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DEVELOPMENT OF DENTAL BILLING SYSTEM

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ABSTRACT

The application is developed for billing and stocks management for a wholesale dental material seller. The seller mostly sells operational tools; his clients include other retailers, legitimate Doctors, hospitals and medical colleges. As the a result of rapid growth in business, the data to be stored, managed and processed is increasing day by day making it very difficult to manually maintain everything. To fix this problem a computer application provides best possible solution in every aspect of business.

The application does all the work of storing, processing, billing and some basic reporting. This is just the basic version of the software with further improvements to be released as per the users' needs in future. The application has simple user interface and does not come with ready list of products, the user stores only the products that are available in his store.

Keywords: Billing, Dental, Application, Software, Development, Java.

INTRODUCTION

Dental store billing system is a software application created for needs of billing, maintenance of stock in the store and to get some essential reports like purchases or sales made for a particular time interval. The application has as imple user interface that will be easy to get adapted. It consists of several frames for different purposes like a scree n to add products to database, another one to create sales order, etc.

All the data entered by user is stored into a single database file. The application uses java as front-end tool and MS access as back-end tool for data storage. There are two popular technologies to develop applications Java and .Net. This applicati on has been developed on the former technology as I am more comfortable coding in java.

LITERARY SURVEY

Proposed System

The system to be implemented in future will digitize the business processes and data involved. The day-to-day tasks will be converted into several system commands and will be carried away by the software system. The b ills will be generated as per the requirements of user, all necessary data to be included in a bill will be stored in a d atabase & also can be printed on a paper.

Tools Used

JavaFX

Java is a general purpose, object-
oriented, platform independent programming language. It is based on methodology of "write once, run anywhere" i.e., java compiled code can run on any java enabled machine without the need of compiling again. It is the most p opular programming language developed by James Gosling, Patrick Norton at Sun Microsystems lab in 1995.

JavaFX is a set of graphics & media packages that enables developers to design, create, test, debug & deploy rich client applications (RCA) that operate consistently across diverse platforms. It can reference API's from any java l ibrary. The look & feel can be customized using JavaFX.

NetBeans IDE

NetBeans is a free, open-source and cross-
platform Integrated Development Environment (IDE) platform for developing applications. It is a product by Oracl e Inc. licensed under CDDL (common development and distribution license) & general public license GNU with classpath exception. It runs on javaSE platform and is developed in java.

NetBeans allows applications to be developed from a setoff modular software components. It is intended todevelop applications in java but can also support development in C, C++, HTML and PHP. We can create web based applic ations, web services or standalone applications. It allows developers to focus only on logic and takes careof other reusable services.

MS Access

Microsoft Access is a tool for database management released by Microsoft in their business suite of application MSOffice. It provides both functionality of a database and programming capabilities. It combines the relational Mi crosoft jet database engine with a graphical user interface and software development tools. It stores all data in a fil e with .accdb or .mdb extension.

It has a very impressive graphical user interface to manage everything in a single place. It stores data in its own un ique way based on Access Jet Database Engine. It provides option to link to other database formats i.e., it can imp ort structure and data from other database management system

HARDWARE & SOFTWARE REQUIREMENTS

HARDWARE	
PROCESSOR :	INTEL OR AMD
RAM :	512 MB
MEMORY :	40 GB
PRINTER :	LASER OR INKJET
SOFTWARE	
OPERATING SYSTEM :	WINDOWS 7
TECHNOLOGY :	JAVA
DBMS :	MS ACCESS

SOFTWARE REQUIREMENT SPECIFICATION

System Analysis

The current generation uses computers in every aspect of their lives because of its efficiency. But, the current system used by some of the businesses is manual filing. File systems can be used for a small scale business set-up, but, as the business grows the amount data also increases. To maintain ever growing amount of data & transactions manually becomes very difficult, the file system technique cannot be trusted completely & the drawbacks of this system start to show up gradually.

Drawbacks of current system are as follows,

1. Expensive, uses a lot of paper.
2. Time consuming.
3. Inaccurate, human errors usually in calculations.
4. Duplication of records.
5. Inefficient updating of records.
6. Difficult to search anything.

System Requirement

When the business is growing at a good pace the existing system needs to discontinued & replaced with new computerized system. The computerized system overcomes all the drawbacks of current system. The advantages are as follows,

1. Transaction speed increases.
2. Accuracy in calculations.
3. Decrease in usage of paper.
4. Redundancy control.
5. Easy to search records.

Resources required for implementation of the proposed system are as follows,

- Operating System: Windows 7
- Front end : JAVA
- Back end : MS Access

User Requirement

The client's needs for the system are as follows,

- Maintaining a single database for inventory in store.
- Computerized billing.
- Maintaining ledgers for purchases & sales.
- Stocks reporting.

- Repetitive tasks to be handled by the system.
- Easy to use user interface.

SYSTEM DEFINATION

Introduction

A billing software is one which keeps track of all the transactions (purchases & sales) & stocks of that store. The implementations of requirements is done by system design.

Use Case Diagram

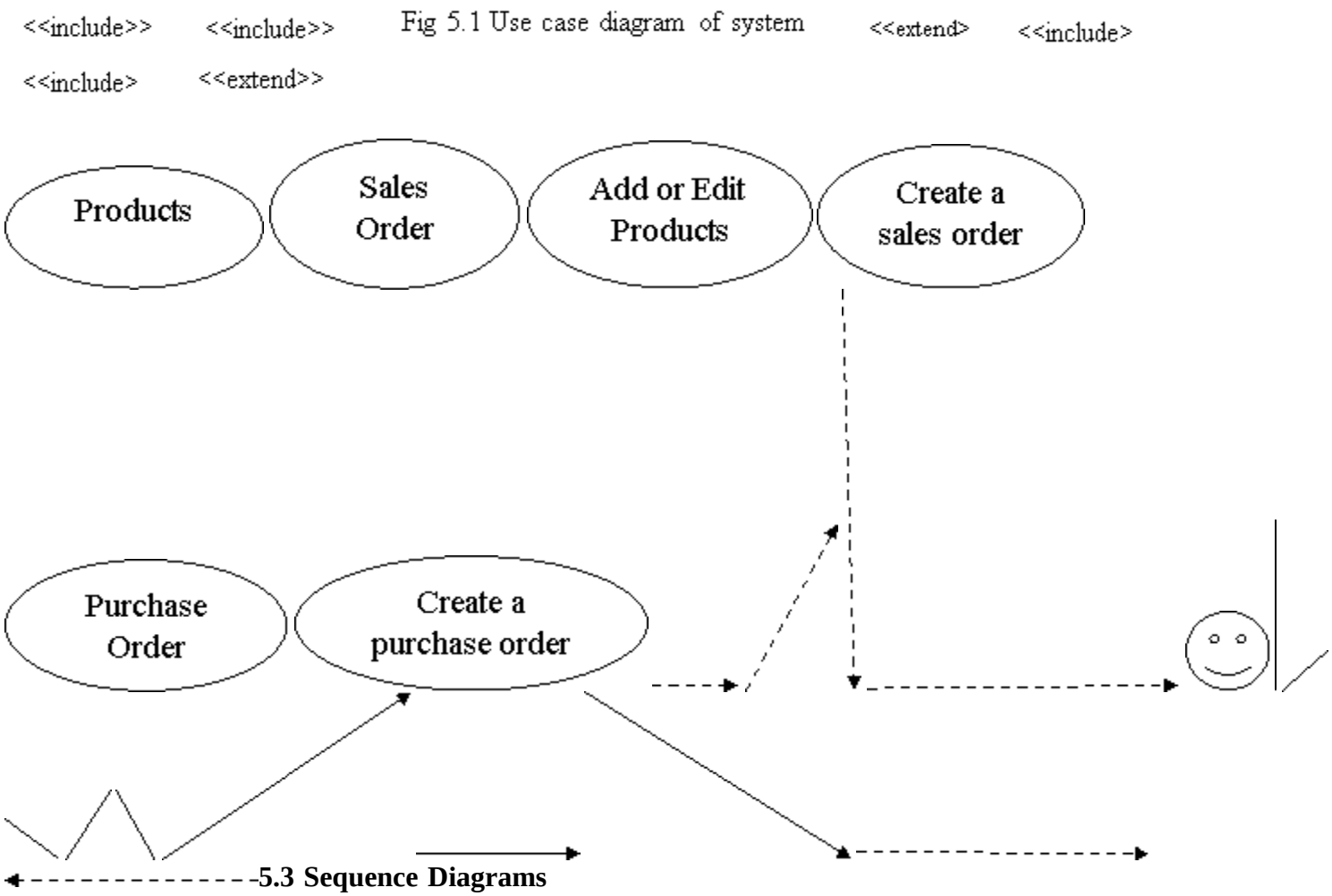
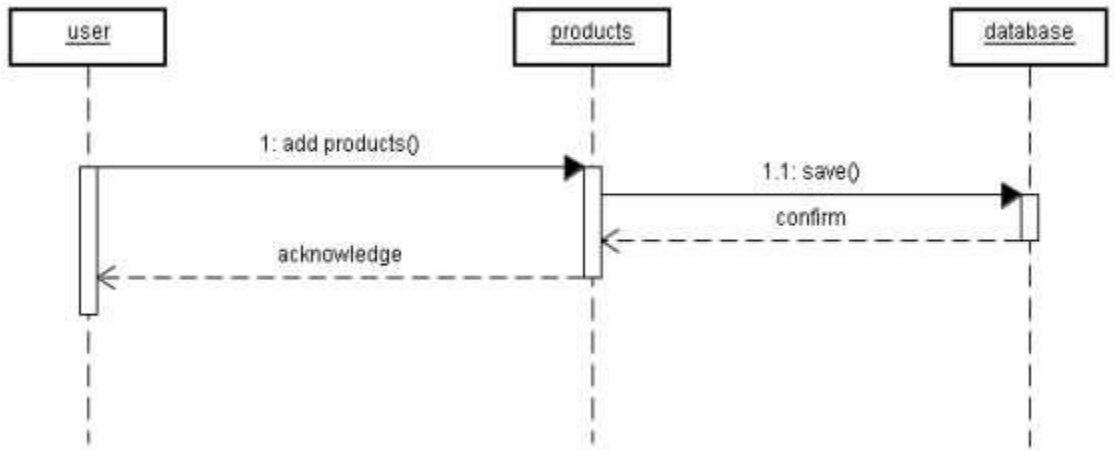


Fig 5.1 Use case diagram of system

5.3 Sequence Diagrams

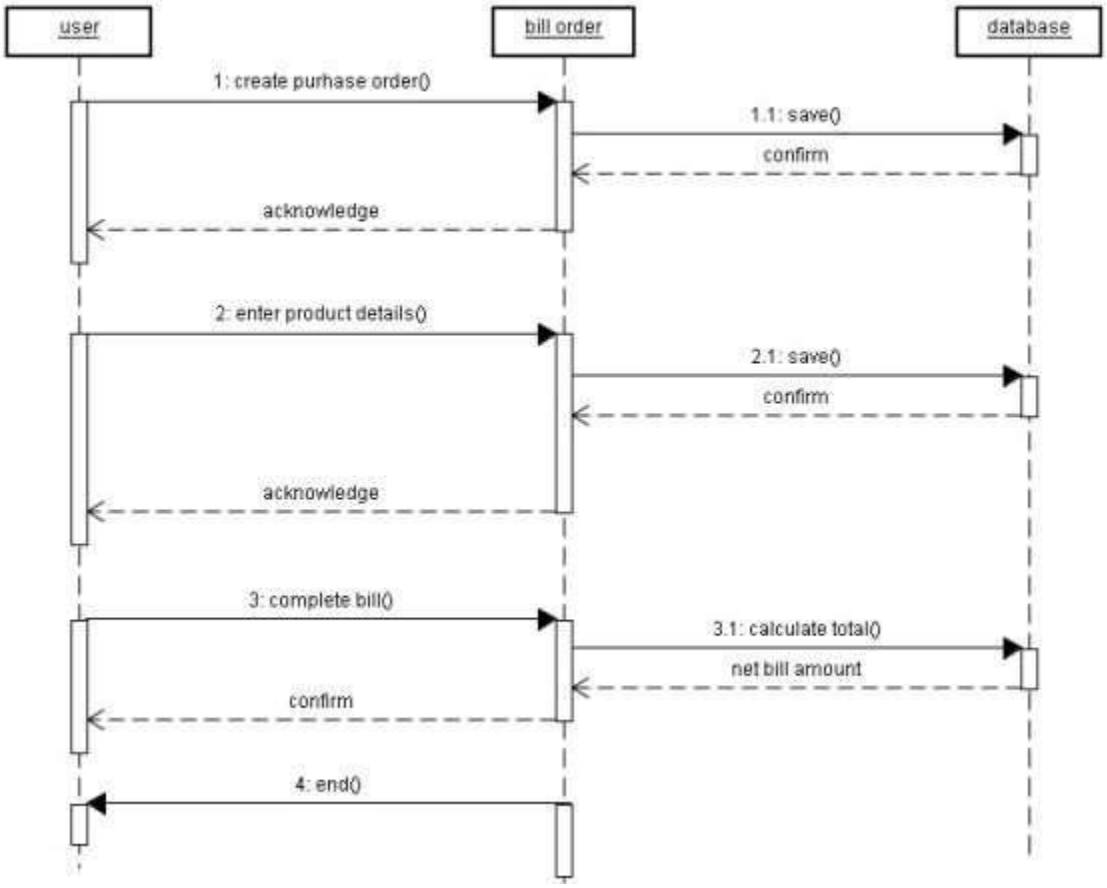
Sequence Diagram to add or edit product

Fig 5.2 Sequence diagram for product



Sequence diagram for purchase & sales orders

Fig 5.3 Sequence diagram of bills



DETAILED DESIGN

DATABASE DESIGN

Product Table Design

Field Name	Data Type	Description	Example
Pid	Integer	Product ID number	10101
Pname	Short text	Product name	Mouth Mirror with Handle
Mfg	Short text	Manufacturer name	GDC
Type	Short text	Product category	Mouth mirror
Subtype	Short text	Sub category	5 Inch
Package	Short text	Type of packing	1 No
Tax	Double	Tax on product	5.5%
Trp	Double	Selling price	105
Stock	Integer	No. of items available	22

Table 6.1: Product table

Batch table for drug products

Field Name	Data Type	Description	Example
BatchID	Integer	Batch ID	121085
P_ID	Integer	Product ID	100701
P_Name	Short Text	Product name	Plax
B_Date	Short Text	Purchase date	06/22/2014
Tin_No	Integer	TIN no. of supplier	151531
E_MM	Integer	Expiry Month	08
E_YYYY	Integer	Expiry Year	2020
Trp	Double	Selling price	55
Tax	Double	Percentile of tax	14.5
Qty	Integer	No. of items available	10

Table 6.2 Drug products table

Purchase order table design

Field Name	Data Type	Description	Example
BillID	Integer	Bill ID number	252501
BillDate	Short text	Billed date	05/25/2014
S_Name	Short text	Supplier Name	Samrat Pharma
TIN_No	Integer	TIN no. of supplier	141275
DLic	Integer	Drug license no. of supplier	880764
Items	Integer	Total no of items	12
Tax_55	Double	5.5% of tax	28.875
Tax_145	Double	14.5 % tax	78.155
CST_2	Double	Inter-state tax	0.0
Rounding	Double	Rounding up of bill amount	0.97
Forwarding	Double	Courier charges	150
Total	Double	Total cost of all items excl. of tax	1064
Grand Total	Double	Net Bill amount	1322

Table 6.3 Purchase order table

Sales order table design

Field Name	Data Type	Description	Example
Bill_No	Integer	Bill number	250401
B_Date	Short Text	Date of sale	04/25/2015
C_Name	Short Text	Customers name	Dr. Karan
Quantity	Integer	No. of items	12
Tax_5	Double	5.5% of tax	21.175
Tax_145	Double	14.5% of tax	111.65
Disc	Double	Discount on total bill	7.5
Total	Double	Total amount exclusive of tax	1155
GTotal	Double	Total inclusive of tax & discount	1280.325

Table 6.4 Sales bill

Entity Relationship Diagram

E-R diagram is visual way of representing how the data is related with other data. E-R diagram has three main components that are,

1. Entity: It can be any object, person or class. It is represented using a rectangle.
2. Attribute: It describes a property or characteristics of an entity. It is represented a solid line.
3. Relationship: It describes relationship between entities. It is represented by a diamond shape.

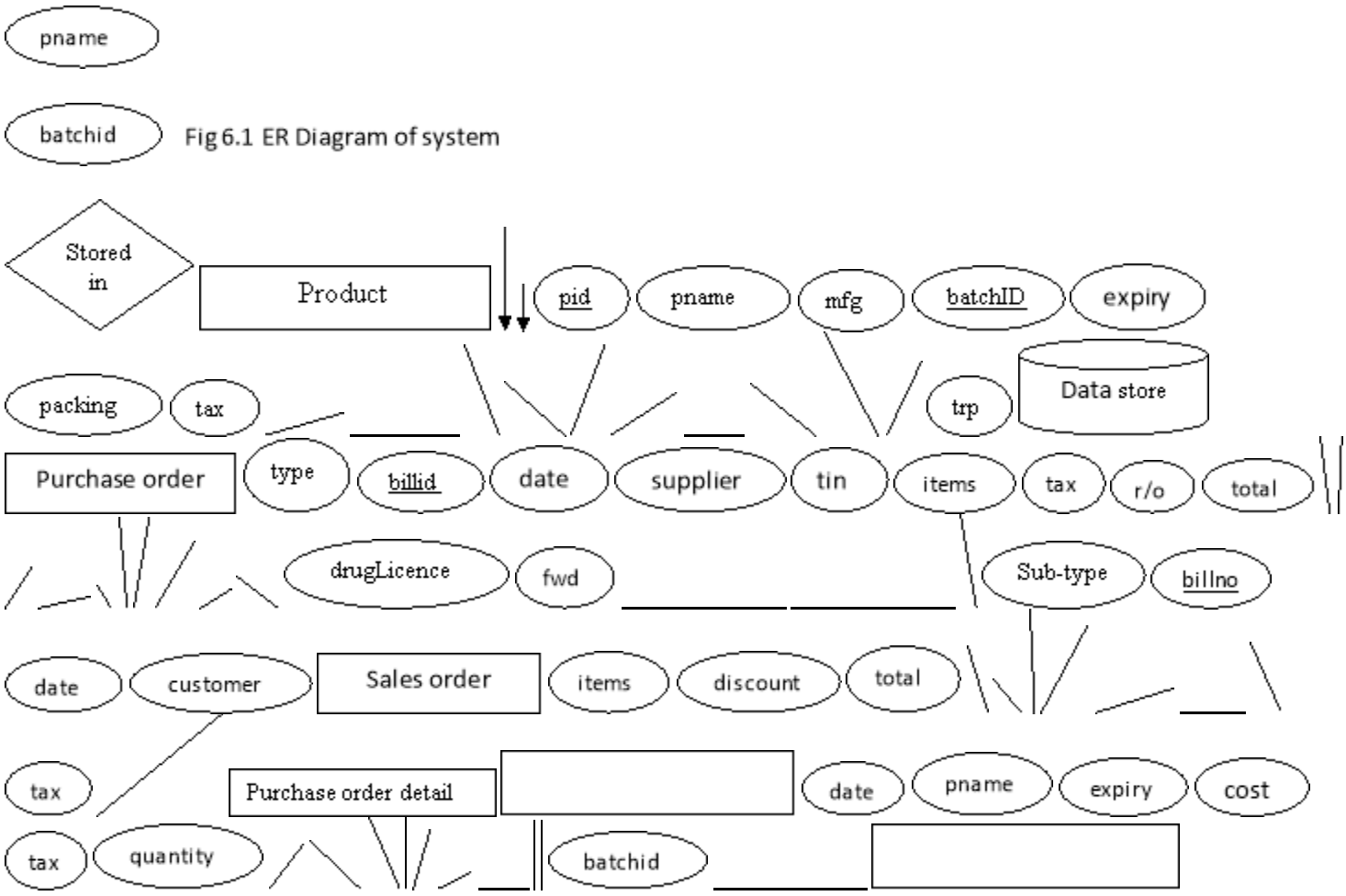
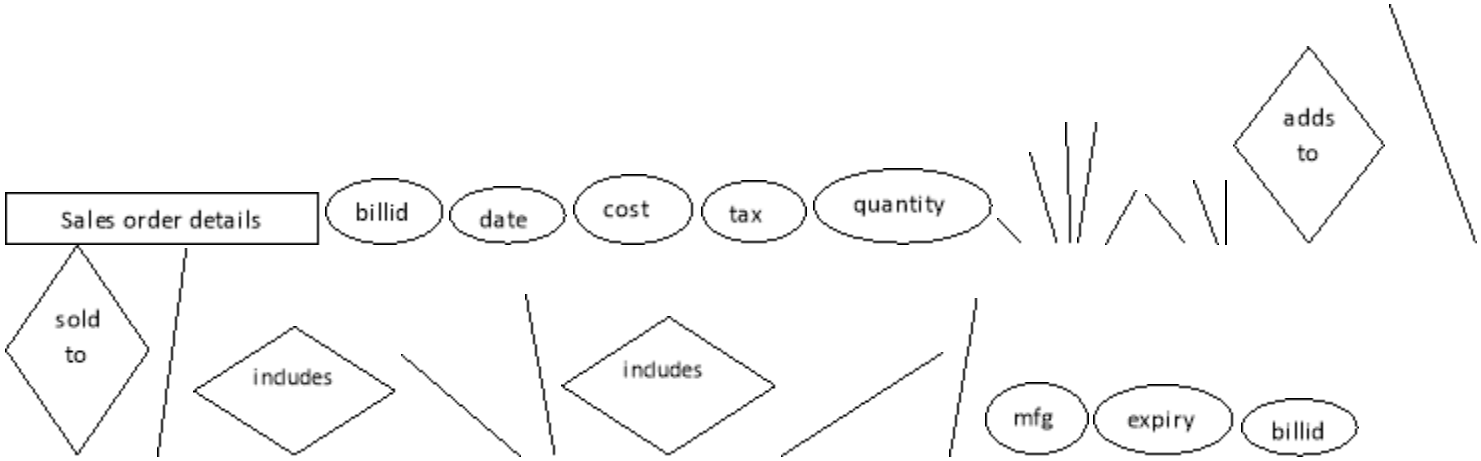


Fig 6.1 ER Diagram of system

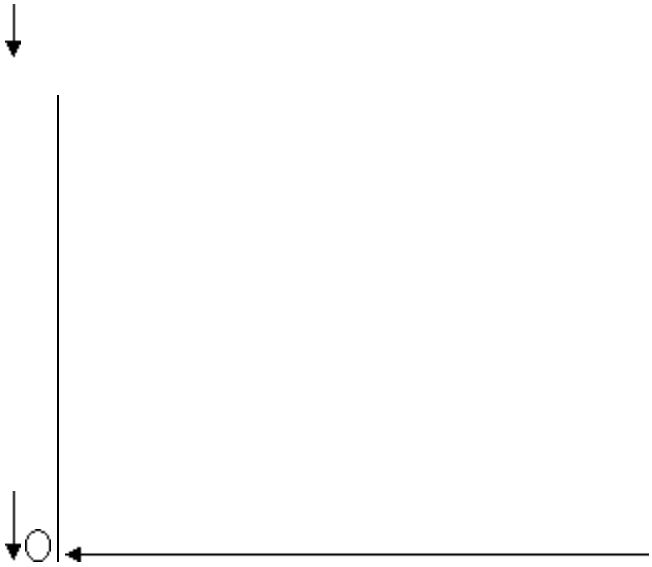


IMPLEMENTATION

Data Flow Diagram

Data Flow Diagram (DFD): A DFD is a graphical representation of flow of data through information system, where data comes from, goes to & gets stored. It creates an overview of system, which will be elaborated in later stage.

DFD to add new product into database



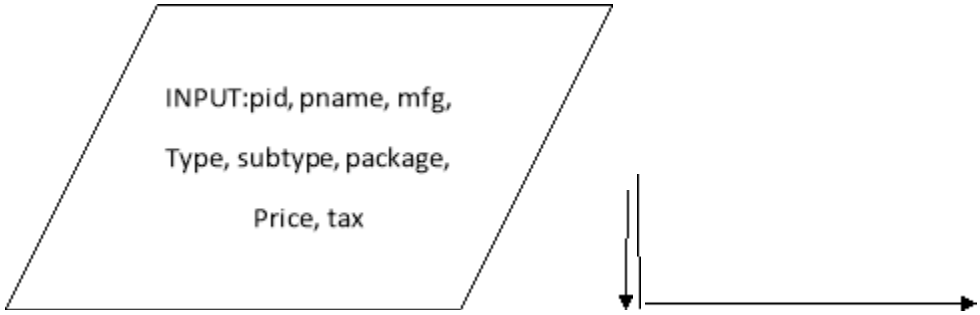
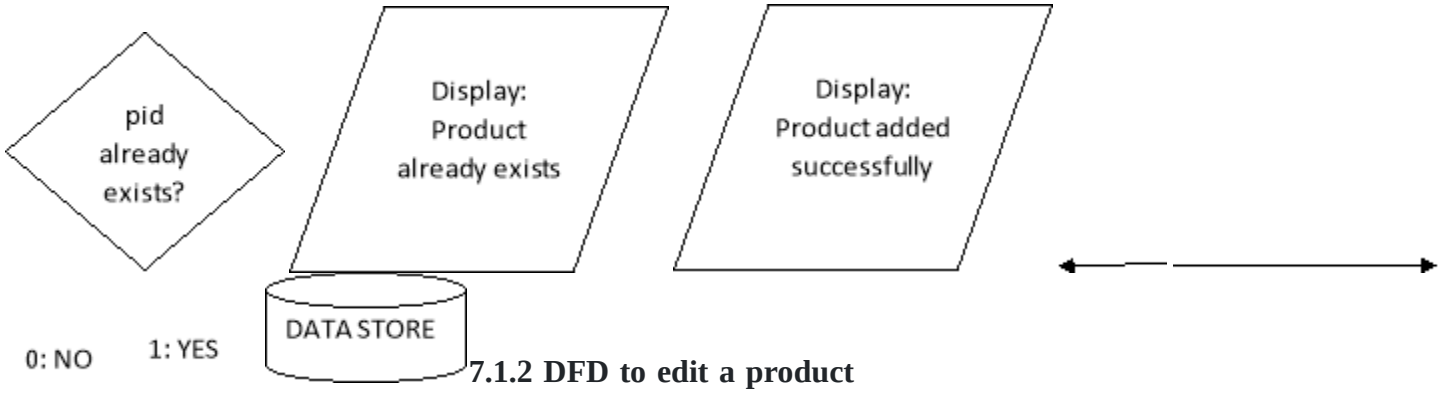
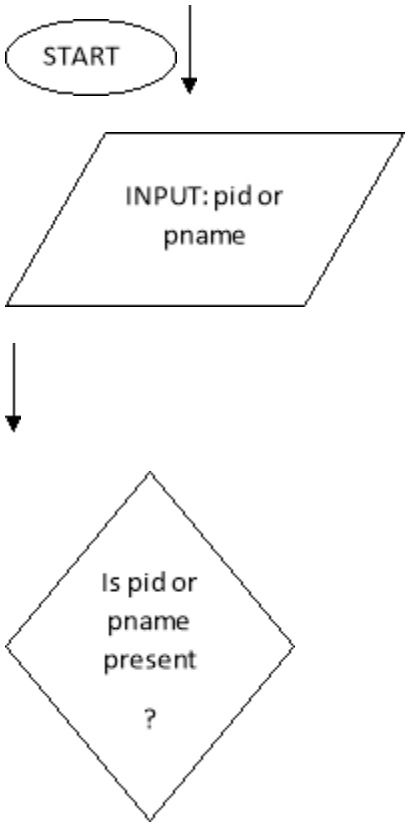


Fig 7.1 DFD for new product



7.1.2 DFD to edit a product



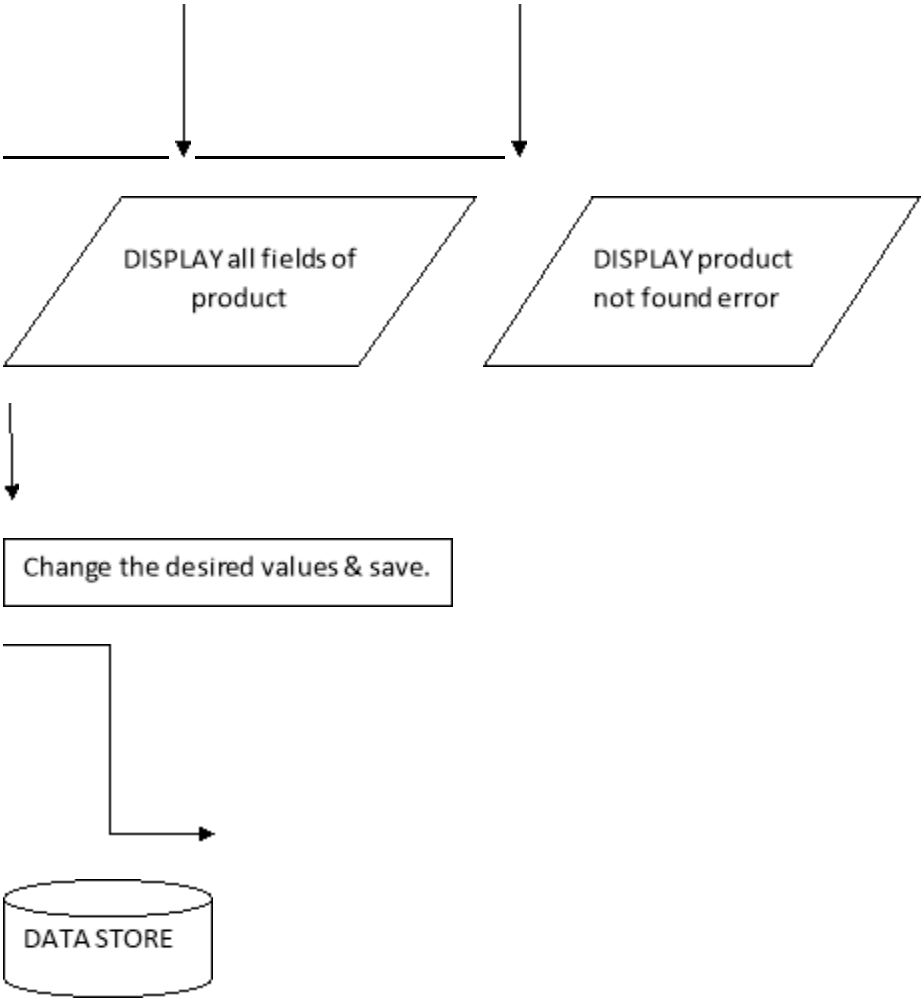
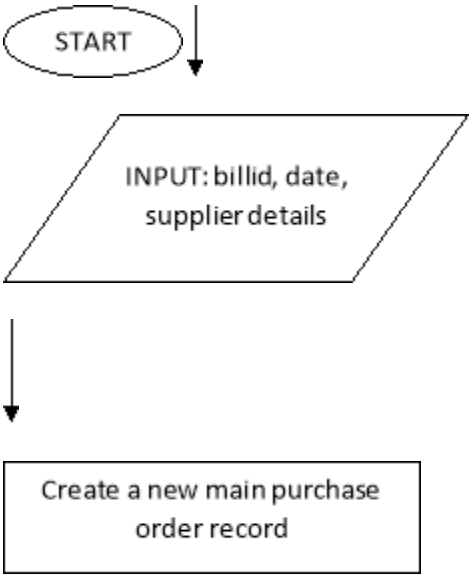
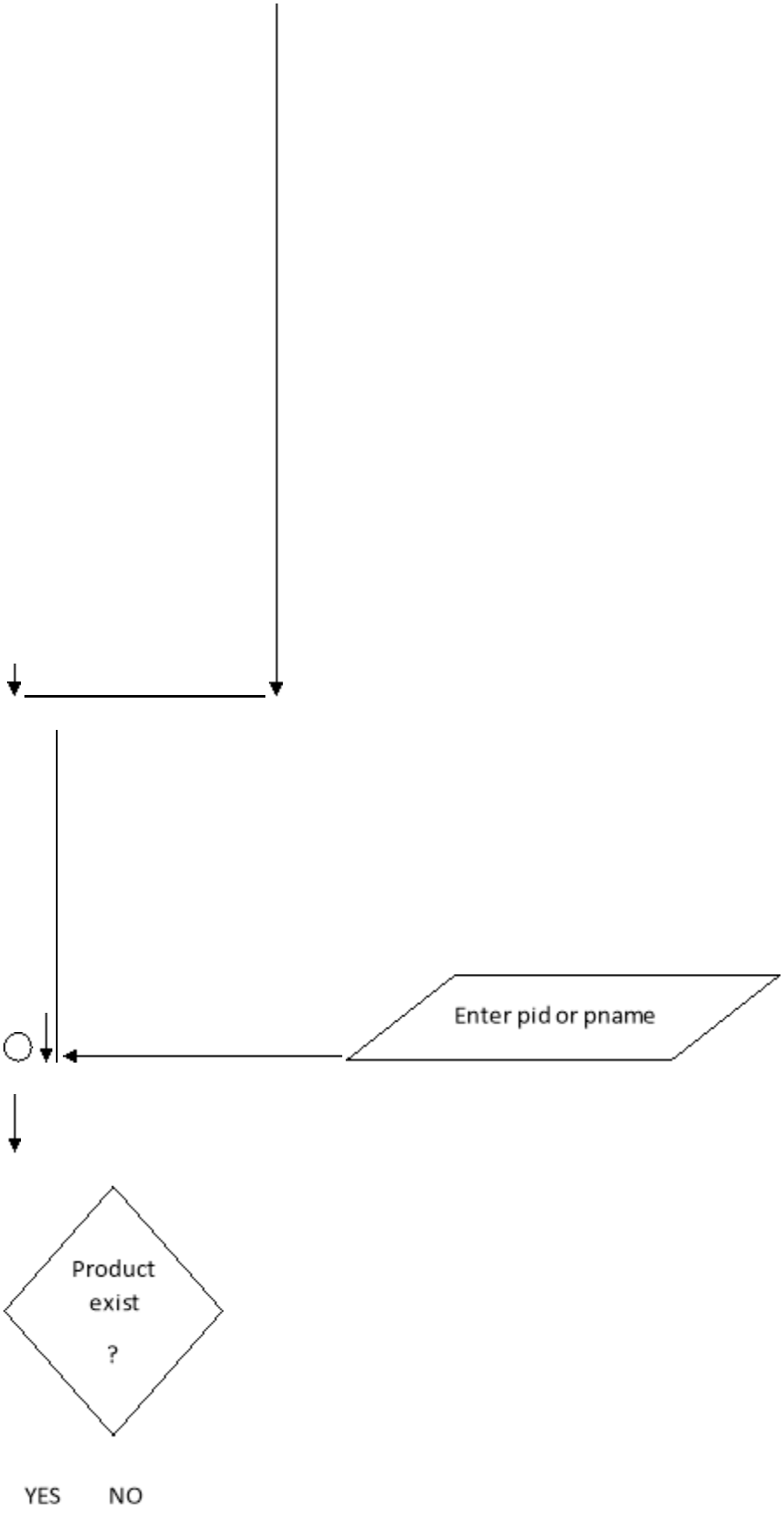


Fig 7.2 DFD for product update

DFD to add purchase order




Enter pid or pname
Product exist ?
YES
NO

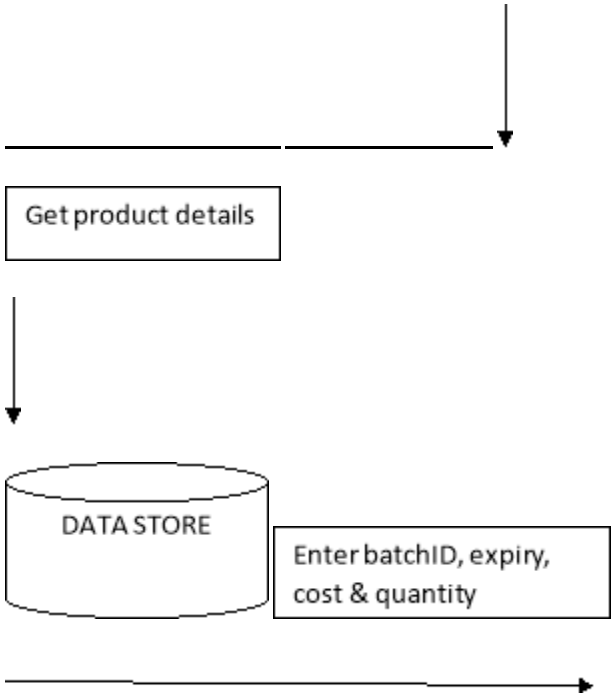
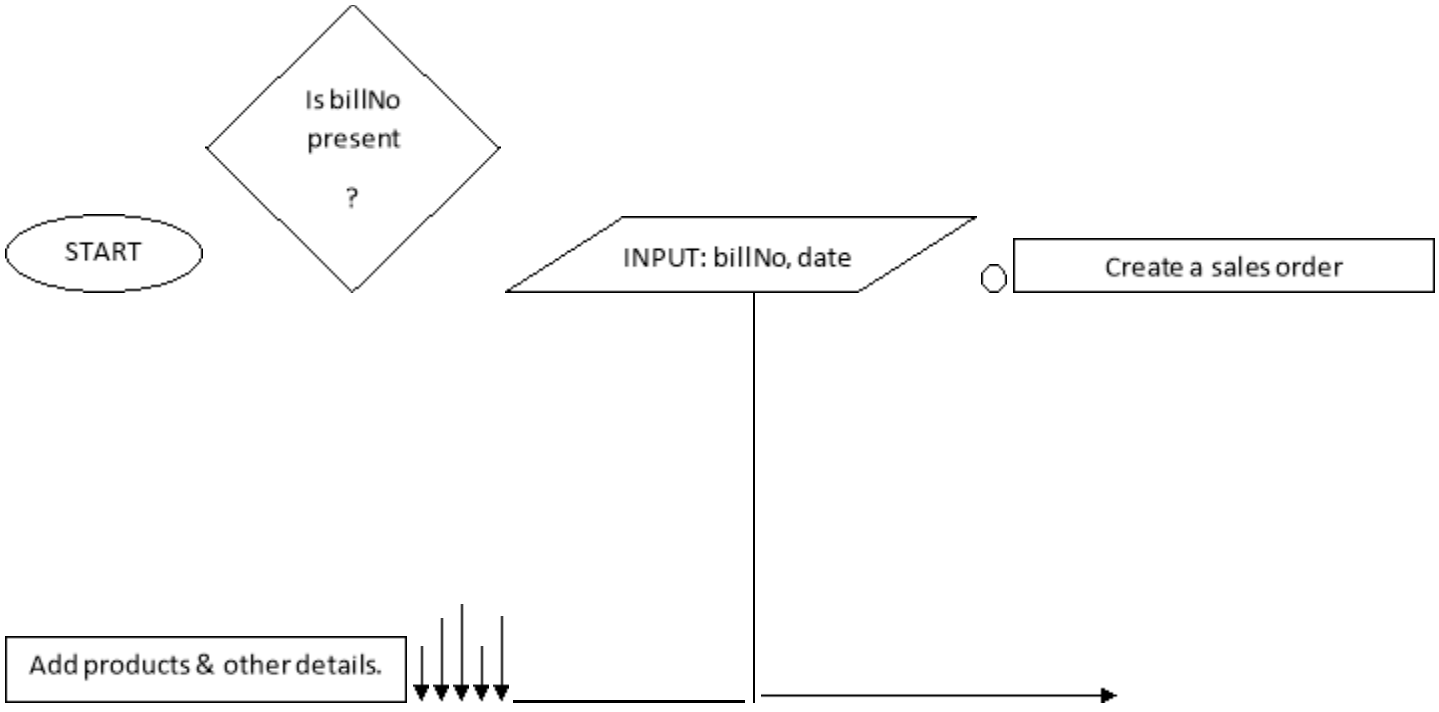
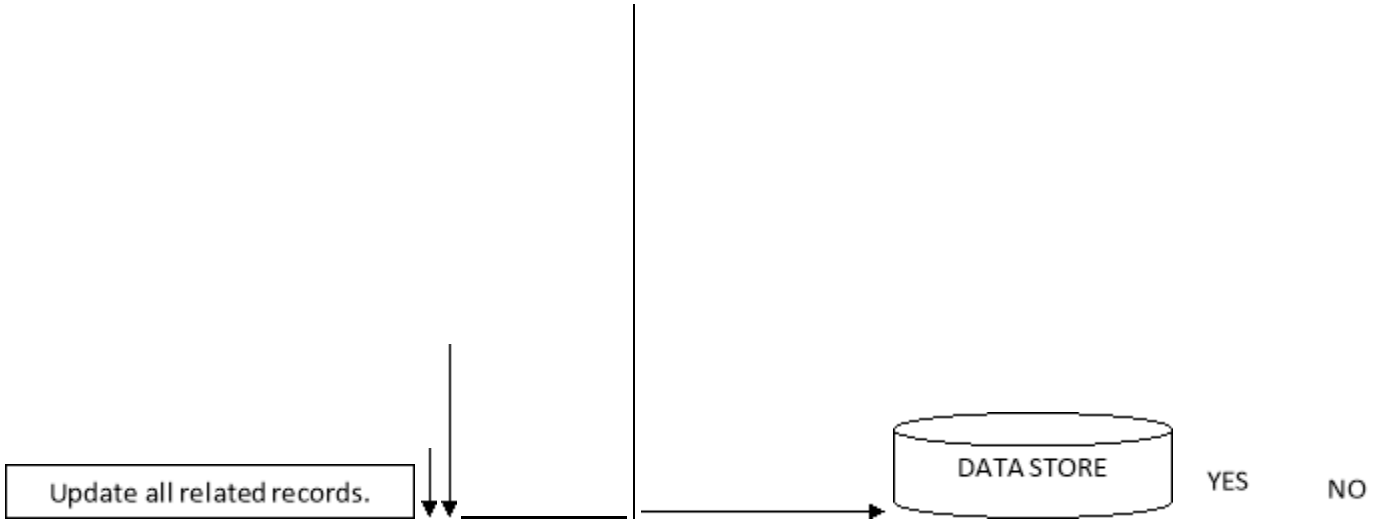


Fig 7.3 DFD for new purchase order

DFD to for sales order

2 Fig 7.4 DFD for new sales order 1





USER INTERFACE

New product screen

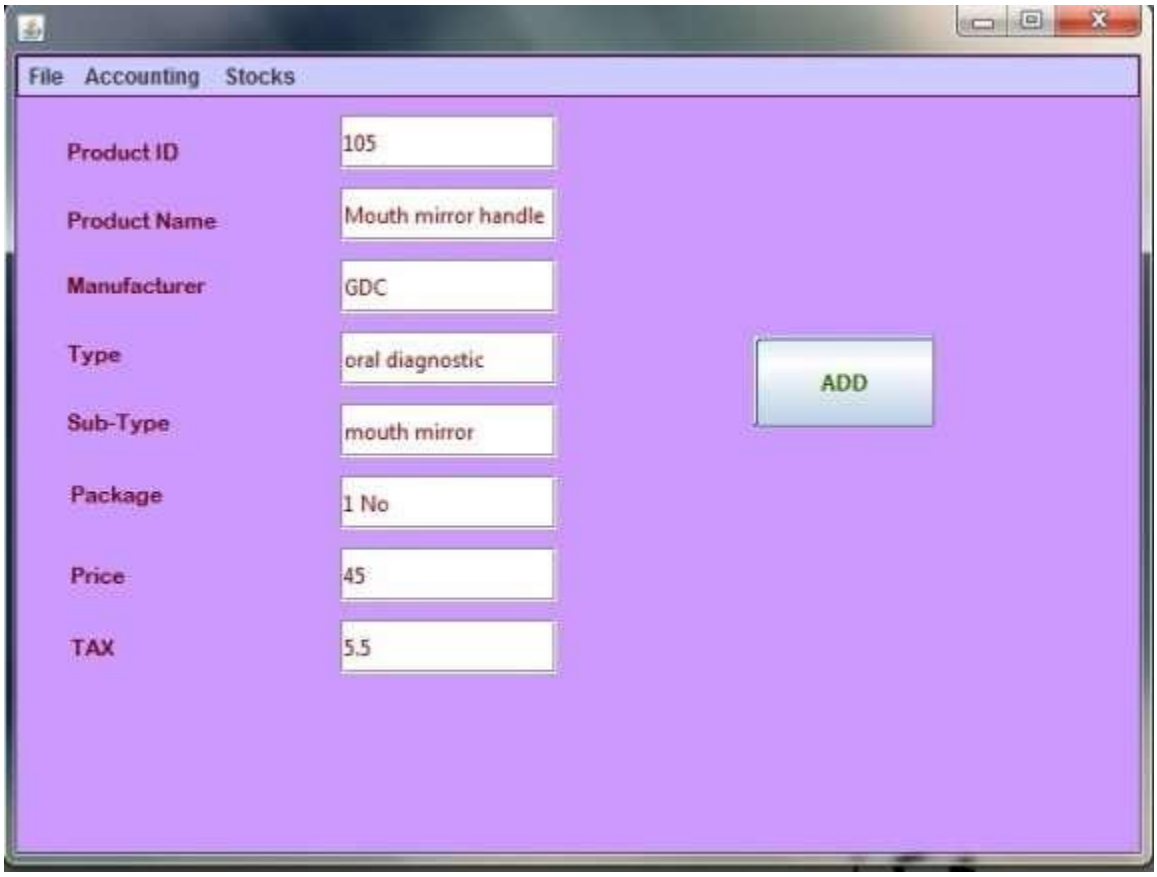


Fig 7.5 Adding new product to database

Product editing screen

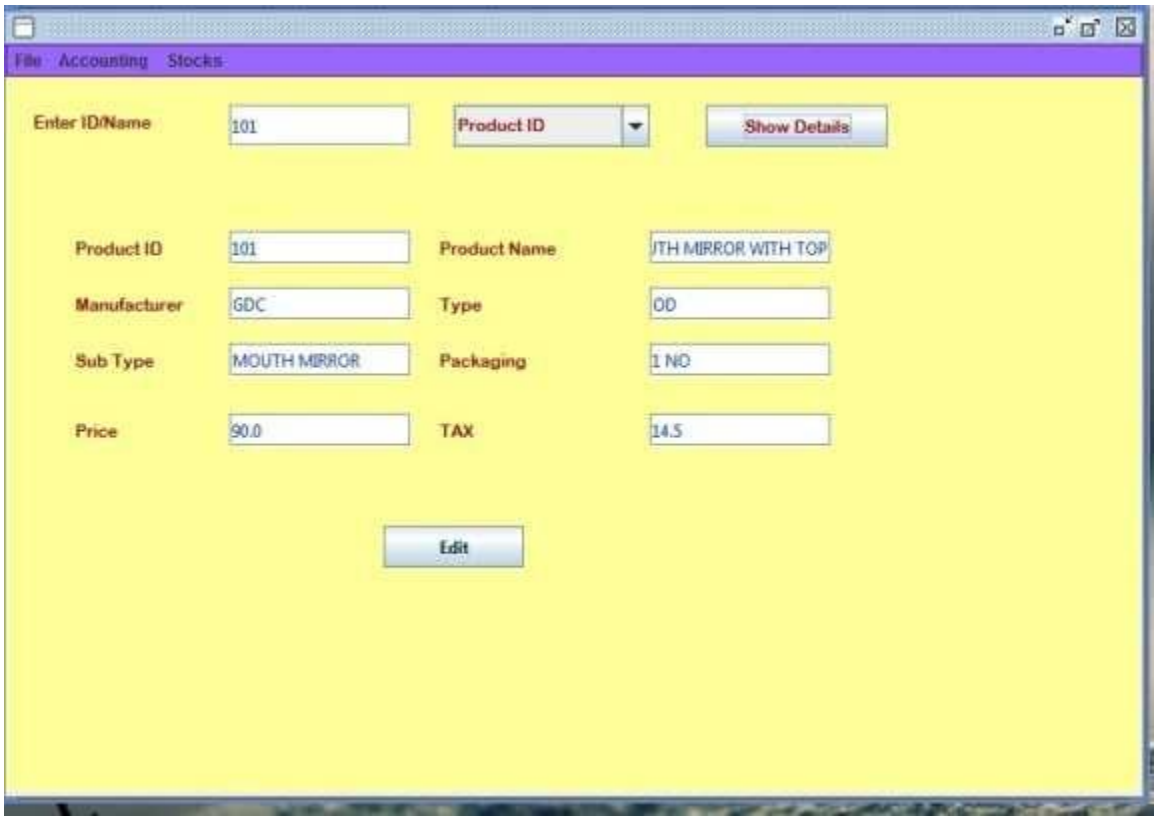


Fig 7.6 Editing a products details.

Purchase order screen

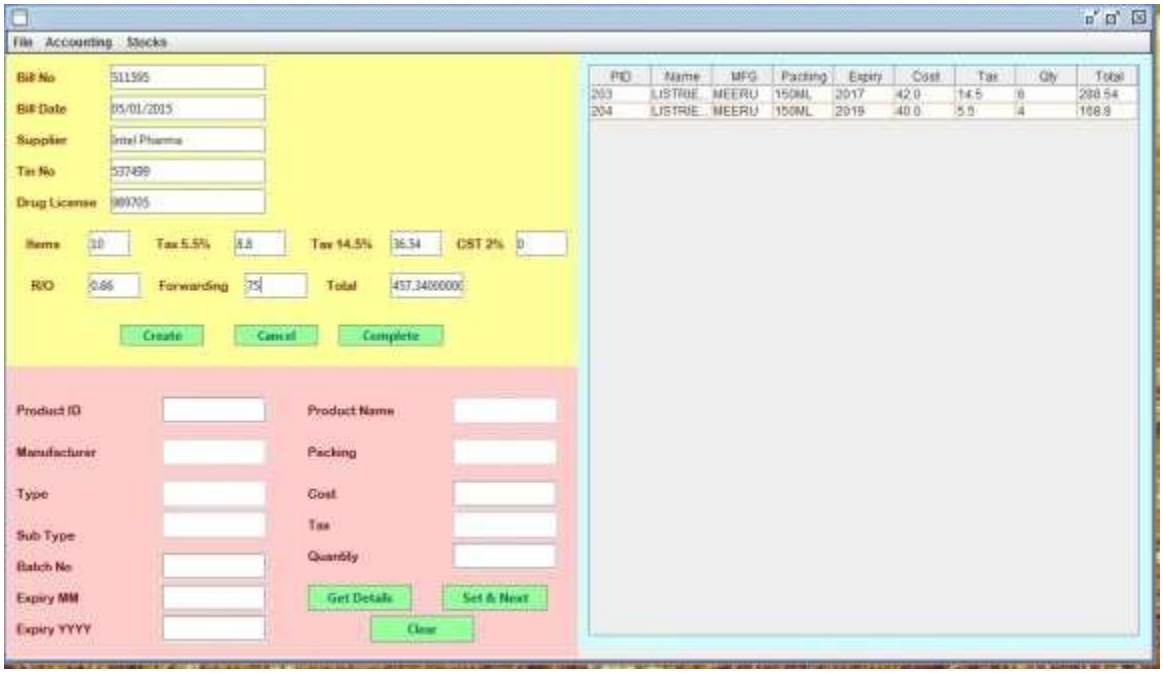


Fig 7.7 Purchase order details

Sales order screen

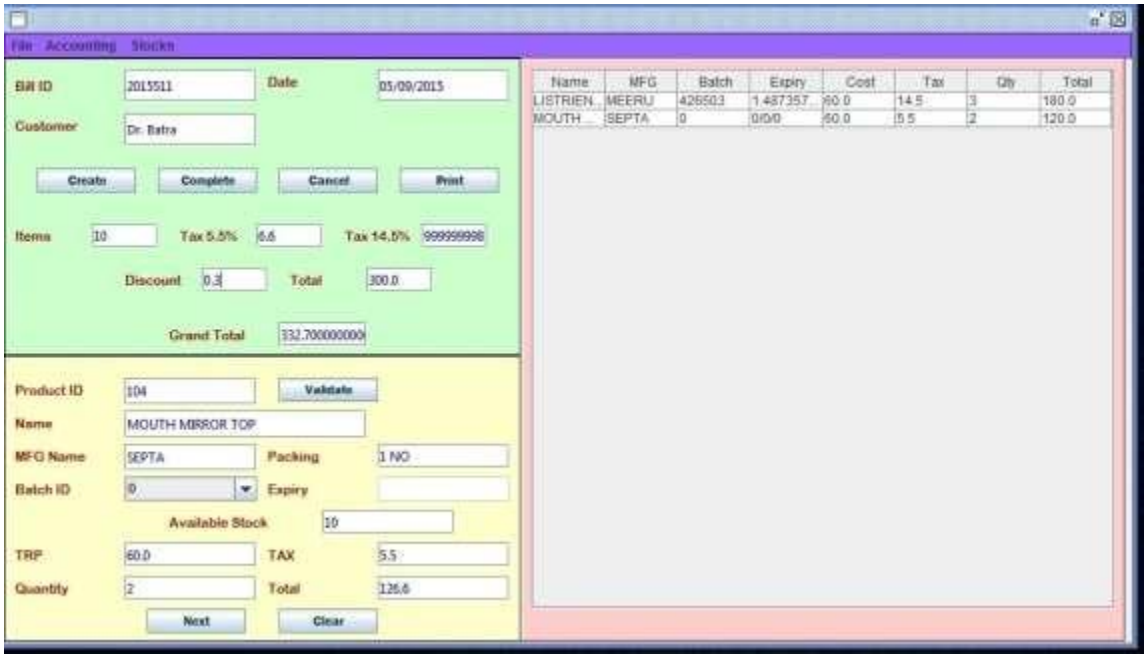


Fig 7.8 Sales order completion.

Product view screen

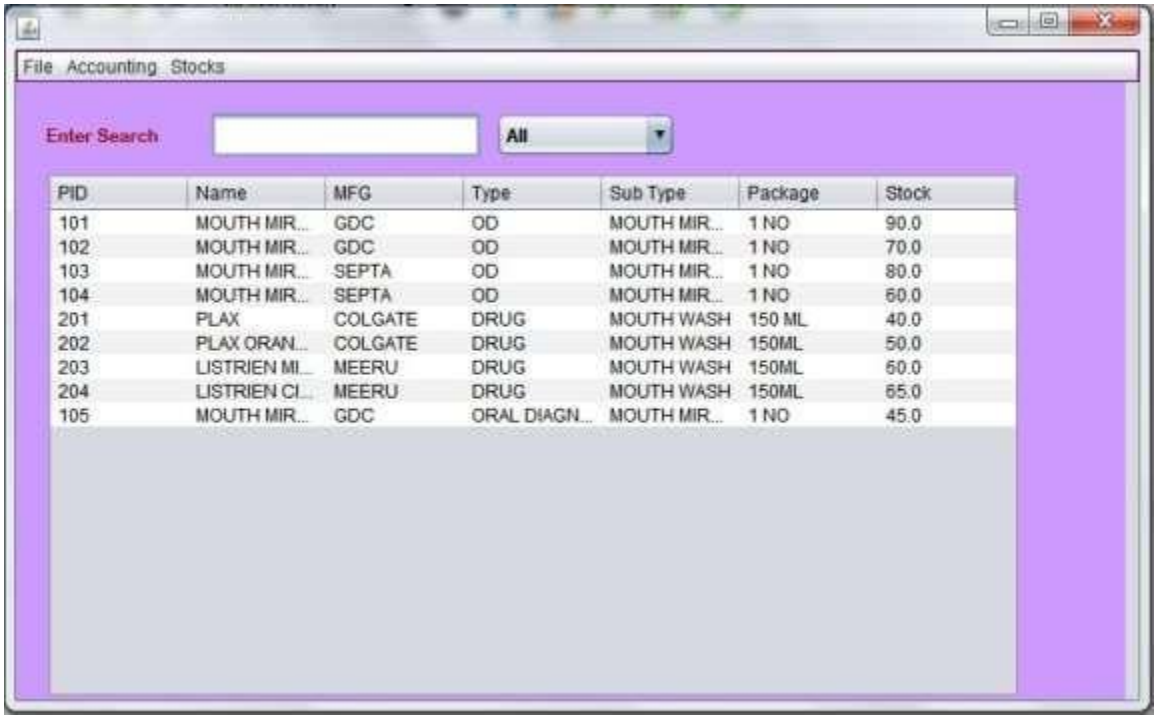


Fig 7.9 Viewing records.

Sales report screen

Fig 7.10 Shows the sales made.

Purchase reports screen

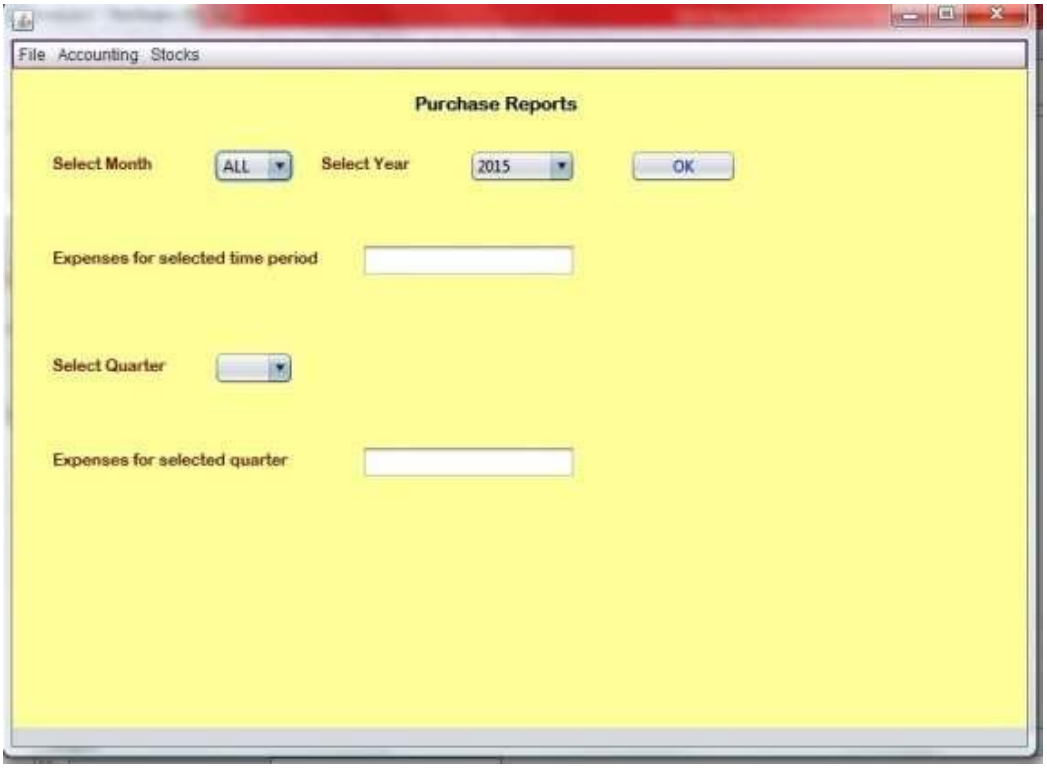


Fig 7.11 Shows purchase history.

TESTING AND RESULT

Test Case	Test Description	Expected Results	Result
Test product existence	To check if the product ID or name exists	Pop up dialog box with an error message.	Pass
Test bill existence	To check if bill with same ID exists in sales	Restrict creating bill & pop up dialog box with an error message.	Pass
Test for empty values	To find the empty fields before doing any operations	Display warning about empty fields.	Pass
Testing input	Checking items quantity in sales order	Display warning about withdrawing more items than available.	Pass
Check purchase updates	Checking if all the related records have been updated after a purchase order	Show a confirmation message after updating	Pass
Check sales updates	Checking if all the related records have been updated after a sales order	Show a confirmation message after updating	Pass

Table 8.1 Test cases and results

CONCLUSION

The software system provides an easier and more convenient way to manage their resources & billing for the sales they make. The software effectively reduces repetitive tasks done through manual labor. It is built on java which makes it light weight, machine independent & efficient. It can run on a computer that has java installed on it.

FUTURE ENHANSMENT

- Improvements in user interface.
- Tax returns filing.
- Paperless billing.
- Cloud backup of data.

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