

SUPPLY CHAIN MANAGEMENT SYSTEM USING THE PROPERTY OF GRAPHICAL USER INTERFACE

¹Venkatesan.M, ²Namachivayam.A

¹Faculty of Marine Engineering, ²Faculty of Computer Science and Engineering,
College of Marine Science and Technology, Massawa, Eritrea, North East Africa

kmv1975@gmail.com

Abstract:

Manufacturing companies use the supply chain management system (SCM). SCM is a system for managing raw material and finished goods requirements in a manufacturing process. It is a set of techniques that use inventory data, requirements for materials and goods etc. The system also makes recommendations for purchasing, sale and send for job work of raw materials. The main objective of the project is to maintain the raw materials and finished goods in the manufacturing organization. In this software the information is stored in the database, which prepares reports when asked, and a very reliable front-end structure with GUI property to make the user understand and work in a right way even though he/she is a layman.

This project is developed using Oracle Developer 2000 Forms 6i as front-end, Oracle 8.0 as a back-end, and Oracle Developer 2000 Reports 6i as reporting tool.

Key words: SCM – modules - Graphical user interface – oracle - database.

1. 0 Introduction:

Supply Chain Management- System for integration and tracking of finished goods indents to raw materials procurement is used for maintaining the materials in manufacturing company. The process in this system is, first orders are taken from the customer or head office. The availability of stock is checked, if the stock is available then dispatched against the requirement. If not then production process is

started. In production process, the raw material is checked and the required raw material is produced. After the production over the item are checked for quality. Then the finished goods are added to the stock and dispatched to the customer or head office.

The modules in this project are:

Purchase:

This module facilitates the purchase of raw materials and finished goods from the suppliers and if raw materials are not ok then sends back the raw material to the supplier. Purchase order information is stored in database and updates the stock.

Sale:

This module facilitates the sale of raw materials and finished goods to the clients and if raw materials are not ok then the raw material sale comes back. Sale order information is stored in database and updates the stock

Job work:

This module facilitates the job work order process done raw material issue for job work and information is stored in database. When raw material is converted into finished goods than finished goods receive. If raw material is not used for job work then remaining raw materials collected back and update stock.

Master:

This module is the important module in this project. It provides information about the required raw material for a particular item, current stock, supplier, and client.

Report:

This module gives the total information of all the transaction taken place in the organization. It handles the information about the current stock of raw material and finished goods. Sale and purchase reports control all the inflow and outflow at revenue. Job work reports give the information about all job work order.

1.1 Life cycle model:

Prototyping:

The goal of a prototyping-based development process is to counter the limitation of the waterfall model. The basic idea here is that instead of freezing the requirements before any design or coding can proceed, a throwaway prototype is built to help understand the requirements. The prototype is developed based on the currently know requirements. Development of the prototype obviously undergoes design, coding, and testing, but each of these phases is not done very formally or thoroughly. By using this prototype, the client can get an actual feel of the system, because the interactions with the prototype can enable the client to better understand the requirements of the desired system. This results in more stable requirements that change less frequently.

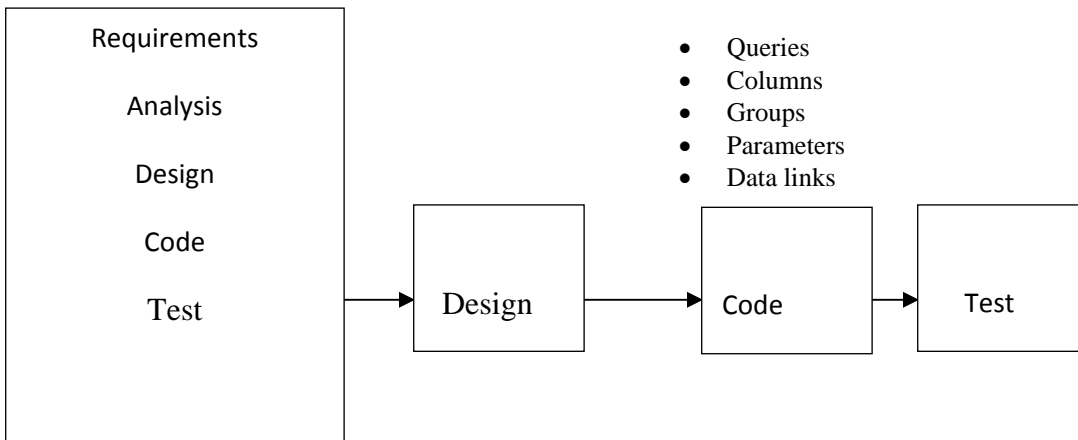


Fig – 1 Life cycle model

The development of the prototype typically starts when the preliminary version of the requirement specification document has been developed. At this stage, there is a reasonable understanding of the system and its needs and of which needs are unclear or likely to change. After the prototype has been developed. The end

users and clients are given an opportunity to use the prototype and play with it. Based on their experience, they provide feedback to the developers regarding the prototype: what is correct, what needs to be modified, what is missing, what is not needed, etc. based on the feedback, the prototype is modified to incorporate some of the suggested changes that can be done easily, and then the users and the clients are again allowed to use the system. this cycle repeats until, in the judgment of the prototypes and analysts, the benefit from further changing the system and obtaining feedback is outweighed by the cost and time involved in making the changes and obtaining the feedback.

1.1.1 Understanding the Parts of a Report

Two models determine the look and feel of a report:

- The data retrieved for a report is defined in the **data model**.
- The style of a report is defined in the **layout model**.

1.1.2 Understanding the Data Model

The data model is composed of objects that define the data to be included in a report. Data model objects include:

- Queries
- Columns
- Groups
- Parameters
- Data links

1.1.3 Understanding the Layout Model

The layout model is composed of objects that define the positioning and appearance of data and other objects in a report. Layout model objects include:

- Repeating frames
- Frames

- Fields
- Anchors
- Boilerplate objects
- OLE2 objects
- Buttons

2..1 HARDWARE REQUIREMENTS

Processor: Pentium III (733 MHz)

Memory :128 MB RAM

Hard Disk :10 GB

2.2 SOFTWARE REQUIREMENTS

Operating System: Windows 98 / Windows2000 / Windows NT

GUI : Oracle Developer 2000 (D2K)

Data Base : Oracle 8i

3. 0 Functional Requirement

1. Job work order date, sale order date, purchase order date cannot be less than System date.
2. Cost price cannot be zero.
3. Selling price cannot be zero.
4. Selling price cannot be less than cost price.
5. Software has to ensure security.

The following are the different modules covered in this project.

- Purchase
- Sale
- Job Work
- Master
- Report

3.1 Purchase Modules

The following are the different forms under this module.

1. Fg_purchase Form
2. Rm_purchase Form
3. Rm_purchase_return Form

The Fg_purchase Form is used to handle the supplier information and supplied item detail information as well as views the supplier information and supplied item detail information by selecting the Fgpo_no.

The Rm_purchase Form is used to handle the supplier information and supplied item detail information as well as views the supplier information and supplied item detail information by selecting the po_no.

The Rm_purchase_return Form is used to handle the supplier information and supplied item detail information as well as views the supplier information and supplied item detail information by selecting the po_rtn_no.

3.2 Sale Modules

The following are the different forms under this module.

1. Fg_sale
2. Rm_sale
3. Rm_sale_return

The Fg_sale Form is used to handle the vendor information and vendor item detail information as well as views the vendor information and vendor item detail information by selecting the Fgso_no. The Rm_sale Form is used to handle the vendor information and vendor item detail information as well as views the vendor information and vendor item detail information by selecting the so_no. The Rm_sale_return Form is used to handle the vendor information and vendor item detail information as well as views the vendor information and vendor item detail information by selecting the so_rtn_no.

3.3 Job Work

The following are the different forms under this module.

1. Job work order Form
2. Job work rm_return Form
3. Job work receive Form

The Job work order Form is used to handle the vendor information and vendor item detail information as well as views the vendor information and vendor item detail information by selecting the Jwo_no. The Job work rm_return Form is used to handle the vendor information and vendor item detail information as well as views the vendor information and

vendor item detail information by selecting the Jw_rtn_no. The Job work receive Form is used to handle the vendor information and vendor item detail information as well as views the vendor information and vendor item detail information by selecting the Jwr_no.

3.4 Master

The following are the different forms under this module.

1. Rm_stock Form
2. Fg_stock Form
3. Req_gen Form
4. Vendor_mst Form

The Rm_stock Form is used to handle the raw material stock information and we can view the current stock for particular raw material by selecting the rmcode from combo box. The Fg_stock Form is used to handle the finish goods stock information and we can view the current stock for particular product by selecting the code from combo box. The Req_gen Form is used to handle the finish goods information and raw material information. We can view the raw material requirement for a particular product by selecting code from combo box.

The Vendor_mst Form is used to handle the vendor information. We can add the new vendor in database. And view the vendor information.

3.5 Report

The following are the different forms under this module.

1. Current stock Report
2. Sale Report
3. Purchase Report
4. Job work Report
5. Sale return Report

The Current stock Report shows the current status of the raw material and finish goods in the database. The sale Report shows the all sale of the raw material and finish goods. The purchase report show the all purchase information of raw material and finish goods. The job work Report shows the all job work information. The sale return Report shows the all sale return information.

4.0 SYSTEM DEFINITION

This section deals with the system design. This section contains the complexities for the system design as well as the important modules of the software.

4.1 System:

A system is an orderly grouping of interdependent components linked together according to a plan to achieve a specific objective. The components that make up systems may actually be other smaller system; or subsystems.

4.1.1 Existing system:

In the existing system the supply of product and manage the raw material and finished goods was done manually. The records are managed manually. The process of order tacking, stock checking, job work, purchase, sale etc are done manually. The documents are kept in one file folder and the folder is physically moved from one officer to another. During this process, documents can become misplaced or lost.

All of this takes time and costs productivity, efficiency and money. Since the existing system is manual one, request for any particular transaction is made using specific forms, for specific purpose designed and approved by the management or higher authority.

In the existing system, business process has been conducted via paper handling, status meetings and phone tag. This detracts from doing real work, reduces accountability, and drives up cost. The drawbacks of existing system are listed below:

Drawbacks of the existing system

1. It is manual, so maintain the whole system is very difficult to maintain large amount of details, performing large number of routine transactions manually is very difficult.
2. Preparing reports by extracting data from various requisites is time consuming and a difficult one .

3. Wastage of human resources, more manpower is used to do the needful.
4. Wastage of time, time consumption is more when the transaction is done manually.
5. Data redundancy, the same information may be duplicated and stored in several files.
6. This redundancy Leads to higher storage.

4.1.2 Proposed system

The proposed system computerizes the full process and designed in such a way that most of the above problems found in the existing system are eliminated. Some features of proposed supply chain management system are listed below.

Scalability

This provides, we can add the new features of the software as if required, without affecting the present features.

Flexibility

The proposed system allows the flow of multiple forms such as purchase request form, purchase order form across the entire organization.

Robustness

Bulk volume of file transaction can take place. There is also a communication capacity for sending and receiving may number of files. Secured transmission using unique password for each user is provided.

No repetition

The system does not allow duplication of stored information.

Economical

No addition hardware and softer infrastructure is needed. Since the operations are simple and easy to handle no special training is needed. The system finally provides an extensive customer support package.

Non-atomicity problems

A computer system like any other mechanical or electrical device is subject to failure. In many applications, it is crucial to ensure that, once a failure has occurred and has been detected, the data restored to

consistent state that existed prior to the failure. The proposed system avoids the atomicity problems.

Security

Only the authorized users can carry out the transaction according to their privilege. So security is maintained.

5.0 Data Dictionary:

A *Database management System (DBMS)* consists of a collection of interrelated data and a set of programs to access of those data. The collection of data, usually referred to as the database, contains information one particular enterprise. The primary goal of a Database is to provide an environment that is both convenient and effective to use in retrieving and storing database information.

Database systems are designed to manage large bodies of information. The management of data involves both the definition of structure for the storage of information and the provision of mechanism for the manipulation of information. In addition, the database system must provide for the safety of the information stored, despite system crashes or attempts at unauthorized access. If data are to be shared among several users, the system must avoid possible anomalous results.

Purpose of database management System:

- ❖ Less data redundancy and inconsistency
- ❖ Easy in accessing data
- ❖ Provide data isolation
- ❖ Solved integrity problems
- ❖ Solved atomicity problem
- ❖ Provides security

For this purpose all the data entities were identified from various input forms, and reports. These were compiled into tables as per the common practices of forming tables.

These tables were passed through the various normal forms and normalized. The necessary tables were also renormalized.

Fig – 2 Context diagram (level 0 DFD)

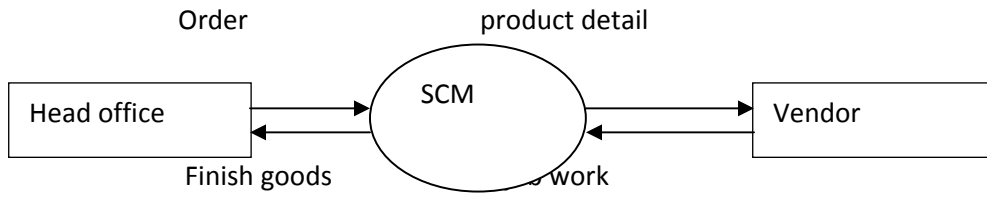


Fig – 3 E-R diagram

Fig – 3.1 . Raw material purchase

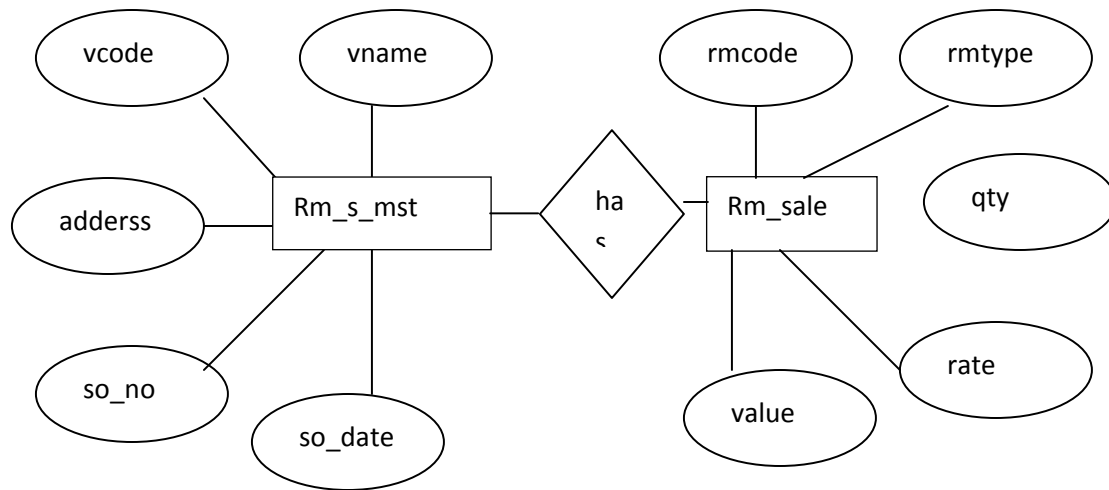
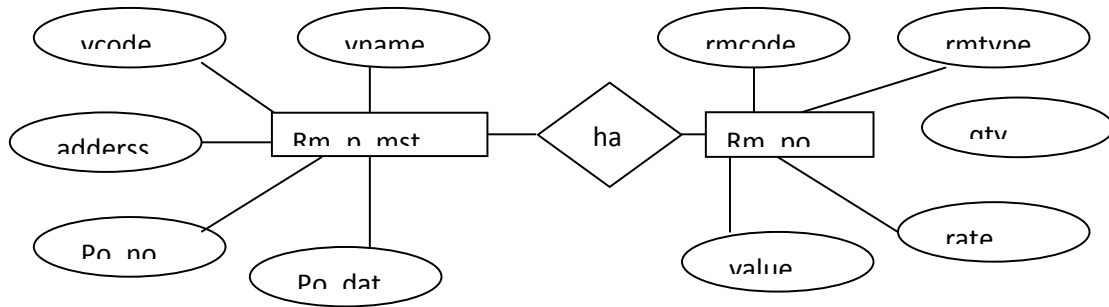


Fig – 3.2 . Finish goods purchase

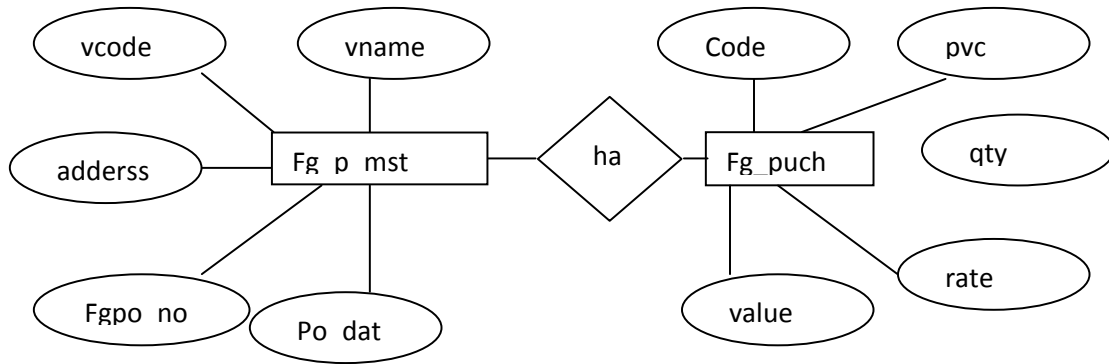


Fig – 3.3. Finish goods sale

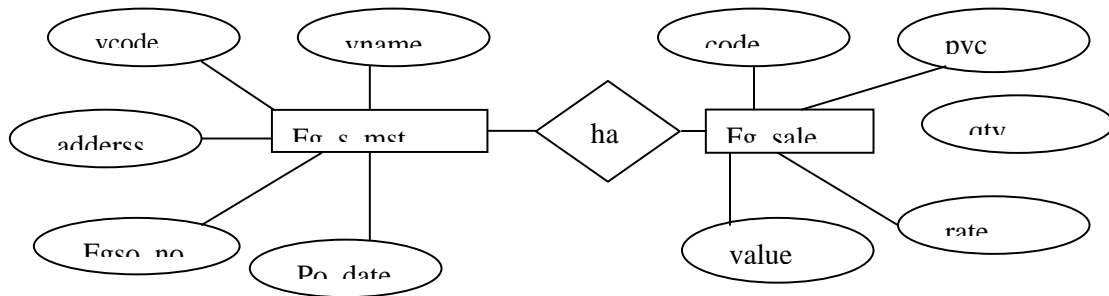


Fig – 3.4. Job work receive

Fig – 3.5. Job work raw material return

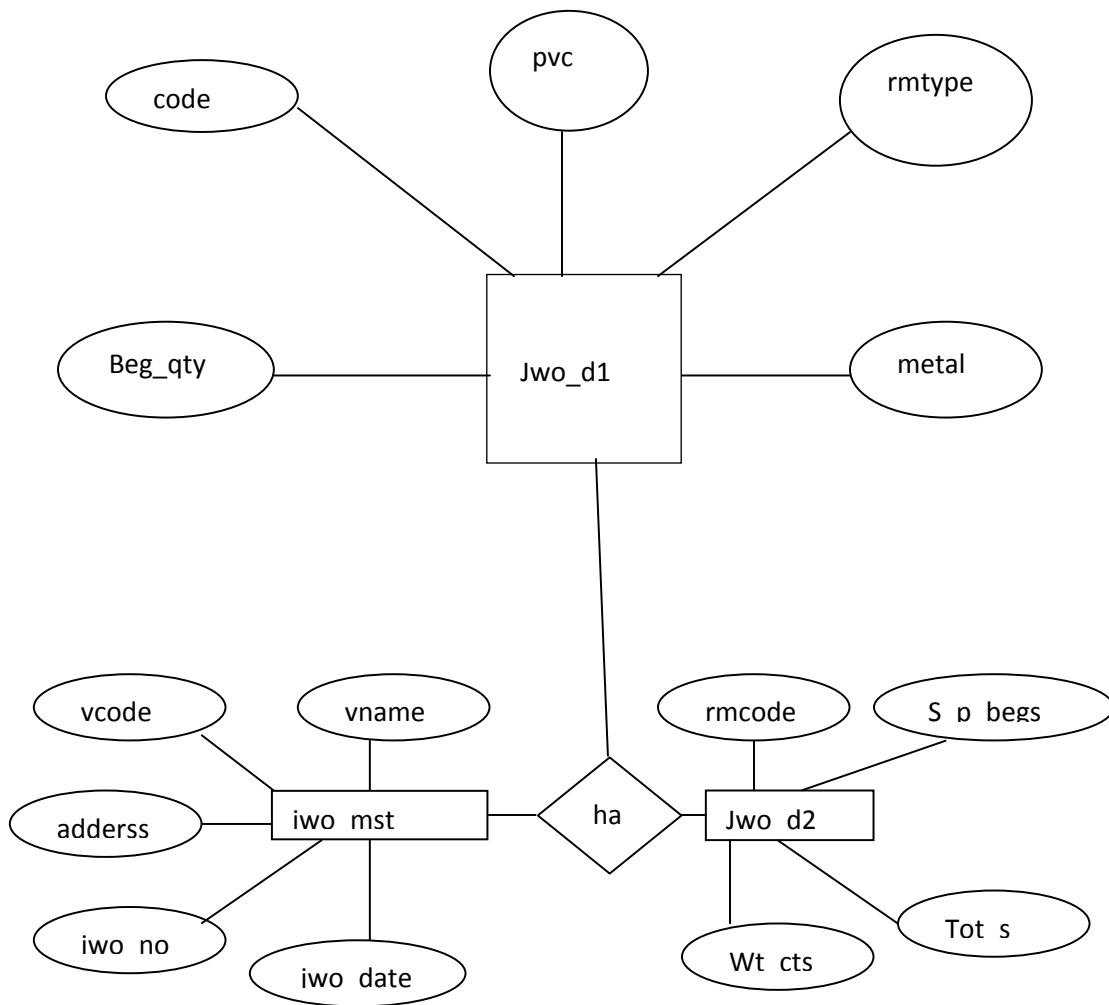


Table – 1 Test cases and results

Test case id	Test input	Expected result	Actual results	Test results (Pass/fail)
1.0	User has to enter his user ID and password.	It should be entered into the system if it is valid user otherwise it has to display an error message.	It is successfully performing the required task.	Pass
1.1		It has to display main screen.	As expected	Pass
2.0	The user has to select an appropriate option in the main window.	The user will be routed based on the option selected.	Result as expected	Pass
3.0	User selected purchase option in purchase menu	It should be routed to purchase order form.	As expected	Pass
3.1		It should prompt for details of vendor and product.	As expected	Pass
3.2	User selects save option in the purchase order form	All detail should store into the database	As expected	Pass
4.0	User selects sale order option in the sale menu	It should be routed to sale order form	As expected	Pass
4.1		It should prompt for details of vendor and product	As expected	Pass
4.2	User selects save option in the sale order form	All detail should store into the database	As expected	Pass
5.0	User selects job work order option in the job work menu	It should be routed to job work order form	As expected	Pass
5.1		It should prompt for details of vendor and product	As expected	Pass
5.2	User selects save option in the job work order form	All detail should store into the database	As expected	Pass
6.0	User selects current stock option in the reports menu	It display the current stock	As expected	Pass

6.0 Post Implementation Review:

After the system is implemented and conversion is completed, a review should be conducted to determine whether the system is meeting expectations and where implementations are needed. By using review questions and review methods the post implementation is achieved.

For the "supply chain management system", the direct cut over method is suitable. The old system is replaced with supply chain management system.

The organization relies fully on the new system. It offers immediate benefits from new methods and controls but it requires careful planning. The hardware and software is used in the system to make the work easy.

7.0 CONCLUSION

The software, which is implemented and tested with all range of value and found error free. Anyway it has far better result than existing system. Also it is found that system will work successfully even in peak loads. I tried to make the system user friendly and this system was operated with person who does not have prior knowledge about the system and was found work smoothly. The system does not reduce the respond time. Thus it is found to be operationally feasible. Security also maintained. The system is protected from unauthorized access by giving user name and password for login. The system can be used any company which supply finished goods to other company and managing the raw material and finished goods.

8.0 FUTURE ENHANCEMENTS

The project has been designed and developed for the basic management of raw material and finished goods. It is easy for them to enhance the system accordingly while taking the drawbacks and the related areas of application.

The future enhancements may be

1. Globalization of site
2. Addition of some more categories
3. Updating module

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