Monitoring the Mechanical Components Inventory Management System

A project work done at

ISRO Satellite Centre, Bangalore.

Submitted in partial fulfilment of the requirements

for the award of the Degree of

MASTER OF COMPUTER APPLICATIONS

of Bharathiar University

Submitted by

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

Kumaraguru College of Technology

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CERTIFICATE

This is to certify that the project work entitled

MONITORING THE MECHANICAL COMPONENTS INVENTORY MANAGEMENT SYSTEM

Submitted to the

Department of Computer Science and Engineering

KUMARAGURU COLLEGE OF TECHNOLOGY

in partial fulfilment of the requirements for the award of the degree of Master of Computer applications is a record of original work done by Mr.K.Rajendiran, Reg.No. 9838M0514 during his period of study in the Department of Computer Science and Engineering, Kumaraguru College of Technology, Coimbatore under my supervision and this project work has not formed the basis of award of any Degree/Diploma Associateship /Fellowship or similar title to any candidate of any University.

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This is to certify that the project work entitled ***"Monitoring the Mechanical Components Inventory Management System"*** done by **Mr.K.Rajendiran**, Master Of Computer Application (MCA) student of **"Kumaraguru College of Technology"**, TamilNadu, during the partial fulfillment of the requirements for the award of MCA Degree by "**Bharathiar University**" is a bonafide record of the work carried out by him at **ISRO Satellite Centre, Bangalore** during the period of January 2001 to May 2001 under my guidance.

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DECLARATION

I hereby declare that the project entitled '**Monitoring the Mechanical Components Inventory Management System**', submitted to **Bharathiar University** as the project work of **Master of Computer Applications Degree**, is a record of original work done by me under the supervision and guidance of **Mr.B.V.Prasad Sci/Eng'SF', ISRO Satellite Centre, Bangalore** and **Mrs.D.Chandrakala M.E., Senior Lecturer, Kumaraguru College of Technology, Coimbatore** and this project work has not found the basis for the award of any Degree/Diploma/ Associateship/Fellowship or similar title to any candidate of any university.

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SYNOPSIS

The software entitled "**Monitoring the Mechanical Components Inventory Management System**" is basically intended to monitor and control the stock of mechanical components in Control Components Division of Control Systems Group effectively. This software has been proposed to be developed as a two-tier client/server based architecture with Java as a front end, JDBC as bridge and, MS-Access as a back end.

This software provides online help to the Control Components Division of Control Systems Group of ISRO Satellite Centre regarding total stock provision for mechanical components and also includes any common facilities like data storage, retrieving the data based on users choice and updating data in a user interface format.

This software is developed to overcome the difficulties such as processing time faced by the existing system, huge amount of paper work involved in the functioning of the office.

ACKNOWLEDGEMENTS

The satisfaction and euphoria that accompany the successful completion of any task would be incomplete without the mention of the people who are responsible for the successful completion of this project.

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1. INTRODUCTION

1.1 PROJECT OVERVIEW

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This software provides online help to the Control Components Division(CCD) of Control Systems Group of ISRO Satellite Centre regarding total stock provision for mechanical components and also includes any common facilities like data storage, retrieving the data based on users choice and updating data in a user interface format.

This software provides facility for inserting a new record based on code and updates the quantity field of database table if the code is

already existing in the database table, otherwise, it freshly inserts the record with new code and

provides facility for deleting an existing record based on code and updates the quantity field of the database table. This software also provides facility for viewing the current status of mechanical components and for updating the records of the database.

This software is developed to overcome the difficulties such as processing time faced by the existing system, huge amount of paper work involved in the functioning of the office.

from Soviet Union. Over the years, ISAC has planned and executed several satellite missions for Indian Space Research Organisation. Today ISAC has grown into a premier centre for Research and Development in Satellite technology. The centre has a flexible organisation structure striving to ensure best possible use of the resources. The core systems like control, structure, sensors, power, digital mechanisms, assembly integration, testing, etc., are involved in the operations. The direction of the Indian Space Programme for the decade 1900 – 2000 is basically driven by the application growth. The two key systems established for the operational services through IRS and INSAT series will be sustained and planning for the development of satellite which can carry our all services in India is foreseeing.

Control Systems Group

Control System Group (CSG) is one of the important groups in ISAC, which takes care of building the complex control system for the

1.2. ORGANISATION PROFILE

Indian Space Research Organisation (ISRO) is one of the prestigious organisations of our nation. The Indian Space Research Organisation Satellite Centre (ISAC) is a part of it. This is one of the organisations under the Department of Space, Government of Indian. Over the years, this organisation is playing a front – end role in the nation development and achievement in the field of Space Research. The organisations main activities are research in the field of space, design, launch and operationalise spacecraft for multiple uses such as communication, weather forecasting, remote sensing, resources survey and management.

About the Organisation

ISRO Satellite Centre(ISAC) is the leading centre for the Satellite design, fabrication and testing. It was established in the year 1972 as Indian Scientific Satellite Project (ISSP) to build the first Indian Satellite Aryabhatta, which was launched on 19th April 1975

spacecraft. In the recent past, the Control System is built around microprocessors to give flexibility in operation.

Control Simulation and HILS Facility Division (CSHFD) is one of the major divisions in CSG. Computer Facility Section is part of CSHFD. The facility comprises of Digital Workstations with VMS operating system, DEC Alpha based workstations based with digital UNIX as operating system and IBM PC s with Windows 95,98 and NT. All the heterogeneous systems are connected through LAN. The facility caters the computing power for the whole group in general and Engineers of Control Dynamics and Analysis Division in particular.

This project work is being taken up at Computer Facility section.

2. SYSTEM STUDY AND ANALYSIS

2.1 EXISTING SYSTEM

Feasibility Assessments

The main objective of a feasibility study is to test the technical, social and economic feasibility of developing the proposed project. This is done by investigating the existing manual process and generating new ideas about the new computerised mechanical components database system. The proposed project is evaluated from the technical view point and then later the mechanical components is accessed.

Technical Feasibility

The assessment of technical feasibility highlights the various system requirements in terms of hardware, software and input-output data.

Since the hardware and software requirements are met by using the current facilities available at the computer facility section in Control System Group are found technically feasible to develop the proposed project without need to purchase or procure any hardware or software package.

Social Feasibility

The proposed mechanical components database system meets the various requirements of the organisation since the system specification and the requirements to be met have been finalised taking into considerations, the lack of facilities not available in the existing system. Also due to the windows based self explanatory and ease of use of Graphical User Interface, it would not be difficult for the user to use it. The proposed project would actually improve the quality and quantity of the work. So, the social costs incurred for training and educating and consultation is greatly reduced.

Economic Feasibility

The proposed project must be justified by cost and benefit criteria to ensure better results with the efforts put in.

Cost benefit analysis is often used as a basis for accessing economic feasibility. This type of analysis is carried out for many capital development projects.

The factors for evaluation are

* Cost of operation of the existing and proposed system
* Cost of development of the proposed system
* Value of the benefits of the proposed system

(i) Cost of the existing and proposed systems

The manpower requirements for maintaining the proposed project is quite less since the computerised system developed to store and update mechanical components details will greatly reduce the existing manual processing.

The proposed system developed on the available windows 98 based Compaq PCs.Since the specified hardware and software requirements are completely available in the computer facility section of CSG, the cost of the proposed system is greatly reduced. Hence, there is literally no expenses incurred for the proposed project. The only cost incurred would be that of the system usage and resources.

(ii) Intangible benefits of the proposed system

There are a no. of benefits in the proposed program. They are

* Computerised rather than manual processing
* Better response, faster data entry, updation etc.. Also due to better methods of programming such as use of multithreading etc.
* Ease of use by the user due to windows based GUI. This involves use of widgets such as push buttons, text widgets etc.
* Use of Java as front end to develop GUI is to provide flexibility for dealing with database for a lay man rather than to know the database concepts.

2.2 PROPOSED SYSTEM

In order to avoid the drawbacks in existing system, a new automated system for storing the mechanical components details of CCD was proposed. The proposed system will store the mechanical components details in a database. The new system is an on-line multi user system. The database is kept in the server so that access is possible from clients. The application is protected with a login-id and password. For a valid entry, the user can enter the next screen where he/she is given option of viewing, inserting, deleting and updating the database. On selecting the view (select) option, the application will show the details of mechanical component based upon code .

2.3 REQUIREMENT ON NEW SYSTEM

Specific Requirements

Functional Requirements

Initially the user is allowed to register themselves with the user id and the password if he is a registered user else the user has to

register himself by filling the registration form. Once the registration is completed he is allowed to perform the required operations in the menus. Updations are done on the administration record based on the operations.

Information Processing Required

Once the registration is complete the user is allowed to select the type of account he opts.Based on the selection of the menus the particular menu will appear and the user has to fill all the details. After entered all the details it will be stored in the database. The user can add more record .This is more user friendly so that user can easily work with the system.

Performance Requirements

Security

Authorisation and authentication of the user and security measures available in the database. Administration process is hidden from the user, and authorised administrator is allowed to access.

Capacity

Capacity scales is concurrent users and also depends on the server.

2.4 USER CHARACTERISTICS

This product is used in ISRO stores. The store members are given a user id and password. They are alone eligible to use this software product.

PROGRAMMING ENVIRONMENT

3. PROGRAMMING ENVIRONMENT

3.1 HARDWARE ENVIRONMENT

System	:	IBM PC
Processors	:	Pentium II
Clock Speed	:	200MHZ
RAM	:	62 MB
Cache Memory	:	512 KB
FDD	:	1.44MB
Monitor	:	IBM Colour
H/D Capacity	:	7.83 GB
CD ROM Drive	:	48X

3.2 SOFTWARE USED

Operating system	:	Windows 98
Front End	:	Java 1.2 (SWING), JDBC
Back End	:	MS-Access

3.3 DESCRIPTION OF SOFTWARE USED

Introduction to JAVA

About JAVA

The Java language is a remarkable example of programming language evolution. Java builds on familiar and useful features of C++ while removing its complex, dangerous and superfluous elements. The result is a language that is safer, simple and easier to use.

Features of JAVA are :

Platform independence

The capability of the same program to run on different platforms and operating systems-is one of the most significant advantages that java has over other programming languages.

JAVA is Familiar and Simple

If you have ever programmed in C++, you will find Java's appeal to be instantaneous. Since Java's syntax mirrors that of C++, you will be able to write Java programs within minutes. Your first

programs will come quickly and easily, with little programming overhead.

You will have the feeling that you have eliminated a lot of clutter from your programs-and you will have. All the cryptic header files and pre-processor statements of C and C++ are gone. All the arcade #define statements and type definitions have been taken away.

Java programs simply import the software packages they need. These packages may be in another directory, on another drive, or on a machine on the other side of the Internet. The Java compiler and interpreter figure out what objects are referenced and supply the necessary linkage.

JAVA is Object-Oriented

If you think C++ is an Object-Oriented Programming language, you are in for a big surprise. After using Java to write a few programs, you'll get a better feeling for what object-oriented software is all about.

Java deals with classes and objects, pure and simple. They aren't just more data structures that are available to the programmer-they are the basis for the entire programming language.

Java provides all the luxuries of object-oriented programming: class hierarchy, inheritance, encapsulation and polymorphism-in a context that is truly useful and efficient.

Once you have begun developing software in Java, you have two choices :

* Build on the classes you have developed, thereby reusing them.
* Rewrite your software from scratch, copying and tailoring useful parts of existing software.

Java Is Safer and More Reliable

Java is safer to use than C++ because it keeps you away from doing the things that you do badly, while making it easier to do the things that you do well.

Java won't automatically convert data types. You have to explicitly convert from one class to another. C++, under the most undesirable conditions, will automatically convert one to another. C++ pointer don't exit in Java. You can no longer access objects indirectly or by chance. You don't need to. You declare objects and references those objects. Complex pointer arithmetic is avoided.

Java Is Secure

If you have a skilled hacker a program written in C or C++ and told him to find any security flaws , there are half a dozen things that he would immediately look for gaining access to the operating system, causing an unexpected return of control, overwriting critical memory areas, acquiring the ability to spoof or modify other programs, browsing for security information, and gaining unauthorised access to the file system.

Why is C or C++ more vulnerable than Java? When a programmer develops software, he or she usually focuses on how to get the software to work correctly and efficiently. Every time a

Java-enabled browser downloads a compiled Java class, such as an applet, it runs the risk of running Trojan horse code. Because of this ever-present threat, it subjects the code to a series of checks that ensure that it is correct and secure.

The Java runtime system is designed to enforce a security policy that prevents execution of malicious code. It does this by remembering how objects are stored in memory and enforcing correct and secure access to those objects according to its security rules. It performs bytecode verification by passing compiled classes through a simple theorem proven that either proves that the code is secure or prevents the code from being loaded and executed. The class is Java's basic execution unit and security is implemented at the class level. The Java runtime system also segregates software according to its origin. Classes from the local system are processes separately from those of other system.

Java enabled browsers, such as Hot Java, allow the user to control the accesses that Java software may make of the local system. When a Java applet needs permission to access local resources, such

as files, a security dialogue box is presented to the user, requesting explicit user permission.

Java Is Multithreaded

Java, like Ada, and unlike other languages, provides built-in language support for multithreading. Multithreading allows more than one thread of execution to take place within a single program.

This allows your program to do many things at once : make the Duke dance, play his favourite tune, and interact with the user, seemingly all at the same time. Multithreading is an important asset because it allows the programmer to write programs as independent threads, rather than as a convoluted gaggle of intertwined activities. Multithreading also allows Java to use idle CPU time to perform necessary garbage collection and general system maintenance, enabling these functions to be performed with less impact on program performance. Synchronisation time in a way that is thread safe.

Java Is Interpreted and Portable

While it is true that compiled code will almost always run more quickly than interpreted code, it is also true that interpreted code can usually be developed and fielded more inexpensively, more quickly, and in a more flexible manner. It is also usually much more portable.

Java, in order to be a truly platform-independent programming language, must be interpreted. It does not run as fast as compiled native code, but it doesn't run much slower, either. The advantages of being interpreted outweigh any performance impacts. Because Java is interpreted, it is much more portable. If an operating system can run the Java interpreter and supports the Java API, then it can faithfully run all Java programs.

Interpreted programs are much more easily kept up-to-date. You don't have to recompile them for every change. In Java, recompilation is automatic. The interpreter detects the fact that a program's bytecode file is out-of-date with respect to its source code file and recompiles it as it is loaded.

Because of Java's interpreted nature, linking is also more powerful and flexible. Java's runtime system supports dynamic linking between local class files and those that are downloaded from across the Internet. This feature provides the basis for Web programming.

Java Is the Programming Language of the Web

Java has become the de facto programming language of the Web. Nearly every major software company is licensing it. It has some offshoots and potential competition such as Javascript, VB script, and Bell lab's inferno, but it remains the first Web Programming language and the most powerful language for developing Platform-independent software.

The Java API

The Java API is what makes Java attractive and useful. It consists of a set of packages that are distributed with the JDK as class libraries. These packages provide a common interface for developing Java programs on all Java platforms. The Java API furnishes all the

capabilities needed to develop console programs, window programs, client and server networking software, applets, and other applications. It is the difference that takes Java from being a really good programming language to making it a very powerful and efficient programming environment.

Java packages contain classes, interfaces, and exceptions. Classes form the basis for object-oriented software development in Java. They contain variables and methods. Variables are data containers. Methods implement operations on the class and its variables. Interfaces are collections of related methods. Exceptional handling should be used to process only exceptional situations.

About SWING

Swing is a set of user interface components that is implemented entirely in Java. We can use a look and feel that is either specific to a particular operating system we can also design our own look and feel. Swing is a set of classes that provides more powerful and flexible

components that are possible with AWT. In addition to the familiar components, such as Buttons, Checkboxes, and lables, Swing supplies several exciting additions, including tabbed panes, scroll panes, trees, and tables. Even familiar components such as buttons have more capabilities in Swing. For example, a button may have both an image and a text string associated with it. Also, the image can be changed as the state of the button changes.

Swing Features

Lightweight Components

Starting with the JDK1.2, the AWT supports lightweight components development. For a component to qualify as lightweight, it cannot depend on any native system classes, also called "peer" classes. In Swing, most of the components have their own view supported by the Java look-and-feel classes. Thus the components do not depend on any peer classes for their view.

to put relational DBMS to put behind their web sites and sought flexible, affordable and extensible tools to accomplish this need.

Until now, the only way to access a database through Java has been to use streams in Java to call and access CGI (Common Gateway Interface) programs. Calling a CGI script from Java lets you call a separate program that accesses the database and return results. Again, to solve the problem of database access in Java, Sun has introduced Java Database Connectivity, which comes with JDK version 1.2. JDBC enables Java applications to connect to any database using various drivers and a new set of Java API objects and methods. The reason to use JDBC is that it is noticeably faster than CGI approach.

The JDBC provides various objects for connecting to a database, executing SQL statements and executing stored procedures.

JDBC is a Java API for executing SQL statements. It is designed to insulate a database application developer from a specific database vendor and consists of a set of classes and interfaces written in the

Java programming language. This enables database developer to write database applications using a pure Java API.

Briefly, JDBC is the Java API which facilitates the following three aspects of database processing :

* Establishing a connection with a database
* Send SQL Stmts. And
* Process the results
* The JDBC API defines Java classes to represent database connections, SQL statements, result sets and database metadata.

In terms of Java classes, the JDBC API consists of

* java.sql.Driver
* java.sql.DriverManager
* java.sql.Statement
* java.sql.PreparedStatement
* java.sql.CallableStatement
* java.sql.ResultSet

JDBC consists two main layers :

The JDBC API, which supports Java application to JDBC Driver Manager communications and the JDBC driver API which supports JDBC Driver Manager to ODBC Driver communications. The JDBC Driver Manager is designed to handle communications with multiple drivers of different types. All three drivers are depicted in fig.

The first is the JDBC-ODBC driver which translates 'JDBC Method Calls' into 'ODBC Function Calls'. The second driver is the JDBC-Net Bridge which uses a published protocol to communicate with a remote database listener and front-ends with ODBC Driver Manager. The last type of bridge is direct JDBC driver that communicates directly with a specific database system.

Java Interfaces

Java provides various interfaces for connecting to the database and executing SQL statements. Using the JDBC API interface, you can execute normal SQL statements, dynamic SQL statements, and stored

procedures that take both IN and OUT parameters. The interfaces provided in the JDBC API are

* **Callable Statement**

Enables you to execute stored procedures that have OUT parameters.

* **Connection**

The interfaces that connects your Java application to the database.

* **Driver**

The interface that is built specifically for each individual vendor database.

* **Prepared Statement**

An interface used to execute dynamic SQL statement and stored procedures.

* **Result Set**

An interface that accepts results from a SQL select statement.

* **Statement**

An interface for executing normal SQL statements and stored procedures.

The Callable Statement Interface

The Callable Statement interface provides methods for executing stored procedures that return OUT parameter values . The Callable Statement object inherits the Prepared Statements object, but also add various methods for registering parameters to be OUT parameters and also provides to get the parameters passed back from the stored procedure.

The Connection Interface

The Connection interface is the object that provides your Java applications with a connection to the database. This object can be used

to create all of the various Statement objects for executing SQL statements and stored procedures. It also enables you to set the transaction properties for the connection.

The Driver Interface

The Driver interface object is a database specific Driver object provided by the JDBC vendor. It contains specific information about connecting your Java application. It also provides information about the database(for example, the version information).

The Prepared Statement Interface

The prepared Statement interface enables you to execute dynamic SQL statements and stored procedures. Dynamic SQL statements differ from normal SQL statements in that values in dynamic statements are not known at the time of creation. The interface lets you set the various parameters in dynamic statements with specified data values.

The Result Set Interface

The Result Set interface is the object that is created and used to get information from a SQL Select statement. A SQL Select statement returns a cursor that is used by the Result Set interface to navigate through the results returned by the Select statement. It provides various methods for getting information from the different columns contained in the cursor.

The Statement Interface

The Statements interface is created from the Connection object and can be used to execute standard SQL statements and stored procedures. The object provides two main methods : execute Query() and execute Update(). These methods let you execute SQL queries and SQL updates. The execute Query() method will return a Result Set object. This object is the ancestor for both the Prepared Statement and Callable Statement interfaces.

Java Objects

Java also provides a handful of objects that you can use in your Java applications. Most of the objects are used to provide Java with some of the database specific data types available in most databases.

Driver Manager

Provides another way to make a connection to the database.

The Driver Manager Object

The Driver Manager object provides another way to make a connection to the database. The object is mainly used to manage JDBC Driver objects and can be used to create a connection to the database. It provides various methods for registering drivers , getting connections , and sending information to the database output stream.

The Date Object

The Date object is inherited from the normal Java Date object, but provides methods for accessing the various values within the Data object.

JDBC Exceptions

When an error occurs in Java, an exception is thrown. Any Java method that "throws" an exception must be "caught" by the user. The JDBC API contains three new exceptions that can be caught identifying various errors in executing the JDBC methods. The three JDBC exceptions are listed here.

The Data Truncation Exception

The Data Truncation exception is thrown whenever JDBC unexpectedly truncates a data value. The exception provides methods for getting information about the data value that was truncated as well as to get information about the truncation error.

The SQLException Exception

The SQLException exception is thrown by almost all methods in the JDBC API. This exception provides various methods for getting information about the error and the current state of the SQL transaction.

Pluggable Look-and-Feel

This feature enables the user to switch the look-and-feel of Swing components without restarting the application. The Swing library supports a cross-platform look-and-feel that remains the same across all platform wherever the program runs. The native to whatever particular system on which the program happens to be running including Windows and Motif. The Swing library provides an API that gives great flexibility in determining the look-and-feel of application. It also enables you to create your own look-and-feel.

INTRODUCTION TO JDBC

About JDBC

It was only a while ago when most websites were delivering simple web pages that amounted to nothing more than fancy billboards. Many organisations that were publishing on the web has now moved to complex features including Java based content and navigation tools, online ordering system etc. They have found the need

The SQLWarning Exception

The SQLWarning exception is generated when the database issues a warning. The warning is sent silently to the object that caused the warning to be encountered.

4. SYSTEM DESIGN AND DEVELOPMENT

Using the analysis done earlier, the system can be designed as follows. The system must have a user friendly GUI to get the input values from the user. So, the GUI has been carefully designed with all the required inputs.

Flow charts are the most widely used graphical representation for procedural design. As a part of procedural design, the flow charts for the system are developed.

4.1 INPUT DESIGN

The Graphical User Interface was designed using different widgets in gradual hierarchy. Different screens are created and designed using different layouts, frames, panels, text areas, text fields, labels, buttons etc. Some dialogue boxes are also created to make it user friendly.

4.2 OUTPUT DESIGN

The expected results are shown for issues and receipts in the form of status. The status will display all the components in the database. The retrieved information was displayed in the form of table format.

The Choice will be given for the receipts and the issues in the status module. The status module will wait for the user's options. According to the option the information will be displayed. The entire data will be viewed in the status module.

4.3 DATABASE DESIGN

The login information was stored in the login table, which is given below. The User Name and the Password validations are checked by this table.

Login Table

Field Name	Data Type	Description
Uid	Text	UserId
Pwd	Text	Password

Receipt Table

Field Name	Data Type	Description
Code	Text	Code of Material
Indname	Text	Indentor Name
Purpose	Text	Buying Purpose
Qty	Number	Material Quantity
Loc	Text	Location
Mattyp	Text	Material type
Length	Number	Material Length

Issue Table

Field Name	Data Type	Description
Code	Text	Code of Material
Indname	Text	Indentor Name
Purpose	Text	Issuing Purpose
Qty	Number	Material Quantity
Loc	Text	Location
Mattyp	Text	Material type
Length	Number	Material Length

Component Table

Field Name	Data Type	Description
Matcode	Text	Code of Material
Matname	Text	Material Name

4.4. PROCESS DESIGN

Here for entering into the system, the user has to type the login and password.

First the login screen

When user enters the user id along with password the next main menu which contains all the other menus will be displayed. The system will check for the user name ie user id and its appropriate password. If both the things are correct the user will get the next menu. If user id or password anyone given is wrong suddenly the system will give the message as " the user id or password is incorrect".

* Receipt Menu :

  Add new items to database

* Issue Menu :

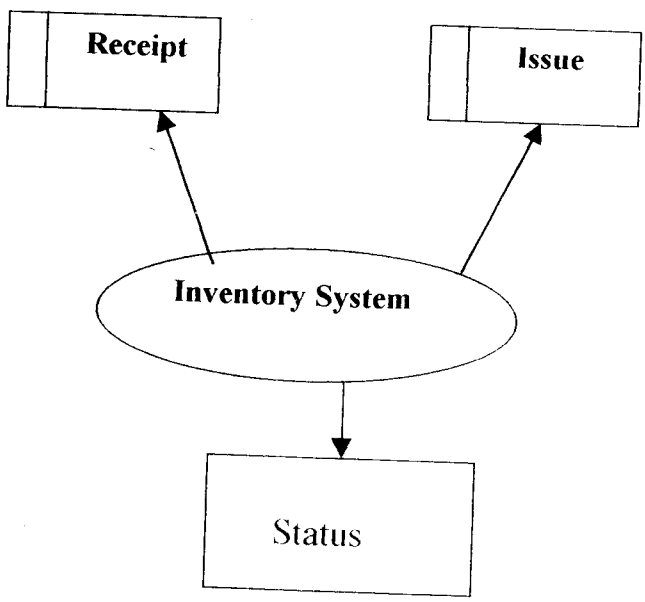
  Delete an item from database and view the table

* Status Menu :

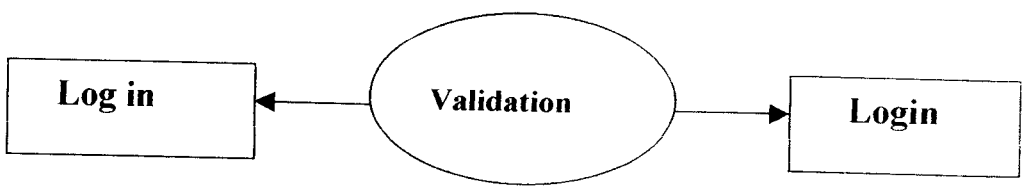
  Display item existing in database and update that item

These are the three check boxes, when the user selects the first check box, the following menu is displayed which requests the user to enter the needed informations.

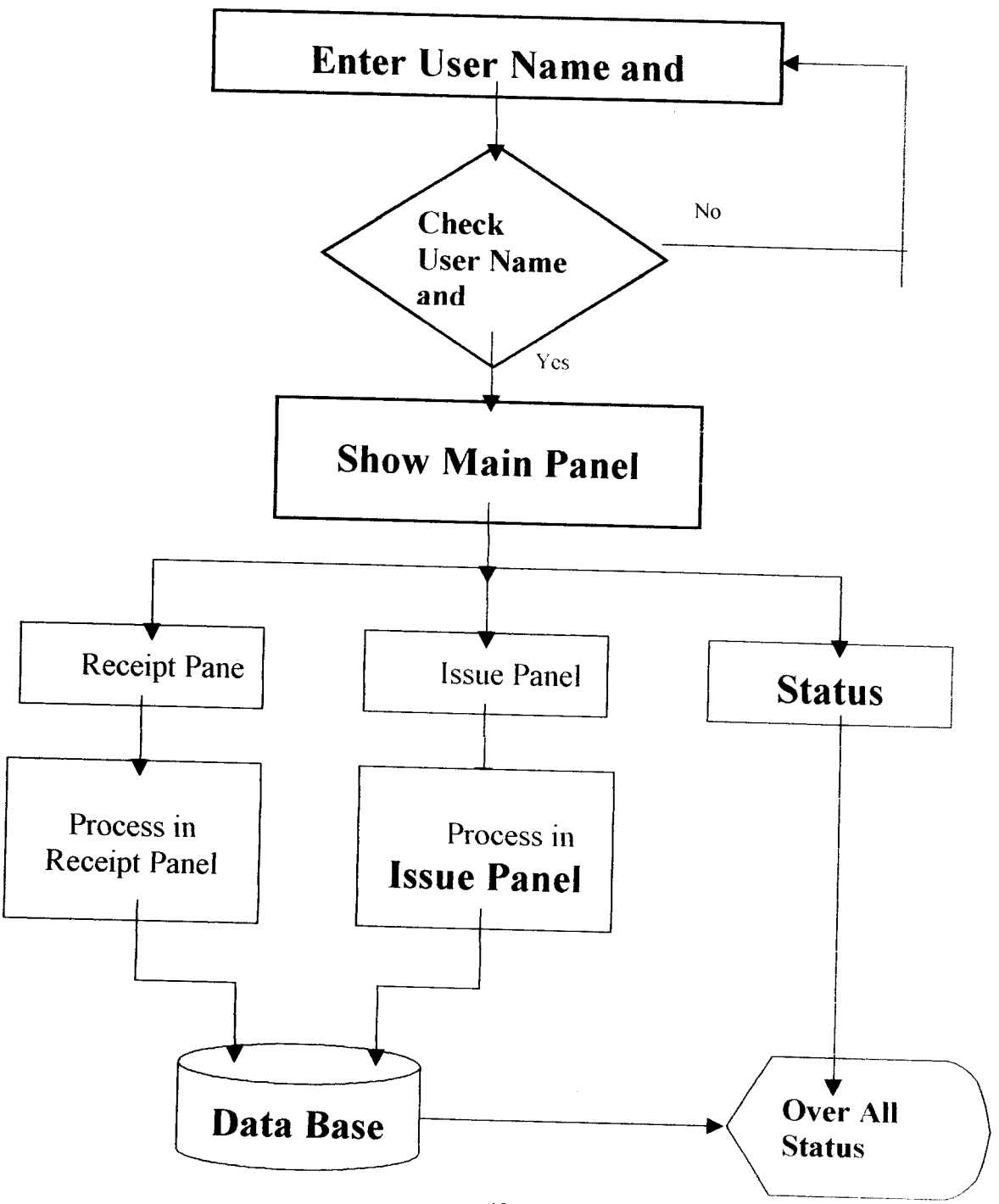
Data Flow Diagram



User Verification



FLOW OF THE PROGRAM



SYSTEM IMPLEMENTATION AND TESTING

2. Integration Testing

3. Validation Testing

4. System Testing

Unit Testing

Unit testing focuses verification effort on the smallest unit of software design, the module. Using the procedural design, as a guide, important control paths are tested. Each individual module is tested for errors.

The module insert is tested by entering details of mechanical components with the code as input and checking the entered data in select and update modules. Data deletion should be checked by entering the code as the input and check the list of details of mechanical component for deletion of that record from the database.

Integration Testing

Integration testing is a systematic technique for constructing the program structure. While conducting tests to uncover errors associated

with interfacing. The objective is to take unit tested modules and build a program structure that has been dictated by the design.

All the individual modules are combined and are tested by taking the test data from the database.

Validation Testing

Validation testing is done to validate the inputs given by the user. The user inputs are checked for their correctness and range. If there are errors, the error message is given and the user is prompted again to enter new value.

System Testing

System testing is actually a series of different tests whose primary purpose is fully exercising the computer-based system. The software developed is tested with different kinds of data.

6.CONCLUSION

The Software has created as user friendly to all the users. The computerisation is made with intention of making the activities to the user with ease.

The package has graphical user interface and help document in such away that irrespective of computer familiarity, the user is able to interact with the system easily.

During code design of the software many difficulties were encountered. All these difficulties are analysed and great efforts were taken to bring an accurate and credible software package.

SCOPE FOR FUTURE DEVELOPMENT

7. SCOPE FOR FUTURE DEVELOPMENT

The client/server program can be developed using RMI (Remote Method Invocation) for accessing data from different methods. Hence, data stored in different databases can also be invoked simultaneously. This system can be further enhanced by putting this model in servlet programming where the application can be invoked from Internet Explorer or any web browser (like Netscape Navigator etc.). Thus improving this to less client installation process. As in servlet programming, the HTML pages are embedded or developed during coding, thereby no need of installing the corresponding html files of the applet. Hence, the system will achieve efficient space management.

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BIBLIOGRAPHY

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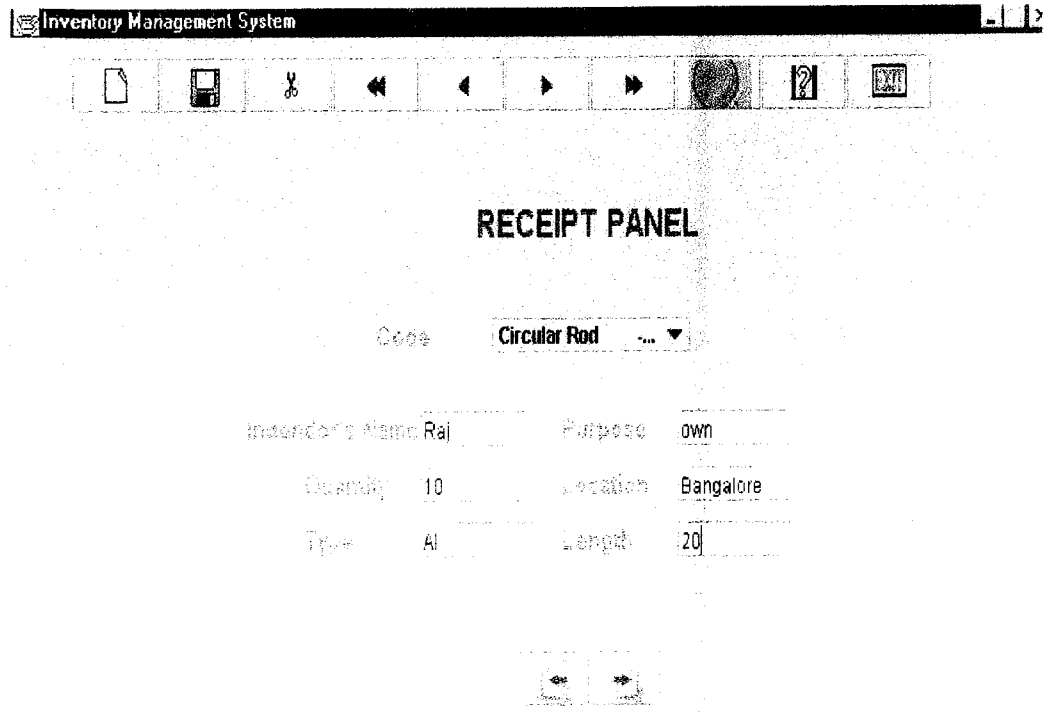
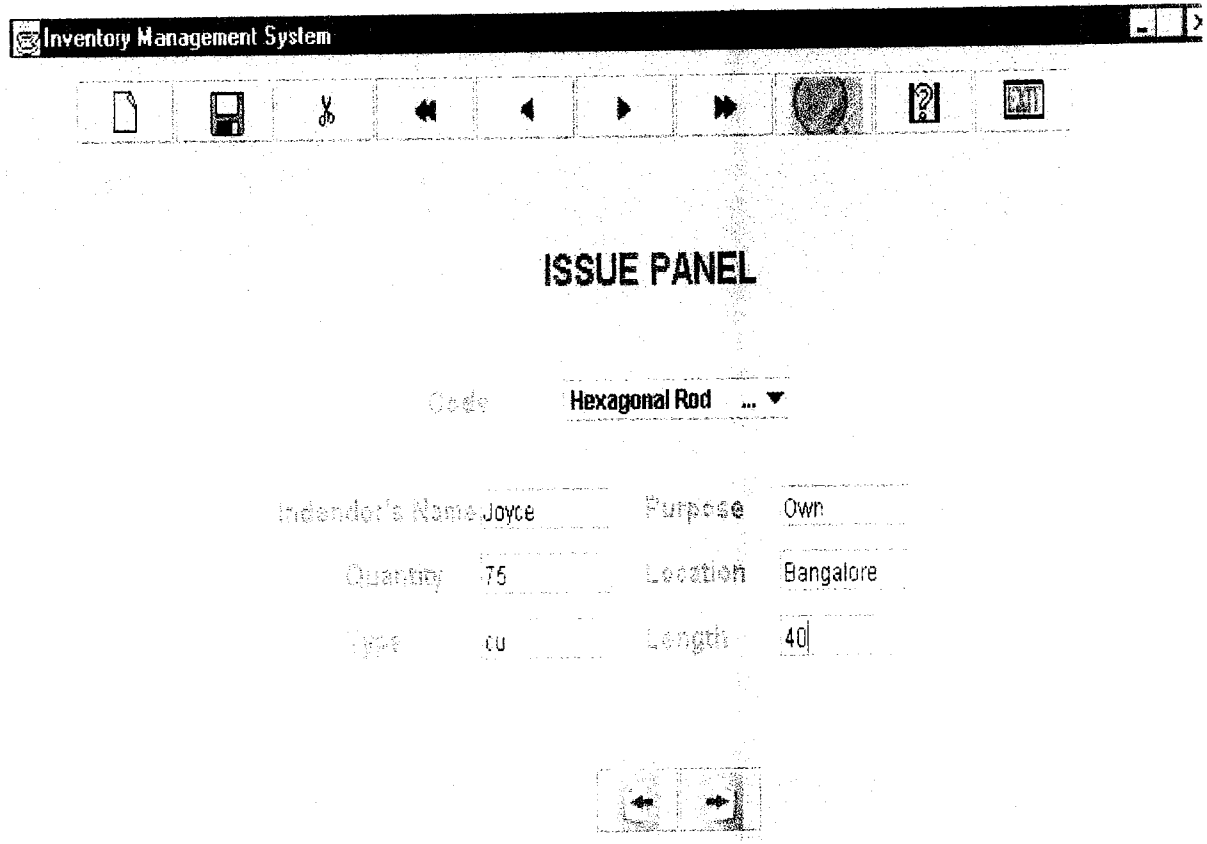
MAIN PANEL

- *RECEIPT*
- *ISSUE*
- *STATUS*


Inventory Management System
RECEIPT PANEL
Code
Circular Rod
Raj
Purpose
own
10
Bangalore
Al
20


Inventory Management System
EXIT
ISSUE PANEL
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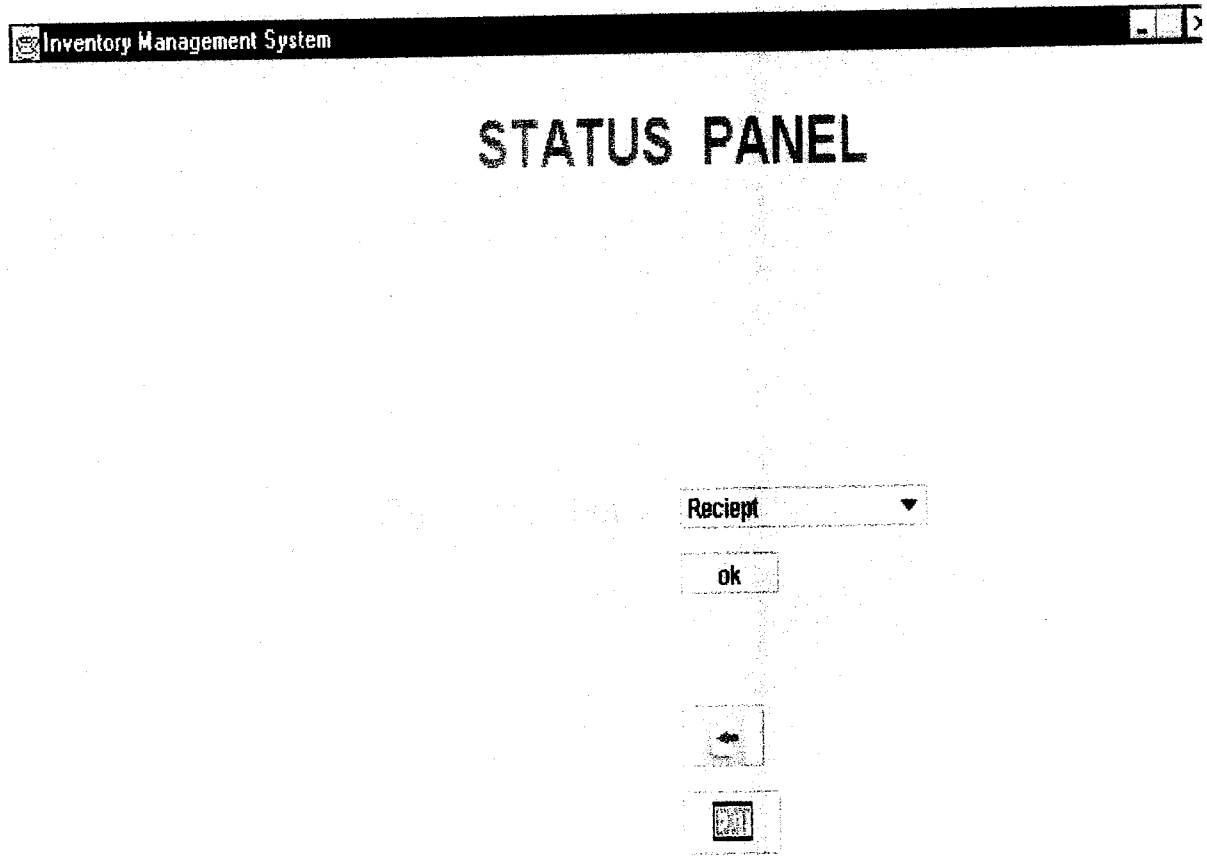
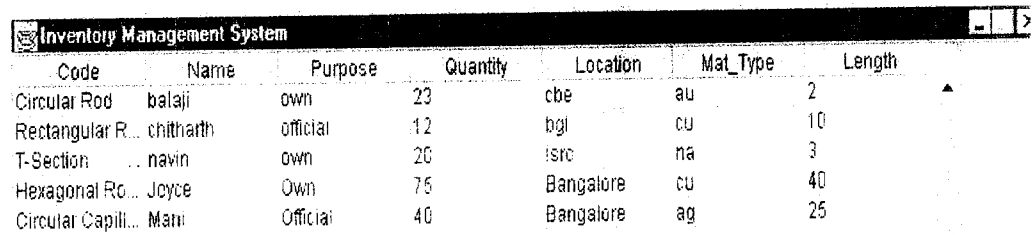
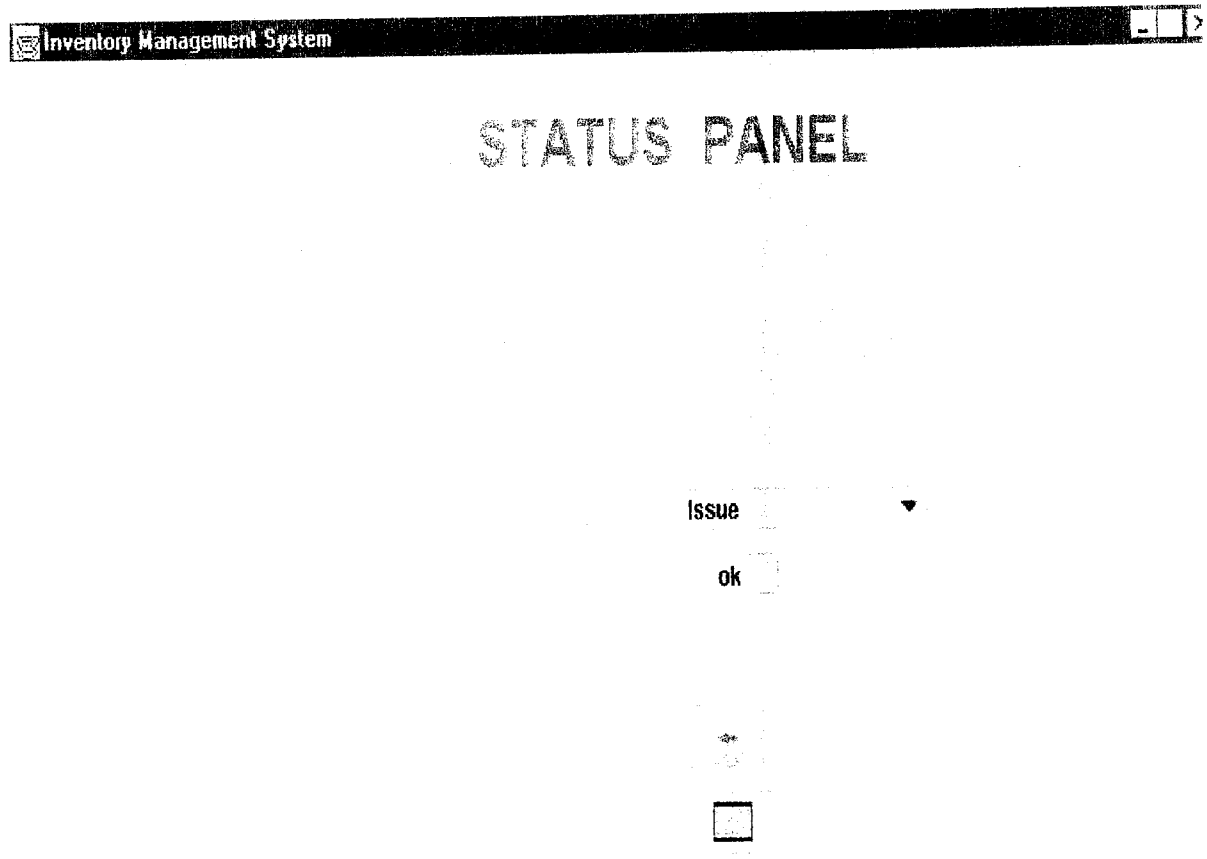
Hexagonal Rod
Indendor's Name
Joyce
Purpose
Own
Quantity
75
Location
Bangalore
Type
cu
Length
40


Inventory Management System
STATUS PANEL
Reciept
ok


Inventory Management System
Code
Name
Purpose
Quantity
Location
Mat_Type
Length
Circular Rod
balaji
own
23
cbe
au
2
Rectangular R...
chitharth
official
12
bgl
cu
10
T-Section
navin
own
20
isrc
na
3
Hexagonal Ro...
Joyce
Own
75
Bangalore
cu
40
Circular Capili...
Mani
Official
40
Bangalore
ag
25


Inventory Management System
STATUS PANEL
Issue
ok