SUPPLY CHAIN MANAGEMENT

PROJECT WORK DONE AT

MURUGAN MILLS
COIMBATORE

P-746

PROJECT REPORT

SUBMITTED IN PARTIAL FULFILLMENT OF THE
REQUIREMENTS FOR THE AWARD OF THE DEGREE OF
MASTER OF COMPUTER APPLICATIONS
OF BHARATHIAR UNIVERSITY, COIMBATORE

Submitted By

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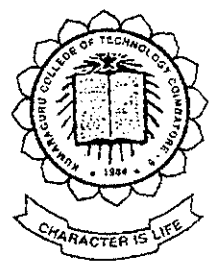

Department of Computer Science and Engineering
KUMARAGURU COLLEGE OF TECHNOLOGY
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May 2002

Department of Computer Science and Engineering

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CERTIFICATE

This is to certify that the project entitled

"Supply Chain Management"

Done By

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Submitted in partial fulfillment of the requirements for the award of degree of

Master of Computer Applications of **Bharathiar University**

Professor and Head 30/9/02

Internal Guide

Submitted to University Examination held on 09-05-2002

9/5/02

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This is to certify that the project entitled **Supply Chain Management** has been successfully completed by **S.Saravana kumar** under my guidance at **Coimbatore Murugan Mills** (a unit of NTC,Govt of India) during the period from December 2001 to April 2002 in partial fulfillment

Of the requirements for the award of Master of Computer Applications from Kumaraguru College of Technology- Coimbatore.

For Coimbatore Murugan Mills

(S. ELANGOVAN)
Personnel Officer

DECLARATION

I here by declare that this Project work entitled "**Supply Chain Management**" submitted to **Bharathiar University** as the Project work of Master of Computer Application Degree, is a record of original work done by me under the supervision and guidance of Mr.S.Elangovan, Murugan Mills, Coimbatore and **Mrs.C.Ramathilagam**, MSc(CS)., Lecturer, Department of Computer Science, Kumaraguru College of Technology, Coimbatore and this project work has not found the basis of award of any Degree/ Diploma/Associateship / Felloship or similar title to any candidate of any University

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ACKNOWLEDGEMENT

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First I would like to thank the almighty with whose blessings I have completed my project successfully.

I express my profound gratitude to our institution **Kumaraguru college of Technology** for giving me the opportunity to pursue our PG level education and to our principal **DR. K.K.Padmanaban for** allowing me to do this project work with partial fulfillment of the degree of MCA.

I also extend a deep sense of gratitude to our Head of the Department Prof. **S.Thangasamy** who played a pivotal role in encouraging me towards the completion of this project.

I would like to thank my guide **Mrs. Ramathilagam,** for her active guidance in completing this project and also thank other staff members.

I would also like to thank **Mr.Thavasi . B.Tech,** for the guidance within the office premises and the project Leader **Mr. S.Elangovan.MCA.** in Coimbatore Murugan Mills(Unit of NTC,Govt of India)

Finally I place my humble accolades for all those who have supported me directly and indirectly throughout this project.

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SYNOPSIS

SYNOPSIS

The project entitled Supply Chain Management has been developed for procuring raw materials through web. The main objective of the project is to effect economies in the cost of materials by purchasing materials of the right quality, right quantity, at right time from right source, at right price which is accomplished by on-line bidding.

Supply Chain Management is aimed at building a good relation ship with the vendors by providing a good communication channel, there by enabling the organization to procure materials effectively. This relation ship between the vendors and the organization helps to minimize the lead-time involved in procuring the item which in-turn increase the productivity of the system.

1. INTRODUCTION

1.1 PROJECT OVERVIEW:

Supply Chains or Supply Chain networks represent a series of process that change and add value to a product as it moves down the chain.

Supply Chains is process of moving goods from the customer order through the raw materials, supply, production and distribution of the products to the customers. All organizations have supply chain of varying degree, depending on the products manufactured. This network obtains supplies and components, change these materials finished products and then distribute them to customers.

SCM software leverages and builds upon ERP by consolidating data from a company manufacturing operations, inventories systems, and suppliers to provide a single, unifies view of the elements that go into building products. SCM helps to allocate resources effectively, maximize efficiency and save cycle time. Stream line operations of a product and information sharing with partners are considered to be the benefits of SCM.

Maintaining constant communication and tight integration are the keys to success, and it all starts with a robust network infrastructure. SCM's goal is to build a highly reliable, secure scaleable, and the manageable solutions to support the enterprise applications and realize the business objectives.

CHARACTERISTICS OF SCM:

- Ability to source raw materials through web.
- On-line real time information processing providing total information validity about supply chain.
- Ability to manage not only within the company but also across industries and enterprises.

- Integration of Supply Chain Network(SCN) processes, third party suppliers and the information's systems.

THE COMPONENTS OF SUPPLY CHAINS:

- A set of core processes from supplier to customer. Each process possesses a set of constrains, Materials requirements etc..,
- A set of owners of these processes and their concerns.
- The product with customer's expectations in terms of demand, preference and satisfaction.
- Supporting activities to ensure the smooth running of core processes.

GOALS OF SCM:

- Maintaining lean inventory through strong vendor relationships.
- Lead-time reduction through suppliers and manufactures production schedule.
- Increased reliability in supply with backup sources
- Consumer-directed manufacturing with the support for product customization.
- Providing utmost customers satisfaction with the quality of services.

ACTIVITIES TO ACHIEVE THESE GOALS:

- Build to order by reducing the amount of stock maintained by the company.
- Manufacture to order to provide customizable products.
- Build strong relationship with the suppliers to reduce lead-time in procurement.

- Co-ordinate activities with the retailers to reduce lead-time in delivering the products.
- Automate the processes to reduce paper flow within the company to reduce internal lead-time.

The goals are to reduce depreciation of the value of the goods, i.e. the money spent in maintaining the product or raw material within the organization.

The goals and objectives of the Supply Chain Network vary with the characteristics of the product in question. The products can be classified with into two types, namely regular counts, on-demand counts.

THE ADVANTAGES OF WEB-ENABLING THE SUPPLY CHAIN MANAGEMENT ARE:

- The order transactions are made through web where all the processing is done through web.
- The lead-time involved in the order processing is reduced when the system is web-Enabled.
- The internal lead-time taken in the document flow between the organizations is reduced if the flow of the paper is reduced.
- The relationship between the organization and the customers/vendors are ensured by building a secure Intranet and through effective communication.
- Customer support and servicing can be handled effectively.

1.2 ORGANIZATION PROFILE

Coimbatore Murugan Mills was established in the year 1936 with the spindleage of 11480.In the year 1952, Hundred numbers sakomoto Automatic looms were added during the private regime.

Murugan mills is a leading producer of high quality yarn, catering to the requirements of highly discerning international market. This global acceptance of their yarn comes through superior quality. Quality that comes through the Technology and through team work.

PRE-PRODUCTION

The fine grown Indian cotton –one of the best in the world. They have with them this basic advantages- mature's bounty and excellent raw material .Yet, they do not leave anything to chance. Even the best of cotton goes through stringent checks thereby eliminating even the slightly inferiority. They do believe that well begun is after all-half done.

FACILITIES

Murugan mills has been maintaining contemporarily in terms of technology and techniques. Right from their Blow Room line through high production Carding Machines.

MURUGAN MILLS MACHINERY COMES FROM -
>LMW,CROSOL,HOWA,HARACHERRY,TOYODA,SCHLAFHORST)

PERSPECTIVE

Through upgradation of capacity and technology , Murugan Mills plans to cater exclusively to the international market. Their 1200 strong dedicated workface speaks only one language **QUALITY**. With training programs and an environment that is conductive to growth, teamwork comes through their people, who stretch themselves that extra length to gain leading edge-in terms of Quality.

2. SYSTEM STUDY AND ANALYSIS

2.1 EXISTING SYSTEM

The procurement process starts with the purchase indent by the production units. The purchase indent specifies the requirement of raw materials, which includes the quality, quantity and the due date for the delivery of raw materials.

An vendor list is maintained for the purchasable items. After arriving at the quantity to be procured, vendors are selected from the vendor list and the purchase order is issued.

The quality and the lead-time of the items delivered by the vendors are the two factors that are used for rating the vendors, namely performing vendors and the non- performing vendors. Multiple vendors for a item are maintained in order to avoid the dependency in single source vendor. Whenever the quality and the lead-time of the item delivered is unsatisfactory for a respective period, then the vendor is removed from the vendor list.

Whenever a item is to be procured, a set of vendors from the vendor list are identified and are sent the item specification along with the trial purchase order. The sample is tested in order to ensure the quality. Based on the quotation submitted by the vendors and the sample test reports, a comparative statement is generated and the purchase order is sent to the vendor quoting the least amount.

The purchase order is issued to vendor only if the quality of the sample is accepted and a inspection report is sent to the vendor each time the quality is checked stating the reason for rejection. If the quality of the item supplied by the vendor is good and the lead- time for the delivery of the item is less for a respective period, then the vendor is rated high.

As the vendor delivers the item, Material Inward Note is generated which is used to track the quantity accepted after quality assurance. The rejected items are returned to the vendor along with a debit note.

Vendors are rated on a quarterly basis on the parameters of quality, delivery and rejections. Based on the rating, vendors fall into either the performing or non-performing vendor's categories.

DRAWBACKS OF THE EXISTING SYSTEM:

There are several drawbacks in the existing system.

- The vendor relationship is not assured in the existing system, as there is no reliable communication between the vendors and the system.
- The lead-time of the vendor is not clearly known, as there is no good relationship between the vendor and the system.
- The internal lead-time of the system is high due to the delay in the flow of paper documents.
- Inventory is maintained to a considerable level to meet the requirements in time since the lead-time involved in the delivery of the items is not clearly known.
- Stationary charges spent on documents sent between vendors and the organization is considerably high.
- Considerably slow in the process of collecting data, processing the order and delivering the products.

2.2 PROPOSED SYSTEM:

The requirement of items is posted on the web page along with the specifications quantity required and the due date for delivery of products. The vendors are intimated through e-mail about the requirement. The vendors pull the requirement from the posted information's and this helps the organization to source the materials from the potential suppliers.

The purchase indent that is from the production unit is made on-line and the net requirement of the quantity of materials to be procured is done automatically. When the items is to be procured, the requirements of the item along with the trial purchase order is posted in the web pages. The vendors across different locations pull the information or the requirement from the web page. The vendor submits bids and samples for the required item. Based on the evaluation of the sample quality and online negotiations, potential vendors are located through on-line bidding and purchase order is issued to them. An inspection report is sent to the vendor each time the quality of the item is checked stating the reason for the rejection.

The information for vendors is posted into their area in the web site. Whenever needed the vendor can sign in to view the data. Any purchase orders issued to the vendors are posted into this region and are also intimated through e-mail.

The flow of documentation within the organization and also between the organization and the vendors are made through web. This reduction in documentation flow reduces the lead-time internally and also in the delivery of the items. This also enables a good co-operation between the vendors and the organization and also to provide the vendor a good service and response.

Vendors are rated for each quarter by the system automatically and are informed about their status/performance, so that the vendors are allowed to rectify their faults. The rating takes into consideration bow far the vendors have stuck to their promised lead-time, quality etc. Based on their rating, the vendors are classified as performing and non- performing vendors. Based on their ratings , the vendors are automatically added or removed from the performing and non- performing lists. Whenever the quality and lead-time of the items delivered is unsatisfactory for a respective period, then the vendors is removed from the vendor list.

ADVANTAGES OF THE PROPOSED SYSTEM:

- Push based order fulfillment is transformed into pull based order fulfillment which enables to source materials from potential vendors across geographical locations.
- Web based transactions brings into contact vendors of different locations working with different environments.
- Performing the entire process on-line reduces the internal lead-time.
- Supplier to provide the facility to access the delivery status of their supplies through internet.
- Advantages of on-line bidding

  Hold multiple bidding rounds until a favorable price is reached.
  Receives and manages bids and sellers communications effectively.
  Distribute item specifications details to multiple suppliers simultaneously.

2.3 USER CHARACTERISTICS:

This system has two kinds of users

- Customers
- Administrator
- Vendors

User characteristics – Customers:

The Customer has the facility to search through the catalogue, select required Products and customize them if needed and he/she can order the Products.

User characteristics – Administrator:

The administrator needs to identify the type of user one is before logging in. He has the privileges of accessing of any data's and he can also give rights to users.

User characteristics – Vendors:

The Vendors across different locations pulls the information from the web page. The user is provided with the information about the status of his order he has taken etc,.

USE CASE DIAGRAM

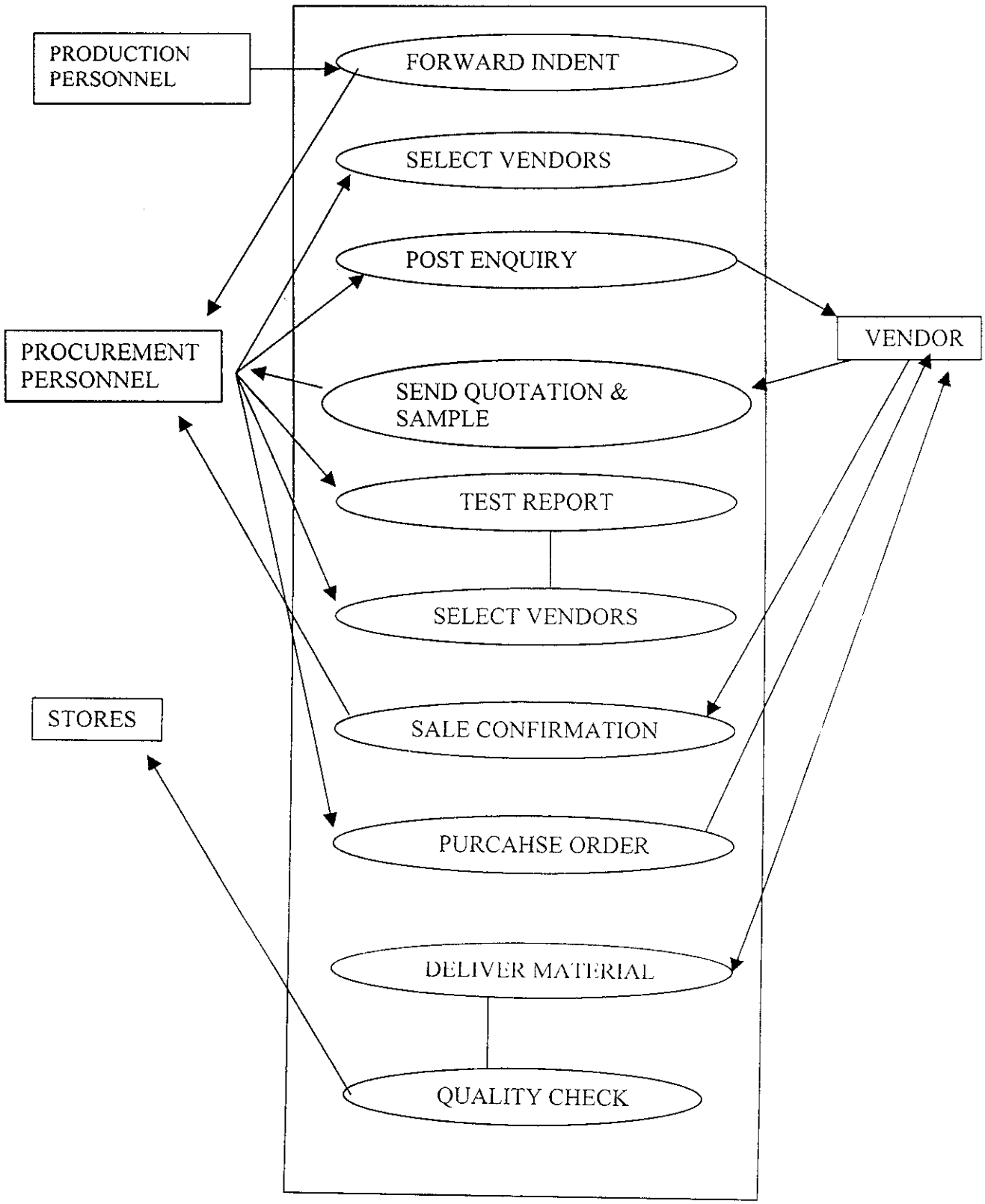
The requirement specification is centered on the business case and user needs for the software system. Use Case are the particular functions or services of the system, which are visible to its Actors. Use Case constitute a coherent unit of functionality provided by a system as manifested by sequences of messages exchanged among the system, and one or more Actors together with actions performed by the systems.

The Use Case diagram represents the functionality of a system as displayed to external interactors-alias Actors of the system. Actors are role of an object outside of a system that interact directly with it as a part of a coherent work unit. An Actor element characteristic the role played by an outside object, where one physical object may play several roles and therefore be modeled by several Actors. In simpler terms, a Use Case view represents the interface or interfaces that a system make visible to the outside world, the external entities that interact with it, and their relationship.

Use Case are used to document system requirements. They provide a useful technique, which in conjunction with Object Modeling, help us to clarify what the system is supposed to do.

The Actors identified are the purchase personnel, vendors, stores. The uses of every actor are given

USE CASE DIAGRAM



3. PROGRAMMING ENVIRONMENT

3.1 HARDWARE CONFIGURATION:

Server Configuration:

Processor : Pentium III - 800 MHz .

Hard disk : 20GB .

RAM : 128 MB .

Client Configuration:

Processor : Pentium III – 800 MHz .

Hard disk : 20GB .

RAM : 128 MB .

3.2 DESCRIPTION OF SOFTWARE AND THE TOOLS USED – REASONS:

The system uses various tools and software to be developed,

SOFTWARE REQUIREMENTS

Operating System	: Client – Windows Server - Windows
Web Server	: IIS 4.0 .
Browsers	: Microsoft Internet Explorer 5.0 . Netscape Navigator 4.7 .
RDBMS	: Oracle 7.3 .
Technology	: ASP .
Designing IDE	:MS FrontPage
IDE	:MS Visual InterDev 6.0
Testing Tool	:SQL Query Analyzer
Web Browser	:Internet Explorer 5.0

ASP

Active Server Page is an integral part of the active platform.ASP is actually a DLL component installed on our web server. These component processes files that end with the extension .asp and transmits the result to the client that requested the ASP file. ASP is a form of technology, which allows scripting processes to take [lace on

the Web server prior to any HTML being delivered to the Client. By being a server –side technology it is completely Browser independent.

ASP contains both HTML syntax and server side scripting logic. ASP enables the scripting logic to interface to a number of ASP intrinsic objects which automatically handles many of the tasks, and so simplifies the amount of development required. In addition to this ASP scripts has the ability to interface with external COM complaint software components. Like the ActiveX Data Object (ADO) which is used to interact with the database.

ASP and Microsoft Platform

Active Server runs in the same address space as IIS and IIS is running as a service under NT, so both IIS & Active server inherit all the security features of NT OS.

Microsoft Transaction Server (MTS), which is included in the Windows NT Option Pack reduces the complexity and cost of building applications on the server.

MTS handles the complexities of developing secured, scalable and reliable web applications.

- **Advantages of ASP**

Dynamically edit, change or add any content of a web page.
Respond to user queries or data submitted from HTML forms.
Access any data or database and return the results to a browser.
Customize a web page to make it more useful for individual users.
Provides security since the ASP code cannot be viewed from the browser.
Since Asp files are returned as plain HTML, they can be viewed in any browser.

ORACLE

In today's world, a database need to be universally accessible, so those users of every system in a diverse network may enjoy the benefits of database access. Not only does Oracle run on the most popular Operating System-Windows NT, Windows 95,os/2,AIX, HP_UX-a Oracle database may be accessed by an even wider array of client applications.

But it's Oracle and VB support that truly makes database access "universal". Using VB, you can provide client access to Oracle.

Data replication is the key technology for harnessing the full power and potential of distributed environments. It lets the user to distribute data universally wherever business needs it to branch offices, to mobile salespeople, even to business partners. Oracle Universal Database has powerful data replication built-in.

Oracle features:

- Oracle provides very strong security, with authentication and authorization services that can be integrated easily with network and operating system security services.
- Oracle's universal Database delivers amazing fast access to dynamic, growing database.
- The VB development tool provides a gateway to corporate data. Interactive applications have the performance and scalability to exploit the advanced data types in Oracle database applications

4. SYSTEM DESIGN AND DEVELOPMENT

4.1 DETAILED DESIGN

Key activities in development of the system are

Sign-in the user of the system
Purchase order generation
On-line bidding

SIGN-IN :

The login management has been designed such that the login-id's are unique to all the users of the system and the type of the user and what the user is authorized to view can be known form his login-id.

The sign-in process acts as the single entry point to the entire site. The input comes from the user that includes the login-id and the password in encrypted format. The information is decrypted before any further processing. Only on successful validation of login-id and password the user can use the site. On successful validation, a session is registered indicating which session-id corresponds to which login. This session-id will be used throughout the site to validate user request and to track their transactions. The process then finds the type of the user and the routes him to the right page he has been authorized to view and use. This is done based on the type of the user; the request is redirected to appropriate page by providing the required services. For example, the vendors are provided with the facility to access the page and known the requirement, but others are not allowed to enter the page.

To perform login validations, the login table is verified to see whether the login-id is present in that table. If present, then the password is checked for equivalence. If these actions are successful then the type field of the table is used to identify the permission allowed for the user, and the subsequent pages are generated based on this information. If the type is "C" then the user is treated as a

customer and is provided the facility to search through the catalogue, select required products and customize them if needed and order those products. If the type is "V", meaning vendor, the user is provided with the information about the status of his order he has taken etc. for the type "A", meaning administrator, the user has the privilege of accessing any data. For the type being "E", meaning Employee, the user has the privilege of accessing their respective regions.

Once the login has been made successfully, the session id is stored into the session table mapping against the login-id. This helps in maintaining shopping cart effectively for each customer.

PURCHASE ORDER GENERATION:

As the production unit raises the indents, this module is invoked to procure the items that are needed. An enquiry from specifying the quantity and quality is generated automatically. For the item to be procured the potential vendors i.e. the performing vendors along with the non-performing vendors are identified and the enquiry is been posted in the web page along with the trial purchase order. Any enquiry issued to the vendors is posted into this region and are also intimated through e-mail. Preferences are been given to the performing vendors.

The vendors across different locations pull the information or the requirement from the web page. The vendors are given a period of three days to submit their duly filled quotations. The vendors submit the quotation along with the samples for the required item.

The sample is being tested and the test report is stored in the sample test reports. Based on the evaluation of the sample quality and on-line negotiation, Potential vendors are located through on-line bidding. The administrator arrives at a competitive slip in order to confirm the business. The organization on receiving the sale confirmation slip sends the purchase order to the respective vendor.

The trial purchase order is sent along with the enquiry, to the identified vendor requesting for a sample in order to assure the quality. On the acceptance of the quality, purchase order is sent to the vendor along with the sample test report. On rejection, the sample with the sample test report is sent to the vendor. Once when the order is finalized and the products reach the company, quality assurance is carried out, and a quality assurance report are compared and decision on the acceptance/ rejection of the item is finalized. If the quality assurance report results are not satisfactory then the goods are sent back to the vendor stating the reason for rejection. On acceptance of goods they are forwarded to the stores.

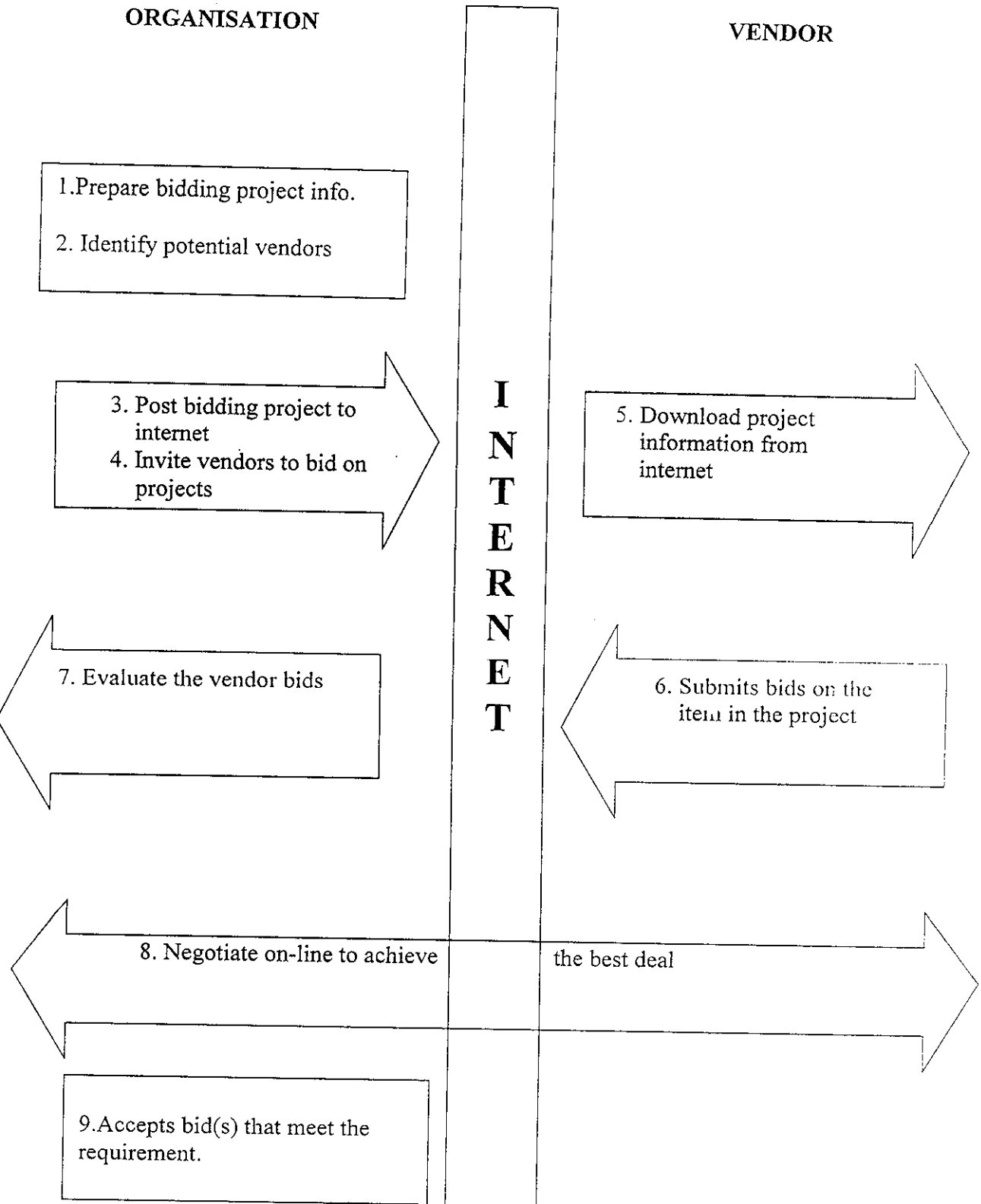
ON-LINE BIDDING:

The requirement of the item to be procured is posted into the web which include the details such as the quantity required, the technical specification of the item and other relevant form that specifies the details of the vendor including quality norms.

The administrator sends an invitation for the requirement for the selected vendor to bid on the item before a specified date. The vendor download the requirement posted in the web and submits the quotation for the items along with the minimum order quantity. The vendors can re-quote their values any number of times before the specified date.

On-line negotiations are carried in between the administration and the competitive vendors on the parameters of quality and the prices to achieve the best deal. The administration will decide to choose the vendor based on the negotiations. Purchase order is sent to selected vendors through on-line bidding.

ONLINE BIDDING PROCESS VIA INTERNET



4.2 INPUT DESIGN

Input design is the part of the overall system design that requires very careful attention and is the most expensive phase. It is the point of contact for the users with the computer system and so it itself is prone to error. If data going into the system is incorrect then processing and output will magnify these errors. Objectives during input design are as follows:

- Produce cost effective method input.
- Achieve high-level accuracy.
- Ensure that input is free of ambiguity.

Several stages of our input design are:

- Data Recording.
- Transfer of data to input form.
- Data verification.
- Transmitting data to computer.
- Data correction.

The input design involves converting the user-originated input into a computer-based format. The aim of input design is to make the data entry easier, logical error free. It help us to filter errors in the otherwise entered into the database might have brought in a lot of inconsistency.

It involves procedures for capturing data, verifying it and then passing them on to the computer database. After choosing the input medium, attention is given to the careful design of input stages for error handling , control , grouping and validation procedures.

During application development, care has been taken to make this system extremely user-friendly and organize the screens such that the possibilities of making errors are minimized.

List of possible values, list box , text area etc. are provided to the user for selecting the input .This makes system less prone to errors as the input texts are to be selected rather then to be typed in by the users.

Alerts for wrong entries such as primary key duplication , letters in numeric data, wrong data format, range exceed have been provided in the application. Upon this, a well-documented instruction set, have been also provided for the non-frequent and novice

users to familiarize them with our application. Maximum care has been taken to ensure that users type in only minimum data into the system.

In this project, forms used to display the report. There are many forms like New Vendor Registration Details, Purchase Indent Details, Online Query Processing and Reports like Purchase Requisition List, Purchase Indent Details, Purchase Order, Vendor List, Vendor Item List.

New Vendor Registration

In New Vendor Registration Form, the input fields are Login Id used for authentication, Vendor code is unique, Organization name, Mail id etc.,

Purchase Indent Details

In this form, the input fields are Indent code, Indent Date, Required Date, Item code is unique, Description etc.,

Online Query Processing

This form is used to process users query on-line and forwarded them via e-mail .

Vendor quotation form

This form is used to submit the quotation for a particulars enquiry. The values in this screen can be edited by the vendor if necessary.

Vendor sale confirmation slip

This screen is used to submit the sale confirmation slip by the vendor.

4.3 OUTPUT DESIGN

An inevitable activity in the system design is the proper design of input and output in a form acceptable to the user. Outputs from the system are required primarily to communicate the result of processing to users.

Outputs also provide a permanent copy of the results for later consultation. An intelligible output design will improve system relationships with the user and help in decision-making process. The various types of outputs required by most system are:

- **External Outputs** : Whose destination is outside the organization and which require special attention.

- **Internal Outputs** : Whose destination is within the organization and which require careful design because they are user's main interface with the computer.

- **Operational Outputs**: Whose use is purely within the computer department.

- **Interactive Outputs**: Which involve the user in communicating with the computer.

The approach to output design is very dependent on the type of output and nature of data. Special attention has to be made to data editing. The choice of appropriate output medium is also an important task.

The selection may be affected by the following kinds of considerations.

- Response time
- Cost
- Software/Hardware
- Suitability of the device for application concerned.

The output design must be specified and documented. Data items have to be accurately defined and arranged for clarity and easy comprehension. The other two objectives that were taken care of were:

- The interpretation of the results of the computer part of the system to users in a form that they can understand meets their requirements.
- The output design specification is made in such a way that it is unambiguous, comprehensive and capable of being translated into a programming language.

There are many reports generated in different modules , among these reports some of the major ones are,

Purchase order

This report specifies the format of the purchase order. The purchase order specifies the item is to be procured, their quantity, the vendor form which the item is to be procured and their address etc,.

Vendor list

This report specifies the details of all the vendors or the specified vendors along with their rating. The list can be restricted to specify rating of the vendor.

Vendor details

This report gives all the details of the existing vendors including the option to search for the existing vendor.

Transaction details

This report list out all the details of a particular transaction tracking from the ndent code through quotation code, to the purchase order.

Quality assurance report

This report is used to display the quality assurance result .

Rejected items

This report gives the details of all the items that were rejected after quality assurance. This report can be sorted or indexed by PO code or the item code.

Store details

This report gives the details of the items that are stored in stores.

4.4 DATABASE DESIGN

VENDORS:

All the companies involving in the organization activities have certain information in common. This table maintains the basic details of those organizations.

ATTRIBUTE NAME	DATA TYPE	CONSTRAINS	DESCRIPTION
Vend_code	Varchar2(10)	PK	Vendor code
Org_code	Varchar2(20)	Not Null	Organisation name
Address	Varchar2(40)	Not Null	Address
City	Varchar2(15)	Not Null	City
State	Varchar2(15)	Not Null	State
Zip code	Number(10)	Not Null	Zip code
Country	Varchar2(15)	Not Null	Country
Phone1	Number(15)	Not Null	Phone1
Phone2	Number(15)		Phone2
Fax	Number(15)		Fax
Mail_id	Varchar2(10)	Not Null	Mail_id
Web site	Varchar2(20)	Not Null	Web site
Contact person1	Varchar2(20)	Not Null	Contact person1
Contact person2	Varchar2(20)		Contact person2
Appr_date	Date	Not Null	Date of approval of vendors
Login_id	Varchar2(20)	FK-Login	Login_id of the vendor refers LOGIN table

LOGINS:

This table is used to manage the Login_ID and passwords for all the users of the entire site.

ATTRIBUTE NAME	DATA TYPE	CONSTRAINS	DESCRIPTION
Login_id	Varchar2(20)	PK	Login_ID's
Password	Varchar2(20)	Not Null	Password
Type	Varchar2(15)	Not Null	Type of the user_vendor,administrator, employee.

INDENT_DETAILS:

Information specific to indent is held in this table

ATTRIBUTE NAME	DATA TYPE	CONSTRAINS	DESCRIPTION
Ind_code	Varchar2(10)	PK	Indent code
Dept_code	Varchar2(10)	FK-department	Department code
Emp_code	Varchar2(10)	FK-employee	Employee code
Ind_date	Date	Not Null	Date of the raised indent
Due_date	Date	Not Null	Due date to receive indent
Item_code	Varchar2(10)	FK-item	Item code
Qty_req	Varchar2(10)	Not Null	Quantity required
Remarks	Varchar2(50)		Remarks
Status	char(15)	Not Null	Status of the state of the indent-PO,Rejected,Under process

ITEMS:

This table issued to maintain the details of the items procured by the organization.

ATTRIBUTE NAME	DATA TYPE	CONSTRAINS	DESCRIPTION
Item_code	Varchar2(10)	PK	Item code
Item_desc	Varchar2(20)	Not Null	Product name
Cat_code	Varchar2(10)	FK-category	Category code the item belongs
Remarks	Varchar2(15)		Remarks

CATEGORY:

This table holds information about their items and their corresponding category

ATTRIBUTE NAME	DATA TYPE	CONSTRAINS	DESCRIPTION
Cat_code	Varchar2(10)	PK	Category code the item belongs
Cat_name	Char(20)	Not Null	Category name
Counts	Varchar2(5)	Not Null	Counts
Station	Char(15)	Not Null	Station name
Desc	Varchar2(50)		Description of the category

ENQUIRY:

This table holds the details of the enquiry for the items to be procured

ATTRIBUTE NAME	DATA TYPE	CONSTRAINS	DESCRIPTION
Enq_id	Varchar2(10)	PK	Enquiry_ID
Enq_date	Date	Not Null	Enquiry Date
Ind_code	Varchar2(10)	FK-Indent_Details	Indent code
Specification	Varchar2(50)		Specification

QUOTATION:

This table holds the details of the quotation submitted by the vendor>

ATTRIBUTE NAME	DATA TYPE	CONSTRAINS	DESCRIPTION
Quot_code	Varchar2(10)	PK	Quotation Code
Sample_ID	Varchar2(10)	FK-Sample	Sample-ID of the item
Enq_ID	Varchar2(10)	FK-Enquiry	Enquiry-ID
Vend_Code	Varchar2(10)	FK-Vendors	Vendor Code
Supply_Qty	Varchar2(10)	Not Null	Qty that can be supplied
Unit_Price	Varchar2(10)	Not Null	Price Per Unit
Date_Quot	Date	Not Null	Quotation Date
Vallid_Till	Date	Not Null	Valid till the specified date
Trans_LD	Number(5)	Not Null	Lead-time in transport

SAMPLE:

This table holds the Sample details of the item.

ATTRIBUTE NAME	DATA TYPE	CONSTRAINS	DESCRIPTION
Sample_ID	Varchar2(10)	PK	Sample-ID of the item
Unit	Varchar2(10)	Not Null	Unit of measurement
Unit_Amt	Varchar2(10)	Not Null	Amount per unit

STR:

This table holds the sample test report details.

ATTRIBUTE NAME	DATA TYPE	CONSTRAINS	DESCRIPTION
Sample_ID	Varchar2(10)	FK-Sample	Sample- ID of the item
Lab_code	Varchar2(10)	FK-Lab	Lab code
Fibre_length	Number(7,2)	Not Null	Fibre span length
Fibre_fitness	Number(7,2)	Not Null	Fibre fitness value
Fibre_bundle_str	Number(7,2)	Not Null	Fibre bundle strength
Maturity_test	Number(7,2)	Not Null	Maturity coefficient
Thrash_analysis	Number(7,2)	Not Null	Thrash analysis
Cotton_clr_grade	Number(7,2)	Not Null	Cotton color grade
Test_date	Date	Not Null	Testing date
Result	Varchar2(20)	Not Null	Accepted,Rejected

LAB:

Information about the material testing lab is stored in this table.

ATTRIBUTE NAME	DATA TYPE	CONSTRAINS	DESCRIPTION
Lab_code	Varchar2(10)	PK	Lab code
Address	Char(10)	Not Null	Location of the lab

SCS:

Information about sale conformation slip from the vendor.

ATTRIBUTE NAME	DATA TYPE	CONSTRAINS	DESCRIPTION
SCS_code	Varchar2(10)	PK	Sales Conformation Slip code
SCS date	Date	Not Null	SCS date
Quot_code	Varchar2(10)	FK-Quotation	Quotation code
Supply_qty	Varchar2(10)	Not Null	Quantity that can be supplied
Unit_price	Varchar2(10)	Not Null	Price per unit
Term_cond	Varchar2(50)	Not Null	Terms & Conditions
Remarks	Varchar2(20)	Not Null	Remarks

PURCHASE _ORDER:

Information about purchase order.

ATTRIBUTE NAME	DATA TYPE	CONSTRAINS	DESCRIPTION
PO_code	Varchar2(10)	PK	Purchase Order code
SCS_code	Varchar2(10)	FK-SCS	Sales Conformation Slip code
PO_date	Date	Not Null	Purchase Order date
Quantity	Varchar2(10)	Not Null	Quantity ordered
PO_amount	Varchar2(15)	Not Null	Total amount of the order
Payment	Varchar2(20)	Not Null	Payement details
Lorry_freight	Varchar2(15)	Not Null	Lorry freight
Insurance_exp	Varchar2(15)	Not Null	Insurance expenses
Despatch	Varchar2(15)	Not Null	Despatch Location
Term_cond	Varchar2(50)	Not Null	Terms&conditions
Del_date	Date	Not Null	Delivery date
Remarks	Varchar2(20)	Not Null	Remarks
Status	Char(15)	Not Null	Status – Pending,closed

MIR:

This holds the material inward register details.

ATTRIBUTE NAME	DATA TYPE	CONSTRAINS	DESCRIPTION
MIR_ID	Varchar2(10)	PK	MIR-ID
PO_code	Varchar2(10)	FK-Purchare_order	Purchase Order code
Date_arrv	Date	Not Null	Date of arrival
Veh_no	Varchar2(10)	Not Null	Vehicle number
DC_no	Varchar2(10)	Not Null	Despatch Challan number

MIR_ITEMS:

This table holds the item details in materials inward register.

ATTRIBUTE NAME	DATA TYPE	CONSTRAINS	DESCRIPTION
MIR_ID	Varchar2(10)	FK-MIR	MIR-ID
Item_code	Varchar2(10)	FK-Items	Item code
Vendor_weight	Varchar2(10)	Not Null	Item weight by Vendor
Mill_weight	Varchar2(10)	Not Null	Item weight by Mill

QAR:

This table holds the details of the quality assurance report.

ATTRIBUTE NAME	DATA TYPE	CONSTRAINS	DESCRIPTION
QAR_ID	Varchar2(10)	PK	QAR-ID
MIR_ID	Varchar2(10)	FK-MIR	MIR-ID
Lab_code	Varchar2(10)	Not Null	Lab code
Fibre_lenght	Number(7,2)	Not Null	Fibre span length
Fibre_fittness	Number(7,2)	Not Null	Fibre fitness value
Fibre_bundle_str	Number(7,2)	Not Null	Fibre bundle strength
Maturity_analysis	Number(7,2)	Not Null	Maturity coefficient
Thrash_analysis	Number(7,2)	Not Null	Thrash analysis
Cotton_clr_grade	Number(7,2)	Not Null	Cotton color grade
Test_date	Date	Not Null	Testing date
Result	Varchar2(20)	Not Null	Accepted,Rejected

MIN:

This table holds the material inward note details.

ATTRIBUTE NAME	DATA TYPE	CONSTRAINS	DESCRIPTION
MIN_ID	Varchar2(10)	PK	MIN-ID
QAR_ID	Varchar2(10)	FK-QAR	QAR-ID
Qty_accepted	Varchar2(10)	Not Null	Quantity accepted
Store_ID	Varchar2(10)	Fk-Stores	Store-ID

STORES:

This table maintains information about the stores.

ATTRIBUTE NAME	DATA TYPE	CONSTRAINS	DESCRIPTION
Store_ID	Varchar2(10)	PK	Store-ID
Location	Varchar2(15)	Not Null	Location

STORE_DETAILS:

This table maintains the item stored in the stores.

ATTRIBUTE NAME	DATA TYPE	CONSTRAINS	DESCRIPTION
Store_ID	Varchar2(10)	FK-stores	Store-ID
Item_code	Varchar2(10)	FK-items	Item code
Qoh	Number(10)	Not Null	Quantity on hand
Recent_date	Date	Not Null	Date on which item was used

REJECTED_ITEMS:

This table holds the details of the item rejected.

ATTRIBUTE NAME	DATA TYPE	CONSTRAINS	DESCRIPTION
MIR_ID	Varchar2(10)	FK-MIR	MIR-ID
Item_code	Varchar2(10)	FK-Items	Item code
Qty_rejected	Varchar2(10)	Not Null	Quantity rejected
Reason_ID	Varchar2(10)	FK-Reasons	Reason-ID
Remarks	Varchar2(10)		Remarks

REASONS:

This holds the information on the reason for the rejection of the items.

ATTRIBUTE NAME	DATA TYPE	CONSTRAINS	DESCRIPTION
Reason_ID	Varchar2(10)	PK	Reason-ID
Reason_det	Varchar2(25)	Not Null	Reason details

VENDOR_ITEMS:

Information specific to items delivered by the vendors.

ATTRIBUTE NAME	DATA TYPE	CONSTRAINS	DESCRIPTION
Vend_code	Varchar2(10)	PK	Vendor code
PO_code	Varchar2(10)	FK-Purchase_order	Purchase order code
Start_supply	Date	Not Null	Date of first supply
End_supply	Date	Not Null	Date of last supply
Rating	Varchar2(15)	Not Null	Rating of the vendor

EMPLOYEE:

This table holds the details of the employees of the organization.

ATTRIBUTE NAME	DATA TYPE	CONSTRAINS	DESCRIPTION
Emp_code	Varchar2(20)	PK	Employee code
Dept_code	Varchar2(10)	FK-Department	Department code
First name	Varchar2(20)	Not Null	First name
Last name	Varchar2(20)	Not Null	Last name
DOB	Date	Not Null	DateOf Birth
Sex	Char(4)	Not Null	Sex
Qualification	Varchar2(10)	Not Null	Qualification
Join_date	Date	Not Null	Date ofJoining
Address	Varchar2(40)	Not Null	Address
City	Varchar2(15)	Not Null	City
State	Varchar2(15)	Not Null	State
Zip code	Number(10)	Not Null	Zip code
Country	Varchar2(15)	Not Null	Country
Phone1	Number(15)	Not Null	Phone Number
Mail_id	Varchar2(10)	Not Null	Mail-id
Login_id	Varchar2(20)	FK-Login	Login- id refers to xLOGIN table

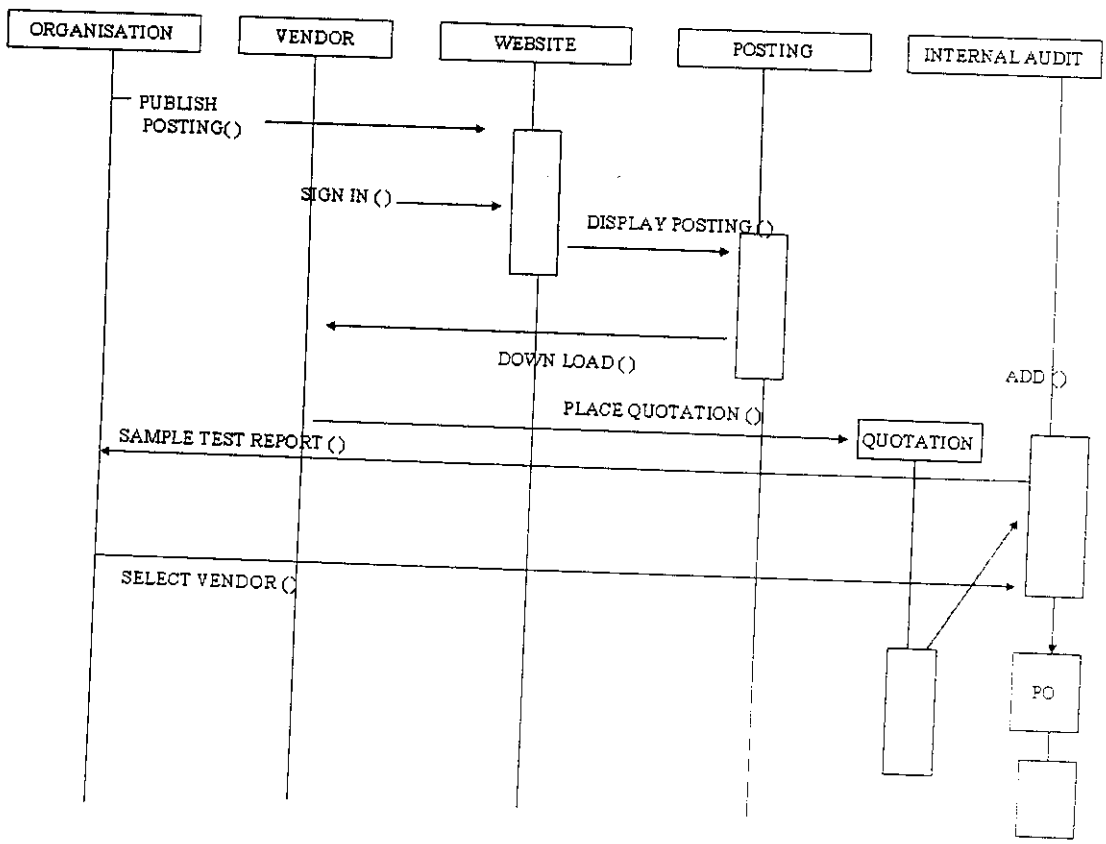
4.5 PROCESS DESIGN

SEQUENCE DIAGRAM

Sequence diagram is a form of interaction diagrams, which depicts the dynamic behavior of the system.

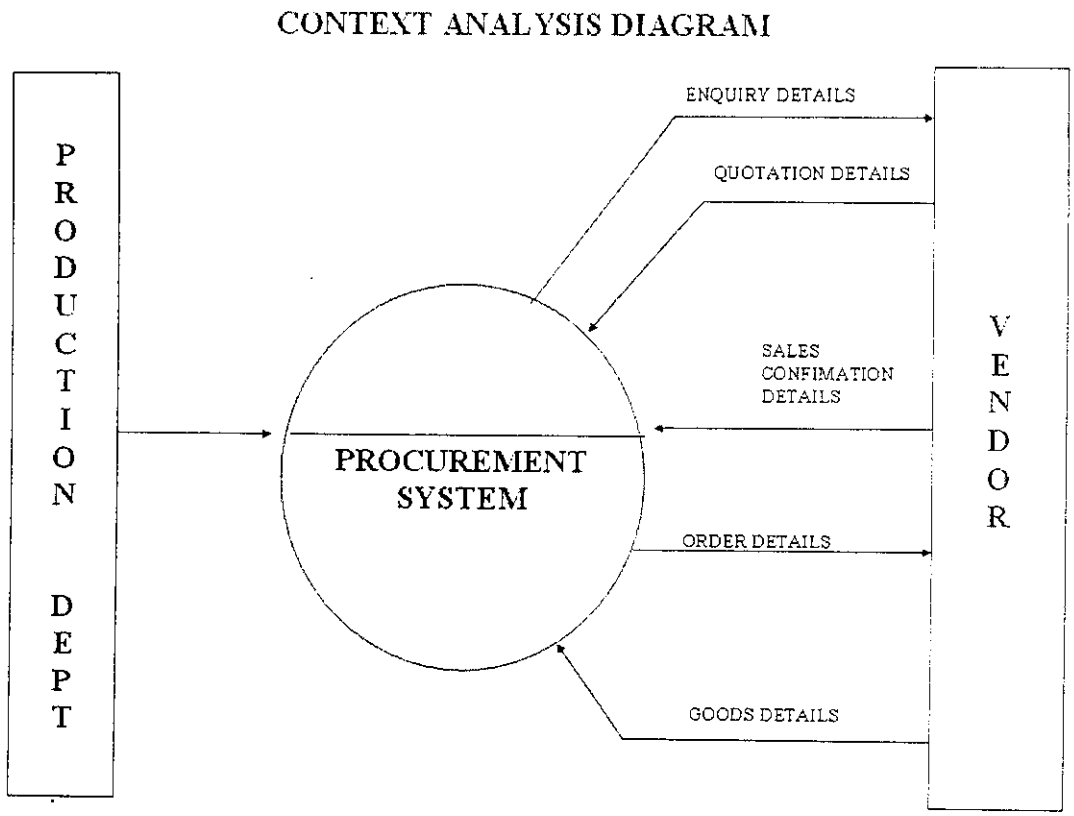
Sequence diagram are models that describe how a group of objects are shown as vertical lines with the message as horizontal lines between them. This depicts the actors involved in the system and their behavior or the interaction between them. The actions are given in sequence as the behavior can be traced easily.

Here the interaction between the vendor and the organization are given. The interaction starts with the vendor entering the website and the sequence continues till the administrator of the organization identifies the potential vendors and places the purchase order after comparing the quotations sent by the vendors.

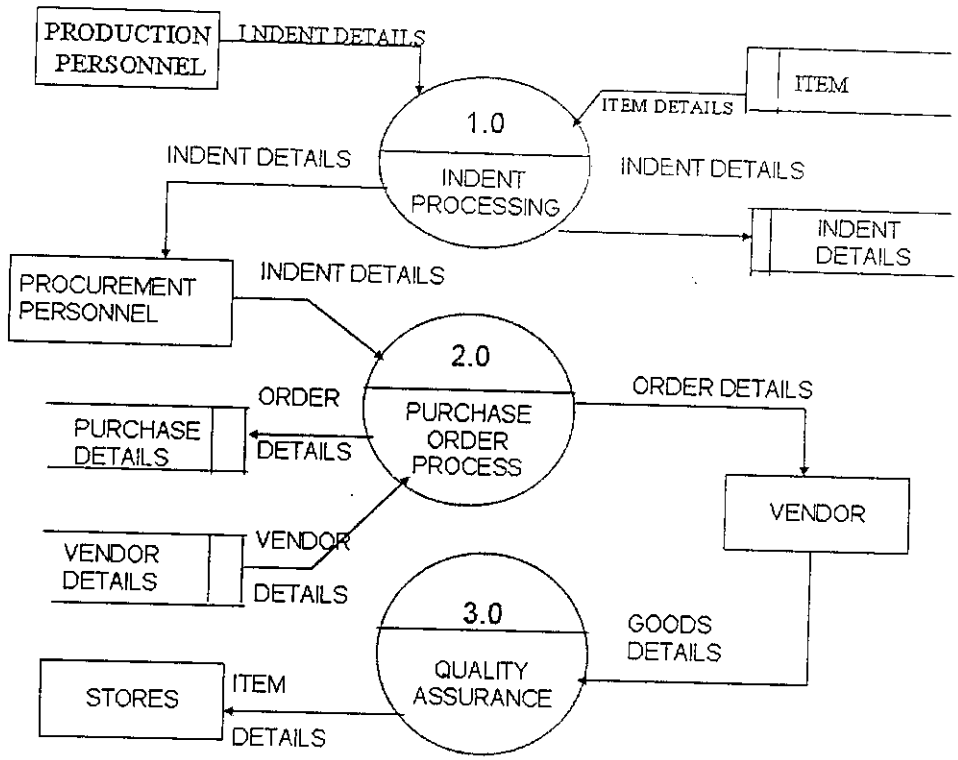


Data Flow Diagrams

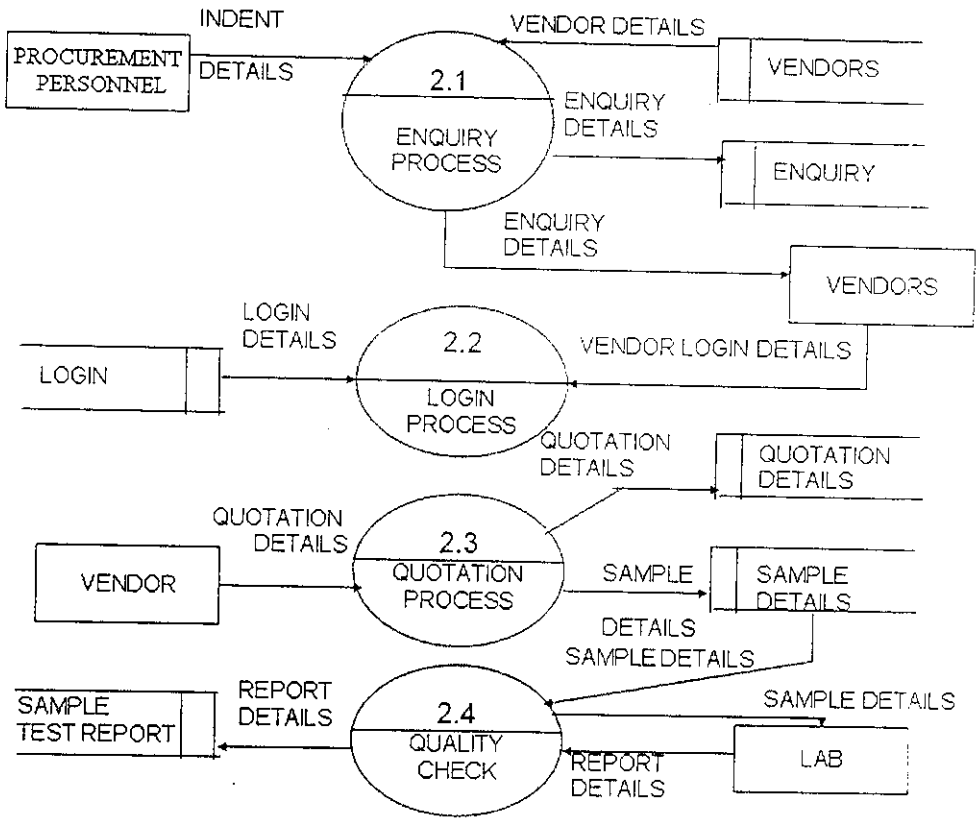
Context Analysis Diagram



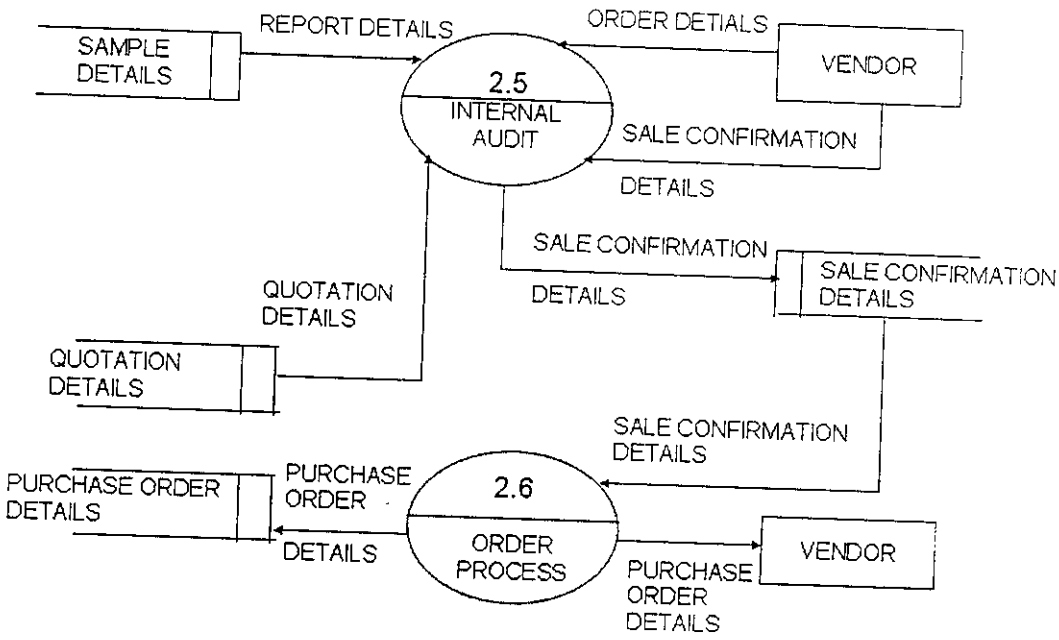
DATA FLOW DIAGRAM-LEVEL 1



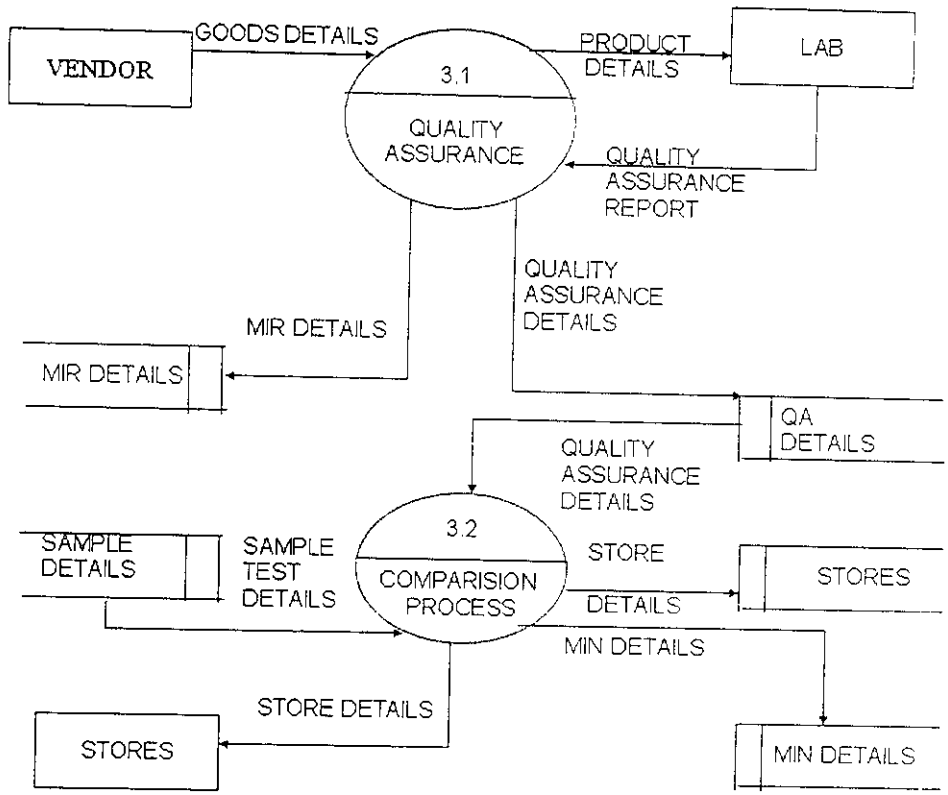
DATA FLOW DIAGRAM-LEVEL 2



DATA FLOW DIAGRAM-LEVEL 2



DATA FLOW DIAGRAM-LEVEL 2



5. System Implementation and Testing

5.1 SYSTEM IMPLEMENTATION

Implementation is the stage of project when the theoretical design is turned into a working model. A lot of planning has to go for the successful implementation of the system. The major steps that were carried out and the events that occurred in these stages are summarized below.

Training was given to the users of the software application, both, theoretically as well as practically. They were briefed on the lines of the objectives of the system, how to operate the system and the benefits that would be reaped from the system. The system was tested in the user environment and the user was asked to give his / her suggestions. It was found that most of their responses were favourable to the effective use of the system.

Implementation consists of

Implementing the necessaries of user needs.

Hardware and software needs are implemented

Checking errors

Check the flow of data in the required format

5.2 SYSTEM TESTING

Software Testing is to test the success of the system and it requires a significant percentage of overall development time and effort. Testing is the process of executing a program with the explicit intention of finding errors, if any. A series of tests are performed over the proposed system before the system is ready for user acceptances.

The processing of the testing proceeds as follows:

- **Unit Testing**

  Each and every program units are tested, which is known as unit testing.

  In the system, unit testing is performed every page or file thereby monitoring the flow of data from page to page.

  The testing is proceeded with an effort of adding the modular programs to the file or page.

- **Series Testing**

  Series testing is performed by checking the logic of the query designed.

  The bound queries are also tested in this testing.

  The testing is performed on the database to check the load accepting capacity of the database.

- **Integration Testing**

  Integration is the process of linking various modules. As the individual modules have to be integrated, a thorough checking has to be done on integration system also. Few modules of system are linked and carried out with the integration testing. All the possible data has been given and tested. One area for this integration testing is discussed below.

  One instance of the modules integration is the area where the parameters and the values that has to be transferred are analyzed. From the Apply palette to the transaction palette the values of the citizen number has to be precisely sent.

- **System Testing**

  System testing is doe to test the entire software in a simulated environment and in the realistic environment. It is the stage of implementation, which is aimed at ensuring that the system works accurately and efficiently before the operation, commences. Thus the system test in implementation should be a confirmation that everything is correct and an opportunity to show the users that the system works.

6. Conclusion

CONCLUSION

The project entitled " Supply Chain Management" was aimed at providing the maximum satisfaction to the vendors and to build strong relation ship with the organization which in turn helps the organization to effectively source materials. The system has succeeded in doing that effectively. The response has been good from the user appreciating the efforts to source the materials from vendor and reduction in the lead-time involved in procuring the items from the vendors due to good relationship maintained.

7. Scope For Future Development

SCOPE FOR FUTURE DEVELOPMENT

Any System developed now is becoming obsolete by the next few days. The system is designed in a manner that any future enhancement required by the organization can be easily updated without going for a new system.

Addition of the following functionality to the system can further promote the usage of the system.

On- line money transaction can be arranged to help procuring the material and components through web.

Multiple currencies can also be accommodated here, so as to help the customers buy products with the help of their native currency.

8. Bibliography

BIBLIOGRAPHY

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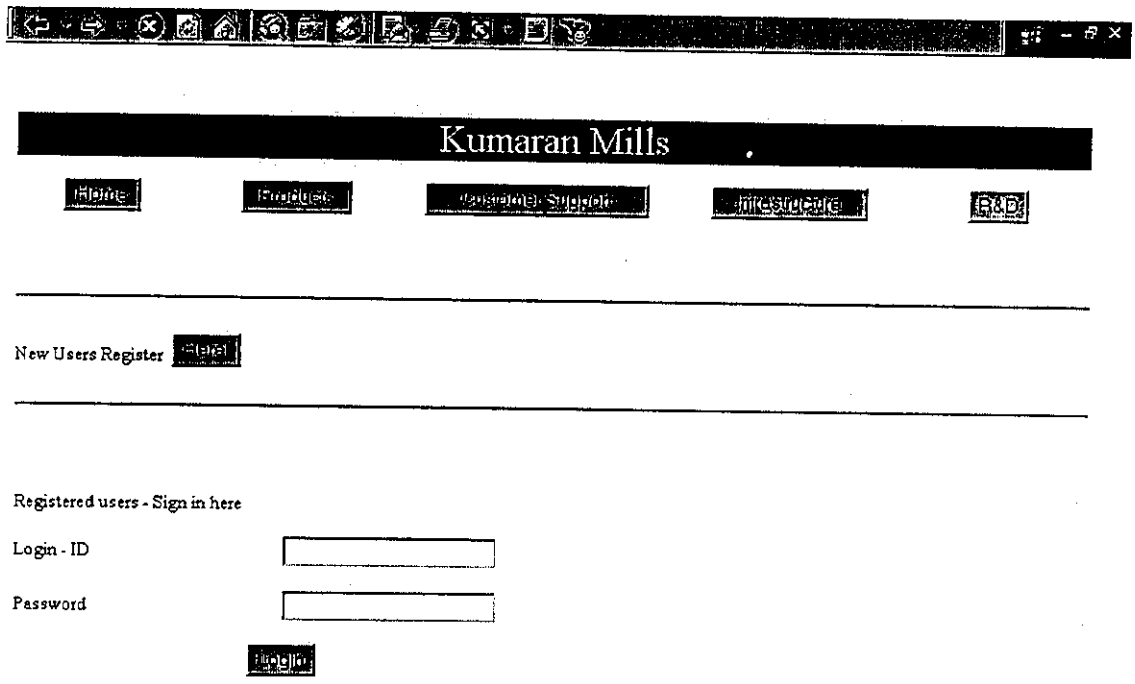
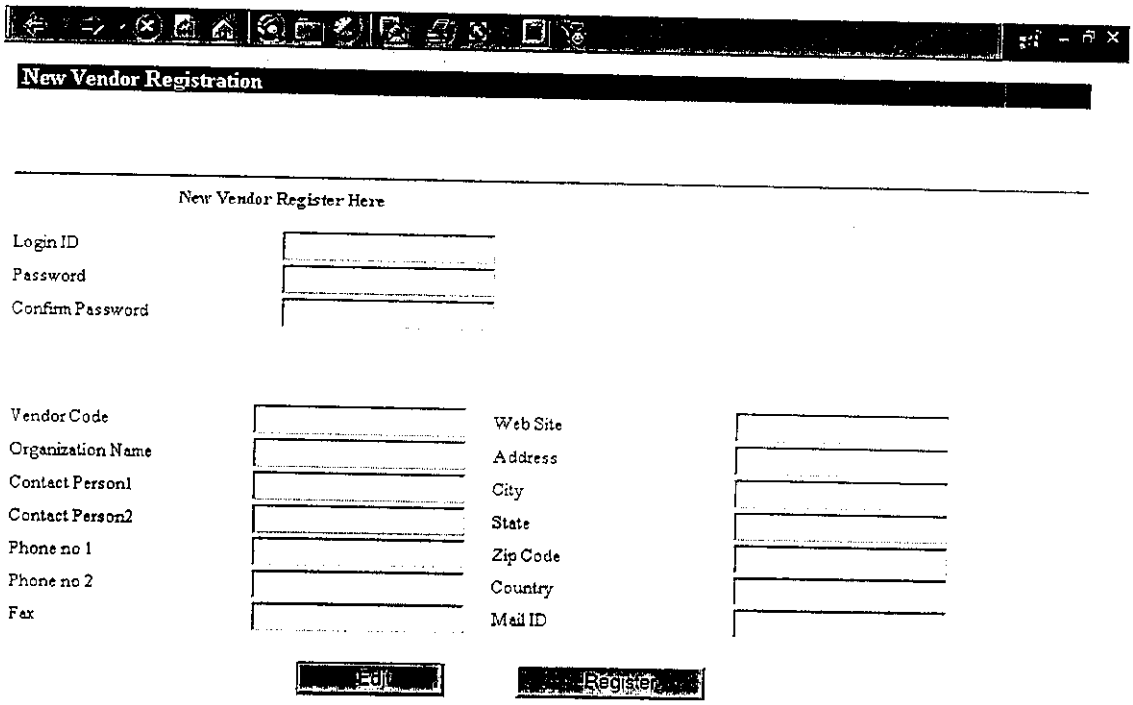
3. Active Server Pagees 101, "www.asp101.com"
4. W3 Schools Online Web tutorials, "www.w3schools.com"
5. HTMLGoodies Online Tutorials, www.htmlgoodies.com.
6. George Koch and Kevin Coney ,Oracle 8 the complete reference , Tata Mc Grawhill Publishing Company,1999.

9. Appendices



THE HOME PAGE :

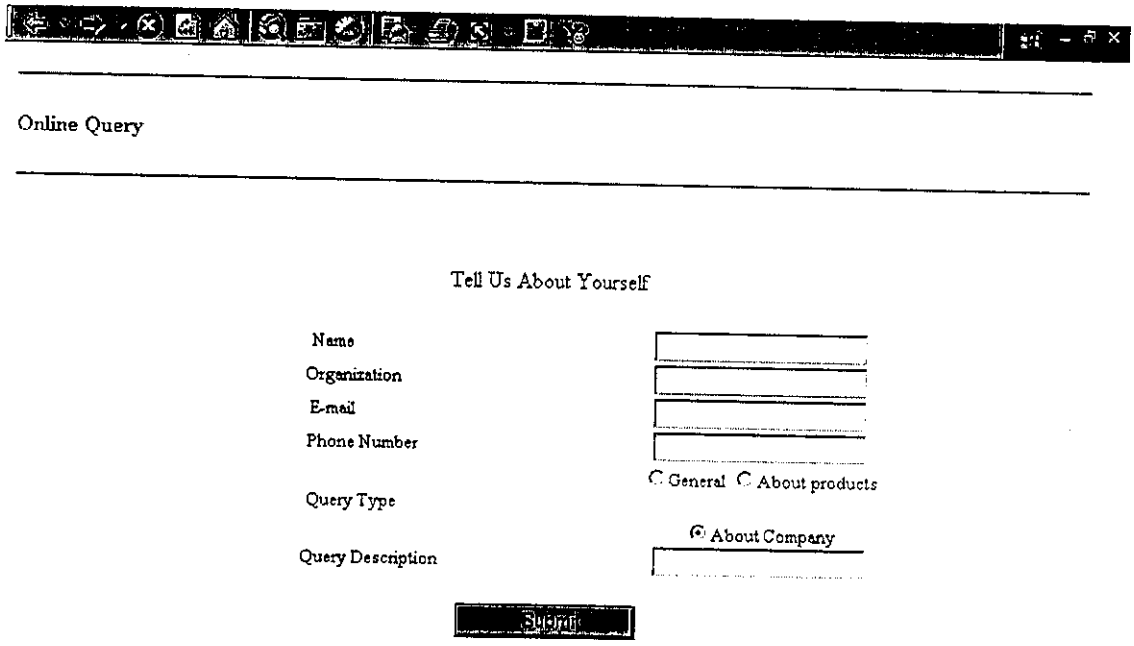
This is the default page of the site that is displayed when the user does'nt make a request for a particular page. This page contains the sign in area, which should be used by the users to obtain the services of the system. Thus it can also be called as the sign in page.



PURCHASE-NEW VENDOR REGISTRATION

New Vendor Registration:

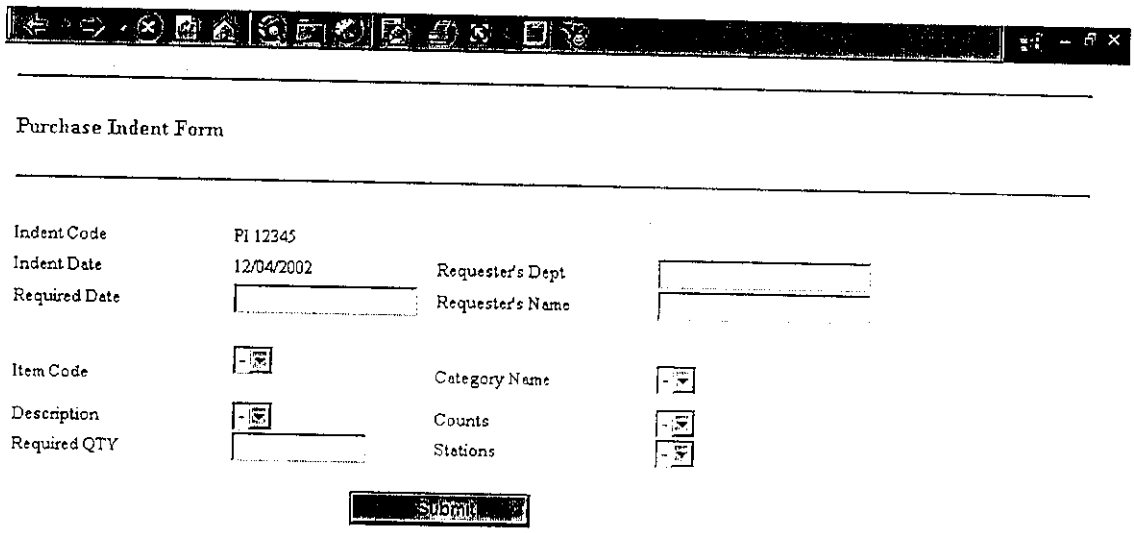
This screen is used for addition of a new vendor to the organization.This includes all the relevant details about the new vendor.



PURCHASE – ON-LINE QUERY

On-Line query:

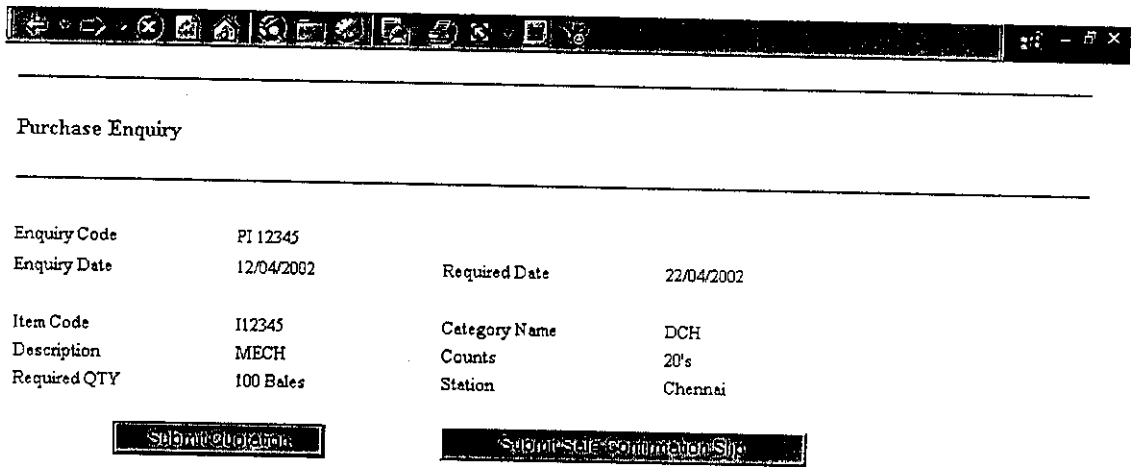
This screen is used for on-line query processing



PURCHASE- PURCHASE INDENT FORM

Purchase Indent Form:

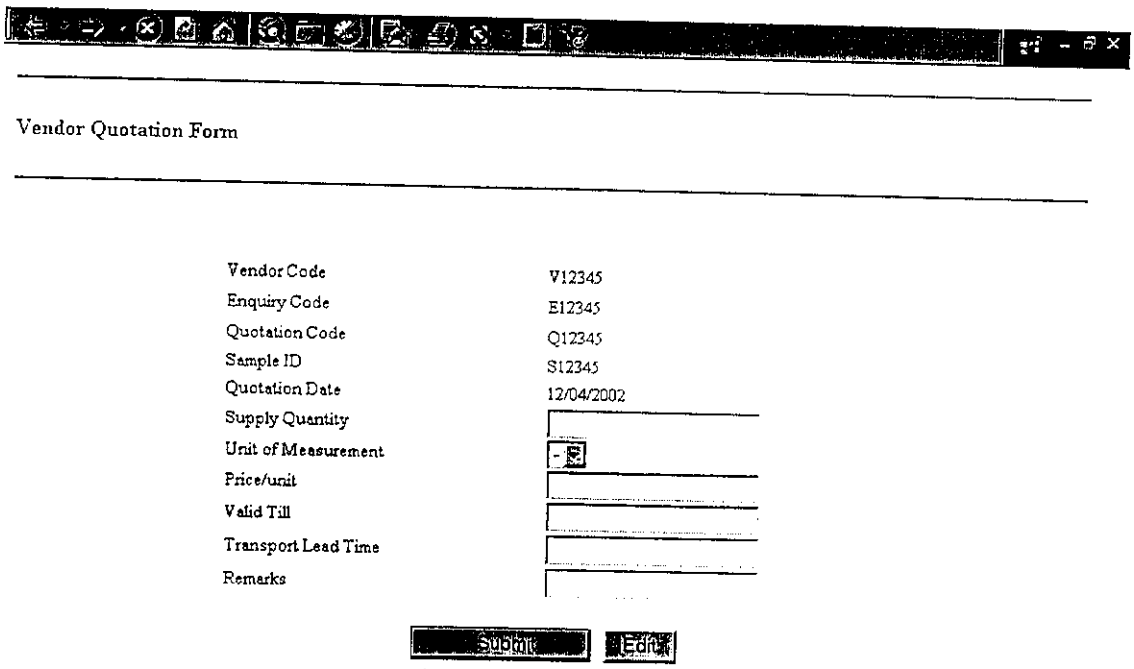
This screen is used to submit the indent to the procurement department requesting for the purchase of raw materials.



PURCHASE- PURCHASE ENQUIRY

Purchase enquiry:

This screen gives the details about the raw materials requisition posted to the vendors. This screen has the option of letting the vendors submit the quotation or the sale confirmation slip to the organization.



PURCHASE-VENDOR QUOTATION FORM

Vendor Quotation Form:

This screen is used to submit the quotation for a particular enquiry. The values in this screen can also be edited by the vendor if necessary

Vendor Sale Confirmation Slip Form

Vendor Code	V12345
Sale confirmation Slip Code	SC12345
Quotation Code	Q12345
SCS Date	12/04/2002
Supply Quantity	
Unit of Measurement	
Price/unit	
Valid Till	
Transport Lead Time	
Remarks	
Terms and Conditions	

Submit Edit

PURCHASE- SALE CONFORMATION SLIP FORM

Vendor SCS Form:

This screen is used to submit the sale confirmation slip by the vendors.

Purchase Requisition List

Indent Code Code

Item Code

Indent Date

Sort by

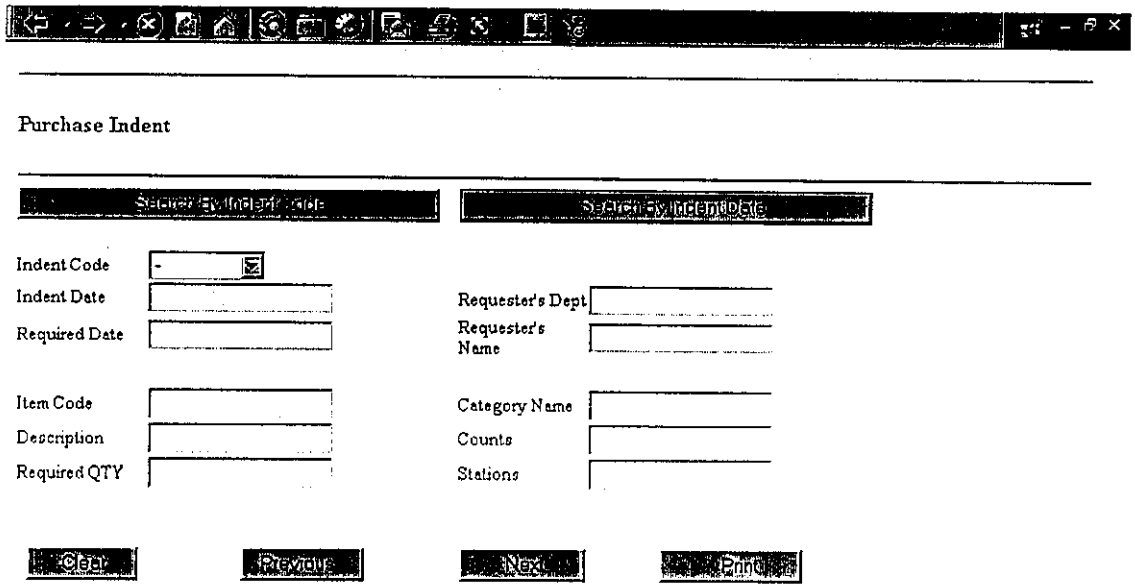
Indent #	Indent Date	Item #	Desc	Category	Counts	Qty Required	Due Date	Status

Clear Display Print

PURCHASE-PURCHASE REQUISITION LIST

Purchase Requisition List:

This report gives the details of all the items that were specified in the indents. This report is sorted or indexed by indent date or the item code.



PURCHASE – PURCHASE INDENT

Purchase Indent Details:

This report notifies the details of the purchase requisition or the indent, which specifies the details of the item, and the quantity required. The indent can be searched by the indent code or by the indent date.

Item Vendor List

Indent Code Code Display Vendor Details

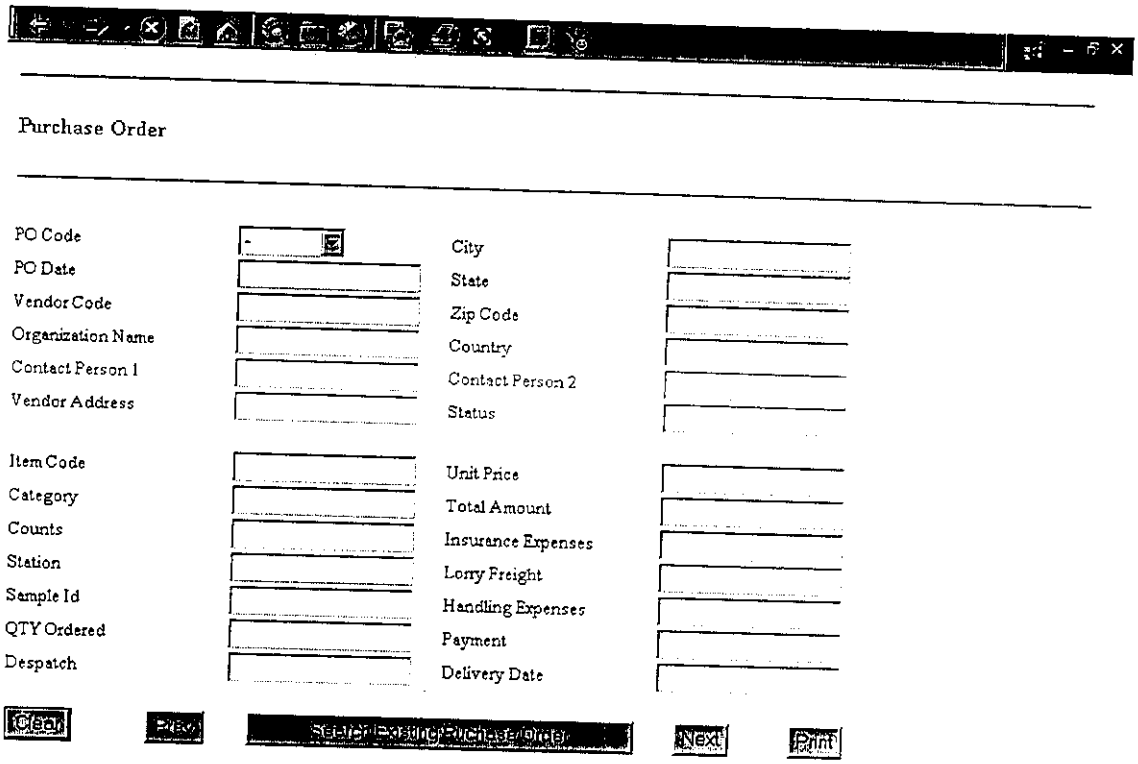
Vendor #	Org name	Address	Contact name	Phone #	Mail-Id	Qty	Amount	Rating

Clear Print

PURCHASE – ITEM VENDORS LIST

Item Vendors List :

This report list out all the vendors who have supplied the items to the organization.



PURCHASE-PURCHASE ORDER

Purchase Order:

This report specifies the format of the purchase order. The purchase order specifies the item that is to be procured, their quantity, the vendor form which the item is to be procured and their address etc,.

Vendor List

Vendor Code Code

Display Performing Vendor Display Non-Performing Vendor

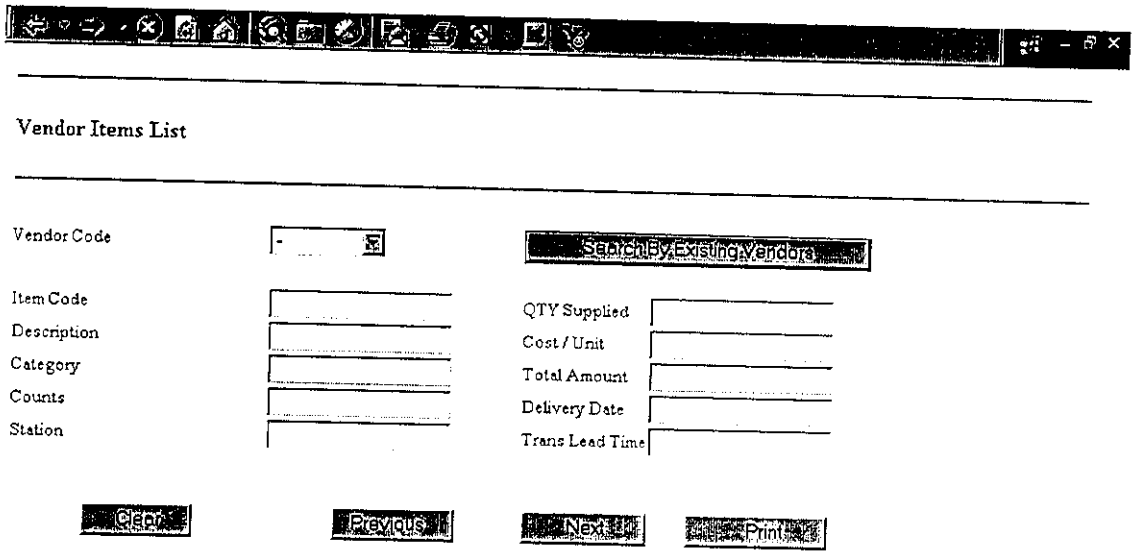
Vendor #	Vendor name	Address	Contact name	Phone #	Mail-Id	Rating

Clear Print

PURCHASE – VENDOR LIST

Vendor List :

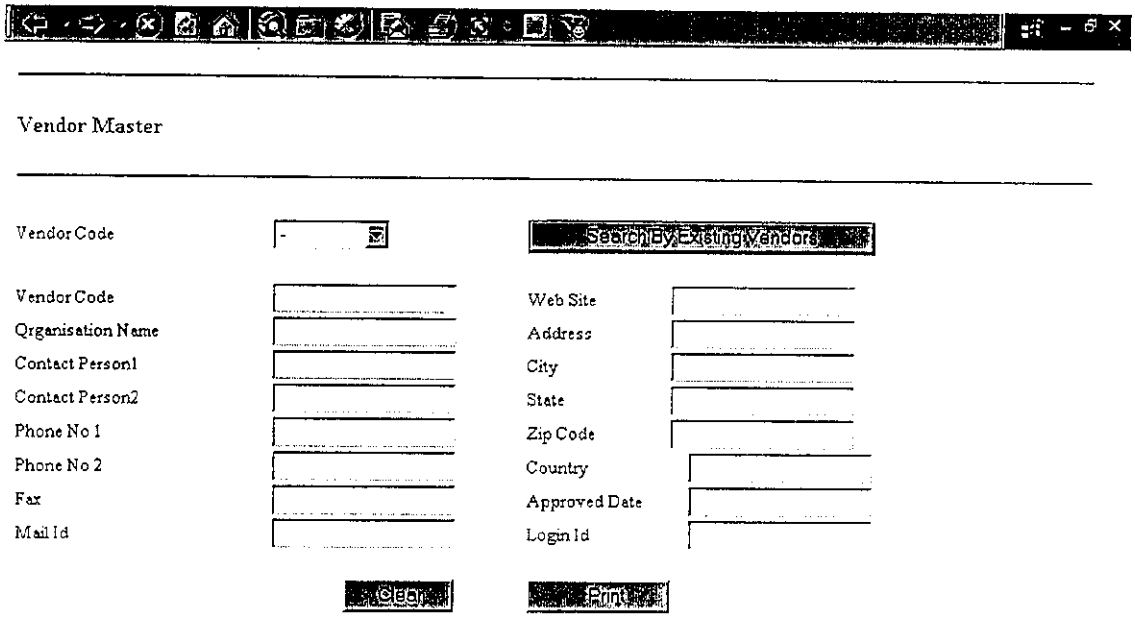
This report specifies the details of all the vendors or the specified vendors along with their rating. The list can be restricted to specific rating of the vendor (i.e) Performing vendor or the Non- Performing vendor and can be stored.



PURCHASE-VENDOR ITEM LIST

Vendor Item List:

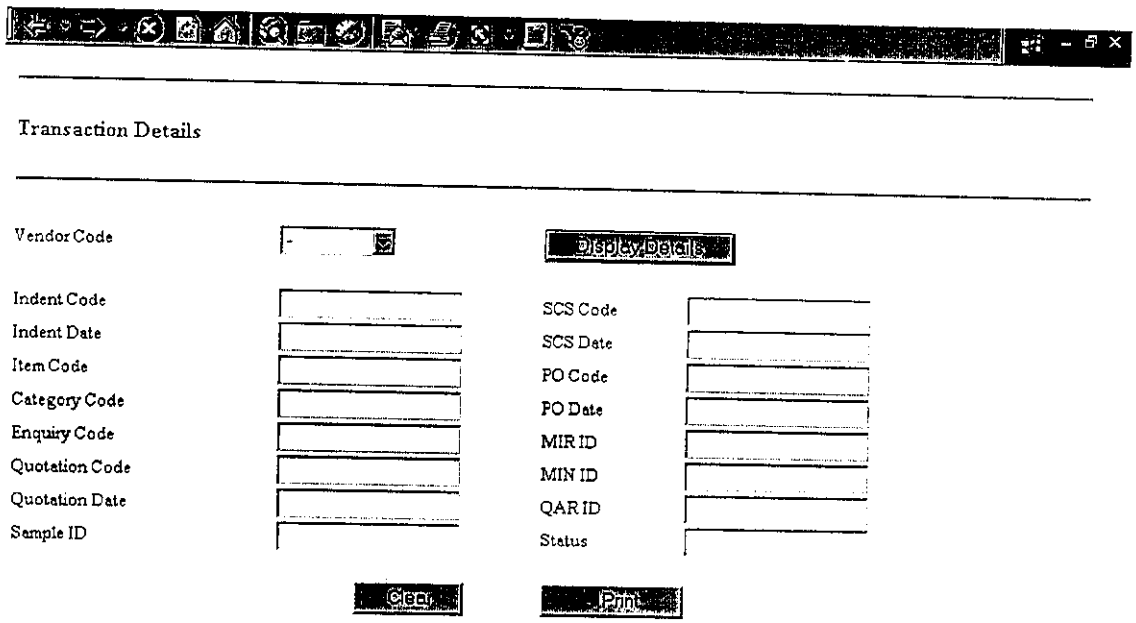
This report specifies the set of items that were delivered by the vendor.



PURCHASE – VENDOR MASTER

Vendor Master:

This report gives all the relevant details of the existing vendors including the option to search for the existing vendor.



PURCHASE-TRANSACTION DETAILS

Transaction Details :

This report lists out all the details of a particular transaction tracking from the indent code through quotation code, to the purchase order.

Purchase By Item

From Date To Date

Vendor Name	Item #	Description	Category	Counts	PO#	PO Date	QTY	Unit Price	PO Amt

Display Clear Print

PURCHASE- PURCHASE BY ITEM

Purchase By Item :

This report gives the details of all items that were procured within the specified date. This report is stored or indexed by vendor code.

Vendor Quotation

Quotation Code

Vendor Code

Search By Quotation Code

Item Code

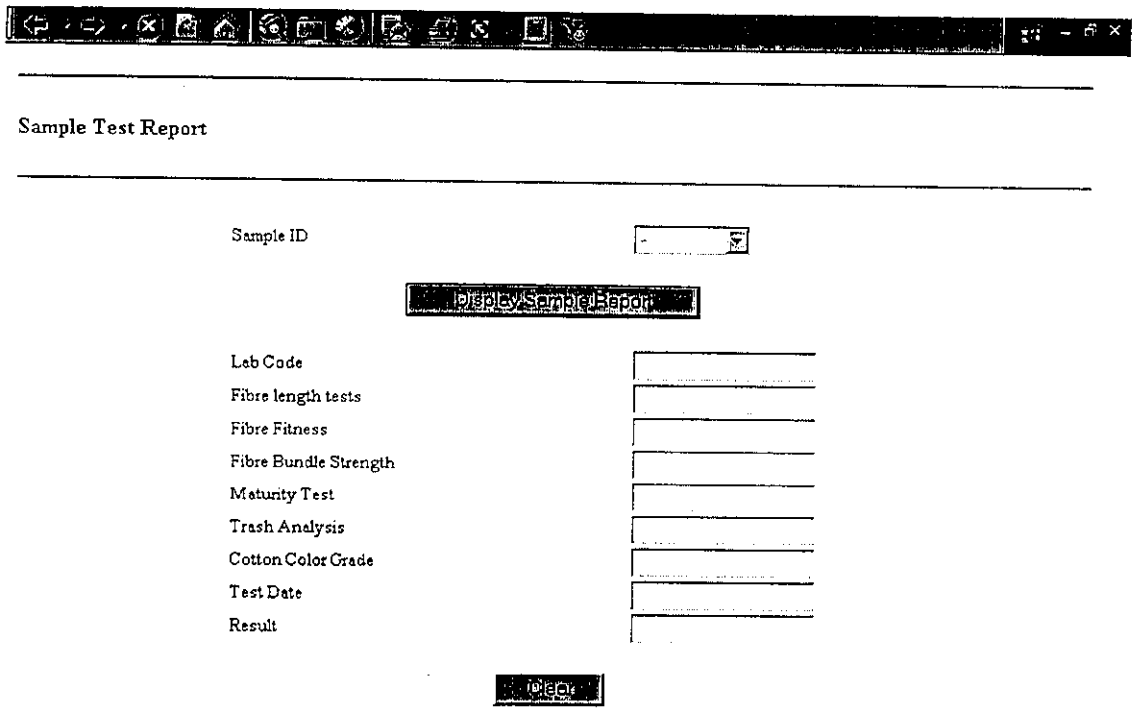
Sort By Item Code

Quot #	Vendor #	Item #	Category	Counts	Required QTY	Supply QTY	Unit	Amt/Unit	Price/Unit	Trans LD	Status

PURCHASE- VENDOR ITEM

Vendor Item :

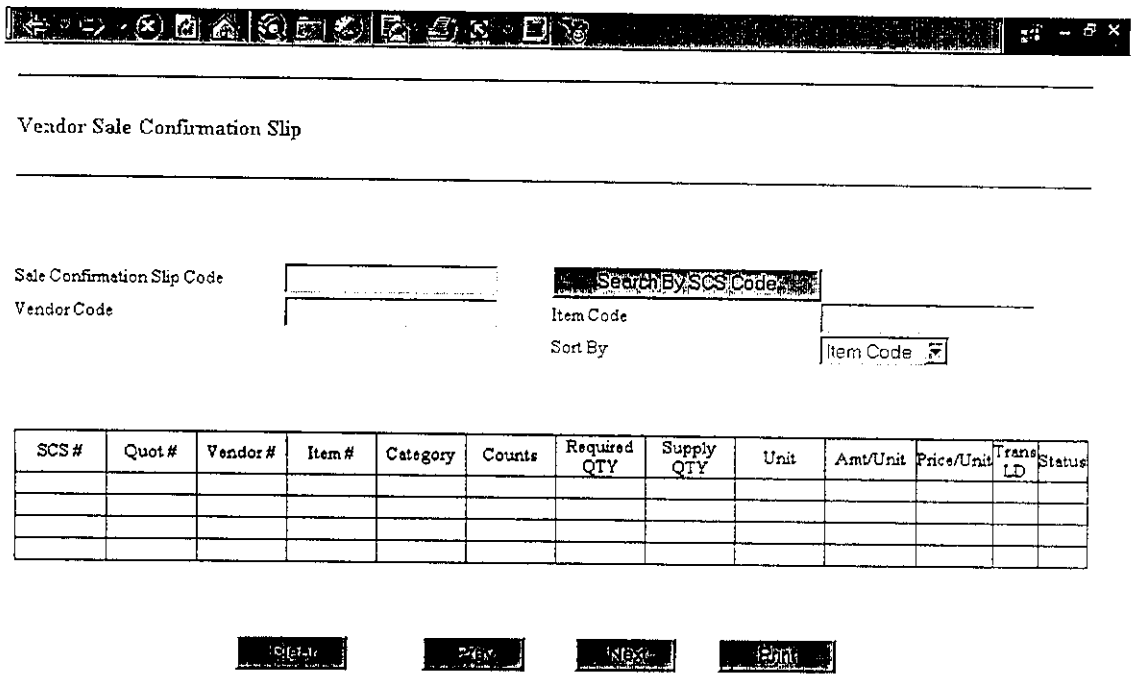
This report gives the details of the quotation send by the vendors in response to the purchase requisition from the company.



PURCHASE-SAMPLE TEST REPORT

Sample Test Report :

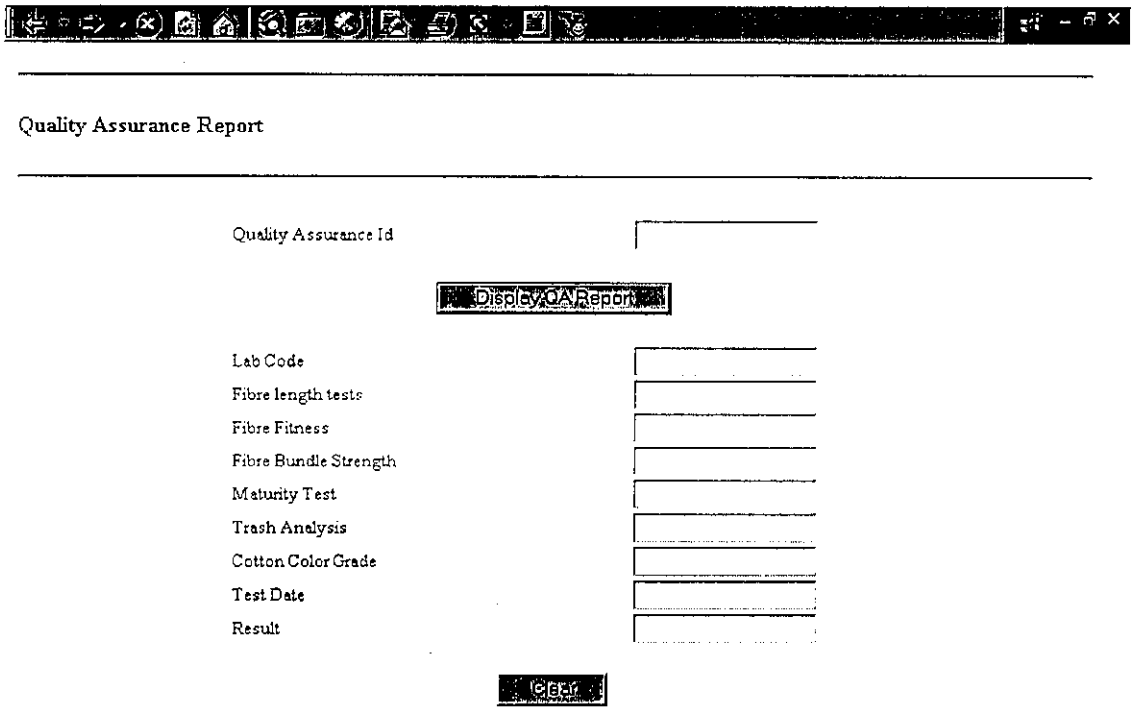
This report is used to display the sample test results.



PURCHASE- VENDOR SALE CONFIRMATION SLIP

Vendor Sale Confirmation Slip :

This report gives the details of the sale confirmation slip send by the vendors. This can be sorted or indexed by the item code or the vendor code.



PURCHASE- QUALITY ASSURANCE REPORT

Quality Assurance Report :

This report is used to display the quality assurance results.

Rejected Items

Vendor Code

PO Code

Item Code

Sort By

Item Code

Vendor Name	SCS #	Item #	Category	Counts	Rejected QTY	Supply QTY	PO #	MIR ID	QAR ID	PO Amt	Reason ID

PURCHASE- REJECTED ITEMS

Rejected Items :

This report gives the details of all the items that were rejected after quality assurance. This report can be sorted or indexed by PO code or the item code.

Store Details

Store ID
Item Code

Search by Store ID
Search by Item #

Store ID	Item #	Description	Category	Counts	Station	QOH	Date	Location

Help Prev Next Print

PURCHASE- STORE DETAILS

Store Details :

This report gives the details of the items that are stored in the stores.