

# **INVENTORY MANAGEMENT SYSTEM**

A Report for the Evaluation 3 of Project 2

**RAJ KUMAR**

Admission No:  
1713203027

**NEELESH KUMAR  
SINGH**

Admission No: 18032030096

Under the Supervision Of  
**Mr. Ajay Kumar**  
(Asst. Professor, Galgotias University)



School of Computing Science and Engineering  
Greater Noida, Uttar Pradesh  
Winter 2019-2020

## **TABLE OF CONTENTS**

- 1. Acknowledgement**
- 2. Abstract**
- 3. Introduction**
  - **Overall description**
  - **Motivations and scope**
- 4. Literature Review/Comparative Study**
- 5. Problem Formulation**
- 6. Feasibility Analysis**
- 7. Features**
- 8. ER Diagram**
- 9. Dataflow Diagram**
- 10. Activity Diagram**
- 11. Gantt Chart Diagram**
- 12. Hardware Requirements**
- 13. Software Requirements**
- 14. Modules Added**
- 15. Added Works**
- 16. Proposed System**
- 17. Existing System**
- 18. Algorithm and Design Techniques**
- 19. Architecture Diagram and Implementation**
- 20. Screenshots**
- 21. Conclusion**
- 22. References**

## **ACKNOWLEDGMENT**

I wish to record my deep sense of gratitude and profound thanks to my research supervisor **Mr. Ajay Kumar**, Associate Professor, School of Computing Science and Engineering department, Galgotias University, Greater Noida for his keen interest, inspiring guidance, constant encouragement with my work during all stages, to bring this dissertation into fruition.

I extend my sincere thanks to Dean SCSE for providing excellent platform and resources to carry out my research projects. Also I would like to thank the panel members for their valuable suggestions and support during presentation of my research projects..

I thank my friends, fellow researchers and family members who have encouraged me in my research efforts and shouldered me in needy times.

**RAJ KUMAR**  
**NEELESH KUMAR**  
**SINGH**

## **ABSTRACT**

Inventory management system is an application which is helpful for business operate. Inventory management is a challenging problem area in supply chain management. Companies need to have inventories in warehouses in order to fulfil customer demand, meanwhile these inventories have holding costs and this is frozen fund that can be lost. Therefore, the task of inventory management is to find the quantity of inventories that will fulfil the demand, avoiding overstocks. This paper presents a case study for the assembling company on inventory management. It is proposed to use inventory management in order to decrease stock levels and to apply an agent system for automation of inventory management processes. Inventory management system (IMS) use for a departmental store.

This system can be used to store the details of the inventory based on the sale details, generate sale and inventory report periodically etc. this is one integrated system that contains both the user component( used by sales persons , sales managers inventory managers) and the admin component (used by the administrators for performing admin level function such as adding new item to the inventory) etc.

**Keywords** – Inventory Management System, Hardware sales, Warehouse, tracking inventory, time saving, maximum profit.

## INTRODUCTION

Inventory management information system is high performance software, which speed up the business operation of the organization . Every organization , which deals with the raw materials, put its great effort in the efficient utilization of its raw, material according to its need and requirement . The organization has to perform number of tasks and operations in order to run its business in manual system .For example From [NaavebUROM](#)

- ▶ Estimation of new raw material required.
- ▶ Preparation of purchase order.

Preparation of inward sale invoice

This Software “Inventory Management System” , is used for recording the information about the day to day transaction of stock of an organization. It stores purchase information of the products with credit/debit information form the supplier. Similarly, it stores sales information with credit/debit about the customer. If a product is purchased, then the related information is stored in stocks , that is , stocks are up to date. Another part I it prepare sales report after product it sold. in the sales information, the information about who sold the product is also kept, so there is no problem for misunderstandings in future.

## OVERALL DESCRIPTION

The Inventory Management System is developed and designed for recording and managing the inventory of an organization. It can also be used for different institution with fewer modification as per requirement. the system can be easily updated as the other institutional requirement may not be integrated on our project . After the continuous effort , testing and debugging the current system is ready to be implemented in an organization.

The System development Project has developed the ability on us to implement the theoretical Knowledge we have gained during BIM study in the real life scenario.

Some of the lesson that we had learned from the project are:-

Sharpen the knowledge of working cooperating in working organizational environment and work place.

Know the value of time and discipline.

Work in group and make group decision.

Learnt communication skill, leadership , quality and to make good public relation.

## **MOTIVATION AND SCOPE**

### **MOTIVATION:**

This aim of this research is to optimize the total cost / total profit of the inventory models for deteriorating and expiry products under the consideration of lead time in different business environments. A lot of research has been done, related to expiry products. But most of the researchers ignored lead time and considered deterioration as a constant. For effective inventory management, consideration to deterioration and lead time is essential. So any study done, ignoring this concept cannot be accurate. Hence, in our study, we tried to develop models with deterioration and lead time, while considering the expiry products

### **SCOPE:**

The project is remarkable chance to experience the real word working environment and culture where the knowledge learn during the BIM course can be implemented. This project not only marks us familiar with real working environment but also make us more mature in the way we deal with real word problem and try to solve problem in the best way possible by applying the knowledge we have acquired throughout the BIM course.

The main objective of the project is to analyze the existing system under study and give necessary suggestions or solution to improve it. To implement the theoretical knowledge

Acquired from college in real working environment .

To enable us to understand how theory knowledge differs from practical life thus helping us to understand the complexity and unforeseen nature of problem and opportunity that exist in the country as it name implies, the main objective of this software is to record the information about the stocks of an organization and perform basic operations.

## FEATURES

- **Reliability:** Achieve a more Secure development SQL SERVER providers rich security features to protect data and network resources.
- **Confidentiality:** Protect your data . SQL server clustering supports kerberos authentication on a virtual server and Microsoft style policies on standard logins so that a consistent policy is applied all accounts in the domain.
- **Integrity:** SQL Server support encryption capabilities within database itself , fully integrated with a key management infrastructure . By default ,client server communication are in encrypted.
- **Scalability:** Customer can easily scale up and scale down the functionality according to the requirements.
- **Platform Independent:** This Software can be easily subjected to any platform like Mac,Windows and Linux.
- **Flexibility:** It is very flexible to the user policy.
- **User Friendly:** The interface of the Software enhances user experience to a wider range.
- **Less Expensive:** This software is not much costlier to buy.
- **Speed:** Each and every operation takes very less time to execute.
- **Accessibility:** User can easily access such type of software from anywhere, at any time.



## **LITERATURE REVIEW/COMPARATIVE STUDY**

Products are considered as the business resources for the organization. This includes managing the product with appropriate way to review any time as per the requirement. Therefore it is important to have a computer based IMS which has the ability to generate reports, maintain the balance of the stock, details about the purchase and sales in the organization. Before developing this application we came up with 2Inventory Management System existing in the market, which helps to give the knowledge for the development of our project. These application software are only used by the large organization but so we came up with the application which can be used by the small company for the management of their stock in the production houses. After analyzing the other inventory management system we decided to include some of common and key features that should be included in every inventory management system. So we decided to include those things that help the small organization in away or other□

## **PROBLEM FORMULATION**

Inventory control is an essential need for every business organizations. The future of business organizations depends upon inventory considered and on the achievements of company's objectives. To know the significant factors that push for a purchasing behavior and meeting customers' needs remain a critical matter for the growth and survival in the nowadays competitive market. In today's world where rapid developments are taking place in science and technology, mathematical modelling has become a powerful tool to solve complex, interconnected, and interacting phenomena arising from this rapid change. The first step is to define the problem and all of its constraints theoretically. Next, the objective function of this mathematical problem is formed. In most of all industries different departments have a need to optimize their objective function with decision variables, subjected to a set of constraint. Usually the objectives of a firm are to maximize the profit and to minimize the total cost. The strategy of a research can be described by identifying the problems, its scope and objectives. The main objective of a supply chain is to minimize the total cost of the supply chain. In order to minimize the total cost of the supply chain, one has to identify the average inventory level of retailer, supplier and manufacturer. After this the cost of each subsystem will be quantified. After the formulation of the cost function, it will be minimized with respect to the decision variables taking into account the basic assumptions and the constraints of the problem. The feasible region of the solutions of the problem must be maintained. With the help of this methodology one can determine the optimal production quantity, optimal order quantity and the number of shipments at each level, with optimized total cost. The mathematical software MATEMATICA version 5.2 has been used during this research work. This software is very useful to execute the planned approach and to calculate and compare the results of the proposed model

After analyzing many existing IMS we have now the obvious vision of the project to be developed. Before we started to build the application team had many challenges. We defined our problem statement as:

To make desktop based application of IMS for small organization.

To make the system easily managed and can be secured.

To cover all the areas of IMS like purchase details, sales details and stock management

As a result of the motivational concept of studying the implications of deterioration and lead time on different expiry products we have divided our study in various segments. This way there is a slow gradation from an EOQ model of expiry products in realistic conditions, EOQ model of seasonal and expiry products under different seasonal environments, multi item problem, a problem with preservation to reduce the deterioration rate under inflationary environment and non-instantaneous deterioration to developing different kinds of inventory models. To facilitate this discussion, the inventory models for expiry products, has been divided into different areas. These areas are identified after understanding the different researching inventory models. Most of all area represents an issue of the expiration date of the product. A basic description of the used contents and references related to the research work has been provided. In this study, we have attempted to contribute in understanding the application of the techniques in inventory management in seasonal and deteriorating products by developing realistic models. Hence, the study presents a scope for applications in the relevant areas of economical ordering or economical production. There is an ample range of different assumptions that can be imbibed in the present study to come up with better models which can help to develop the theory further. Each model presented in the study can be further enriched by assuming different conditions in addition to already assumed background. Further, the study can be upgraded by fuzzification of models. The scope of this

study is tremendous considering the range of models that have been studied and developed which bring realistic understanding of the theory of inventory management.

## **FEASIBILITY ANALYSIS**

The feasibility study is an evaluation and analysis of the potential of a proposed project which is based on extensive investigation and research to support the process of decision making .

- **Economic Feasibility**

As we need not to perform high level researches on our projects we did not spend any amount while preparing this project.

- **Operation Feasibility**

Our Software runs smoothly in the given software and hardware requirements . it does not consist extra requirement.

- **Technical Feasibility**

This new system require 6 fully trained people to run the system perfectly.

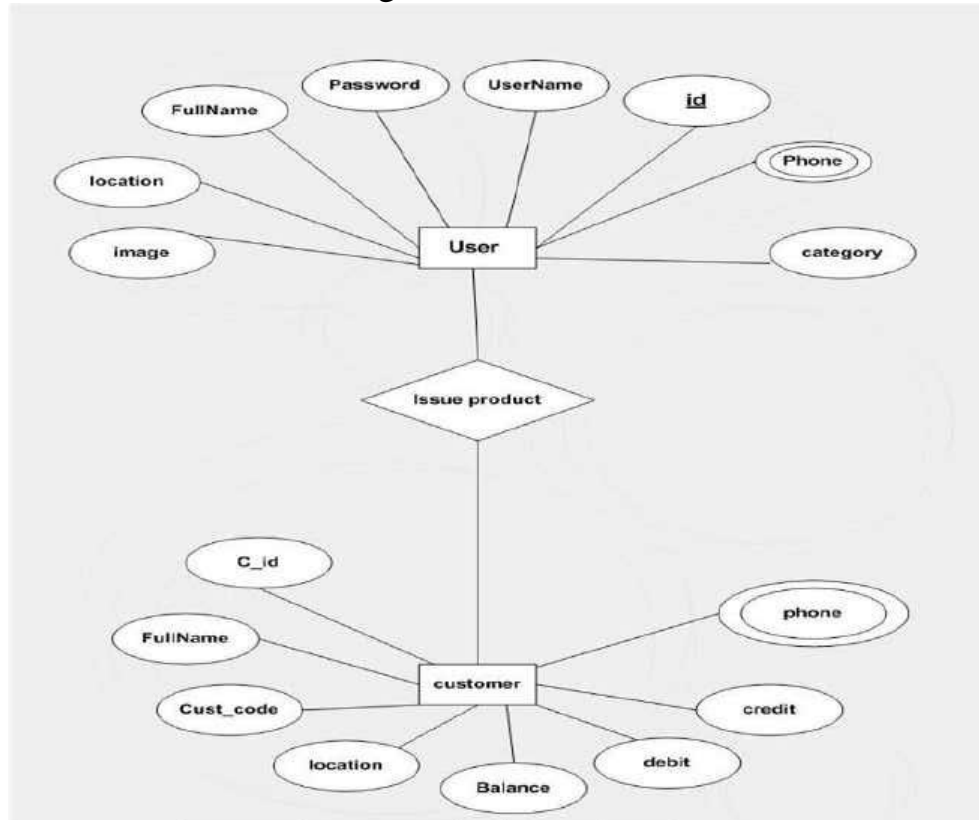
1 admin person to maintain database n other 5 handle the system interface and order making thing.

- **Schedule Feasibility**

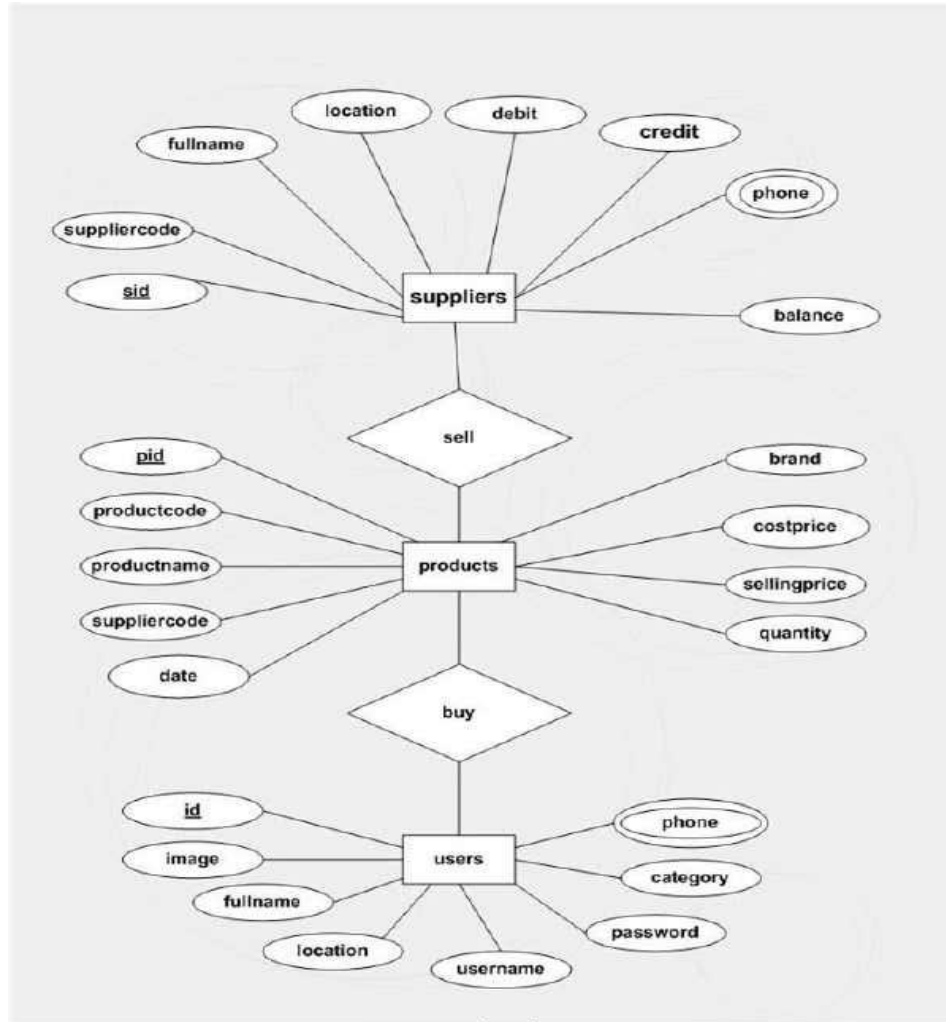
We had about 4-5 months time to prepare this software and we have completed it within.

## ER DIAGRAM

### ERD Of Selling Product To Customers







ERD of Buying product form suppliers



## DATA FLOW DIAGRAM

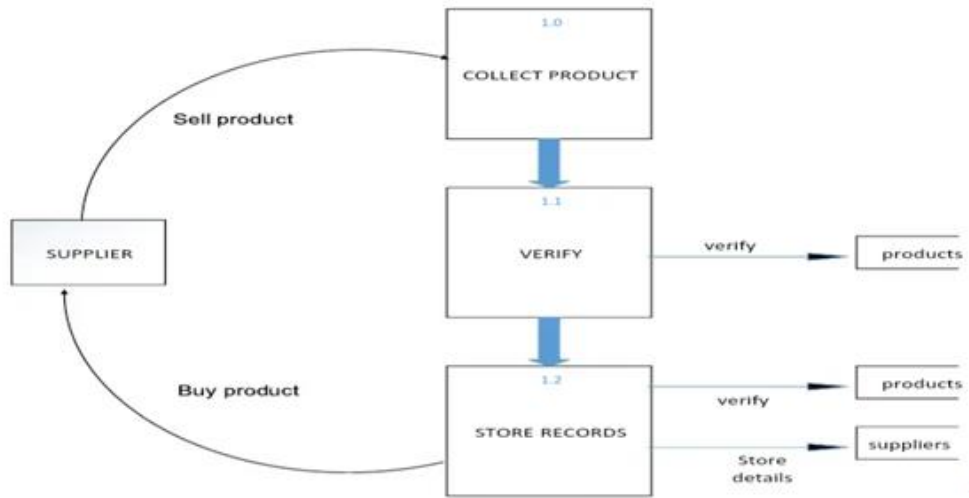
### Level -0 DFD

After The Development Of The ERD the data flow diagram for the IMS is created. It define how the data actually flows in the system and the sources of data in the system.

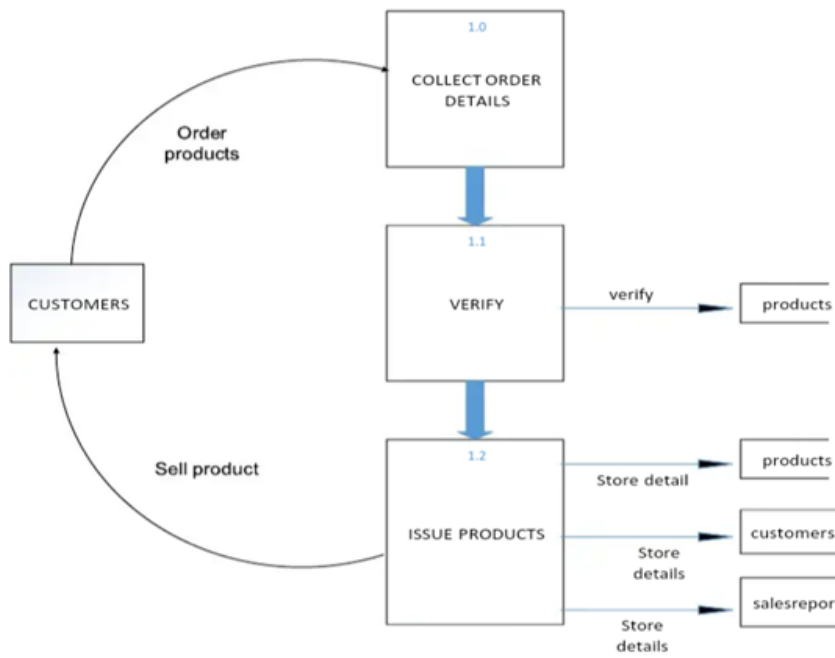
| <i>Symbols</i>  | <i>Description</i> |
|---|--------------------|
|  | <i>Process</i>     |
|  | <i>Data Flow</i>   |
|  | <i>Entity</i>      |
|  | <i>Database</i>    |

DFD symbols And Description

## Collecting Product Form Suppliers

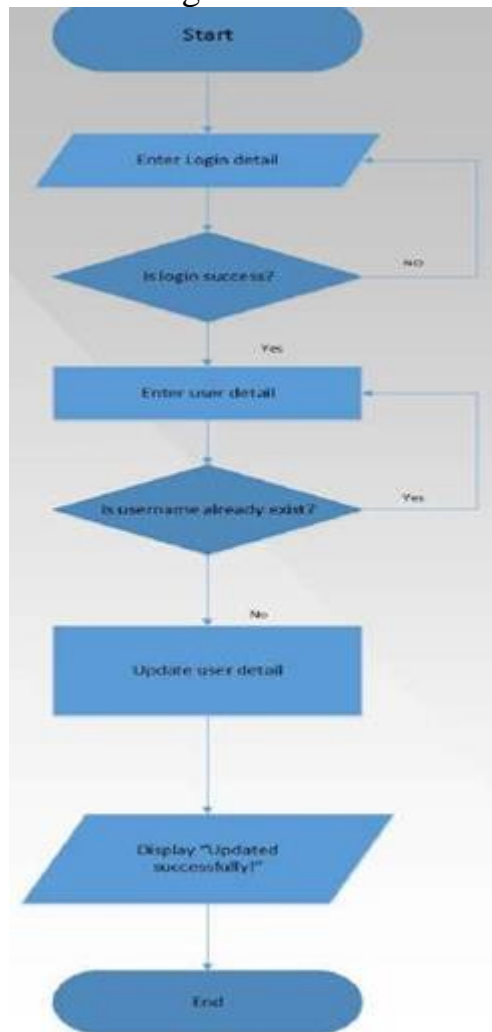


## Selling Product To Customers

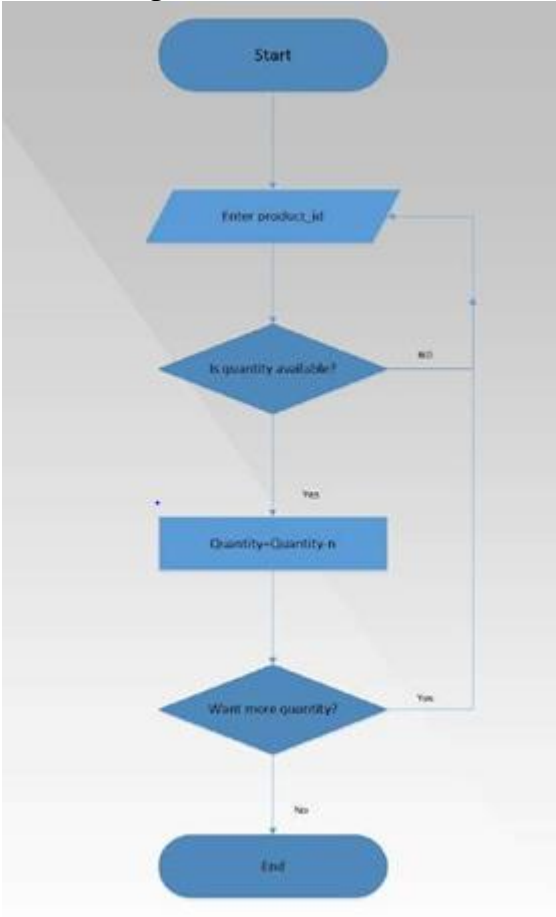


# ACTIVITY DIAGRAM

## Change User Details

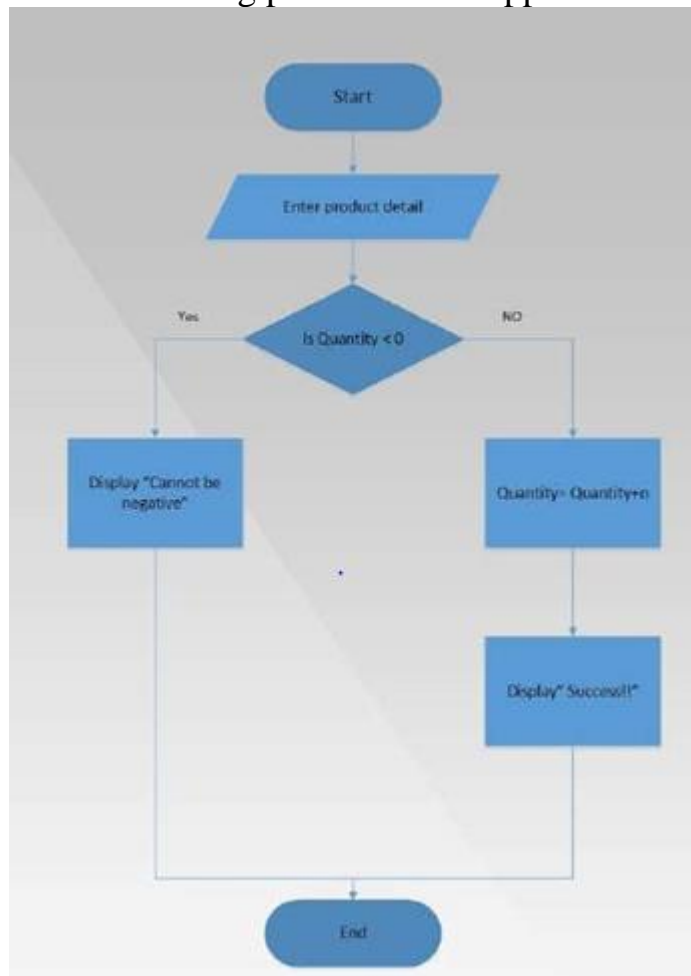


# Selling Product to Customers



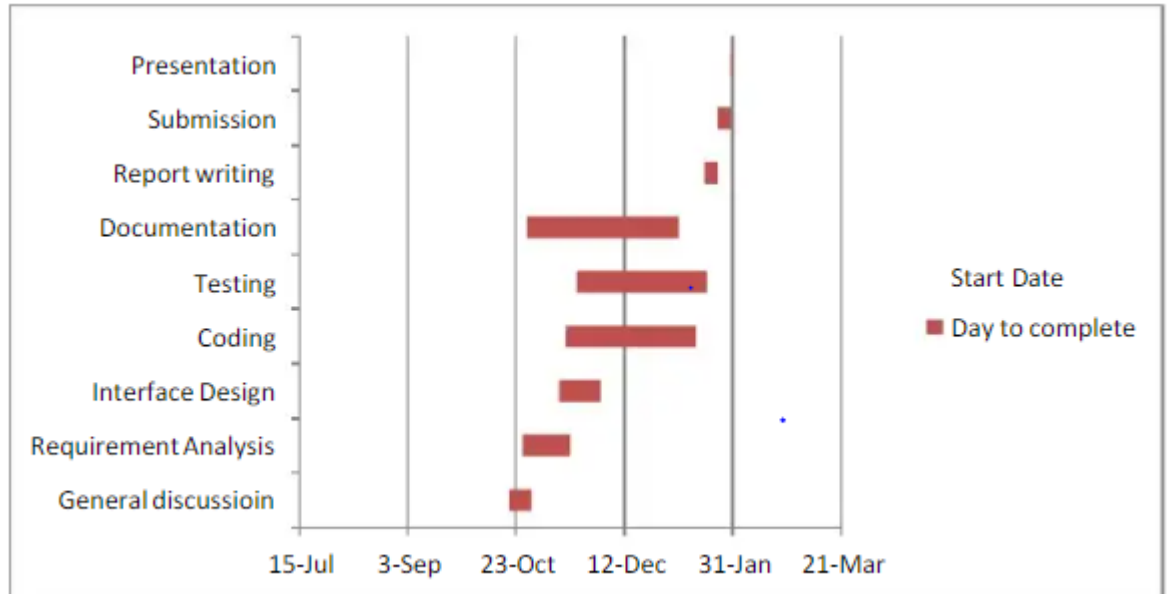


## Receiving product form suppliers



## GANTT CHART

It is one of the popular way to illustrate project schedule .A gantt chart is a graphical representation of a project that each activity task as a bar whose length is propotional to its time for completion. A gantt chart for the project deliverables within time frame this project gantt chart is shown below.



## **HARDWARE REQUIREMENTS**

**PROCESSOR:** Pentium 4 or more for optimum  
performance

**RAM:** Recommended 256 MB

**Hard Disk :** 20GB

## **SOFTWARE REQUIRMENTS**

- ▶ Microsoft/Linux  
Operating System

- ▶ Java Virtual  
Machine

Java Development Kit

- ▶ Java core/unofficial  
API

- ▶ JTattoo.jar

- ▶ JCalendar.jar

- ▶ MySQL

- ▶ Window 10

- ▶ Eclipse

## **MODULES ADDED**

### ▶ Modules Added

- Adding new Functionality in a project by Admin,
- Generate New Module Of Sales and Add in my Project Which is contains Sales Details.
- Generate New Module Of Suppliers and Add in my Project Which is contains Suppliers Details.
- Generate New Page Of About in File Function and Add in my Project Which is contains Developer information
- Generate New Module Of Suppliers and Add in my Project Which is contains Suppliers Details.
- Generate New Function Of Home and Add in my Project Which is Provide Home Page.

### ▶ **And Generate Connectivity Of My DataBase Mysql**

- ▶ Generate Table Of Sales in My Data Base Which is Contains Many Fields.
- ▶ Such as Sales\_id, Product\_id, Product\_name, quantity, revenue, soldby etc.
- ▶ Generate Table Of Suppliers in My DataBase Which is Contains Many Fields.
- ▶ Such as Such as Supplier\_Code, Full\_Name, location, phone etc.
- ▶ Sales Page Contains Search Bar Which is Provide Search using Product\_name,Product\_code,CustomerName, User\_Name.
- ▶ Supplier Page Contains Search Bar Which is Provide Search using Full-Name, location,phone,or Supplier\_code.
- ▶ And Both Module Conatains Add,edit,delete,clear function etc
- ▶ Both Module Showing the Details in Table
- ▶ And About Page Providing a developer information Which is contain name,email,contact etc.
- ▶ And Home page provide a home page

## **After Evaluation**

- ▶ Modules Added
  - Adding new Functionality in a project by Admin,
    - Generate New Module Of Products and Add in my Project Which is contains Products Details.
    - Generate New Module Of Purchase and Add in my Project Which is contains Purchase Details.
  - ▶ Generate Table Of Products in My Data Base Which is Contains Many Fields.
    - ▶ Such as Product\_code, Product\_name, Cost.price,Sell.Price,Brand etc.
  - ▶ Generate Table Of Purchase in My DataBase Which is Contains Many Fields.
    - ▶ Such as Such Purchese\_id,Product\_code,P.name,quantity,totalcost etc.

## **ADDED WORKS**

▶ **Edit:** Many Module contains Edit facilities Which has control of editing value from data base directly and insert new value etc.

▶ **Clear and Delete:**

Clear and delete is provide a advance facilities of this software

Because it is Provide a deletion and clear data process etc.

▶ .Now Next We will Adding New Module Of Project

▶ Like

▶ CUSTMORES ,

▶ CURRENT STOCKS ,

▶ USERS Etc.

## PROPOSED SYSTEM

Preprocessing phases:

**Home:** This first module manages Home Screen Which is Provide A Home Page of my Software. After clicking home button . button will provide Welcome Screen of the Software etc

**Sales:** This is Provide Sales information And Sales Page it is contain sales\_id, Product\_code , Product\_name , Quantity, Revenue, Sold by etc.

**Suppliers:** Suppliers page contain suppliers details and its hold basic value with attributes it is provide a suppliers code, full name ,location ,phone etc

**Products:** It is hold the details of product with product code, product name, cost price selling price brand etc.

**Purchase:** this is contain detail about purchase . It will provide purchase screen which is hold some value like purchase id ,product code ,product name ,quantity ,total cost etc  
And Each page has refresh facilities And search facilities and Direct input value interface etc .

**Edit:** Many Module conatins Edit facilities Which has control of editing value from data base diretly and insert new value etc.

**Clear and Delete:**

clear and delete is provide a advance facilities of this software

Because it is Provide a deletion and clear data process etc

In the proposed system, all the business operations will be automated. Some of the features which the new system will provide are Auto generation of Daily Demand report, Auto generation of Purchase Order of various raw materials. As everything is auto generated, the production delays are avoided. It makes the system more secure as only authenticated users can access the system. Also, there are privileges in which we can authorize a particular user for accessing system or particular modules of the application.

## EXISTING SYSTEM

As We Know the manual processing is quite tedious, time consuming less accurate in comparison to computerised processing Obviously the present system is not is exception consultant encountering all the above problems.

1. Time Consuming.
2. It is very tedious.
3. All information is not placed separately
4. Lot of paper work
5. Slow data processing
6. Not user frequently environment.
7. It is difficult to found records due file management system.

Current system is a manual one in which users are maintaining ledgers, books etc to store the information like suppliers details, inwards, deliveries and returns of items in all godowns, customer details as well as employee details. It is very difficult to maintain historical data. Also regular investments need to purchase stationary every year

In the existing system, the inventory management is handled manually, which is highly tedious. Some of the important business operations are estimating the requirement of new raw material, dealing in the production of Purchase order, purchase invoice, sales invoice and debit note. All these operations are performed by a team of skilled members which are prompt in financial calculations and have a sharp memory. The operations are handled in an effective way, but the process is time taking and subjected to human errors.



## ALGORITHM AND DESIGN TECHNIQUES

The total cost paid for ordering and maintaining the inventory is known as total inventory cost. To optimize the total cost it is essential for the companies to be aware about the factors which influence the total cost. This cost can be calculated by adding purchasing cost, inventory holding cost, ordering cost and shortage cost. Thus, the total cost of the inventory can be calculated as  $TC = P.C. + H.C. + O.C. + S.C$

### Fuzzy System

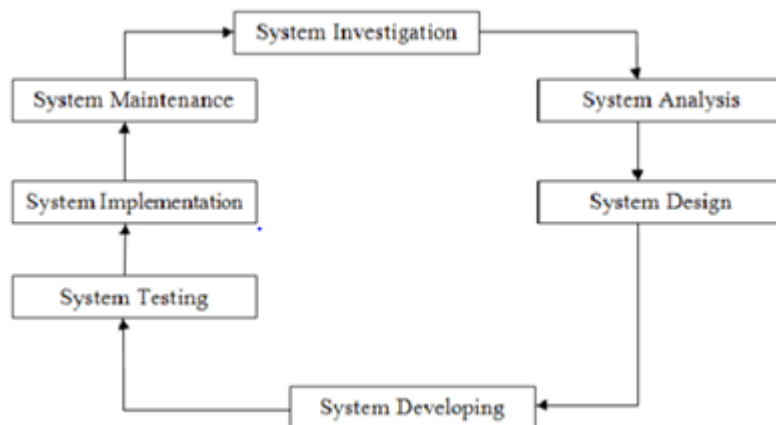
In a fuzzy control system all the input values are usually mapped to the membership function. The method of converting a crisp input value to a defined range or to an unclear value is known as "fuzzification". In crisp studies, all the parameters of the model have definite and clear values with no ambiguity. However, values of different parameters involved in the system are generally uncertain. For any particular problem in the crisp scenario, the aim is to maximize or minimize the objective function under the given constraints. But defining the objective or the constraint precisely by the decision maker may be very difficult in many practical situations, so, he may specify them in the "fuzzy sense." In such a case, the decision maker has to depend upon the fuzzy methods of solving the programming problem. Fuzzification brings the model closer to reality, in the sense that it grants accuracy in the whole setup by allowing a range except a particular value of the variables

Inventory control is an essential need for every business organizations. The future of business organizations depends upon inventory considered and on the achievements of company's objectives. To know the significant factors that push for a purchasing behavior and meeting customers' needs remain a critical matter for the growth and survival in the nowadays competitive market. In today's world where rapid developments are taking place in science and technology, mathematical modelling has become a powerful tool to solve complex, interconnected, and interacting phenomena arising from this rapid change. The first step is to define the problem and all of its constraints theoretically. Next, the objective function of this mathematical problem is formed. In most of all industries different departments have a need to optimize their objective function with decision variables, subjected to a set of constraint. Usually the objectives of a firm are to maximize the profit and to minimize the total cost. The strategy of a research can be described by identifying the problems, its scope and objectives. The main objective of a supply chain is to minimize the total cost of the supply chain. In order to minimize the total cost of the

supply chain, one has to identify the average inventory level of retailer, supplier and manufacturer. After this the cost of each subsystem will be quantified. After the formulation of the cost function, it will be minimized with respect to the decision variables taking into account the basic assumptions and the constraints of the problem. The feasible region of the solutions of the problem must be maintained. With the help of this methodology one can determine the optimal production quantity, optimal order quantity and the number of shipments at each level, with optimized total cost. The mathematical software MATEMATICA version 5.2 has been used during this research work. This software is very useful to execute the planned approach and to calculate and compare the results of the proposed model.

## IMPLEMENTATION AND ARCHITECTURE DIAGRAM

### 1. Architecture Diagram

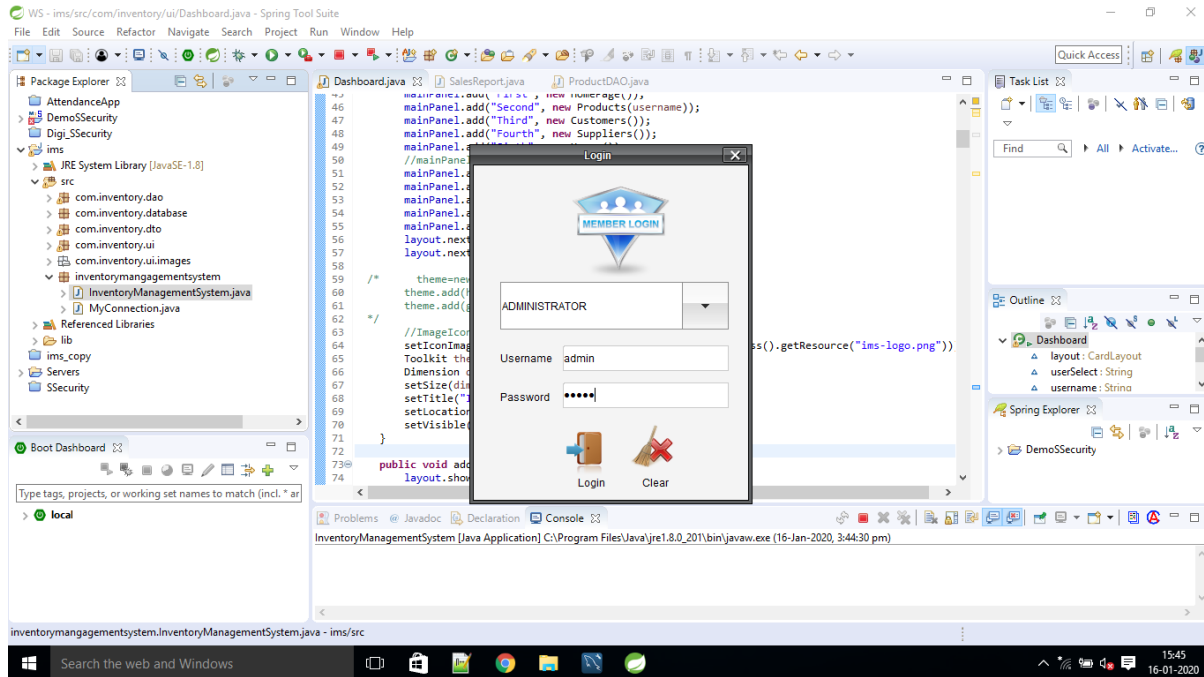


### 2. Implementation

1. An inventory management system, also known as an inventory control system, is usually a software application that tracks every aspect of the items your company keeps in stock to sell. It can assist with purchasing and receiving on the front end, track and ship within your company, manage inventory in retail locations, then track turnover and assist with reordering. While a very small business can use a manual system, most organizations either leverage software-based systems themselves or have their vendors do it for them.

## SCREENSHOTS:

# INVENTORY MANAGEMENT SYSTEM EXECUTION SNAPSHOT



- File Action
- Menu
- Home
- Suppliers
- Products
- Purchase
- Customers
- Current Stocks
- Sales
- Users

# WELCOME



Inventory Management System

File Action  
Menu

Home

# SUPPLIERS

(Search using Full Name, Location, Phone OR Supplier Code) SEARCH

| supplierCode | fullName | location | phone      |
|--------------|----------|----------|------------|
| 456          | raman    | dl       | 7896541230 |





SUPPLIERS

PLEASE ENTER ALL THE FIELDS

Supplier's name

Location

Phone

 Add
  Edit
  Delete
  Clear

Suppliers

Products

Purchase

Customers

Current Stocks

Sales

Users

Search the web and Windows

Inventory Management System

File Action  
Menu

Home

Refresh

# PRODUCTS

(Search using Product Name, Brand Name, OR Product Code) SEARCH

| productCode | productName | costPrice | sellingPrice | brand   |
|-------------|-------------|-----------|--------------|---------|
| 5623        | mobil       | 5000.0    | 52300.0      | Ig      |
| 5624        | TV          | 100000.0  | 150000.0     | SAMSUNG |

PRODUCTS





PLEASE FILL ALL THE FIELDS

Product Name

Cost Price

Selling Price

Brand

 Add
  Edit
  Delete
  Clear

Suppliers

Products

Purchase

Customers

Current Stocks

Sales

Users

Search the web and Windows

- File Action
- menu
- Home
- Suppliers
- Products
- Purchase
- Customers
- Current Stocks
- Sales
- Users

Refresh **PURCHASE** (Search using Product Name, Brand Name, OR Product Code) SEARCH

| purchaseid | productcode | productName | quantity | totalCost |
|------------|-------------|-------------|----------|-----------|
| 1          | 5623        | mobil       | 2000     | 20000.0   |
| 2          | 5624        | TV          | 2000     | 2.0E7     |

**PRODUCTS**

PLEASE FILL ALL THE FIELDS

Date:

Select Supplier's Name:

Product Code:

Cost Price:

Quantity:

Purchase Delete Clear

Purchased Date:  
Supplier Info:

Inventory Management System

File Action  
Menu

Home

# CUSTOMERS

(Search using Full Name, Location, Phone OR Customer Code) SEARCH

| customerCode | fullName | location | phone      |
|--------------|----------|----------|------------|
| 102          | AMIT     | BIHAR    | 9966778822 |
| 103          | RAHUL    | RJ       | 9911920355 |

Suppliers

Products

Purchase

Customers

Current Stocks

Sales

Users





**CUSTOMERS**

PLEASE ENTER ALL THE FIELDS

Customer's name

Location

Phone

Search the web and Windows

Inventory Management System

Inventory Management System

File Action  
Menu

Home

# Sales

(Search using Product Name, Product Code, Customer Name or Username) SEARCH

| salesid | productcode | productName | quantity | revenue  | soldby |
|---------|-------------|-------------|----------|----------|--------|
| 101     | 5623        | mobil       | 200      | 20000    | 200000 |
|         | 5623        | mobil       | 10       | 200000.0 | admin  |

Suppliers

Products

Purchase

Customers

Current Stocks

Sales

Users

**Sales**

PLEASE FILL ALL THE FIELDS




Date

Customer Code

Product Code

Selling Price

Quantity

Sold Date:

Customer Info:

Search the web and Windows

## CONCLUSION

The Inventory Management System is developed and designed for recording and managing the inventory of an organization. It can also be used for different institution with fewer modification as per requirement. the system can be easily updated as the other institutional requirement may not be integrated on our project . After the continuous effort , testing and debugging the current system is ready to be implemented in an organization.

The System development Project has developed the ability on us to implement the theoretical

Knowledge we have gained during BIM study in the real life scenario.

Some of the lesson that we had learned from the project are:-

Sharpen the knowledge of working cooperating in working organizational environment and work place.

Know the value of time and discipline.

Work in group and make group decision.

Learnt communication skill, leadership , quality and to make good public relation.

Creation of New Module;-

- ▶ Now Next We will Adding New Module Of Project
- ▶ Like CUSTOMERS ,CURRENT STOCKS , USERS Etc.



## REFERENCES

- [1] <https://www.camcode.com/asset-tags/what-is-an-inventory-management-system/>
- [2] Jimmy Wales, online encyclopedia Wikipedia , <http://www.wikipedia.org>
- [3] James Gosling. Java (Programming Language) , <http://www.java.com>
- [4] Names Allaire, Netbeans-Fully-featured Java IDE, <http://www.netbeans.org>
- [5] James Gosling , Welcome to java world.com:how-to feature and columns by Java expert; news; Java applets; sample code ; tips , <http://www.javaworld.com>
- [6] Pressman, Roger S. "Software Engineering A Practitioner' Approach "
- [7] John Osborn , JavaBeans: Developing Component Software in Java
- [8] Doug Lea Concurrent Programming in Java: Design Principles and Pattern, Addison-Wesley ,  
November,1996





