome these challenges, businesses need an effective inventory management system that enables them to track their inventory levels, monitor stock movement, and manage their supply chain effectively.

The introduction to an inventory management system describes the system's purpose, benefits, and how it helps businesses optimize their inventory management strategies. The introduction highlights the challenges businesses face with inventory management and how an inventory management system can help overcome them. It provides an overview of the system's features, including inventory tracking, stock management, order processing, and reporting.

The report will begin by discussing the importance of inventory management and the benefits of using an inventory management system. It will then provide a detailed analysis of the existing inventory management system, identifying its limitations and areas for improvement. The report will then discuss the system's architecture, functionalities, and features, including inventory tracking, stock management, order processing, and reporting.

The report will also evaluate the system's performance and benefits, including reducing costs, improving efficiency, and enhancing customer service. It will address the challenges and limitations of the system and provide recommendations for future enhancements. The report will conclude by demonstrating the importance of an inventory management system in modern-day businesses and how it can help businesses improve their operations and profitability.

# PROJECT DETAILS

**HOW TO DESIGN PROJECT -** The inventory management system project is focused on designing and implementing a software tool that can help businesses manage their inventory levels efficiently. The project will include the following details:

- **Analysis of the existing inventory management system:** The project team will analyze the current inventory management system used by the business and identify its strengths, weaknesses, and limitations.
- **Requirements gathering:** The project team will gather requirements from the business stakeholders, including the management team, inventory managers, and sales staff, to understand their inventory management needs and expectations.
- **System design:** Based on the analysis and requirements gathering, the project team will design the inventory management system's architecture, including its hardware and software components.
- **System development:** The project team will develop the system's functionalities, including inventory tracking, stock management, order processing, and reporting. The system will be user-friendly and accessible from any device with an internet connection.
- **System testing:** The project team will conduct various tests to ensure the system's functionalities are working as expected and meet the business requirements.
- **Deployment:** Once the system is fully tested, it will be deployed to the business environment, and the team will provide training to the relevant stakeholders.
- **Evaluation:** The project team will evaluate the system's performance and benefits, including reducing costs, improving efficiency, and enhancing customer satisfaction.
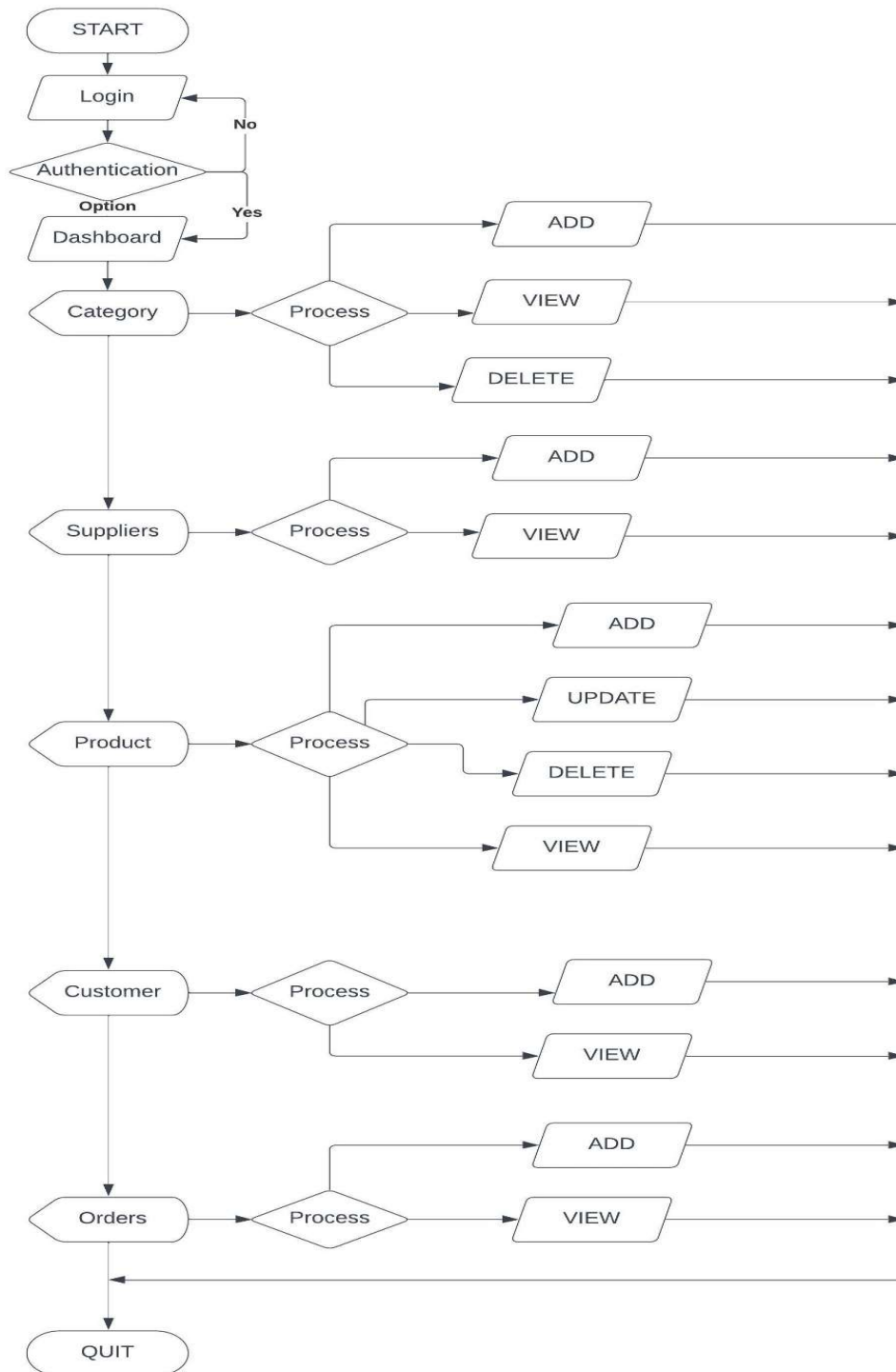
**WHY DBMS IS REQUIRED -** A database management system (DBMS) is required in an inventory management system because it allows businesses to store, organize, and manage large amounts of data related to inventory in a structured and efficient manner. Here are some reasons why a DBMS is essential for an inventory management system:

- **Data Storage:** An inventory management system generates a large amount of data, such as stock levels, sales, and orders. A DBMS provides a centralized location to store this data, making it easier to access and manage.
- **Data Organization:** A DBMS allows businesses to organize inventory-related data into tables, fields, and records. This helps to keep the data consistent and structured, which is important for generating accurate reports and insights.
- **Data Security:** A DBMS provides robust security features that protect inventory data from unauthorized access, data breaches, and data loss. This is essential for maintaining the integrity and confidentiality of sensitive inventory data.
- **Data Retrieval:** A DBMS provides powerful search and query capabilities that allow businesses to quickly retrieve inventory data based on specific criteria, such as product names, stock levels, and sales data.
- **Data Analysis:** A DBMS enables businesses to analyze inventory data to gain insights into trends, patterns, and customer preferences. This helps businesses make informed decisions about inventory management and order fulfillment.

**WHICH DBMS IS REQUIRED -** The choice of a database management system (DBMS) for an inventory management system can depend on several factors such as the size of the business, the complexity of the system, the budget, and the technical requirements. Here are some of the commonly used DBMS for inventory management systems:

**MySQL:** MySQL is a popular open-source DBMS that is widely used for inventory management systems. It is fast, reliable, and scalable, making it suitable for small to large businesses. MySQL is also easy to integrate with other programming languages such as PHP, Python and Java.

## WORKING FLOWCHART –

# DATABASE CODES

-- **CREATE DATABASE**

```
CREATE DATABASE Inventory;
```

-- **CREATE CATEGORIES TABLE**

```
CREATE TABLE Categories (
  CategoryID INT,
  CategoryName VARCHAR(255) NOT NULL
);
```

--**INSERT DATA**

```
INSERT INTO Categories (CategoryID, CategoryName)
VALUES (1, 'Electronics'), (2, 'Clothing'), (3, 'Groceries');
```

-- **CREATE SUPPLIERS TABLE**

```
CREATE TABLE Suppliers (
  SupplierID INT PRIMARY KEY,
  SupplierName VARCHAR(255) NOT NULL,
  ContactPerson VARCHAR(255) NOT NULL,
  PhoneNumber VARCHAR(15) NOT NULL
);
```

--**INSERT DATA**

```
INSERT INTO Suppliers (SupplierID, SupplierName, ContactPerson,
PhoneNumber)
```

```sql
VALUES (1, 'Switch On', 'Rajesh Bajpai', '9826547411'),  (21, 'Sparsh
Khasgiwale', 'Sparsh', '8309083648');
```

-- **CREATE PRODUCTS TABLE**

```sql
CREATE TABLE Products (

  ProductID INT PRIMARY KEY,

  ProductName VARCHAR(255) NOT NULL,

  Price DECIMAL(10, 2) NOT NULL,

  Quantity INT NOT NULL,

  SupplierID INT NOT NULL,

  FOREIGN KEY (SupplierID) REFERENCES Suppliers(SupplierID)

  ON DELETE CASCADE

);
```

--**INSERT DATA**

```sql
INSERT INTO Products (ProductID, ProductName, Price, Quantity,
SupplierID)

VALUES (1, 'Laptop', 999.99, 10, 1),  (2, 'T-Shirt', 19.99, 50, 1, ),
(3, 'Apple', 50.00, 100, 1, );
```

-- **CREATE CUSTOMERS TABLE**

```sql
CREATE TABLE Customers (

  CustomerID INT PRIMARY KEY,

  CustomerName VARCHAR(255) NOT NULL,

  Address TEXT NOT NULL,

  PhoneNumber VARCHAR(15) NOT NULL,

);
```

**--INSERT DATA**

```
INSERT INTO Customers (CustomerID, CustomerName, Address,
PhoneNumber)

VALUES (1, 'Pratham Bajpai', 'Bada, Gwalior', '8770483647');
```

**-- CREATE ORDERS TABLE**

```
CREATE TABLE Orders (

  OrderID INT PRIMARY KEY,

  OrderDate DATE NOT NULL,

  CustomerID INT NOT NULL,

  ProductID INT NOT NULL,

  Quantity INT NOT NULL,

  TotalPrice DECIMAL(10, 2) NOT NULL,

  FOREIGN KEY (CustomerID) REFERENCES Customers(CustomerID),

  FOREIGN KEY (ProductID) REFERENCES Products(ProductID)

  ON DELETE CASCADE

);
```
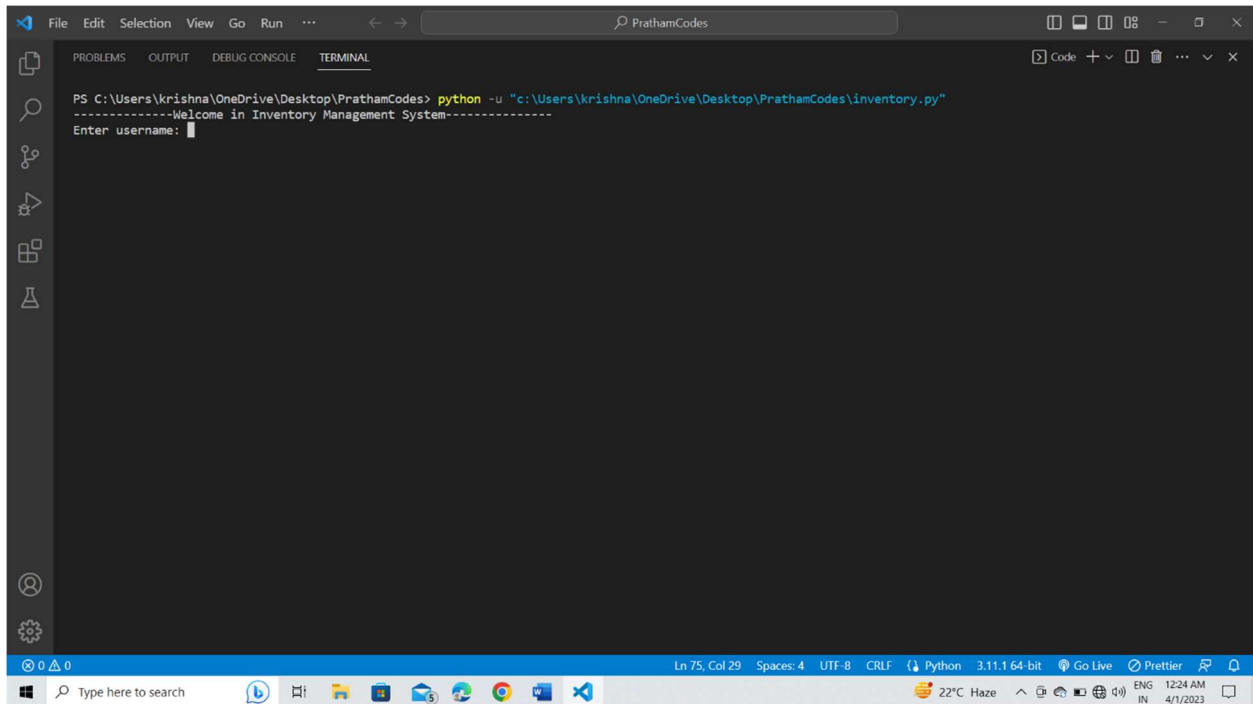
**--INSERT DATA**

```
INSERT INTO Orders (OrderID, OrderDate, CustomerID, ProductID,
Quantity, TotalPrice)

VALUES (1, '2023-03-10', 1, 1, 2, 1999.98), (2, '2023-03-11', 1, 2, 3, 59.97),

    (3, '2023-03-11', 1, 3, 10, 9.90);
```
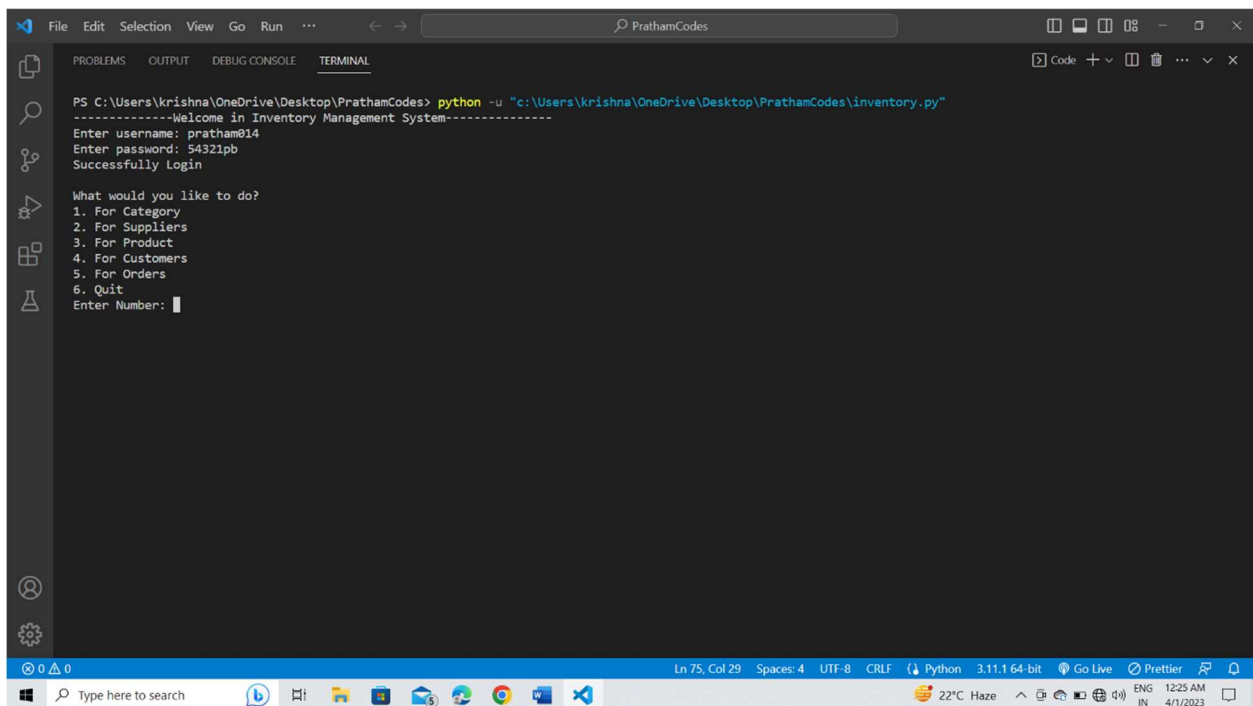
In this example, the Suppliers table stores information about the suppliers, including their ID, name, contact person, and phone number. The Categories table stores information about the categories of products, including their ID and name. The Products table stores information about the products, including their ID, name, price, quantity, and supplier ID. The Customers table stores information about the customers.

# OUTPUT –

# RESULT & LIMITATIONS

**Result -** The implementation of an inventory management system can provide numerous benefits, including:

- **Improved inventory accuracy:** The system can help businesses maintain accurate inventory records and track inventory levels in real-time, reducing the risk of stockouts and overstocking.
- **Enhanced operational efficiency:** The system can streamline inventory management processes, such as order processing, stock management, and reporting, resulting in improved operational efficiency.
- **Cost savings:** The system can optimize inventory levels and help businesses avoid excess inventory, reducing the associated costs of storage, handling, and obsolescence.
- **Improved customer satisfaction:** The system can help businesses fulfill orders quickly and accurately, enhancing customer satisfaction.
- **Data-driven decision-making:** The system can provide businesses with valuable insights into their inventory levels, sales patterns, and other metrics, enabling data-driven decision-making.

**Limitations -** Despite the benefits, inventory management systems have certain limitations, including:

**Dependence on technology:** The system relies on technology to function, and any technical issues can cause disruptions to the inventory management processes.

**Implementation costs:** The implementation of the system can be costly, particularly for small businesses with limited resources

**Staff training:** The system requires trained personnel to operate and maintain it, and training staff can be time-consuming and costly.

**Inaccurate data:** The system depends on accurate data input, and any errors in data entry can lead to inaccurate inventory records.

**Security concerns:** The system stores sensitive inventory data, and any security breaches can result in data loss or theft.

# CONCLUSION & FUTURE WORKS

**<u>Conclusion:</u>**

In conclusion, an inventory management system (IMS) is a powerful tool that can help businesses of all sizes manage their inventory levels more effectively. By automating many manual tasks, providing real-time data, and facilitating better decision-making, an IMS can lead to improved accuracy, increased efficiency, and better customer service.

Overall, implementing an IMS requires careful consideration of the costs and benefits, as well as ongoing monitoring and maintenance to ensure its effectiveness. With proper planning and execution, an IMS can be a valuable asset to businesses looking to optimize their inventory management processes and improve their bottom line.

**<u>Future Works:</u>**

- Inventory Management System can be integrated with emerging technologies, such as artificial intelligence (AI) and the Internet of Things (IoT), to improve inventory management processes. For example, AI could be used to predict demand and optimize inventory levels, while IoT devices could be used to track inventory in real-time.
- Many IMSs currently have limited mobile functionality, but this is an area that could be improved upon in the future. Improved mobile functionality could allow employees to access inventory data and perform inventory management tasks from their mobile devices, which could increase efficiency and reduce errors.
- IMSs could be made more customizable to meet the specific needs of different types of businesses. For example, some businesses may require different data fields or reporting features than others, and an IMS that can be customized to meet these needs would be highly valuable.
- Blockchain technology could be used to enhance the security and transparency of inventory management systems. By creating a decentralized, immutable ledger of inventory data, businesses could improve their supply chain management and reduce the risk of fraud or errors.