ACKNOWLEDGEMENT

This project has been developed in order to fulfill the partial requirements of Purbanchal University for the completion of BCA, Semester-VIII. We should remain thankful to many persons for the successful completion of this project.

First of all, we are thankful to our respected **'Project Coordinator'** teacher Mr. Bhawesh Kafle sir, for his guidance and kind support throughout the development and completion of this project. His suggestions and guidance in every stage is one of the major reasons of the successful completion of our project. Without his guidance, our project would not have been accomplished in time.

We are also thankful to every individual who encouraged us to complete the project.

At last but not the least, we are also very thankful to respected principal of our college, Dr. Rupak Khanal for helping and encouraging us in every aspect of our academic study during in this college and many thanks to Gomendra Multiple College, Birtamod, Jhapa for providing us the opportunity to pursue our BCA-IT degree in such a wonderful academic environment.

With Thanks
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ABSTRACT

This report has been carried out on “A Project On Inventory Management System” using Dot Net. This research report focuses on different technology in developing software for any organization and it also includes the process of software development. The research describes the main preference of the users and an organization mainly focused on client and server-based software. This research is straight driven on the developer’s side fulfilling all terms like analysis, design, and implementation and testing.

Keywords: Dot Net Frameworks.

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ABBREVIATIONS

ER-Diagram:	Entity Relationship Diagram
DFD:	Data Flow Diagram
SDLC:	System Development Life Cycle
SAD:	System Architecture Diagram
UID:	User Interface Diagram

Chapter 1: Introduction

1.1 Introduction

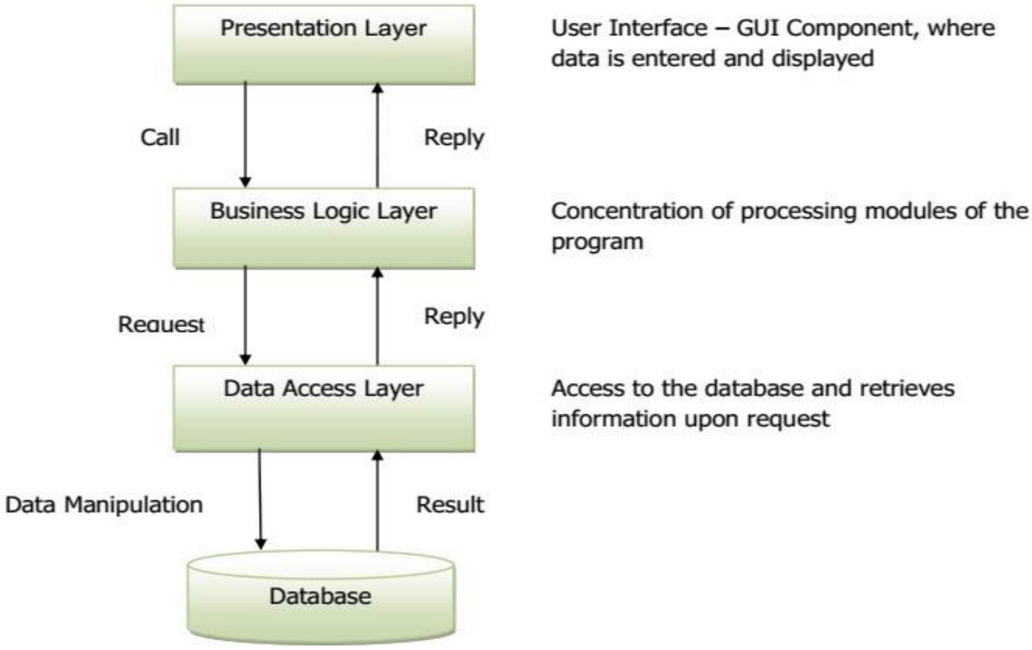
In present world the technology is reaching the new heights. In early days, no one thought of flying in air or communicating with people who are thousands miles away but in the present era everything is possible as technology is growing at jet speed. Once a famous person stated that, **“Necessity is the mother of all inventions”.** The evolution in the technology is directly proportional to the necessity of society. To make the life of people more convenient and comfortable the technology has given birth to the most amazing thing called computer. The computer has changed the life of the people making their work very easy. Computers have made such an impact on the society that each and every work is becoming depended on this technology. Because of this the scientists and the IT industries are working hard in evolving this technology.

1.2. Overview of the Project

The project entitled ‘Inventory Management System’ is designed and developed using C# .Net Core aims at replacing manual administration of Inventory. Inventory means the keeping records of goods, borrow, return and total availability of total goods. Inventory management system present information quickly, clearly and in a way that makes the overall Inventory management smoothly. This project helps to manage purchase, borrow and return as well as allows the billing of fine and searching the stored records of goods.

Since the application will have client server architecture, it will have three-tier architecture.

A.Logical View


Presentation Layer
User Interface – GUI Component, where data is entered and displayed
Call
Reply
Business Logic Layer
Concentration of processing modules of the program
Request
Reply
Data Access Layer
Access to the database and retrieves information upon request
Data Manipulation
Result
Database

1.3 Objectives

The objectives of this Project are:

a. This project has been developed to replace the existing manual system of record keeping with computerized system.

b. This project will automatically reduce the human effort, time and cost and increase the efficiency of the people working on it.

c. This allows individual user to build Positive feeling towards automated system of record keeping.

1.4 Limitations of this Project /software

⇒ This project cannot print reports for now.

Chapter 2: Background Study and Literature Review

2.1 Analysis and Review

Project analysis is the process of collecting and analyzing the requirements to be developed in order to recognize the need and objective of any individual for fast and accurate handling of the records.

2.2 Existing System

An Existing system refers to the system that is being followed till now. Presently all the inventories management are done manually. This is making the person very difficult to keep track of the purchase and sales record of the items.

2.3 Drawbacks of Existing System

a. Time consuming.

b. Updating and Retrieval tasks are very tedious.

c. Highly error prone.

d. Easy Customer service is difficult.

e. Lot of paper work results in lot of confusion.

To avoid all these limitations and make the system working more accurately it needs to be Computerized.

2.4 Preliminary investigation

It is a brief study of a potential project to estimate whether a detailed investigation is required or not. This program does not require any further investigation because simply we are going to develop it with basic functionality required for smooth functioning.

2.5 Proposed System

The Inventory Management application is user-friendly application. It is very simple in design and to implement. The system requirements are very low. System resources and the system will work in almost all configurations.

The main objectives of the proposed system can be enumerated as follows:

a. User can keep track of purchase and sales of items

b. User can search information about the items.

c. User can save the billing-of-fine details easily.

Merits of Proposed System

The system is very simple in design and to implement. The system requires very low system resources and the system will work in almost all Configurations.

a. Security of data.
b. Ensure data accuracy.
c. Reduce the damages of the machines.
d. Minimize manual data entry.
e. Greater efficiency.
f. User friendly and interactive.
g. Saves lot of time.
h. Retrieval and Updating tasks can be performed much faster and easier.

2.6 Project planning and scheduling

The purpose of project planning is to establish reasonable plan for completing in time. The process of project planning involves developing estimates for the work to be performed, establishing the necessary commitments and defining the plans to complete the project. This project requires about two months to get completed.

2.7 Scheduling

2.7.1 Activity Table

Name	Works	Time Taken
1. Kaman Khadka	Designing and Program Coding	2079-04-04 up to 2079-04-29
2. Raj Kumar Pathak	Creating Forms and Tables	2079-04-30 up to 2079-05-25
3. Shyam Dulal	Testing and Documentation	2079-05-26 up to 2079-06-04

Table 2.1: Activity Table

2.7.2 Gantt Chart

Process	1st Week	2nd Week	3rd Week	4th Week	5th Week	6th Week	7th Week	8th Week
Requirement Analysis	■							
Feasibility Study		■						
System Design			■	■				
Codding and System Testing					■	■		
Validation							■	
Documentation								■

Table 2.2: Gantt Chart

2.8 Hardware and software requirements

It indicates hardware and software requirements of the project at the time of project development as well as project implementation.

2.9.1 Hardware Requirements

Processer	Any dual core processor or above
HDD	At least 50 GB free space available
RAM	At least 4 GB

Table 2.3: Hardware Requirements

2.9.2 Software Requirements

OS	Windows 8 or Above(32 or 64 bit)
Database	Microsoft SQL Server 2011 and above
Other software	Microsoft .Net Framework

Table 2.4: Software Requirements

The project **'Inventory Management System'** is based on Graphical User Interface (GUI) Environment. The project has been developed by using Database technology. It also has both input and output design.

Chapter 3: System Analysis and Design

3.1 System Analysis

3.1.1 Feasibility Analysis

The feasibility study can be considered as preliminary investigation that helps management to take decision about whether the study of system should be feasible for development or not. The main advantage of doing feasibility study is to acquire the problem scope rather than solving them. The feasibility study is done basically keeping following points in mind.

3.1.1.1Technical Feasibility

Technical feasibility study assesses the details about of how product or service will be delivered. It assesses the current resources and technology that are required to accomplish the user requirements with in the allocated budget and time.

3.1.1.2 Operational Feasibility

Operational feasibility is a measure of how well a proposed system solves the problem, and takes advantage of the opportunities identified during scope definition and how it satisfies the requirements analysis phase of the system.

3.1.1.3 Economic feasibility

Economic feasibility is a projection of the amount of funding or startup capital needed, what source of capital can and will be used, what kind of return can be expected on the investment.

3.1.1.4 Behavioral Feasibility

Behavioral feasibility evaluates and estimates the user attitude or behavior towards the development of new system. It helps to identify if the system requires special effort to educate, retrain, transfer and change in employee's job status on new ways of conducting business.

3.1.2 System Development Life Cycle

Software Development Life Cycle [SDLC] is a systematic process for building software that ensures the quality and correctness of the software built. SDLC process aims to produce high-quality software that meets customer expectations. SDLC consists of a detailed plan which explains how to plan, build, and maintain specific software. Every phase of the SDLC has its own process and deliverables that feed into the next phase. The different phases of SDLC are as follows: -

- Planning
- Defining
- Designing
- Building
- Testing
- Deployment

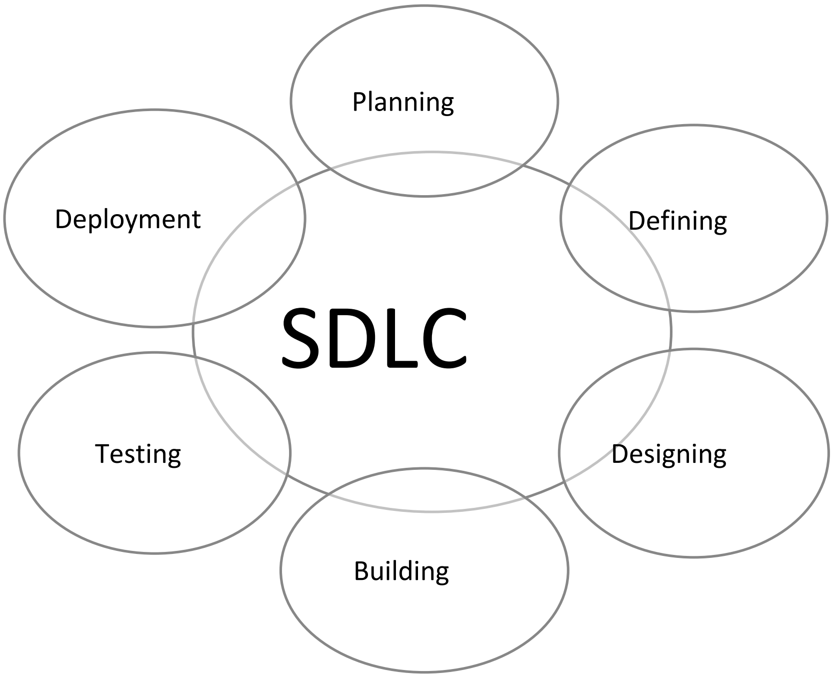


Fig 3.1: Pictorial view of SDLC

3.1.3 Data Modeling (ER Diagram)

Entity relationship model is a high-level conceptual data model diagram. ER modeling helps to analyze data requirements systematically to produce a well-designed database. ER model represents real world entities and the relationship among them.

Entity in ER diagram represents physical or simply fact about the enterprise or an event that happens in real world. Entities can be person, place, object, event and concept.

Attributes is a single valued property of either an entity type or a relationship type.

Relationship is nothing but an association among two or more entities.

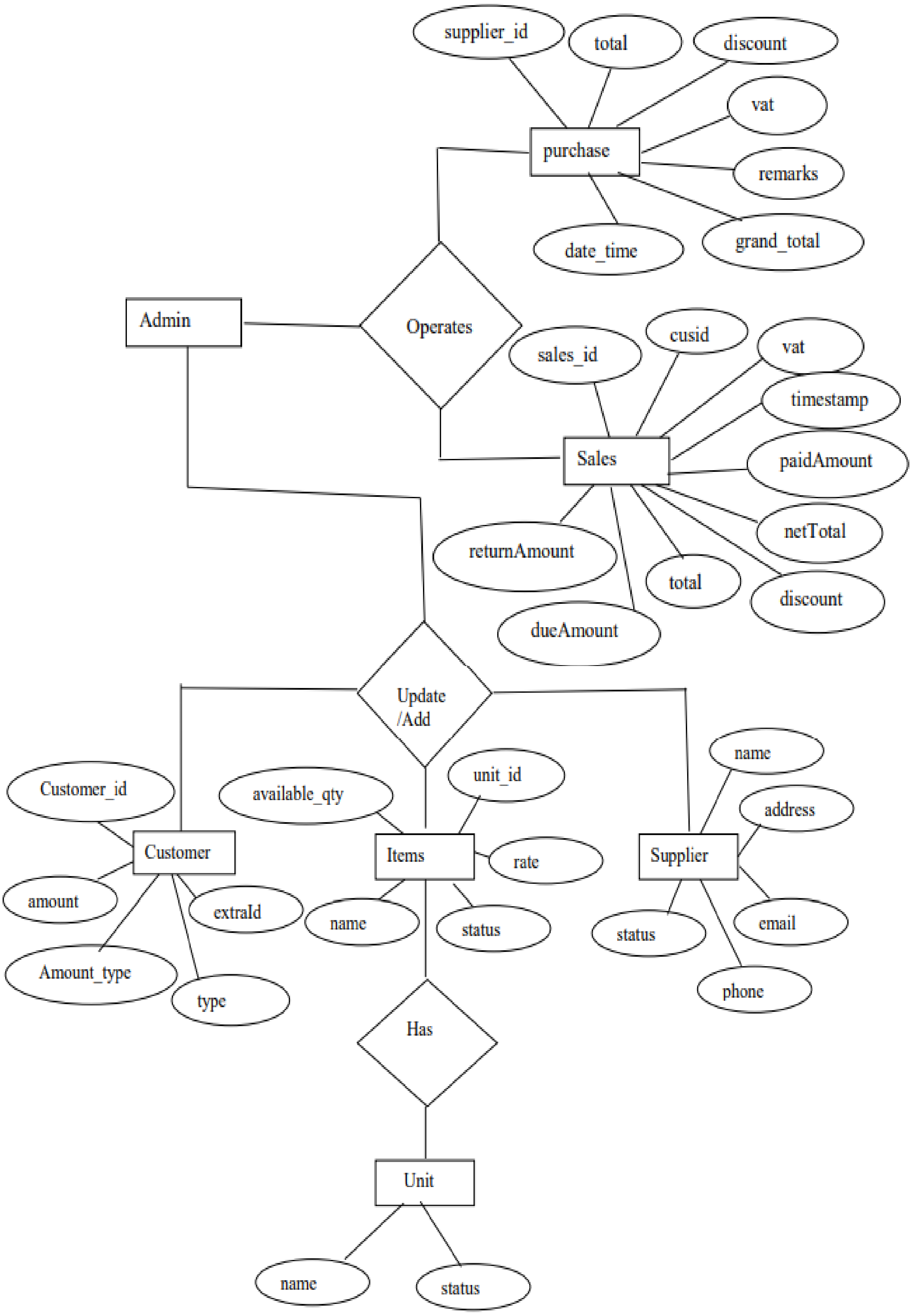


Fig 3.2: ER-Diagram of Inventory Management System

3.1.4 Process Modeling (Data Flow Diagram)

3.1.4.1 Data Flow Diagram

Data flow diagram show how data is processed by a system in terms of inputs and outputs. Data flow diagram can depict a good amount of the system requirements graphically. The purpose of data flow diagram is to show the scope and boundaries of a system as a whole.

3.1.4.2 Zero Level DFD

0 level DFD or context level DFD represents the entire software requirements as a single bubble with the input and output data denoted by incoming and ongoing arrows.

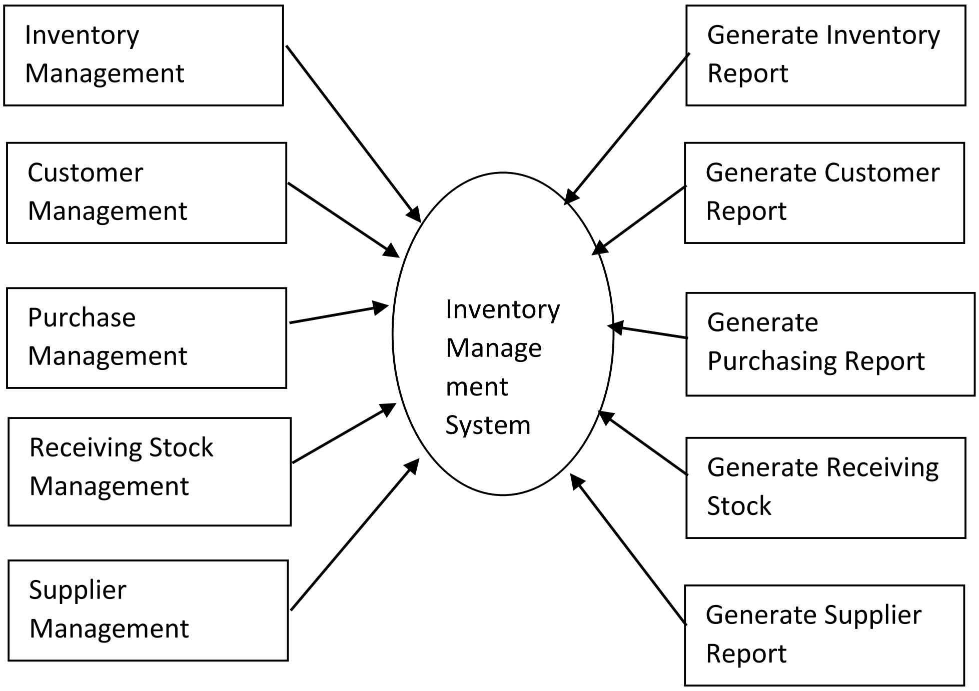


Fig 3.3: Zero Level DFD of Inventory Management System

The above diagram shows the DFD level-0 where the user adds suppliers, customers and items along with units to the inventory system. The Inventory system updates it to the database then the base will retrieve it to the Inventory system. After retrieving the system confirms data to the user. The admin checks the system and maintains the system.

3.1.4.2 First Level DFD

First level DFD is decomposed into multiple bubbles or processes. In this level, the main objectives of the system are highlighted and breakdown the high-level process of 0 level DFD into sub processes.

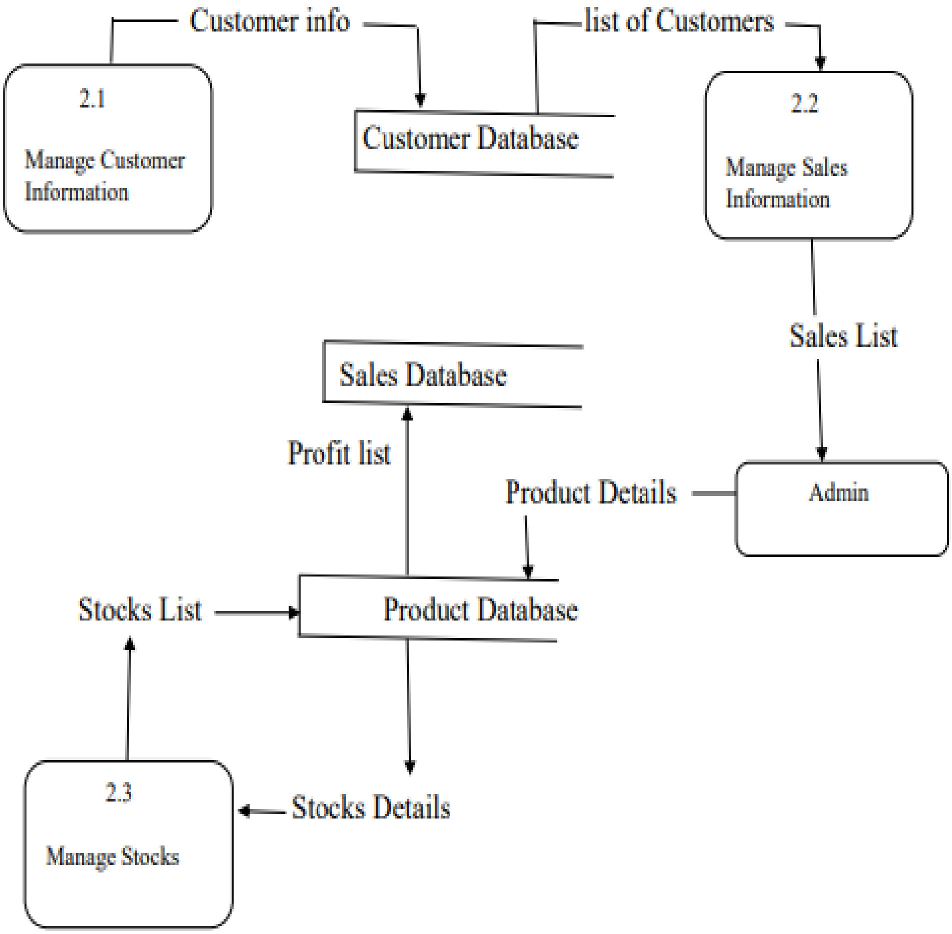


Fig 3.4: First Level DFD of Inventory Management System

The above diagram is for DFD level 1 where we can update data through the processes. This diagram divides the system further into different database.

3.1.4.3 Second Level DFD

Level DFD goes into one process deeper than 1 level DFD. It can be used to project or record the specific detail about the system's functioning.

3.2 System Design

3.2.1 An Overview of Software Design

The design phase focuses on the detailed implementation of the system recommended in the feasibility study. Emphasis in on translating performance specification into design specification. The design phase is a transition from a user-oriented document to a document oriented to the programmers or database personal.

No system design is ever perfect. Communication problem, negligence or time constraints create error that must be eliminated before the system is ready for user acceptance. A designer uses the modeling language to express the information and knowledge in a structure of system that is defined by a consistent set of rules and definitions. The designs can be defined in graphical or textual modeling languages.

3.2.2 System Architecture Diagram

System Architecture Diagram [SAD] is a crucial step for software and application developers to describe the basic software structure by separating functional areas into layers. It's the process of defining a structured solution that meets all of the technical and operational requirements while optimizing common quality attributes such as performance, security, and manageability. It depicts how a system might interact with its users, external system, data sources, and services.

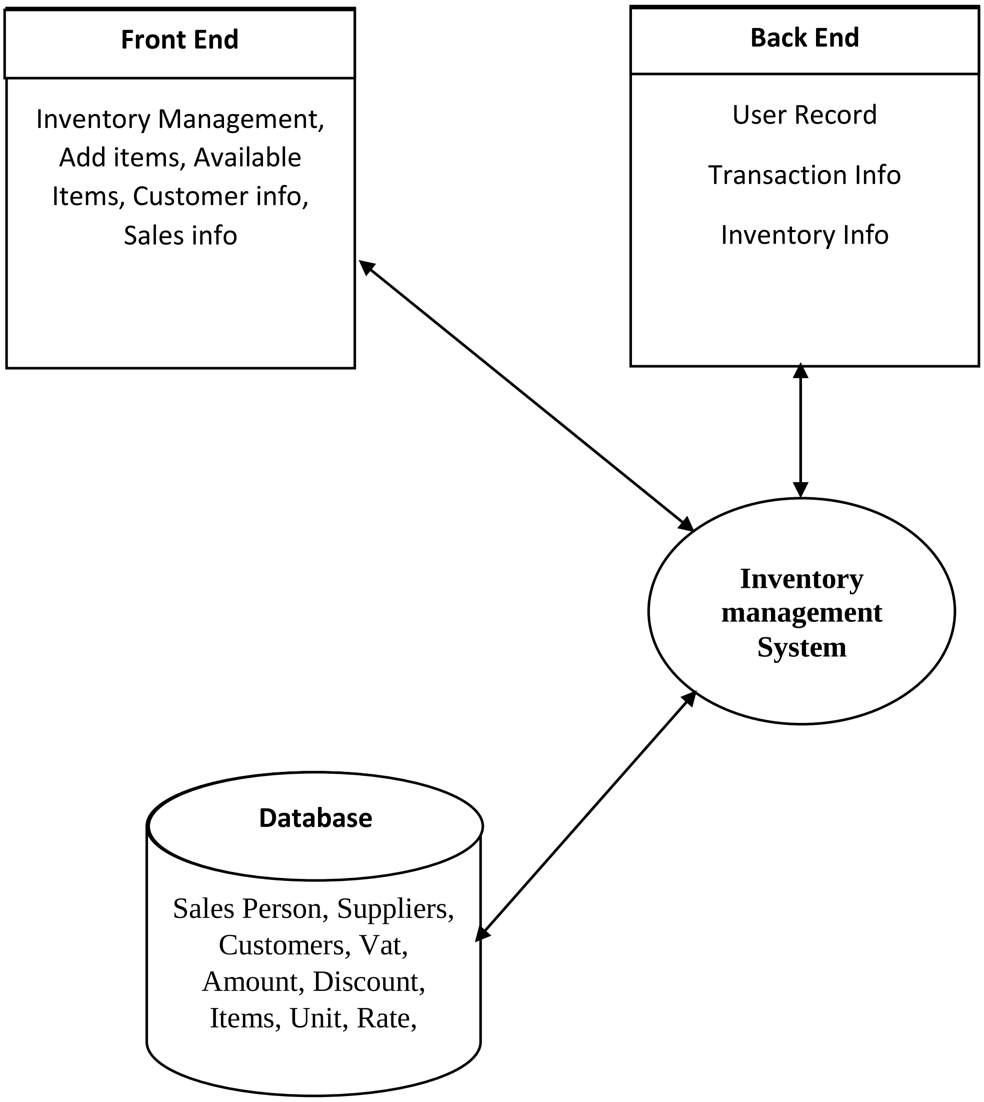

Front End
Inventory Management, Add items, Available Items, Customer info, Sales info
Back End
User Record
Transaction Info
Inventory Info
Inventory management System
Database
Sales Person, Suppliers, Customers, Vat, Amount, Discount, Items, Unit, Rate,

Fig 3.5: System Architecture Diagram of Inventory Management System

3.2.3 Database Design

Data base design is concerned with the data focus from the perspective of the system designer. The end product is called a database schema, a technical blueprint of database.

Database design translates the data models that were developed for the system users during the definition phase in to data structures supported by the chosen database technology. The goals of database design are as follows:

a. A database should provide for the efficient storage, update and retrieval of data.

b. A database should be reliable-the stored data should have high integrity to promote user trust in that data.

c. A database should be adaptable and scalable to new and unforeseen requirements and applications.

3.2.4 Use Case

Use case diagram is simple representation with the system that shows the relationship between the user and the different use cases in which the user is involved. A use case diagram can identify different users and different use case scenarios. The use case diagrams specify how the system interacts with the actors without worrying about the details of how that functionally is implemented.

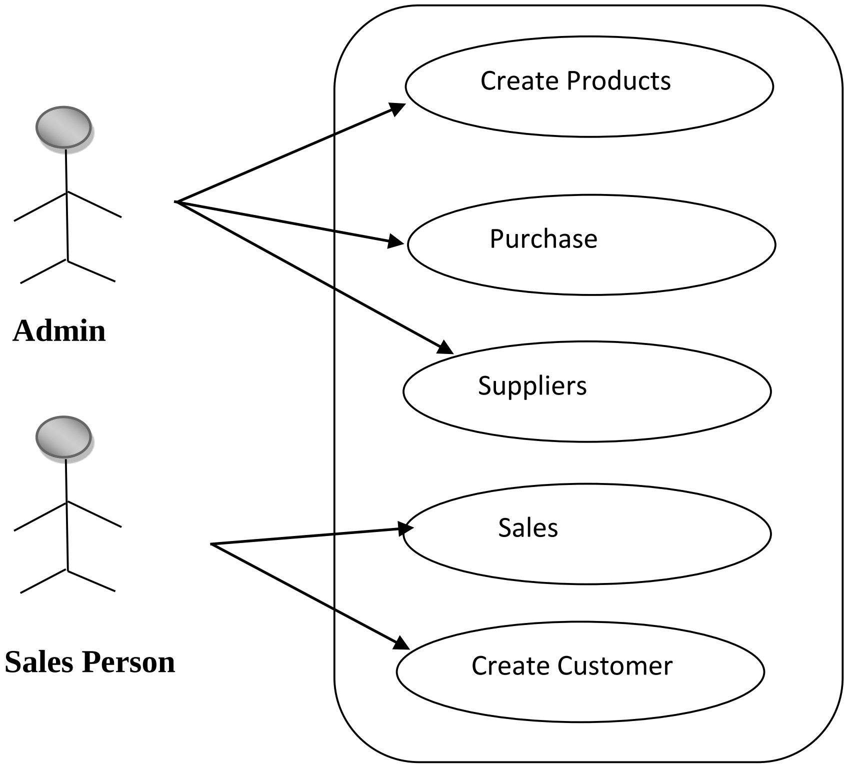


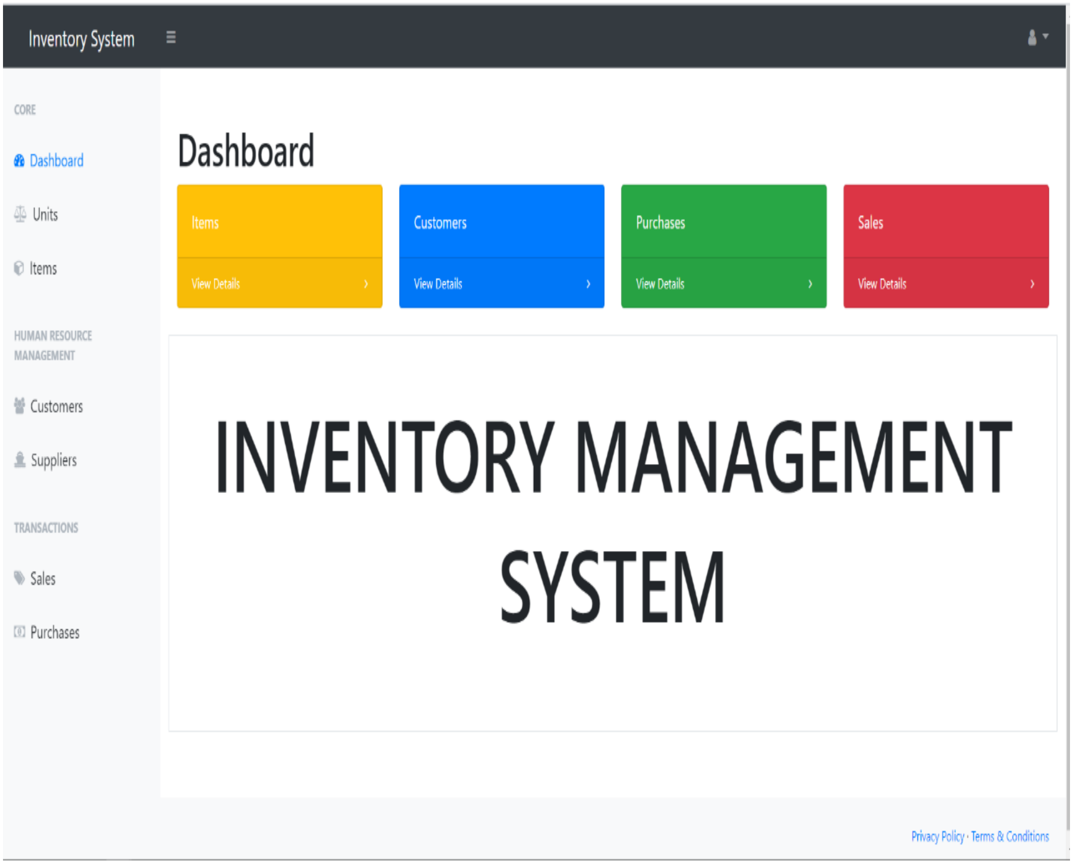
Fig 3.6: Use Case Diagram

3.2.5 User Interface Design

The visual part of a computer application or operating system through which a user interacts with a computer or software. It determines how commands are given to the computer or the program and how data is displayed on the screen. Designers aim to create interface which users find easy to use and pleasurable.

i. Dashboard

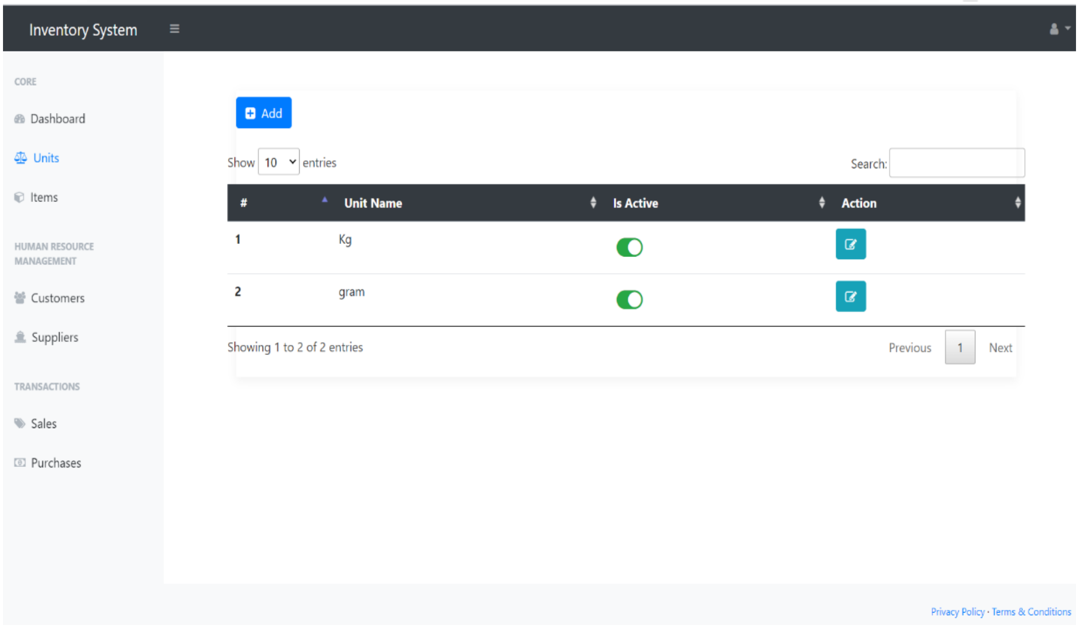
This is the dashboard of the system. Different functions are available in dashboard.



Dashboard of the system

ii. Add Units

User can add different units of the measurement in this Add Units sections.



Show 10 entries

Search:

#	Unit Name	Is Active	Action
1	Kg	●	✎
2	gram	●	✎

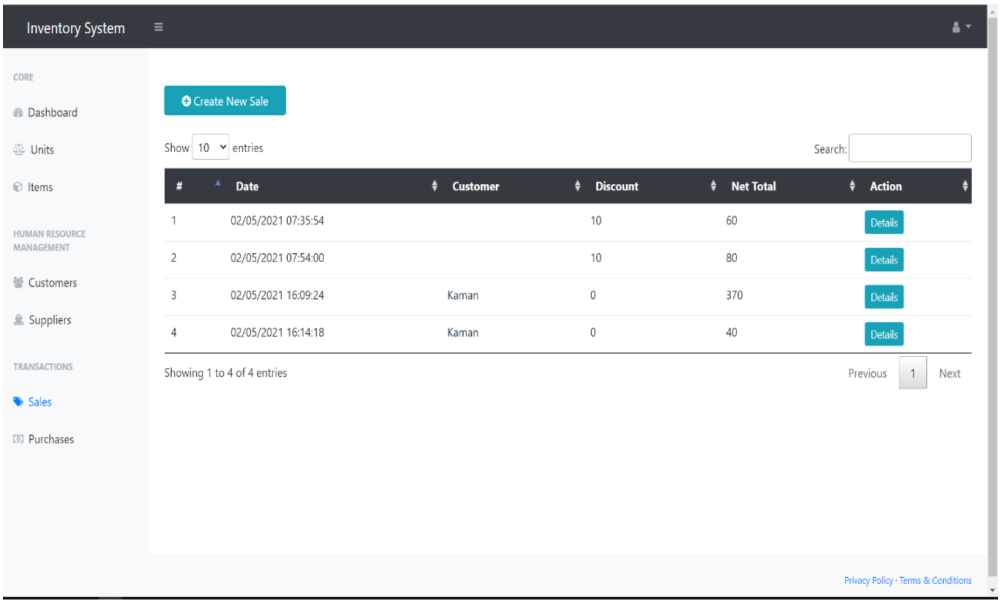
Showing 1 to 2 of 2 entries

Previous 1 Next

Add Units of the System

iii. Sales

This Sections shows the sales unit of different items.



Show 10 entries

Search:

#	Date	Customer	Discount	Net Total	Action
1	02/05/2021 07:35:54		10	60	Details
2	02/05/2021 07:54:00		10	80	Details
3	02/05/2021 16:09:24	Kaman	0	370	Details
4	02/05/2021 16:14:18	Kaman	0	40	Details

Showing 1 to 4 of 4 entries

Previous 1 Next

Sales Section of the System

Chapter 4: Testing and Implementation

4.1 Overview of System Testing

The system development phases involve many activities where changes for occurrence of human errors are enormous. Logical error, run time error, carelessness, improper communication, on time delivery, developer's skills and experience are the factors for errors to creep in. The proposed system must be tested thoroughly so that such errors detected and corrected as early as possible. A successful test is one that uncover every possible error and helps to quality control.

Large system is built out of subsystem, which are in turn built out of modules. The testing process therefore proceeds in stages.

4.1.1 White Box Testing

White box testing is concerned with the functional analysis of internal structure of the component or system. The tester thoroughly tests all subsystems independently to find out if they are satisfying their requirements or else. We had tested every individual function like student, teacher, parent, library, exam, finance, suppliers, etc. whether they are meeting their requirements or not, eventually all of them came out of bug free and further enhancement and optimization were carried out.

4.1.2 Black Box Testing

Black box testing is concerned with the proper execution of the program. The main focus of black box testing is on the proper validation of functional requirements. Black box testing gives abstraction from code and focuses on testing effort on the software behavior. Black box testing provides clear knowledge about communication among subsystems. We had conducted black box testing and found some communicational defect among subsystems. Then those defects were solved accordingly.

4.1.3 Phases of System Testing

Testing is all major milestone of system development. It tells about the performance of the system and the capability of the system to handle absurd data. The phases of system testing include:

a. Unit Testing

Unit testing is a type of software testing where individual units or components are tested. The purpose is to validate that each unit of the software code performs as expected. Unit testing is performed by developers when developing the software with the dummy data.

b. System Testing

System testing is performed on a complete, integrated system. It allows checking system's performance as per the requirements. It tests overall interaction among subsystems and involves load, performance, reliability and security testing. It is the final test that verify that the system meets the specification.

4.2 Implementation

It is the process of using project in client's computer. After the executable file has been created, this project can be copied from saved source to any secondary storage device and pasted to required system. The project can be operated by opening it, replacing the existing manual system.

4.1.1 Maintenance

When time changes, the requirements of the organization also change and this project can no longer fulfill its requirements. The changes are necessary to keep the project running and useful to individual. Maintenance may be required when the individual changes their requirements.

Chapter 5

Conclusion and Future Recommendations

5.1 Future Enhancement

- Can handle online transactions
- More user-friendly environment
- Use of latest methods and practices
- Reusability of less codes
- Use of AI and voice assistance

5.1. Conclusion

The project has been developed in a very short period of time and all efforts have been taken so that this project is very efficient in its execution there still exists some scope of improvement in our project. The following lists some of the enhancement that can be added incorporate into the project.

Help file can be included. The system as of now does not support any help facility for the user of the system. A help menu can be provided with a special function key and help command in main page itself. Help can be either introduced in a separate window, a reference to a printed manual or as one or two lines suggestion produced in a fixed screen location.

Application of the project can be done more attractively. Database management and stock maintenance module can be added which helps the administrator. This project can also be modified into a client server application. More security measures can be taken.

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