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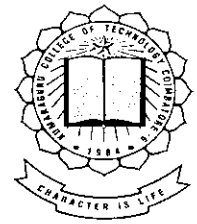

ONLINE AUTOMATION OF VLINK-SYSTEMS WITH MAIL SERVER

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KUMARAGURU COLLEGE OF TECHNOLOGY
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(Affiliated to Anna University)

A PROJECT REPORT

Submitted to the

FACULTY OF INFORMATION AND COMMUNICATION ENGINEERING

In the partial fulfillment of the requirements
for the award of the degree
of

MASTER OF COMPUTER APPLICATIONS

June, 2006

KUMARAGURU COLLEGE OF TECHNOLOGY

Coimbatore

Department of Computer Applications

BONAFIDE CERTIFICATE

Certified that the project report titled **ONLINE AUTOMATION OF VLINK-SYSTEMS WITH MAIL SERVER** is the bonafide work of **Mr. V. SARAVANAN (Reg No: 71203621045)** who carried out the research under my supervision. Certified further that to the best of my knowledge the work reported here in does not form part of any other project report or dissertation on the basis of which a degree or award was conferred on an earlier occasion on this or any other candidate.

PROJECT GUIDE **HEAD OF THE DEPARTMENT**

Submitted for the University Examination held on 30-06-2006

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TO WHOMSOEVER IT MAY CONCERN

This is certifying that Mr. **SARAVANAN.V**, Roll. No **03MCA47** Master of Computer Application at Kumaraguru College of Technology, Coimbatore has completed the project entitled as "**ONLINE AUTOMATION OF VLINK SYSTEMS WITH MAIL SERVER**" in our concern from January '06 to June' 06.

During this period the conduct and attendance found to be good.

Authorized signature,

SRIKANTH.R
(DIRECTOR)

ABSTRACT

The core aim of this application is to automate various departments of an intended organization under one system and integrates its branches through traditional mail server implementation. To facilitate the implementation of system, it has been organized into five categories, such as Static and Dynamic web pages development, On line inventory control system, ASM control system, Service intimation system, Device driver repository & downloading control system, and Mail Server implementation.

The central concept of this application is to allow the purchase department to keep product details in a centralized relational database, from which sales department can sell their products to customer. If there is a problem in sold products, the customer will approach service department, they will make service to customer based on the warranty date of that product. If organization had an ASM agreement with the customer, this system will automatically generates the servicing schedule and keeps the related data. Furthermore this system provides downloading facilities to its users. To integrate its various branches this system provides a mailing facility, through which people at different branches can communicate each other.

Above all this system concentrates to facilitate the maintenance work of web pages, provision allocation for users to access different part of the system in a user-friendly manner. This system not only automates the needs of an organization, but also conveys the general information about the organization such as services offered, technology deals with to the outside world through its attractive web pages.

The goal of this application is to minimize the cost, time and increase the customer service. The potential objective is to make the system implementation in a generalized manner, which means that with some minimal modification it could be adapted into any organization that has been running their business over the same domain of an intended organization.

ACKNOWLEDGEMENT

I would like to thank our principal **Dr. Joseph.V.Thanikal** for having given me the opportunity to do this project.

I would like to express my deep sense of gratitude to **Dr. M. Gururajan,** HOD, Department of Computer Applications for providing moral support towards this project work.

I express my gratitude to **Mr. A. Muthukumar**, Assistant Professor, Department of Computer Applications, who has been my guide with valuable and timely suggestions and extended kind of operation and encouragement.

I thank **Ms. V. Geetha**, Assistant Professor, Department of Computer Applications, who has been encouraging me to do this project.

I also express my gratitude to Managing Director of VLink Systems **Mr. R. Srikanth** for having given me the opportunity to do this project.

And I would like to thank my parents, friends, and all those who helped me in this project and whose names are leftover.

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LIST OF SYMBOLS, ABBREVATIONS AND NOMENCLATURE

JDBC	-	Java Database Connectivity
HTTP	-	Hyper Text Transfer Protocol
HTML	-	Hyper Text Markup Language
SMTP	-	Simple Mail Transfer Protocol
FTP	-	File Transfer Protocol
SQL	-	Structured Query Language
JSP	-	Java Server Pages
DFD	-	Data Flow Diagram
ASM	-	Annual Service Maintenance
VoIP	-	Voice over Internet Protocol

CHAPTER 1

INTRODUCTION

1.1 PROJECT OVERVIEW

The project titled as **ONLINE AUTOMATION OF VLINK-SYSTEMS WITH MAIL SERVER** is basically an online application and has been implemented in three tier architecture fashion. This system takes care of automating the internal processing of various departments of VLink Systems and as well as, it integrates their branches located at different place through mail server implementation. It is highly enhanced version of the existing system. The customers and user of this system are provided with the user friendly interactive screens and it provides plenty of features like centralized user allocation, high data security and instant updating at server.

This system automates the several department of an organization to provide a flexible service. The customer and general user can know the services provided by the organization through user friendly web pages. It provides a provision to purchase and sales department for buying and selling products systematically from outside vendors. It also provides servicing schedules to service engineers where the organization having an ASM based agreement. This system provides another facility to service engineers, such that it integrates all service engineers at different customer site by intimating their service status to each other through its centralized implementation. To avoid the external storage device's need, this system offers the feature, through which the users can download files from the web site. This system also integrates various branches of an organization through traditional Mail Server implementation, which provides an option to send and receive mails from other popular mail service providers.

1.1.1 Objectives Of The System

The goal of this application is to minimize the cost, time and increase the customer service. The potential objective is to make the system implementation in a generalized manner, which means that with some minimal modification it could be adapted into any organization that has been running their business over the same domain of an intended organization. This application will enhance the facilities with latest technologies. This application enables instant access of information globally for the customer, which increase the customer service and satisfaction that keeps building the business towards the competitive world. Organization process and web pages are implemented using Java server side technology. Technologies enable the application with scalability and extended performance measurement for online automation. Objectives of this system are,

- ❖ Intimate organization's services throughout the world
- ❖ Increase sales and buying opportunities
- ❖ Instant data access
- ❖ Keep data security forever
- ❖ Generalized implementation
- ❖ Integrate branches, located at different places
- ❖ Reduce the cost and effort of target users

1.1.2 Systems and Modules

The whole application development work has been organized into six categories. They are,

a) Static and dynamic web pages development and maintenance
b) Online inventory and warranty control system
c) Online ASM schedule maintenance system
d) Online service log maintenance and intimation system
e) Device driver upload and downloading control system
f) Mail server with minimum specification implementation

Each of these systems has fatherly divided into several sub modules.

a) Static and dynamic web pages development and maintenance

This system organizes the static and dynamic information of the VLink systems over the WebPages. History, Partners and collaborators, Contacts, services offered by the VLink systems are static contents that has been organized in a manner such that user can easily access and understood. The dynamic contents such as products album, advertisements and offers, are organized in a manner that can be easily maintained by the user. This system has the following sub modules,

a.1) Dynamic Product Loader

This module, after loading the database driver, maintains the movement of product related data that will appear over the web page to and from the relational database.

a.2) HTML code converter

This module is responsible to convert the product details and images into HTML file format, and it automatically creates the required files and deploys them into web server. So, by just clicking the refresh button of any web browser the user can view the changes made immediately. This module totally avoids the restriction that the maintenance people would know the HTML programming knowledge to maintain dynamic web pages.

b) Online inventory and warranty control system

This system controls the purchase, sales, & stock maintenance of products. It also maintains the warranty details of product that will be used by the service engineers when they deal with the defected products at customer site. This system has the following sub modules,

b.1) User validation process

This module is responsible to allow only authorized persons to access the system. And based on the weight of username and password it will provide the provision to access the various part of

b.2) Customer control process

This module is responsible for adding new customers into the system. If the administrator enters into this module it provides editing and deleting features also.

b.3) Purchase control process

This module gets the details about different categories of products (such as new, serviced and standby products) then makes them available to rest of the system by storing those details in relational database at server side. It also checks the validity of entries and allows only valid products.

b.4) Sales control process

Through this module the sales department people can sell products in stock to customer. There is an instant feature to add new customer from here itself. This module will automatically generate the printable invoice bill to customer. The changes made in this module will automatically reflect to rest of the system immediately. It's able to manage more than one customer at a time by creating separate session to each. After the transaction is completed, this module will automatically update the warranty related data for a corresponding customer at server to make them available to service engineers.

b.5) Warranty date intimation control process

The service engineer will make use this module when they are dealing with defected sold products at customer site. Based on the product code, this module will find that whether that product is in warranty period or not. This will help service engineers to take further steps.

b.6) Report generation process

Only management level people can use this module to generate the variety of reports based on different reporting patterns.

c) Online ASM schedule maintenance system

This module is responsible to provide a servicing schedule of customer site where the organization is having ASM based agreement. It also maintains the status of each service, products installed, and status of each product at server. This will help them when next time makes service over the same place. This system has the following sub modules,

c.1) User validation process

This module is responsible to allow only authorized persons to access the system. And based on the weight of username and password it will provide the provision to access the various part of the system.

c.2) Railway station detail maintenance process

Since the organization have an ASM Agreement with southern railway, this module maintains the all railway station related data and their ASM dates. Service engineers can add, delete, and edit existing entries.

c.3) Service detail maintenance process

This module provides the provision to service engineers to enter status of each service, and also automatically calculate the date on which next service is to be taken. User can view the immediate changes at server.

c.4) Service reminder process

Since there are around 120-railway station belongs to southern railway, it's not possible to remember all dates on which service to be undertaken. To solve this problem this module automatically list out the railway station on which service have to be taken on tomorrow. This module also lists out the status by railway station wise also.

c.5) Report generation process

Only management level people can use this module to generate the variety of reports based on different reporting

d) Online service log maintenance and intimation system

This System maintains the daily service status of each service engineer on different customer site. It is used by the service engineer to know the services have been completed, service to be undertaken...etc. This system also reflects the changes in service immediately at the server; so one user can know the status of others. Before going to use this system all service engineers are validated by the user validation process then they are provided with service entry form, through which they can enter their status to system. Through report generation process they can view the all service engineer's status.

e) Device driver upload and downloading control system

This system provides a feature in which service engineer can upload the product's device driver to mapped directory in the server then they can download them at different customer site. It reduces external storage device cost during installation of product at customer site. Before going to use this system all users are validated by the user validation process, only authorized user can download the files from server.

f) Mail server with minimum specification implementation

This system integrates the various branches of VLink system through traditional mail service. It gives a provision to VLink Systems employee to create a mail account, send and receive mail from other mail server and vice versa. It also gives the security and reliability to the mails stored in the mailbox. It provides various utility functions, such as search a mail...etc. This module has the following sub modules

f.1) User I/F control process

This module is responsible to create users mailbox, based on the mails stored in the allocated space of corresponding user.

f.2) New user registration process

Through this module a new user can create mail account under this mail server. All entries are validated thoroughly before taking them into process.

f.3) Mail sending & Receiving control process

This is the SMTP Client program implementation, responsible to send mail to other popular mail servers from VLink systems server.

f.4) SMTP server

This is the SMTP Server program implementation, responsible to receive mails from other popular mail servers.

1.2 COMPANY PROFILE

Based at Chennai, branches at Coimbatore, Madurai, Bangalore & Hubli, VLink Systems, is a Nine-Year old Engineering firm specializing in the field of Wireless Communication products and accessories for Voice and Data on fixed, point to point, multipoint, mobile wireless platforms.

Formed in March 1995, VLink is a privately held company backed by three engineering graduates with rich IT experience in Product management, Channel Management, Service Management and Branch administration by working with organization like L&T, HCL &Indicom.

At VLink, Co -operation isn't just part of our business. It's the way we do our business. With unparalleled experience in managing the Wireless Net works, we understand the power of effective relationship. Which is why we work side by side with you understand the effective needs, Identify the ideal strategies and implement tailor made solutions.

Partners and Collaborators

The following lists show the partners and business collaborators of VLink systems.

- Motorola
- Tata Indicom
- Zetron
- Wi-Lan
- Smartrunk
- AudioCodes
- RadWin

Marketing & Customers

The high capacity last mile market has been growing very rapidly in India. Thanks to the Deregulation of telecom products. This has made VLink systems

Government agencies, Utilities like Power, Transport, Police etc, Manufacturing, Process Industries, Research Institutions, Educational Institutions, Defense, Oil &Gas agencies, Shipping & related, Social agencies, Traders, Event managements, Service Industries, Cane Industries, Wind mill divisions etc &etc.

Type of services offered

Now a day VLink systems provides two types of business solutions and services to the customers. They are,

- Two way wireless communication
- Broadband Radio communication

Facilities Available

The company is fully equipped with software professionals for development and wireless specialist engineers and marketing people. The company has got highly configured computers installed with required software package/tools. It has been running Internet facility to interact with the customer.

CHAPTER 2

SYSTEM ANALYSIS AND DESIGN

2.1 PROBLEM STATEMENT

The main objective of this system is to automate the organization's needs by integrating its various departments and through mail server implementation make communicate its various branches located at different places. This system should be user-friendly to be able to use and give access to the user who is having corresponding username and password. This system not only provides facilities for the different department people of an organization, but also conveys the general information, services offered and other organization related information to customers and users.

2.2 FEASIBILITY ANALYSIS

Feasibility is the measure of how beneficial or practical the development of information system will be to an organization. Once the problem is explained the feasibility study is to be done to test whether the product is achievable. The feasibility study describes the degree of the usefulness of the product to the organization. The feasibility study can be divided into four phases. They are follows,

2.2.1 EXISTING SYSTEM

Now a day all the process of an organization is done by manually. To intimate the latest updates of an organization to their customers and users it has been using the public media like news papers, Television advertisement... etc but they involve plenty of costs. To make the organization partially systematic, it has been using some third party tools but it also cause some maintenance inefficiencies, above all those products will not exactly adapt into the company.

2.2.1.1 Study on Existing System

The existing system is loaded with discrepancies. All these occur to the manual work done throughout the system. Manual operations derive inefficient

process and information with average accuracy. The main difficulties of these systems are,

- More man power
- Time consumption
- Delay in updating data
- Inefficient & not flexible
- Involves high cost & resources
- Poor customer coverage

2.2.1.2 Drawbacks of the existing system

The existing system has its own inefficiencies as it makes use of man power. It needs the extra work from all workers of an organization.

The sales and purchase department people have to make a manual invoice and delivery Chelan while buying and selling products.

The service engineers have to make special care of warranty periods of each and every product that has been sold out to the customer, then use these details when making services at customer site. And also the service engineers put some extra effort with the ASM agreement customers to make services periodically.

The management level people also suffered with existing system such that to advertise latest updates of an organization they don't have their own advertising media but they are using expensive public media like TV, news papers.

2.2.2 Proposed System

The purpose of implementing the proposed system is to reduce the most of the manual work of various department of an organization. And it also has some potential benefits such as to minimize the cost, and increase the customer service. The model of this system is comparable to an organization doing business with its existing system customer or prospects in away like they normally do, expect that the medium is different. The cost is significantly reduced as compared to the third party tools and public media.

In order to achieve the above, this development work first concentrates to create the company web site and embed the all technical work onto it. The website is not mere reading material for customers but a joint to interaction. The proposed system provides well furnished interface to the customer via web pages. The technical applications and contents of web pages are displayed as number of categories, and have been organized in the manner that the target users can easily find and use.

The user of the system can use the applications with the username and password provided with them. According to the weight of the username and password the further provisions will be given to the user to use various part of the system.

There is a separate area in webpage for administrator use, from which he can control the user of the system. Furthermore the administrator can provide the desired access permissions to all users to use rest of the system from here itself.

2.2.2.1 Benefits of Proposed System

Some of the important benefits of proposed system are,

- Centralized implementation and branch integration

  The proposed system is developed by following client server technology, so it will be able to integrate more than one branches of an organization.

- Cost and risk reduction

  The proposed system avoids more man power and as possible as reduce the cost.

- User-friendly and security

  This system will be user-friendly to access and ensures data security through out the system execution.

- Immediate updating of changes

  Since the system is centralized to all users, the changes made by the one user will reflect immediately to others in a reliable manner.

- In-build searching facility

  To make a search in web, this system provide a in-built link to other popular search engines, and displays the searching results at this webpage itself.

- Inbuilt User-friendly maintenance tool

  The proposed system not only concentrates on implementation of system with prescribed need, but provides a user friendly maintenance tool to refine the webpage.

2.2.2.2 Study on Proposed System

The existing system follows manual processing which derives the business flow with inefficient approach. The current system operations consumes times and huge human resource power. As the system information is distributed, as the accessibility towards the data becomes tedious. The customer servicing and satisfaction becomes very difficult. Since the existing system needs extra work and cost it fails in accuracy and efficiency.

The proposed system is designed based on the objectives prepare to fulfill the existing systems drawback. The system design concentrates on deriving efficient process flow, which uses optimum resources and deliver maximum results. The system concentrates on cost estimation, instant access of information, effective human resource management and customer servicing. The proposed system enables the organization to forecast the business process efficiently and develop the growth rate of the organization with high customer satisfaction. The proposed system uses the latest technology, which customizes and makes the development process of the application very easier and effective.

2.2.3 TECHNICAL FEASIBILITY

Technical feasibility takes care of the technical issues that are to be tested to see whether to see whether the system is feasible. Technical feasibility analysis makes a comparison between the level of technology available and the technology that is needed for the project. The level of technology is determined

platform etc since, the resource required for the development of the project is already available in the organization, and this project is technically feasible.

2.2.4 ECONOMIC FEASIBILITY

Economic feasibility is a measure of the cost-effectiveness of a project or solution. The system has been designed to work for any type of system configuration and platform. Since the effort to develop the product was found to be feasible, the development presents a good investment for the organization. Hence the proposed system is economically feasible.

2.3 PURPOSE OF THE PROJECT

- To maximize the customer
- To reduce the workload of employee
- To reduce the cost as possible as
- Increase the speed of system execution by retrieves any stored data quickly
- Provide way to generate required reports to know the business status

2.4 SCOPE OF THE PROJECT

The scope of the project is to convert requirements specified by the user into functional requirement and implement the same in the system. This system can be accessed from any place around the world, and it involved following stages, Requirement analysis, functional specification, design, coding and implementation.

CHAPTER 3

PROGRAMMING ENVIRONMENT

3.1 HARDWARE SPECIFICATION

The hardware components on which this application is developed are,

Components	Specification
Processor	Intel Pentium IV
RAM	256 MB
Power Supply	300 V
Hard Disk Drive	80 GB
Keyboard	108 Keys Microsoft
Operating System	Microsoft Windows 2003
Monitor	17" Samsung Color

3.2 SOFTWARE SPECIFICATION

The software components required to develop this application are,

Software Components	Name and Version
Programming Language	JAVA 1.3, HTML
Database	SQL Server7.0
Web Server	Apache Tomcat 4.0
Web Browser	Internet Explorer 6.0 Netscape Navigator 7.0
FTP Server	Free FTPD 2.0
Scripting Language	JAVA Script
Standards	SMTP RFC821

3.3 ABOUT THE SOFTWARE

3.3.1 PROGRAMMING LANGAGE

3.3.1.1 JAVA

Java is an Object Oriented Programming language developed at Sun Microsystems in June 1995. Java has built-in support for threads, networking and a vast variety of other tools. The amazing thing about java is that it can be used to create a huge variety of applications and is noted for its 'Write once Run anywhere' characteristic.

Java is simple, object-oriented, distributed, interpreted, robust, secure, architecture-neutral, portable, high-performance, multithreaded and dynamic language.

The Java architecture consists of Java Virtual Machine (JVM), which is an abstract computer that runs compiled java programs. The JVM supports object oriented programming directly by including instructions for object method invocation. The java compiler generates architecture-independent byte codes.

Benefits of java

Java allows the user to:

- Write robust and reliable programs.
- Build an application on almost any platform, and run that application on any other supported platform without having recompiling your code.
- Distribute your applications over a network in a secure fashion.

Java has an extensive use of library of routines for copying with TCP/IP protocols like HTTP and FTP. Java application can open and access objects across net local Universal Resource Locator (URL) with the same ease as accessing the local file system. The Remote Method Invocation method enables communication between distributed objects.

The JDBC (Java Database Connectivity) interface allows Java applets, Servlet and applications to access data from popular database management systems.

Java Servlet

The Servlet technology is the foundation of web application development using the java programming language. It is one of the most important technologies of java, and it is the foundation for another web application development called JSP.

Benefits of java Servlet

- Performance

  Since it's a java technology obliviously it is platform independent, multi threaded.

- Portability

  It can support any system configuration and platform.

- Rapid development cycle

  Since java provides plenty of APIs, we can develop our application in quick time.

- Robustness

  It offers good exception handling and automatic garbage collection.

Servlet Architecture

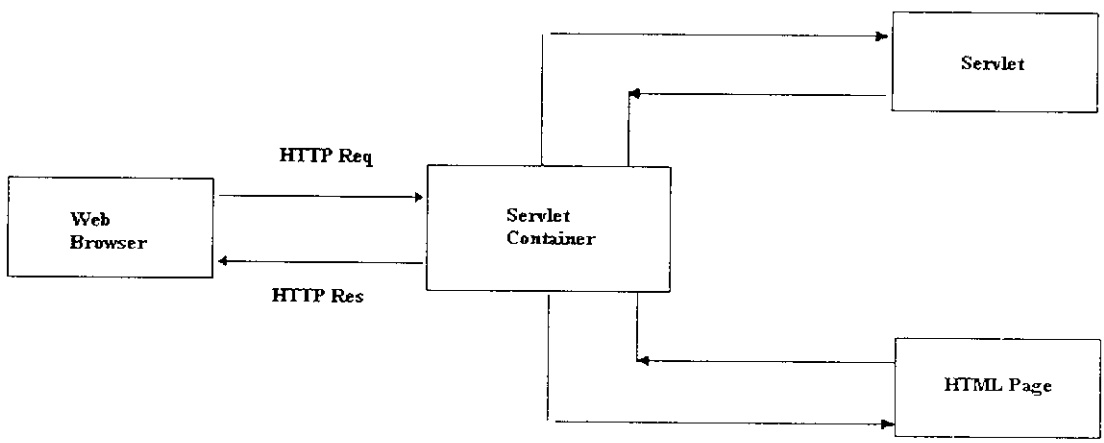


Fig 3.3.1.1.1: Web browser and Server interaction through HTTP Protocol

Servlet interact with the clients through request, response model on HTTP, Because Servlet technology works on top of HTTP. Example, Apache

3.3.1.2 HTML

HTML stands for Hyper Text Markup Language; it's a language to develop a web documents.

Levels of HTML

HTML evolved in the following for stages,

Level-0

Includes only the basic structural elements

Lelel-1

Advanced features included highlighted text and graphics that Were supported depending on the browser capability

Level-2

Introduced the World Wide Web as an interactive medium and the Features of fill forms on the internet

Level-3

Introduced frames inline, videos and sounds...etc

3.3.2 Database

SQL Server7.0 is the 100% ANSI SQL compatible relational database management system. It is available on the wide range of mainframes, minis, and microcomputers. It offers both relational database and object oriented database facilities. Managing large amount of data could present administrative and performance problem. SQL Server 7.0's data partitioning help to minimize the program. Each of the partition can be managed individually, thereby allowing more efficient management of database. In it all information are stored as simple tables consisting of rows and columns.

There are three categories of tools provided by the SQL Server 7.0

- To perform the administration of the database
- For control access to data in the database
- To control the manipulation of the data in the database

Features of SQL Server 7.0

- SQL compatibility
- Portability

Advantages of SQL Server 7.0

- It can store hundred million terabytes of data
- It supports 32 processors
- It is possible of to execute 16 simultaneous instances of a single SQL server
- It supports replications, transactions, distribution, remote access and much more
- It support both GUI and CUI concepts

3.3.3 Web Server

Web server is a network program that is executing over the port 80 normally; it's responsible to handle low level HTTP commands from other HTTP Clients. This system is using Apache Tomcat Web Server 4.0. It is developed by the sun micro system. This server is able to handle both Servlet and JSP Pages.

3.3.4 Web Browsers

It is the HTTP client program normally, but its able to handle other protocols also. This system uses the Internet Explorer6.0 and Netscape Navigator 7.0. These two browsers are supporting plenty of advanced features like plug-ins, secured transmission, and active-x-control support.

3.3.5 Client Side Scripting

Client side scripting is a type of language normally used to validate the form data. This system uses the Java Script for client side scripting.

Capabilities of the java script,

- JavaScript date object simplifies the process of computing and working with dates and times
- The document objects supports a property that specifies the last modified date for the current document. You can use it to automatically display the timestamp on any document.
- JavaScript can perform arbitrary computation. It has a floating point data

3.3.6 FTP Server (File Transfer Protocol)

This is the network program normally run on port number 21.It is used to communicate with all FTP Client Program for handling file operations. This system uses the FTPD file server for upload and download.

3.3.7 SMTP Specification (Simple Mail Transfer Protocol)

The Mail Server implementation module of this project uses the RFC821 version SMTP specification. This contains plenty of commands used to communicate with other all SMTP Clients.

CHAPTER 4

SYSTEM DESIGN AND DEVELOPMENT

4.1 ELEMENT OF DESIGN

System design is the most creative and challenging phase in the life cycle of system development. Design implies to a description of the final system and the process by which it is developed. The first step to determine is what input data is needed to form the system and the database should that has to be designed to meet the requirement of the proposed system. The next step is to determine how the output is produced and in what format.

During the design of proposed system some of thoughts that come to mind are,

What are the inputs required and the outputs produced?

How the data be organized?

What should be the screen format?

What are the processes involved in the system?

These questions derives the following for types of design,

- Input design
- Output design
- Modular design
- Database design

4.1.1 Input design

The input design is the process of converting the user- oriented inputs into the computer-based format. The goal of designing input data is to make the automation as easy and free from errors as possible.

The input design requirement such as user friendliness, consistent format and interactive dialogues for giving the right message and help for the user at right time are also considered for the development of the project.

Throughout the system, the forms found to get input are,

User login form

This form is used to get the user name and password before going to access any authorized area of the system.

Administrator's user manipulation form

This form is only used by administrator to add new user with access permission to handle the system.

Customer detail entry form

This form used by the DEO to add a new customer to the company. It will get the input like name, address, phone number...etc of the customer

Product's purchase entry form

This form is used to get all details about the product such as product ID, name, price, warranty date...etc

Product's sales entry form

This form is used by the sales department people to sell a product to existing customer. It gets the input like customer id, product selling price and tax rate.

Product's detail entry form

This form will be used by the maintenance people to maintain the product album web page. It will get the input like product's name, price, image path, description path...etc

Railway station detail entry form

This form will be used by the service engineer to add a new ASM based railway station details such as ID, name, address...etc to the system.

ASM service entry form

This form is used by the service engineers to enter the service details of ASM based customers

Service status entry form

This form is used by the service engineers to enter the status of the service at different customer site, It will be used by them frequently.

New user registration form for mail server

This form is used to get the user details to register a new mail ID. This

The feedback form also provided with the system to get the valuable suggestion from the user.

4.1.2 OUTPUT DESIGN

A quality output is one, which meets the requirement of the end user and presents the information clearly. Efficient and intelligent output design improves the system's relationship and helps user decision-making. The application output design is customized based on user input, which will generate the data depending on user's requirement. The accessibility of the output design is secured in the system with user authentication and rights.

The output of this system is generated with the intention of 3 types of peoples.

People outside the organization

The only non secured information will be provided for the people like this, such as general information about the organization, products album, services offered, and the other useful information.

Organization's staffs

These peoples are mostly from sales, purchase, and service department. They can view their related information such as stock level, customer details, sales details, servicing status and ...etc.

Administrator

These management level people can view all the reports based on the input category, such as customer report, sales & purchase report, servicing report... etc.

4.1.3 MODULAR DESIGN

It is always difficult for any developer to grasp a system without breaking it up into several smaller systems. These smaller segments will be part of the original system yet they will be independent in the sense that they will incorporate within them a major function in the system.

A software system is always divided into several sub system that makes that it easier for the development. Software that is structured into several sub system makes it easy for the development and testing. The different subsystems

are known as the modules and the process of dividing an entire system into subsystem is known Decomposition.

A system cannot be decomposed into several subsystems in anyway. There must some logical barrier, which facilitates the separation of each module. The separation must be simple but yet must be effective so that the development is not affected. The following list shows the subsystems and their corresponding modules.

Static and dynamic web pages development and maintenance tool

- User validation Process
- Dynamic Product Loader
- HTML code converter

Online inventory and warranty control system

- User validation process
- Purchase control process
- Customer control process
- Sales control process
- Warranty & problem control process
- Report generation process

Online ASM schedule maintenance system

- User validation process
- Railway station detail maintenance process
- Service detail maintenance process
- Service reminder process
- Report generation process

Online service log maintenance and intimation system

- User validation process
- Service maintenance process
- Report generation process

Device driver upload and downloading control system

- User validation process
- File download process

Mail server with minimum specification implementation

User I/F control process

New user registration process

Mail sending & receiving control process

SMTP client

SMTP server

4.1.4 DATABASE DESIGN

A database is a collection of interrelated data stored with minimum redundancy to serve many users quickly and efficiently. The general objective of database design is to make the data access easy, inexpensive and flexible to the user. The design of the database is one of the most critical parts of design phase. An elegantly database can play as a strong foundation for the whole system. The details about the data relevant for the system are identified first.

According to their relationship, tables are designed by the following standard database design methods. The data types for each data item in the tables are decided. For the optimum design of the database, to have better response time, to have data integrity, to avoid redundancy and for the security of the database all the tables created are normalized. The database design is done according to the procedure. The database design transforms the information domain model created during the analysis into the data structure that will be required to implement the system software. The database design is made up of two levels,

- ❖ Conceptual level
- ❖ Normalization

Conceptual Level

The level represents the major data object and relationship between them. Conceptual level describes the essential features of the system data. Just like a DFD for a system, the conceptual level uses symbols for modeling method called Entity Relationship model.

Relationship between entities makes the database structure. Four type of relationship exist among entities. They are, one-to-one, one-to-many, many-to-one, and many-to-many. A one-to-one relationship is an association between two entities. A one-to-many relationship describes an entity that may have two or more entities related to it. Likewise a many-to-many relationship describes entities that have many relationships.

Normalization

After the conceptual level, the next level to organize the database to a good shape is called normalization. The normalization simplifies the entities, removes the redundancies from the system data and finally builds a data structure, which is both flexible and adaptable to the system. Normalization offers a systematic step-by-step approach towards this goal. The different normal form applied is given below,

- First normal form (NF)
- Second normal form (2NF)
- Third normal form (3NF)

The database is designed using RDBMS concept there by enabling the sharing of data and was normalized to avoid the redundancy. This will lead to quicker application development with low maintenance cost.

4.2 TABLE STRUCTURE

Administrator user table

Field Name	Type	Description	Key
Uname	Varchar(15)	User Name	Primary Key
Pword	Varchar(15)	Pass Word	
Cat	Varchar(1)	User Category	

Table 4.2.1 Adminusertab

Products table

Field Name	Type	Description	Key
pcode	Varchar(15)	Product Code	Primary Key
pname	Varchar(15)	Product Name	
pprice	Varchar(15)	Product Price	
ipath	Varchar(100)	Product's Image File's Absolute Path	
dpath	Varchar(100)	Product's Description File's Absolute Path	
pdesc	Varchar(100)	Product's Description	
idpath	Varchar(100)	Product's Image File's Path, Relative to Web Server	

Table 4.2.2 Product

Customer Table

Field Name	Type	Description	Key
cid	Varchar(15)	Customer ID	Primary Key
Name	Varchar(15)	Customer Name	
Address	Varchar(50)	Customer Address	
Phno	Varchar(15)	Customer Phone Number	
Mobno	Varchar(15)	Customer Mobile Number	
Email	Varchar(20)	Customer E-Mail Address	

Table 4.2.3 customer

Purchase table

Field Name	Type	Description	Key
Pid	Varchar(15)	Product ID	Primary Key
Name	Varchar(15)	Product Name	
Pdesc	Varchar(40)	Product Description	
Mdate	Date/time	Manufacturing Date	
Mcny	Varchar(15)	Manufacturing Company	
Price	Varchar(15)	Product Price	
Wst	Datetime	Warranty Starting Date	
Wed	Datetime	Warranty Ending Date	
Status	Varchar(1)	Product Status	
Cat	Varchar(1)	Product Category	

Table 4.2.4 Purchase

New Products sales table

Field Name	Type	Description	Key
cid	Varchar(15)	Customer ID	Foreign key
pid	varchar(15)	Product ID	Foreign Key
price	Money	Product's Selling Price	
tax	Money	Sales Tax	
waf	Datetime	Warranty Starting Date	
wat	Datetime	Warranty End Date	

Table 4.2.5 SalesNew

Other Products sales table (stand by, serviced)

Field Name	Type	Description	Key
cid	Varchar(15)	Customer ID	Foreign Key
pid	varchar(15)	Product ID	Foreign Key
cat	varchar(1)	Product Category	
waf	Datetime	Warranty Starting Date	
wat	Datetime	Warranty End Date	

ASM Train Master

Field Name	Type	Description	Key
rid	Varchar(15)	Railway station ID	Primary key
rname	varchar(15)	Railway station Name	
raddress	varchar(40)	Railway station address	
asmdate	Datetime	ASM Starting Date	
asminterval	Datetime	ASM interval	

Table 4.2.7 Asmtrainmaster

ASM Service dates

Field Name	Type	Description	Key
rid	Varchar(15)	Railway station ID	Foreign key
asm1	Datetime	First ASM date	
asm2	Datetime	Second ASM date	
asm3	Datetime	Third ASM date	
asm4	Datetime	Fourth ASM date	
asm5	Datetime	Fifth ASM date	
asm6	Datetime	Sixth ASM date	

Table 4.2.8 Asmdate

ASM Service status

Field Name	Type	Description	Key
rid	Varchar(15)	Railway station ID	Foreign Key
asm1	Varchar(1)	First ASM service status	
asm2	Varchar(1)	Second ASM service status	
asm3	Varchar(1)	Third ASM service status	
asm4	Varchar(1)	Fourth ASM service status	
asm5	Varchar(1)	Fifth ASM service status	
asm6	Varchar(1)	Sixth ASM service status	

Table 4.2.9 Asmservicestatus

ASM service log

Field Name	Type	Description	Key
asm	Varchar(1)	ASM Service number	Primary key
rid	Varchar(15)	Railway station ID	Foreign Key
sname	Varchar(15)	Service Engineer Name	
cat	Varchar(1)	Servicing Category	
date	datetime	Service date/ASM Date	
sdesc	Varchar(50)	Service Description	

Table 4.2.10 Asmservice

Service Log

Field Name	Type	Description	Key
sname	Varchar(15)	Service Engineer Name	
date	datetime	Current Date	
time	datetime	Current Time	
csname	Varchar(15)	Customer Name	
sdesc	Varchar(50)	Service Description	

Table 4.2.11 Serviceintimation

User of mail server

Field Name	Type	Description	Key
mailid	Varchar(15)	Mail identification name	Primary key
fname	Varchar(50)	First name	
lname	Varchar(50)	Last name	
gender	Varchar(1)	Gender	
location	Varchar(50)	Location of user	
address	Varchar(50)	Address of user	
password	Varchar(15)	password	
uniquecode	int	uniquecode	

Table 4.2.12 user

CHAPTER 5

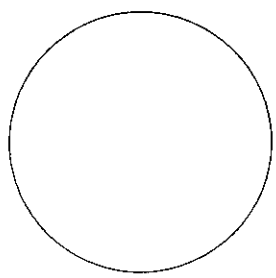
SYSTEM FLOW DIAGRAM

5.1 Data Flow Diagram

The data flow diagram is graphical representation which depicts the information regarding the flow of control and the transformation of data from input to output. The dataflow may be used to represent the system or software at any level of abstraction. In fact dataflow diagram may be partitioned into levels. A level 0 data flow diagram is called the context diagram, which represents the entire software element as single bubble with input and output arrows.

The DFD is a graphical tool for requirement analysis. It depicts the information flow without any explicit representation. In terms of program design the DFD might represent the data flow between individual statement or block of statement.

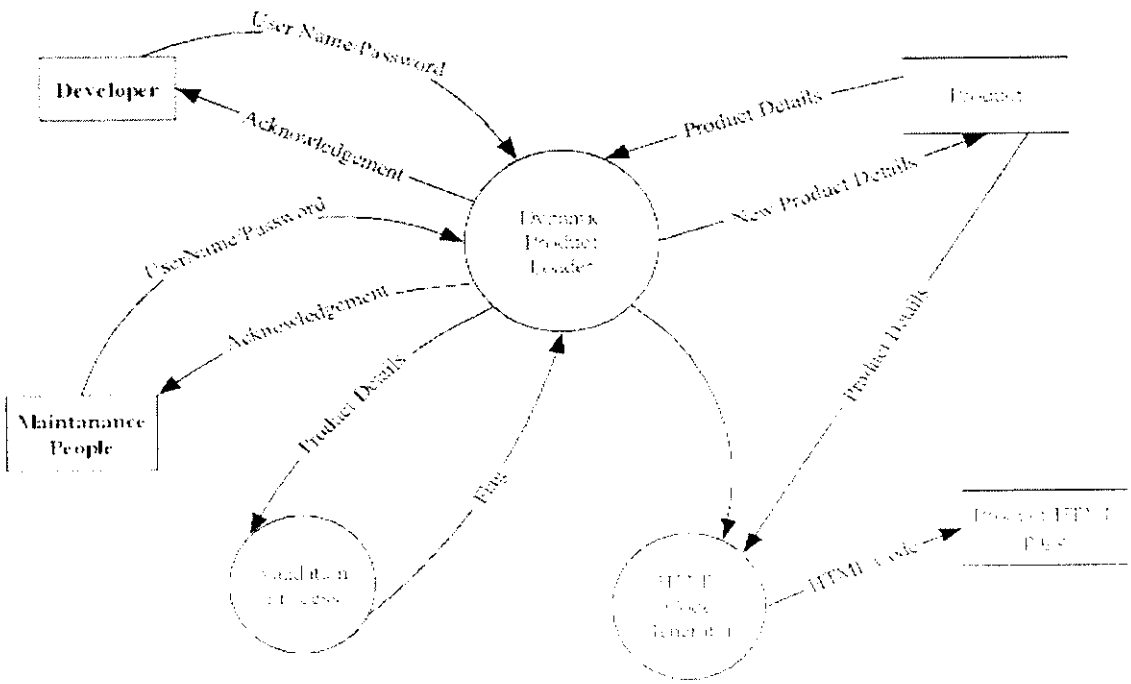
BASIC DFD NOTATION

Symbols	Descriptions
	Person, hardware and other program
	Process

Direction of data flow

Data storage

DYNAMIC WEB PAGE MAINTANACE TOOL



ONLINE INVENTORY & WARRANTY CONTROL SYSTEM

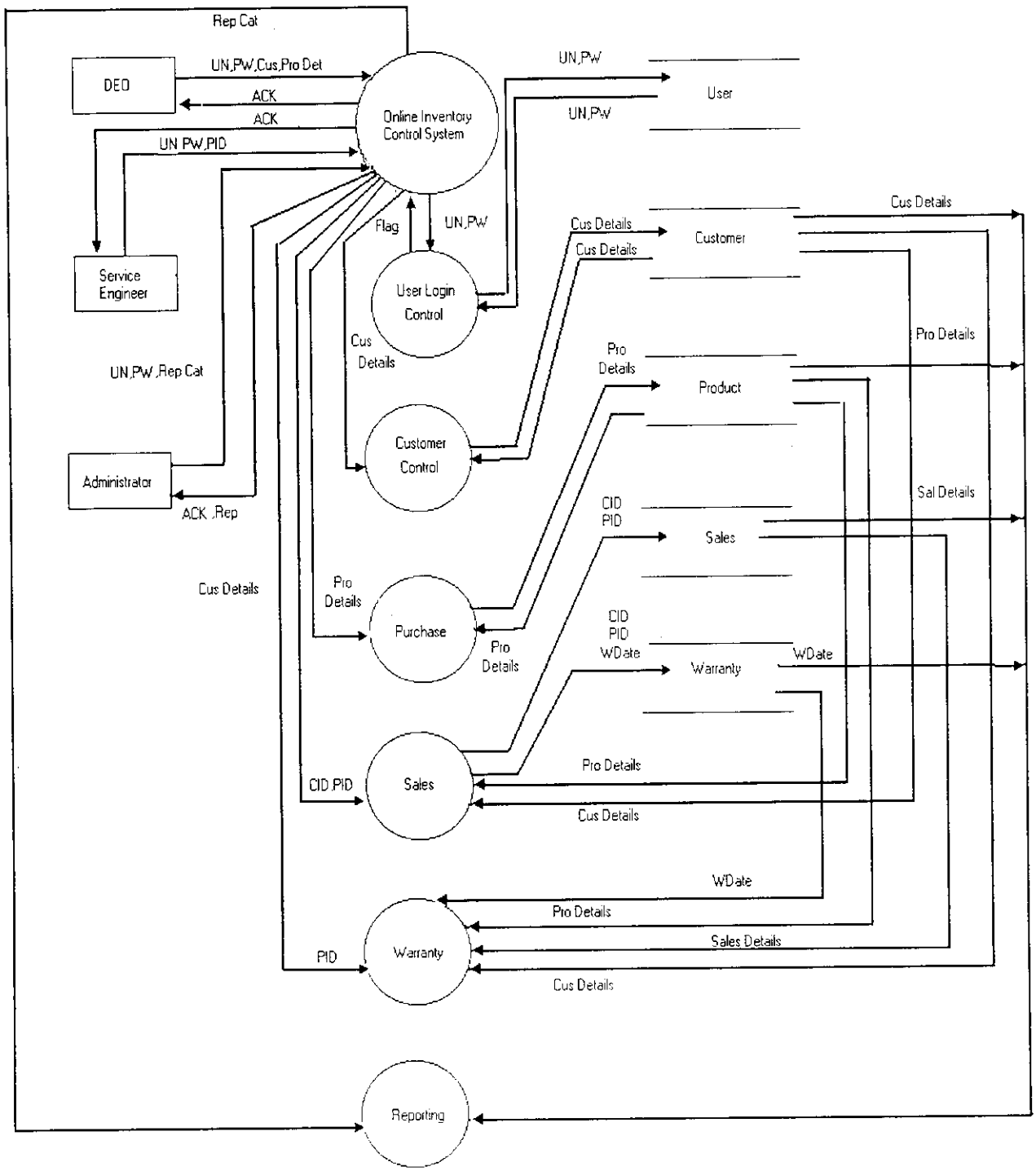


Figure 5.1.2 DFD FOR ONLINE INVENTORY& WARRANTY CONTROL SYSTEM

ASM SCHEDULE INTIMATION SYSTEM

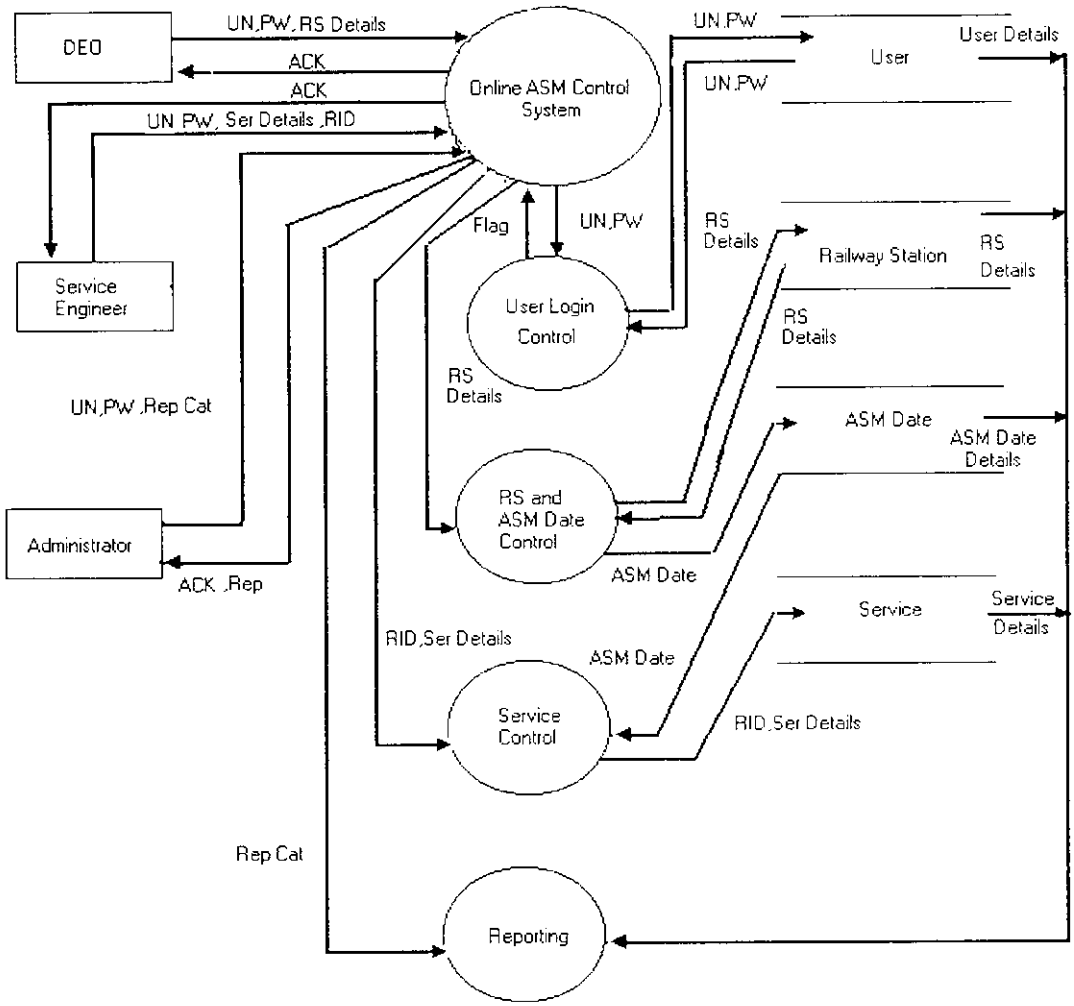


Figure 5.1.3 DFD FOR ASM SCHEDULE INTIMATION SYSTEM

ONLINE SERVICE INTIMATION SYSTEM

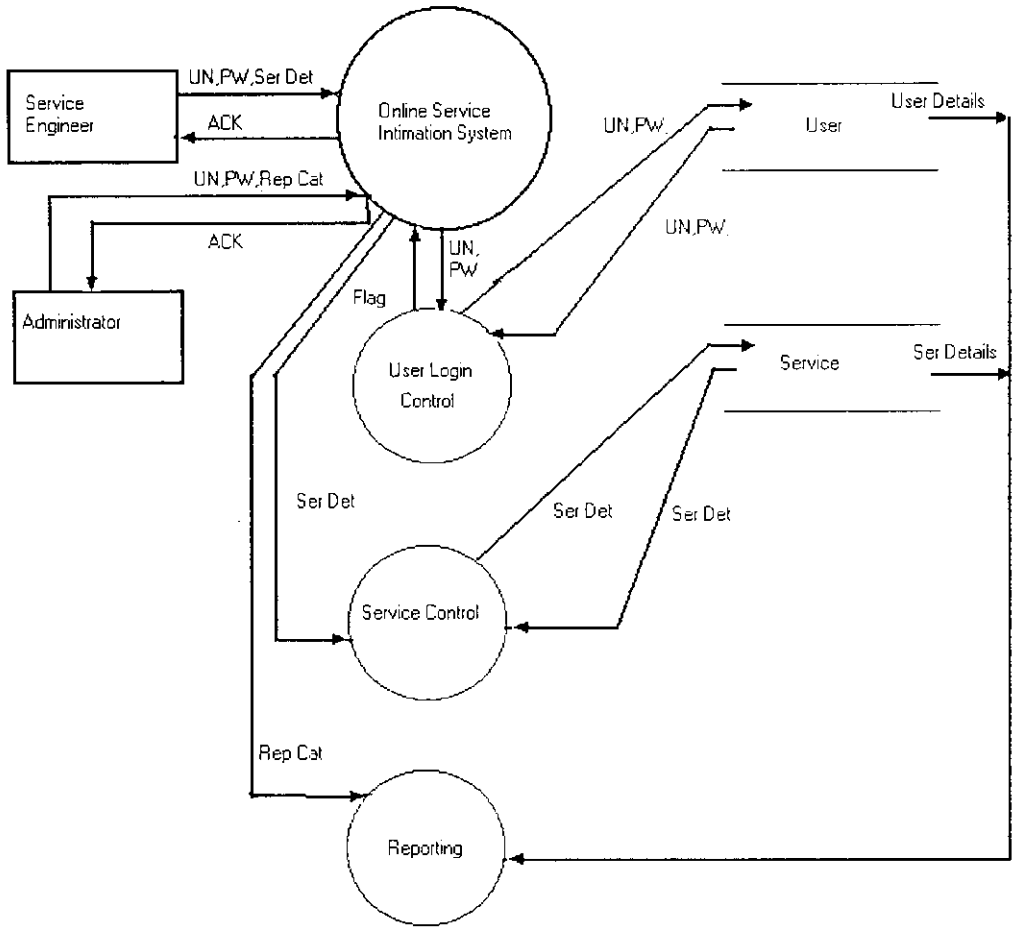


Figure 5.1.4 DFD FOR ONLINE SERVICE INTIMATION SYSTEM

DEVICE DRIVER UPLOAD & DOWNLOAD CONTROL SYSTEM

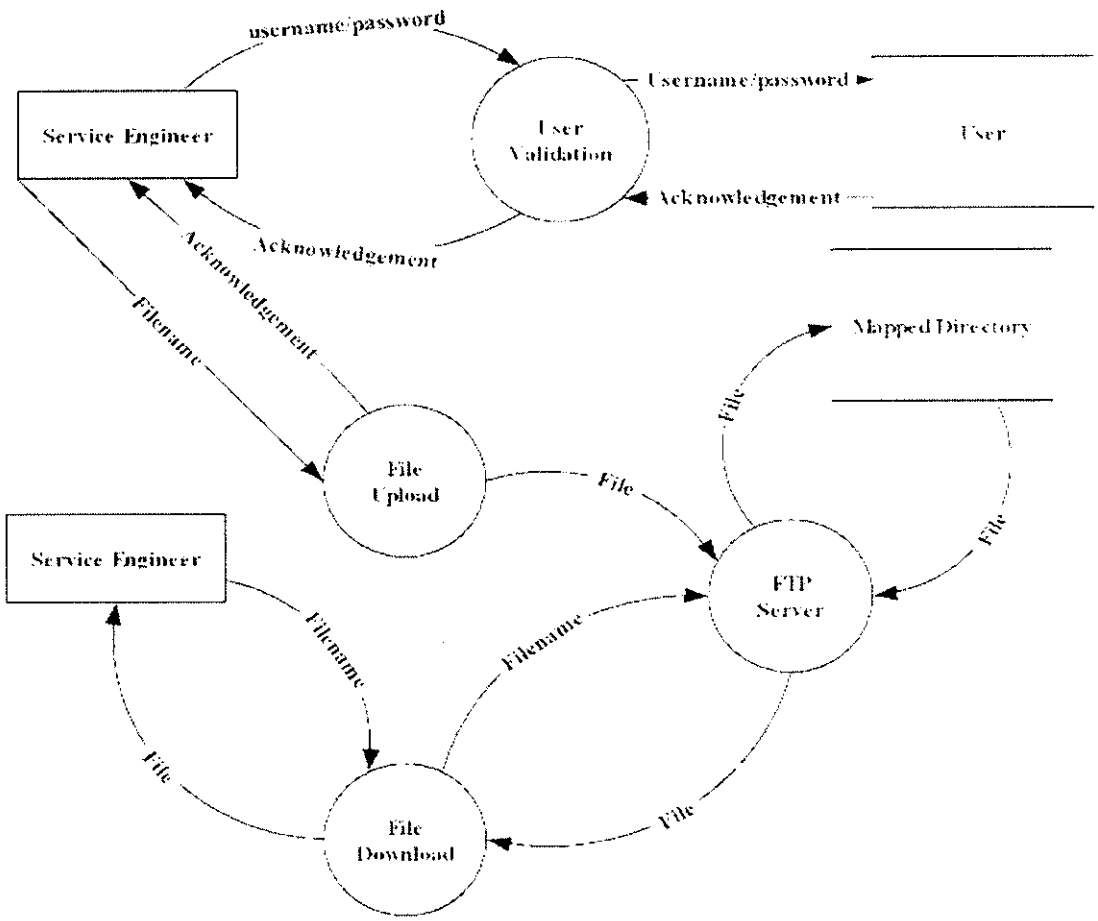


Figure 5.1.5 DFD FOR DEVICE DRIVER UPLOAD & DOWNLOAD CONTROL SYSTEM

Figure 5.1.6 DFD FOR MINIMUM SPECIFICATION MAIL SERVER

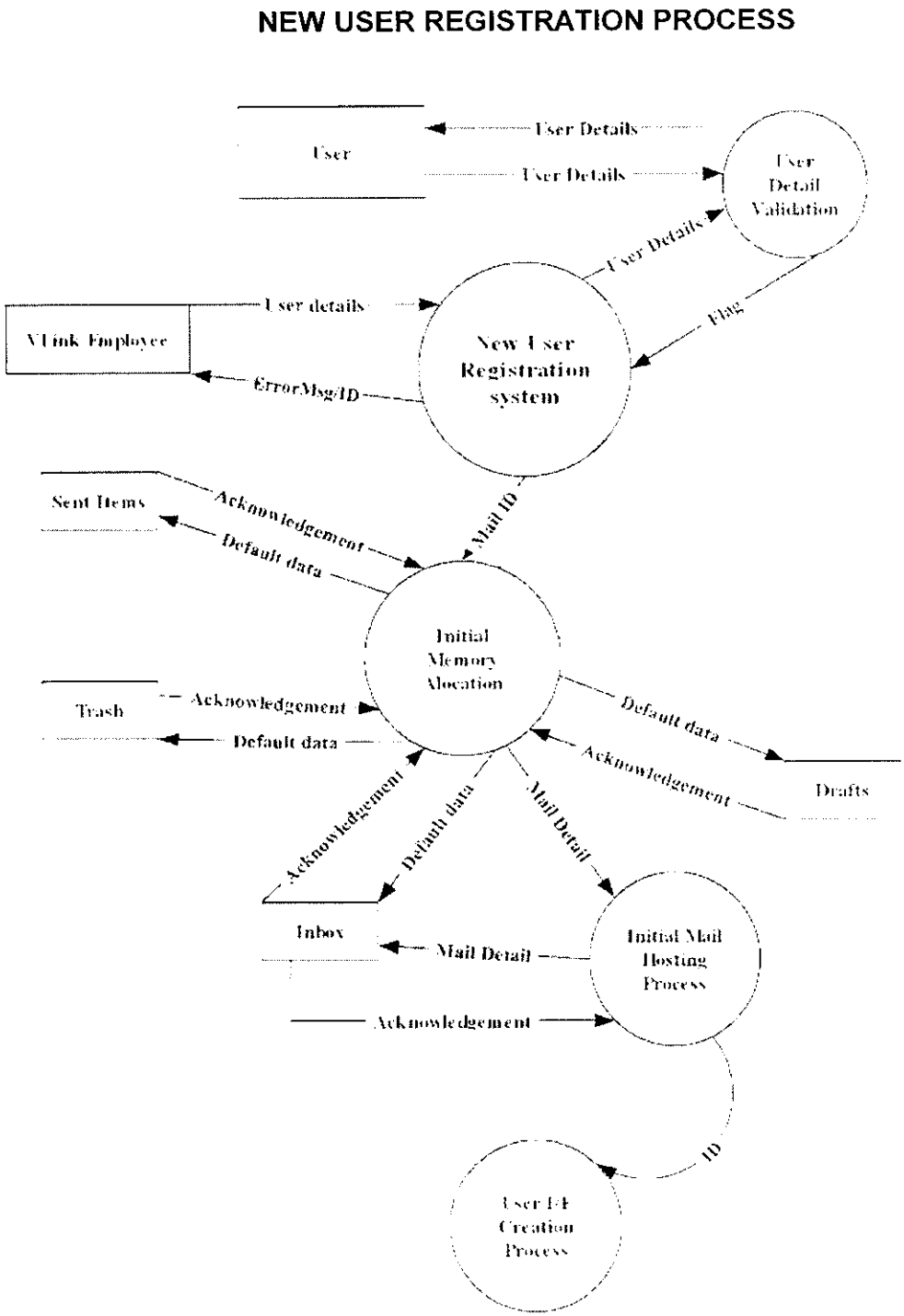


Figure 5.1.6.1 DFD FOR NEW USER REGISTRATION PROCESS

MAIL RETRIEVAL PROCESS

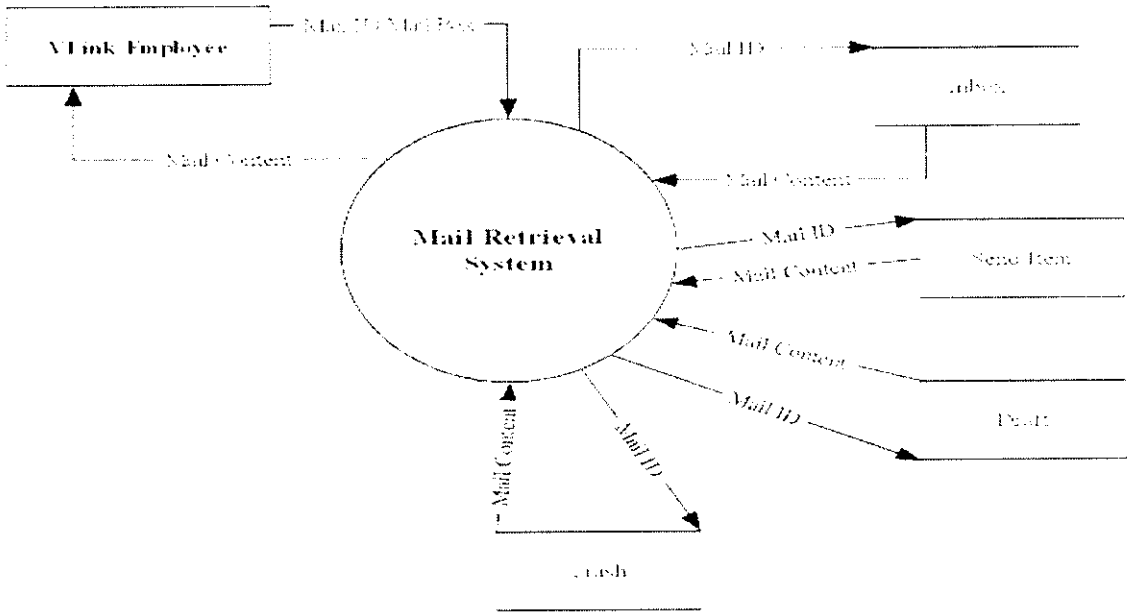
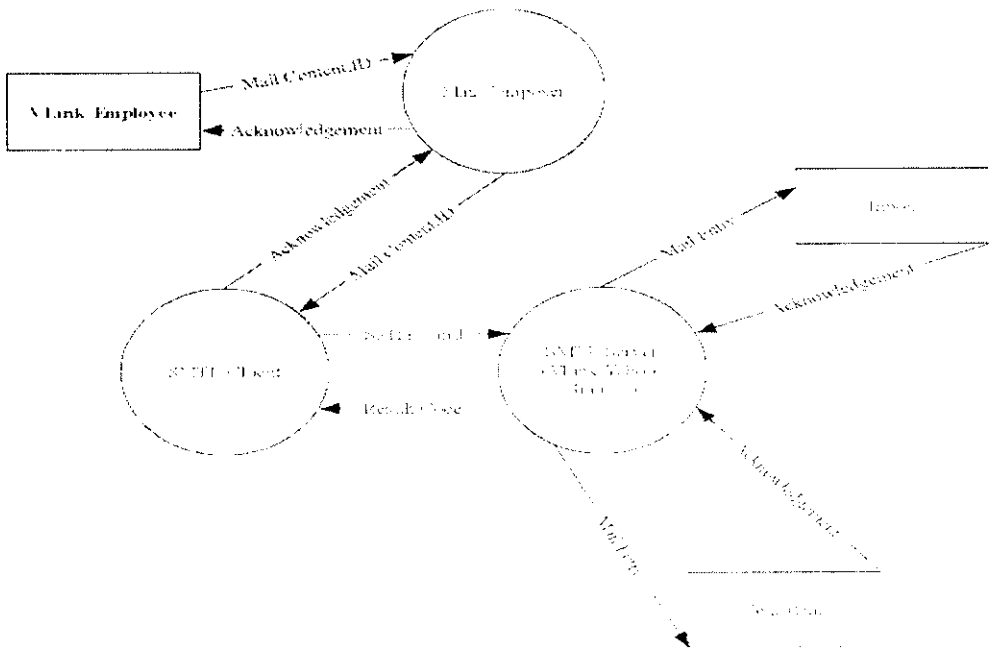


Figure 5.1.6.2 DFD FOR MAIL RETRIEVAL PROCESS

MAIL COMPOSING AND SMTP CLIENT



VLINK SMTP SERVER

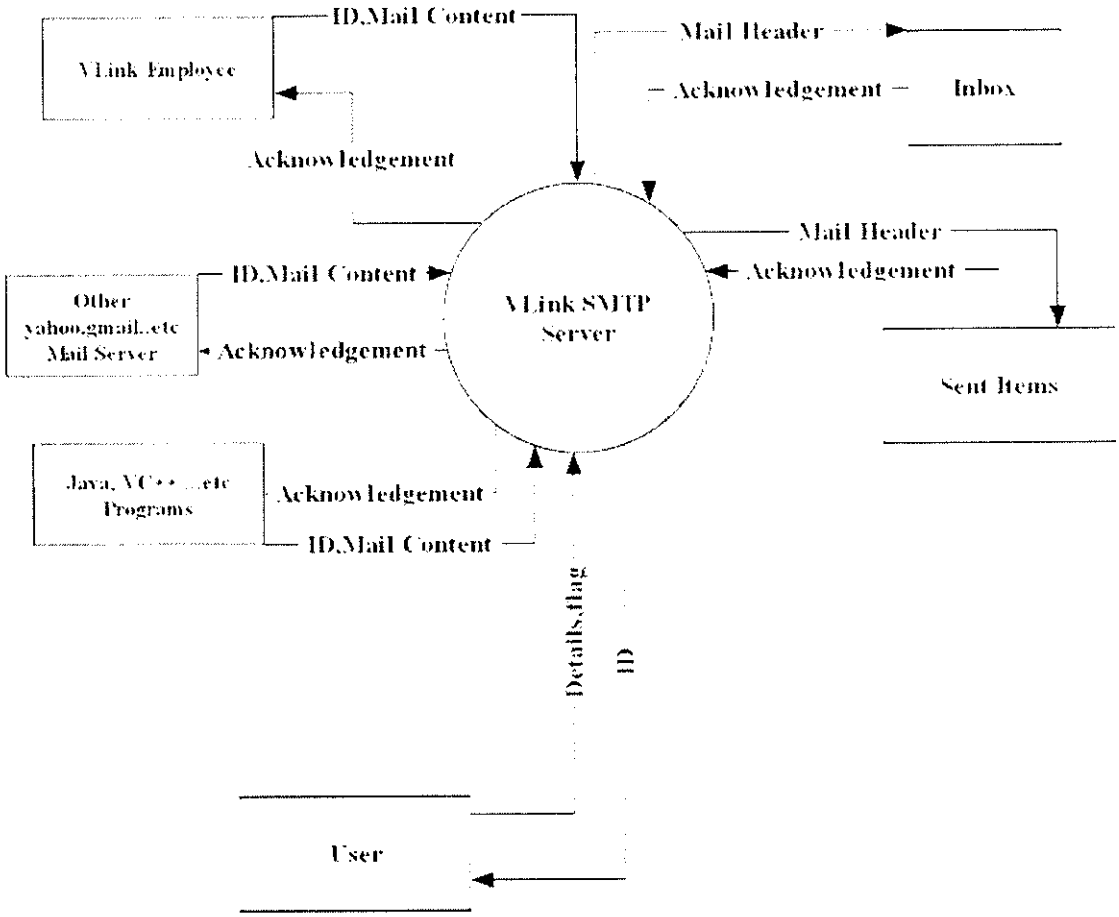


Figure 5.1.6.4 DFD FOR VLINK SMTP SERVER

CHAPTER 6

SYSTEM TESTING AND IMPLEMENTATION

6.1 SYSTEM TESTING

System testing is the most vital activity that has to be enforced in any system development. This could be run parallel during the development phase and after the implementation. The feedback received from this testing was examined carefully for further enhancements. It is the part of testing where the entire website and application has been tested. This testing is performed with the requirement document as the reference and the goal is to see whether the application meets the requirement.

6.1.1 Unit Testing

Unit testing is the process of testing the system module by module. It checks for the various inputs and outputs and also checks whether they are required. Using this method gives a clear idea of the bugs occurred.

In, Online Automation of VLink Systems with Mail Server all modules are appropriately validated with the suitable input. Every module is separately verified with their control program in the bottom up approach fashion.

The following units were tested independently:

Dynamic webpage maintenance tool is checked with all possible input cases

During sales, the shopping cart module is tested for their reliability with more than one user.

6.1.2 White Box Testing

White Box Testing also referred to as glass-box testing. It is a test case design that would use the program control flow structure to derive software test cases. This system has been examined with the following cases,

- All independent paths within a module have been exercised
- All logical decisions are exercised on their true or false side
- All loops are executed at their boundaries and within the operational

6.1.3 Black Box Testing

Black box testing enables the software engineer to derive set of conditions that will fully his system exercise all requirements for the web design code. Also the black box testing is not an alternative to the white box testing. Rather it is a compulsory approach that it is likely to uncover the different class of errors than what white box testing reveals. In this system Black box testing method reveals the errors in the following areas,

- Interfaces of inputs
- When access outside programs such as mail server, databases... etc
- When initialize & terminate the database driver

6.1.4 Acceptance Testing

Acceptance testing involves planning and execution of the functional tests, performance tests and stress tests in order to demonstrate that the implemented system satisfies its requirements. In this system the following attempt is made to .prove the software stability,

It has been examined by simulating more than 100 users access the system at a time and makes a measurement of response time to prove the functional and performance ability of the system. The result found with this test is that there in nothing wrong with software, if underlying server had a good configuration the response time will be ultimately good.

6.1.5 Validation Testing

It is one type of testing used to validate the input values entered in the different components or fields. For example in this system, this test is performed on the following fields.

Text field

The text field can contain only the number of character lesser than or equals to its size in all forms. The alphabetic and numeric data are checked for their validity if the text field contains date as its input, it is checked for their preferred format. If errors or any violation found in this input, the corresponding error or warning messages are flashed to the user. These messages not only

Numeric field

This field can contain only numbers from 0-9. An entry of any other character flashes an error message.

6.1.6 Alpha Testing

This is the test conducted at the developing environment by the developing people itself. Since this project is completed by individually, this test is conducted by the class mates and friends itself who are having knowledge to test and execute this system.

6.1.7 Beta Testing

This is a test conducted at the user environment where the systems will survive. It is done by the actual user of the system.

This system also examined with this test, by installing it into the organization, VLink Systems and gathered the users feed back, according to that this system has been refined.

Each module is subjected to test and run along with sample data. The individual tested modules are integrated into a single system. Testing involves executing the real data set in the program; the existence of any program defect is inferred from the output. The testing should be planned so that all the requirements are individually tested. A successful test is one that gives out the defects for the inappropriate data and reveals plenty of errors. Since the exhaustive testing is not possible, this system has been examined as possible as to reduce the defects and errors.

6.2 IMPLEMENTATION

The implementation is one phase of software. It is concerned with translating design specification with source code. The primary goal of implementation is to write source code to its specification can be easily verified, and so that debugging, testing, and modification can be eased. The goal can be achieved by making the source code as clear and straight forward as possible.

The implementation is the process of converting a new or revised system into operational one. It is the key stage in achieving a new system because it involves a lot of upheaval in the user environment.

System testing is an essential but is critical process that can take much as 50% of the budget of program development. Testing is the stage of implementation which is aimed at ensuring that the system works accurately and efficiently before live operation commence. Through this testing we can examine the logical and physical design of the system thoroughly.

Tests data are designed to show that the system will operate successfully in all aspects and produce expected result as specified. Thus the presentation of test data and checking of results are carried out in conjunction with the appropriate user. Implementation includes all those activities that take place to convert from the old system to new.

The new system may be totally new, replacing an existing manual or automated system or it may be major modification to an existing system. Proper implementation is essential to provide a reliable system to meet the organization requirements if the organization using this system, but improper implementation will prevent it.

CHAPTER 7

CONCLUSION AND FUTURE ENHANCEMENT

CONCLUSION

An attempt has been made to computerize the ONLINE AUTOMATION OF VLINK SYSTEMS WITH MAIL SERVER is implemented at VLink Systems, Coimbatore, up to the satisfactions of the company. On-line validation in all areas wherever required is taken care off. The necessary reports are generated for the view of customers and suppliers over on-line.

The new system is effective in speed of collection of information. All efforts have been put to make sure that the system can take care of almost all the requirements of the company. The system can also be modified and expanded to a greater extent by introducing new entities.

In conclusion it is note worthy to mention the performance of the computer system, against the manual system. Comparative analysis is carried out and it is viewed that the new system is successfully working for the test data provide by the authors and they hope that the software will be extremely helpful to the company. Finally I am very proud to undertake this project work, thank the Master of Computer Application Department for providing me a good opportunity to carry out this project work with the guidance of staff.

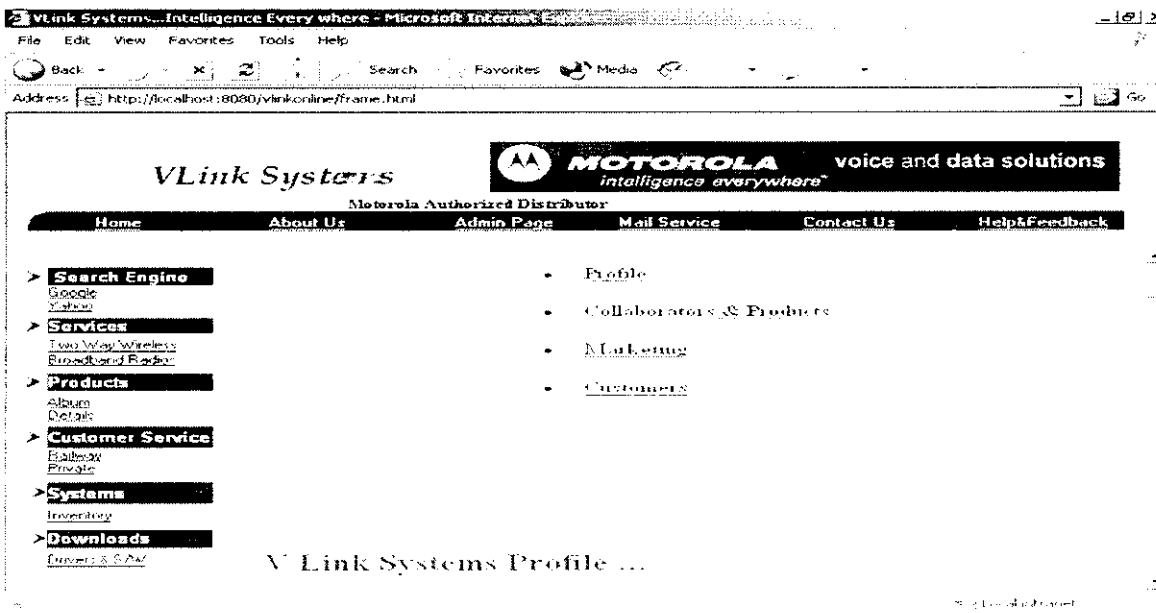
FUTURE ENHANCEMENT

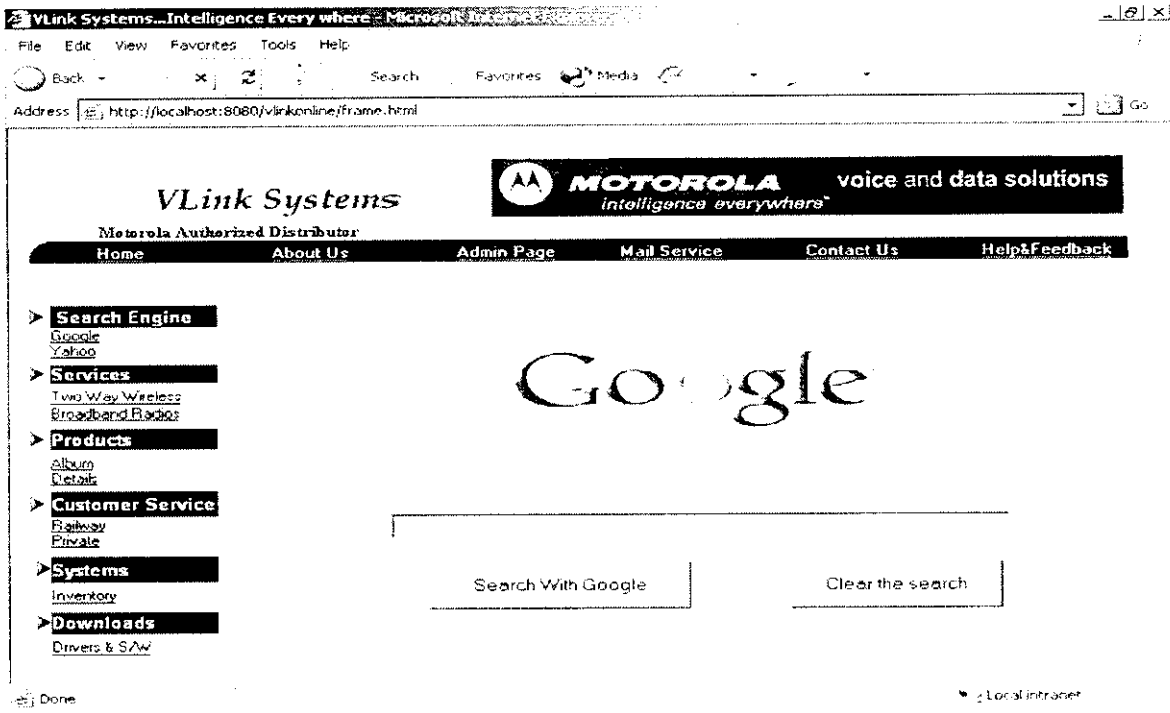
Since the developed work started with only five month duration, it has partially automated the organization still there are several area to computerize, if I get the chance once again I will be doing the work with pleasure, otherwise to help the person who will carry out this work, this document has been developed with care. The future enhancement will be, Encourage the online shopping,
Add mobile indication in mail server... etc. Since the system is so flexible the future enhancement and changes can easily be made.

APPENDICES

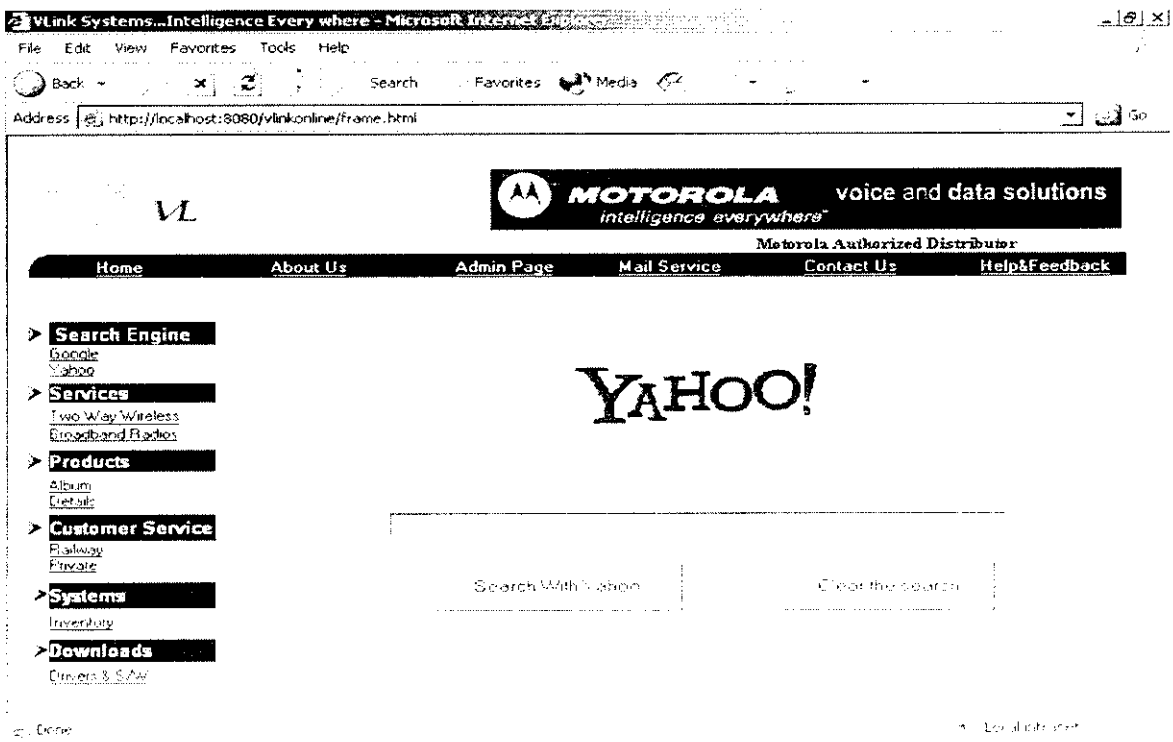
APPENDIX 1

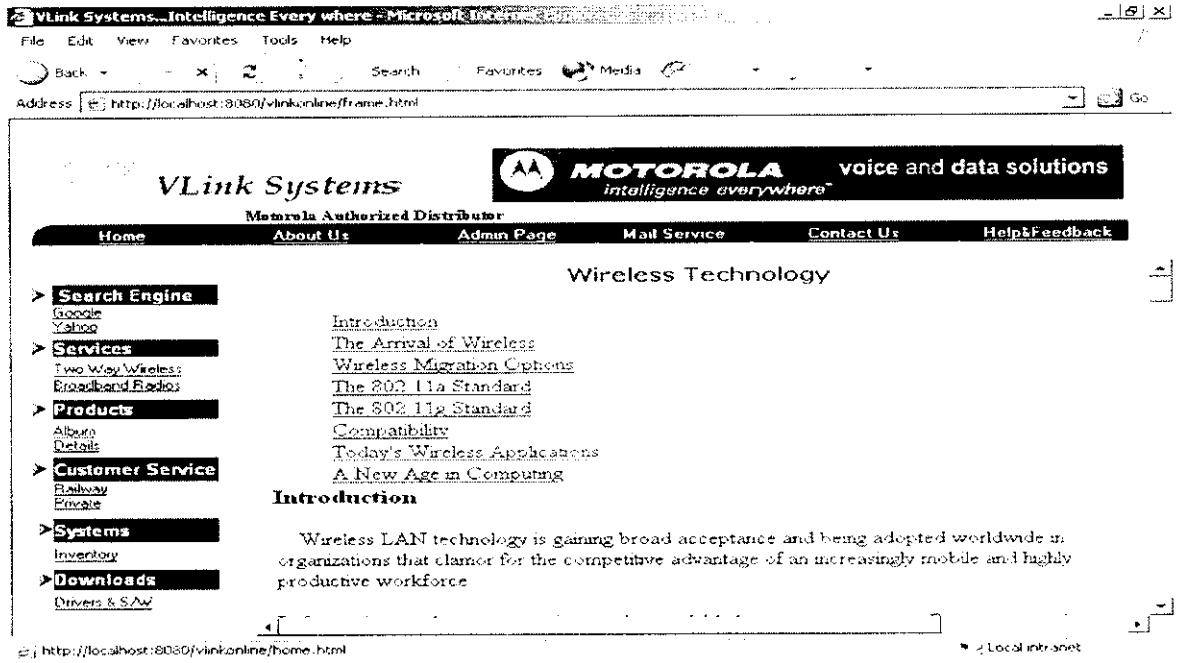
VLink Systems Home Page



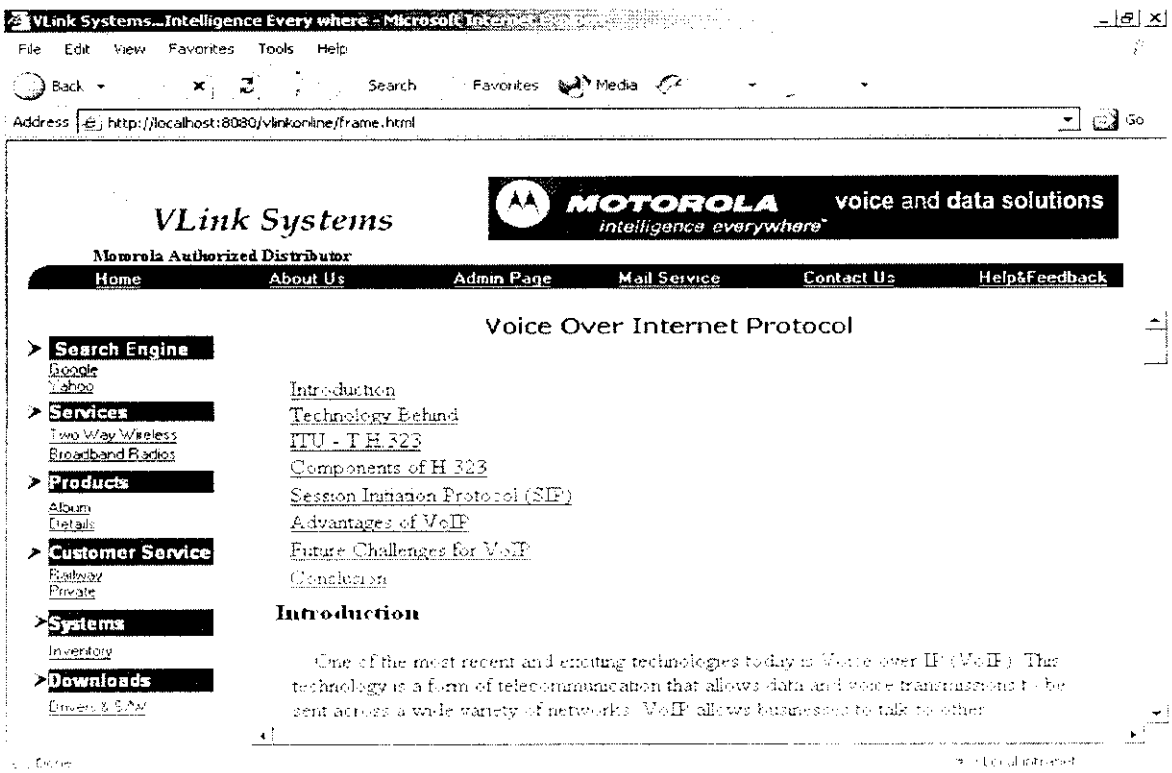


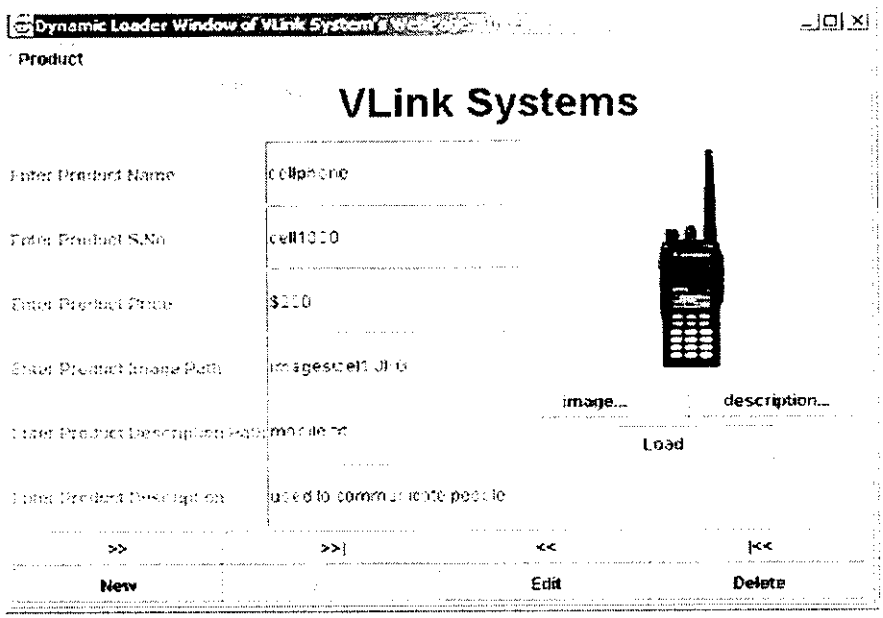
Inbuilt Goggle Searching Facility



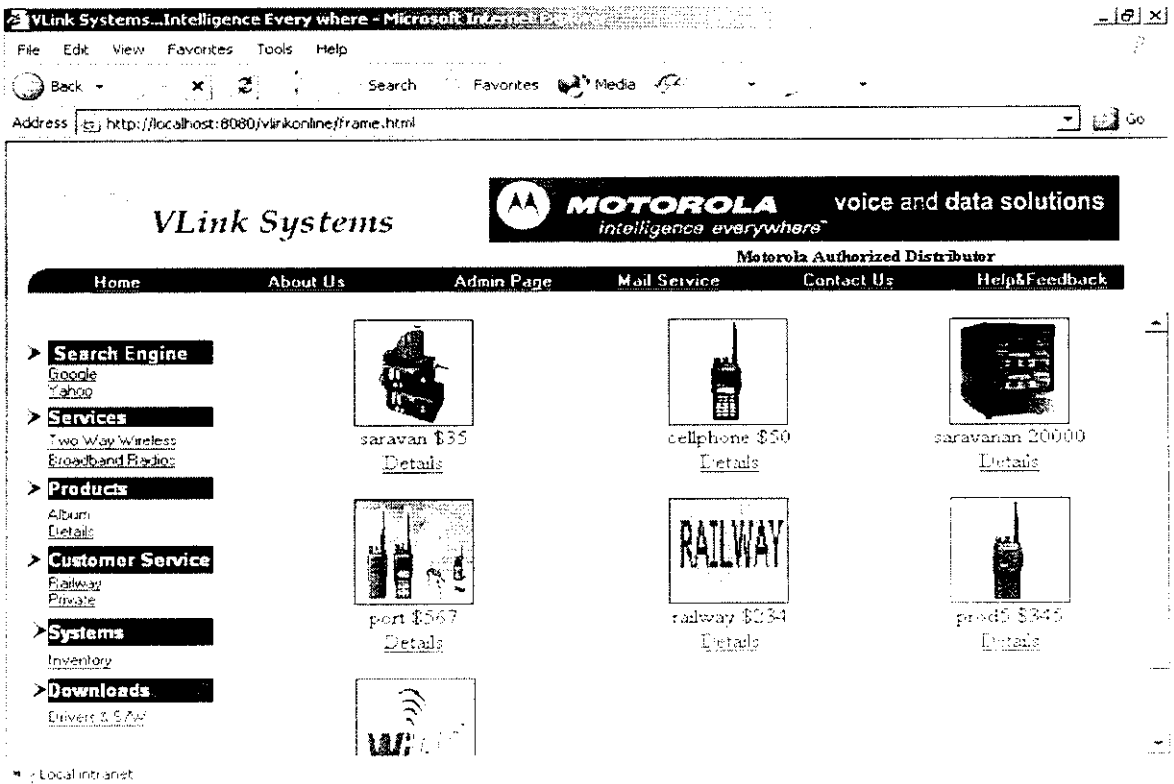


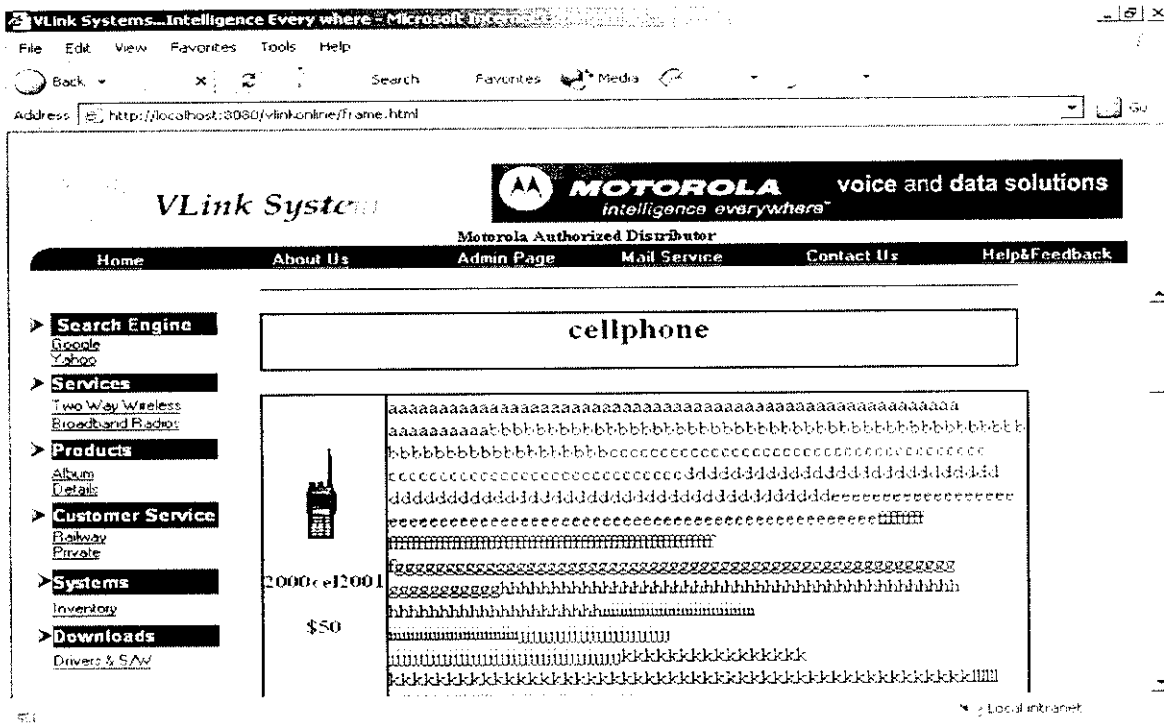
Services Provided by the VLink Systems



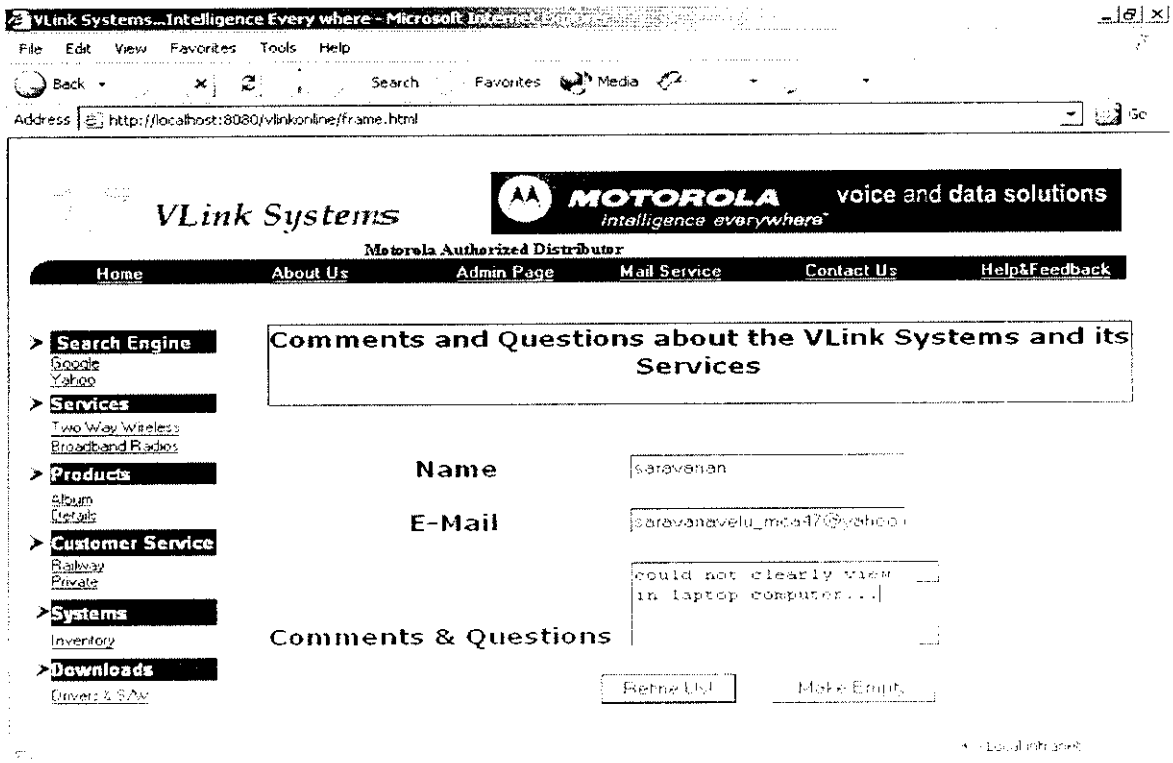


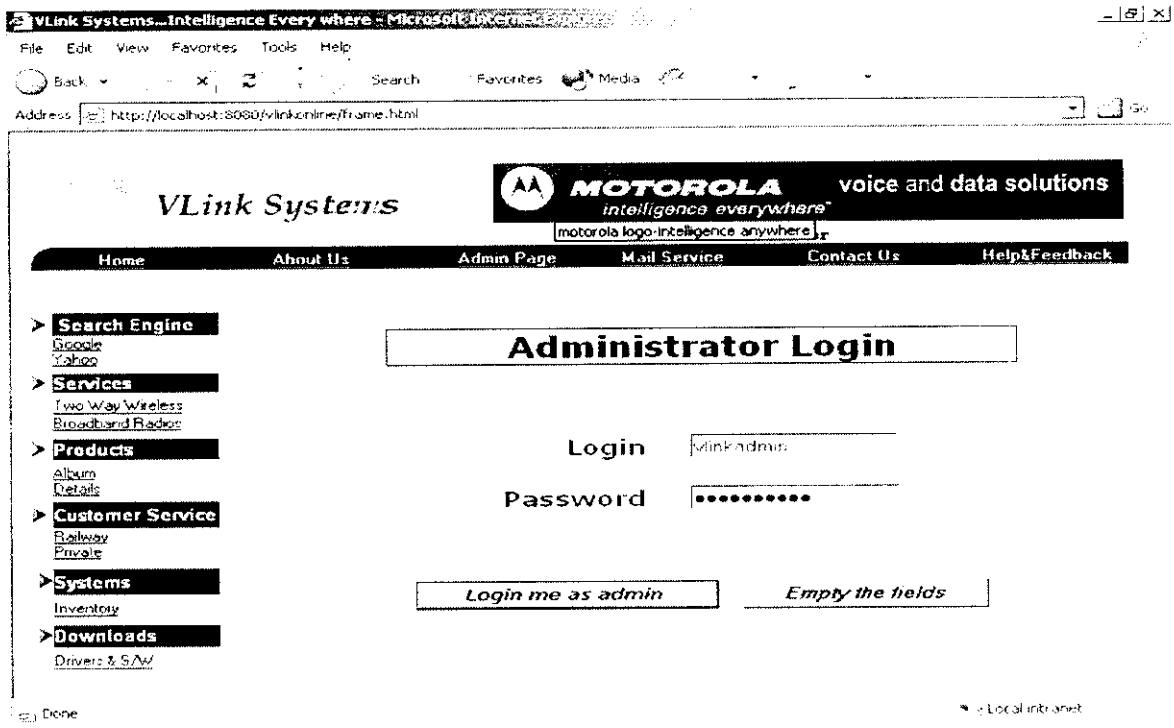
Dynamic Page Maintenance Tool



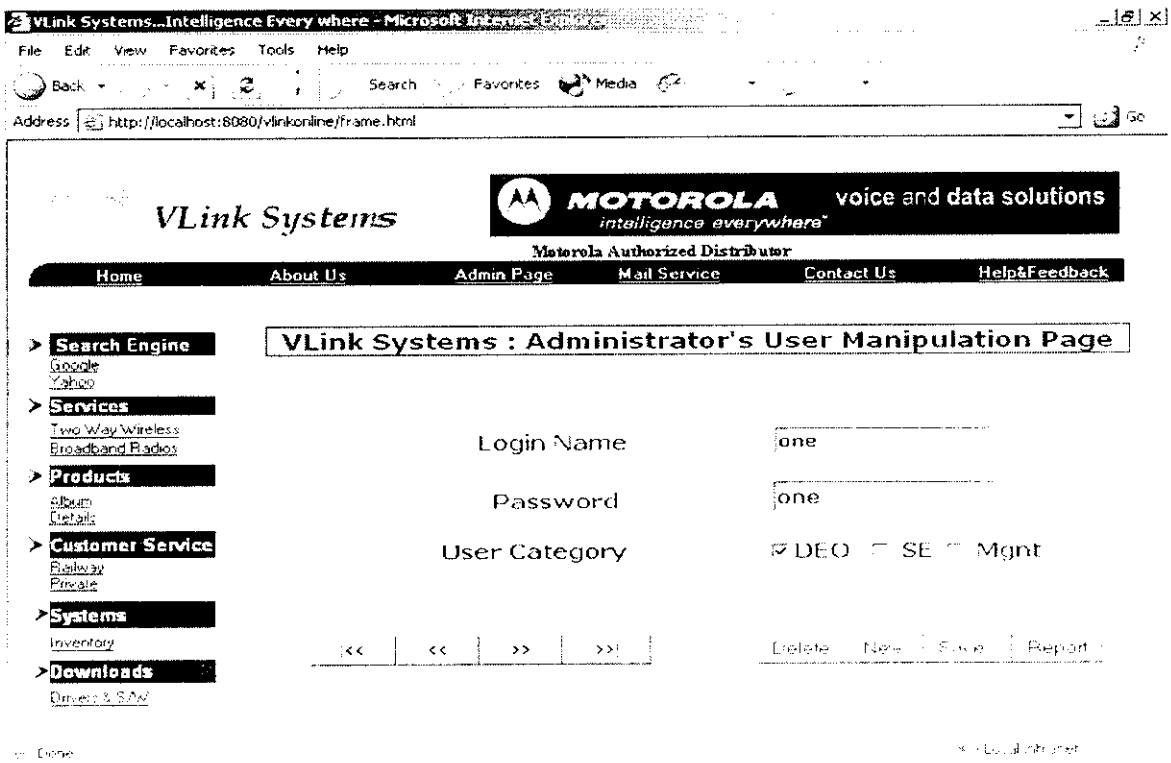


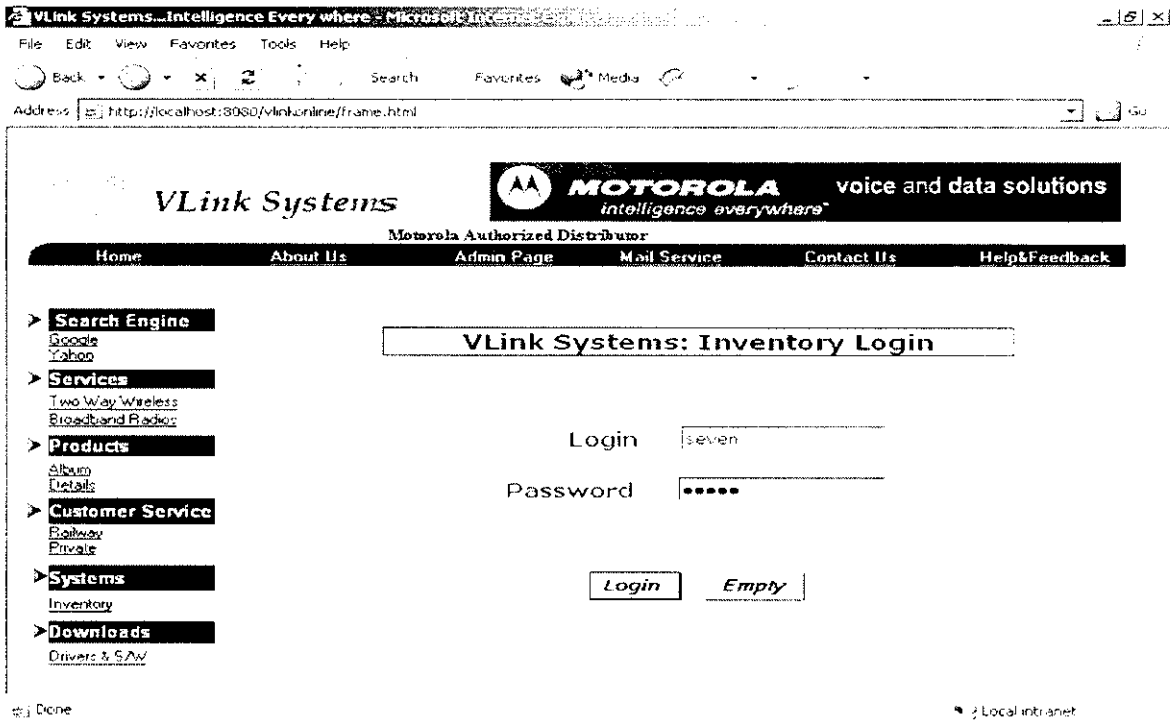
Product Description Page



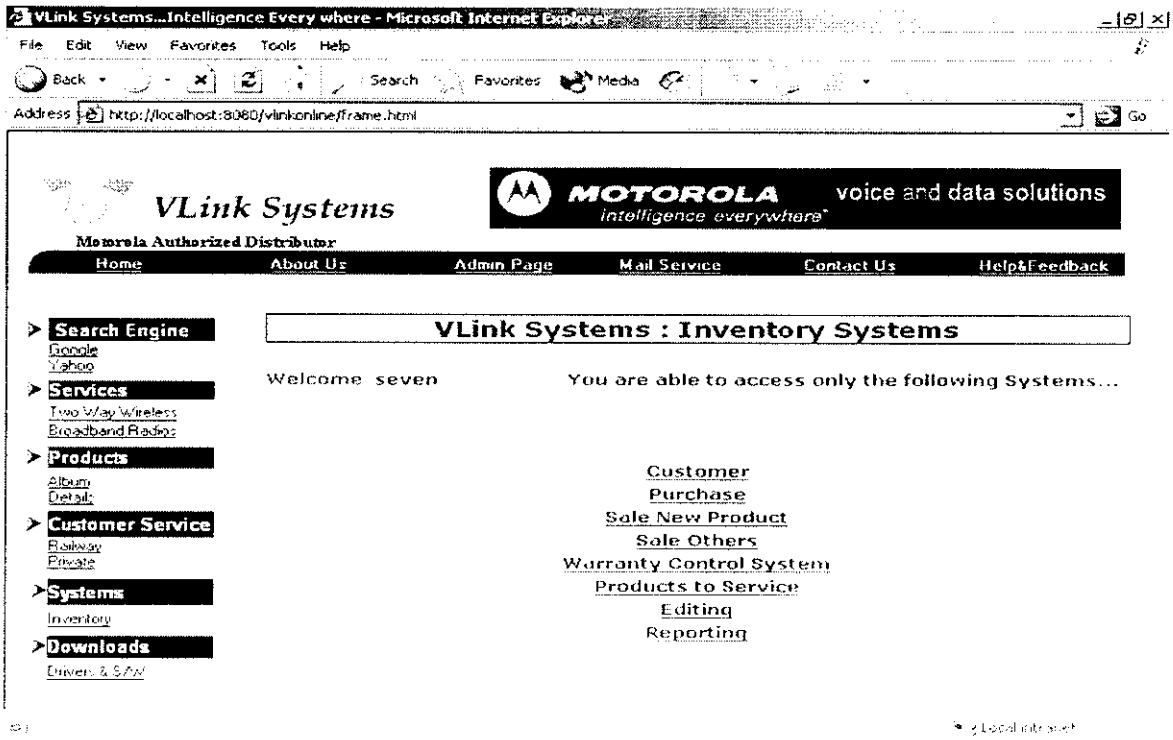


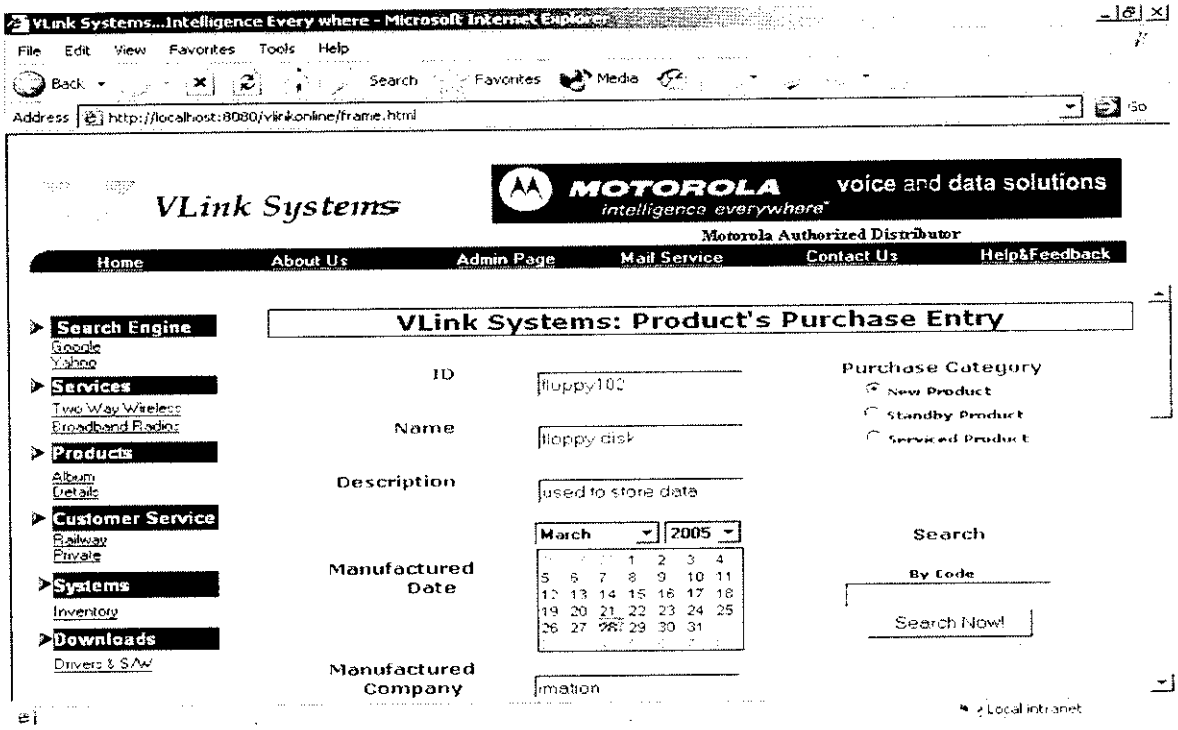
Administrator Login Page



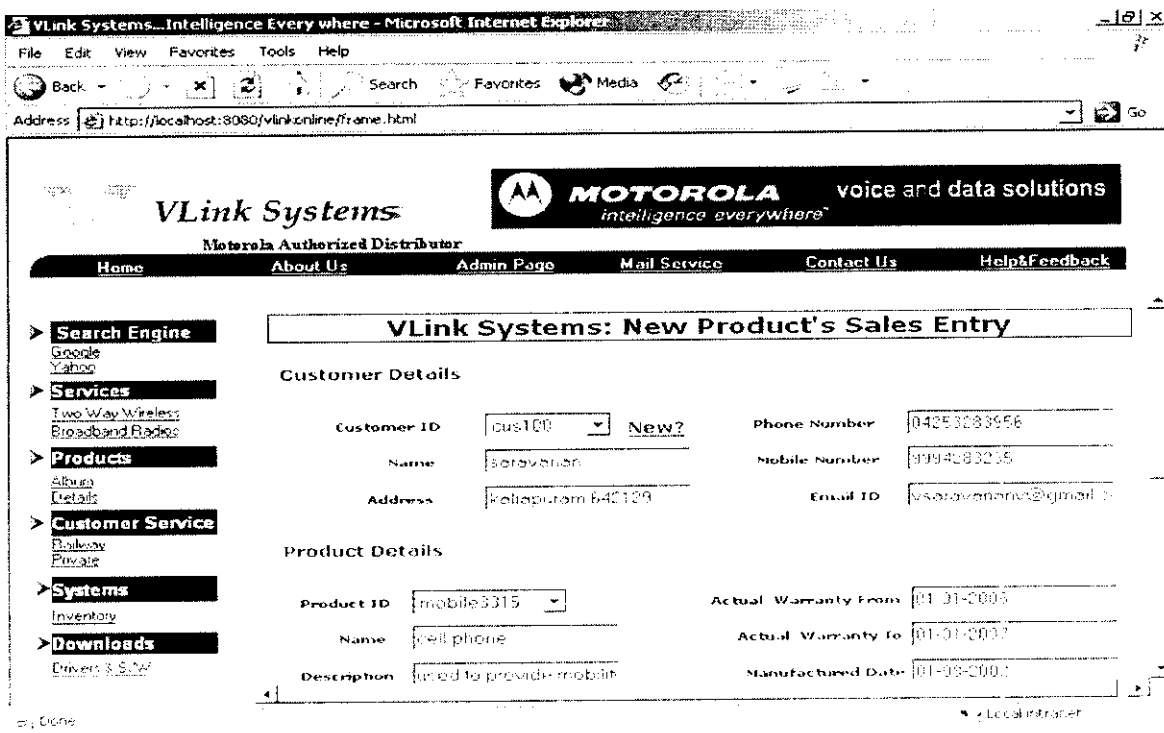


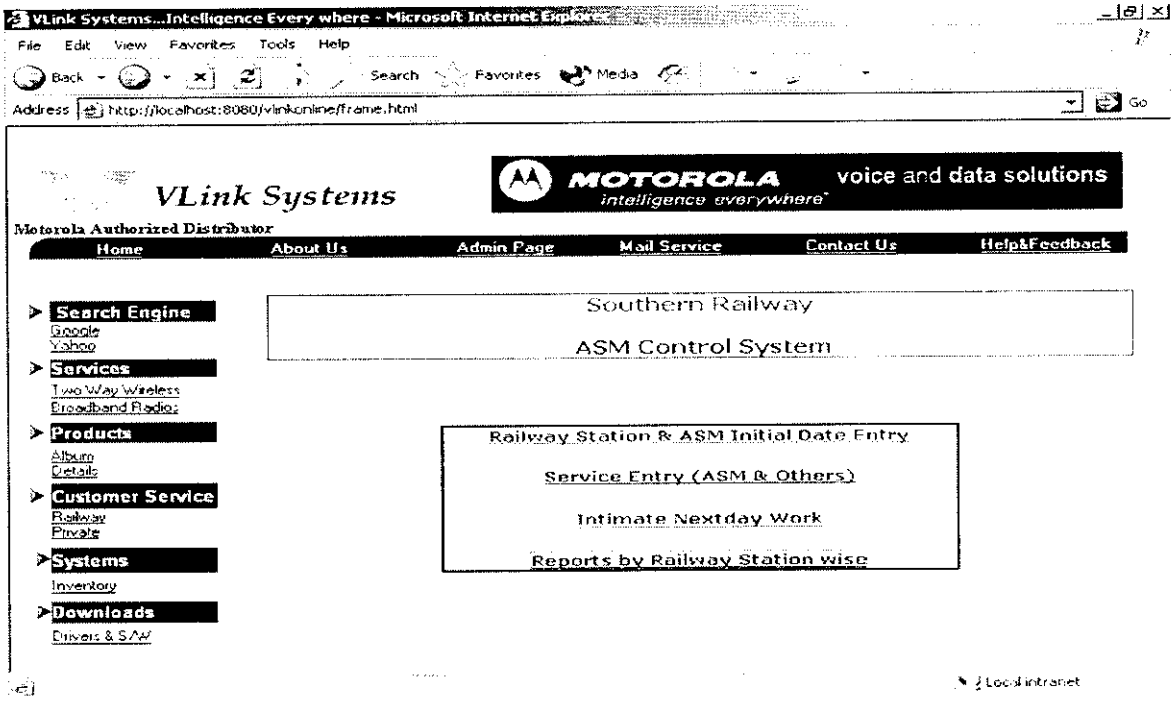
Inventory System Login



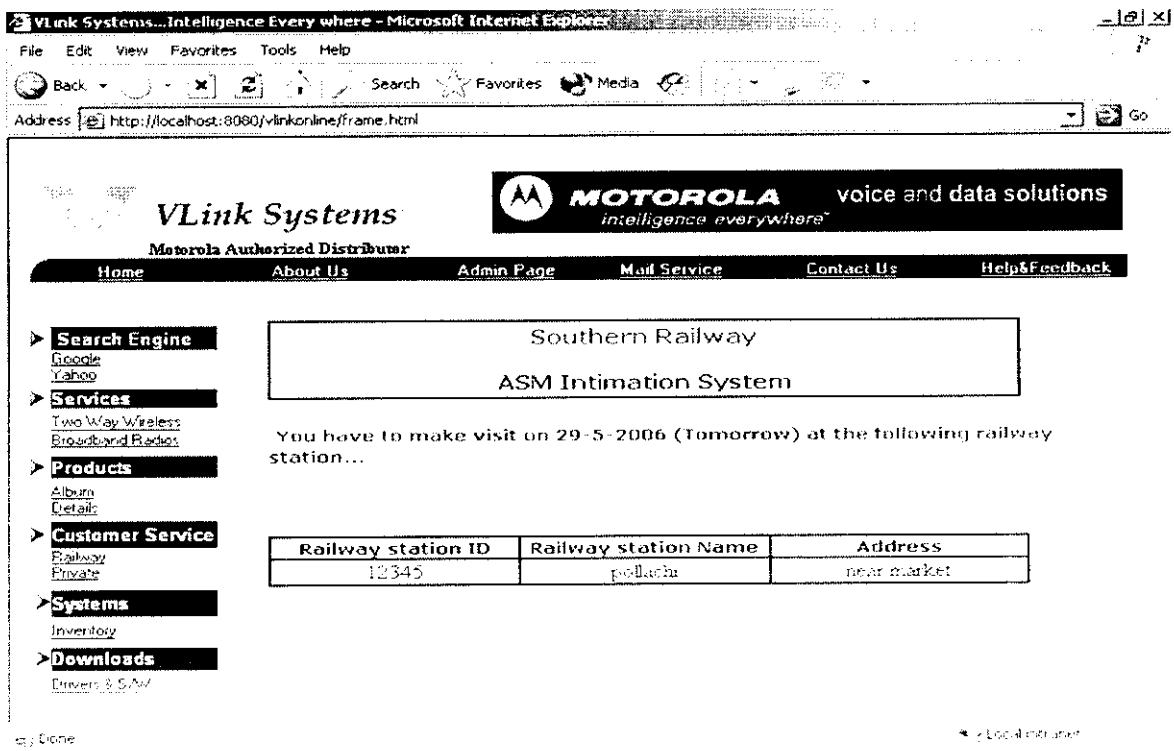


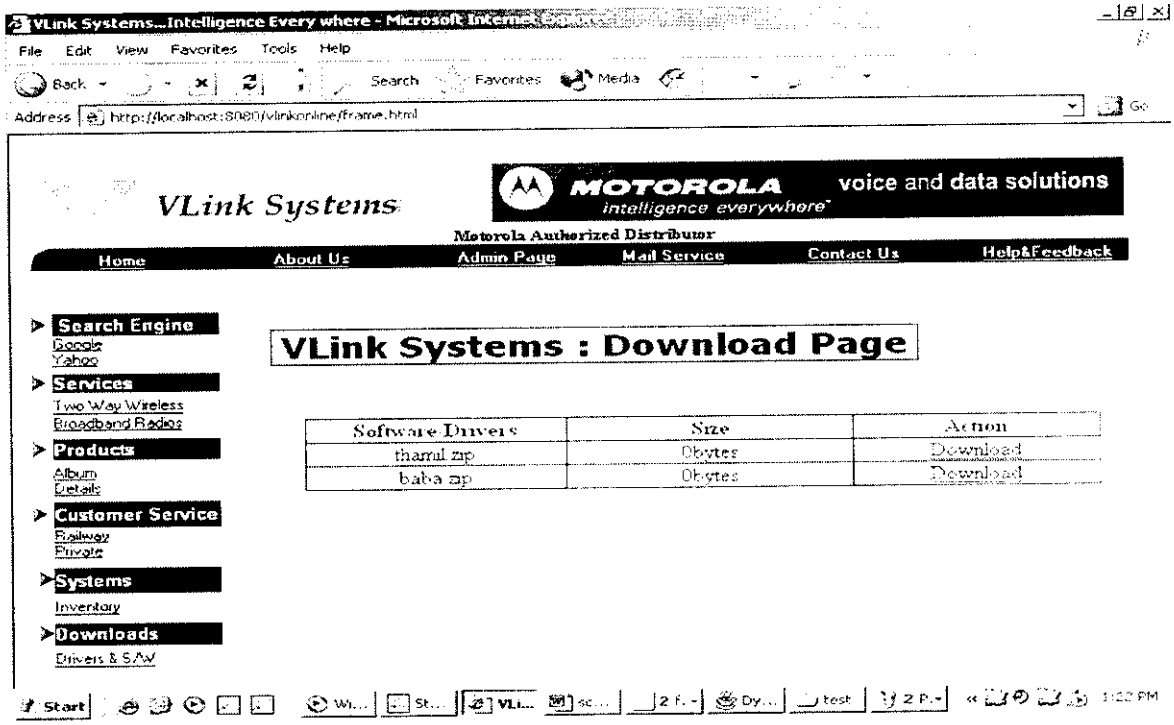
Purchase Module



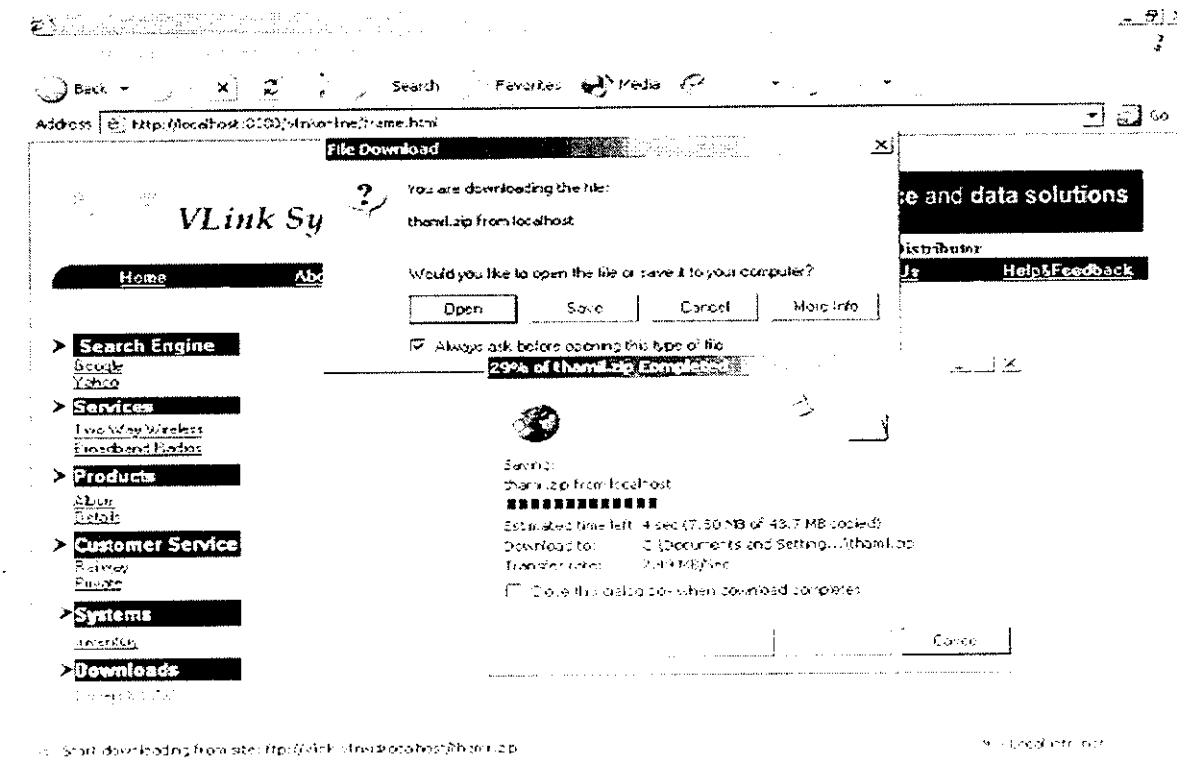


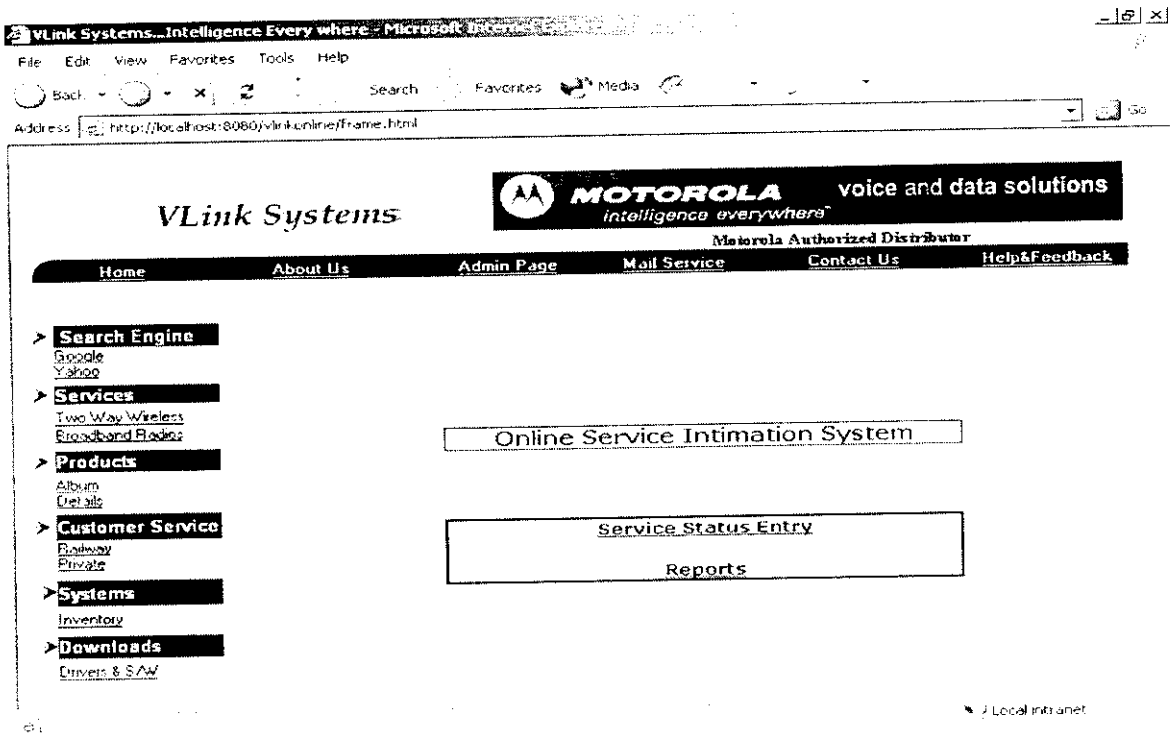
ASM Control System



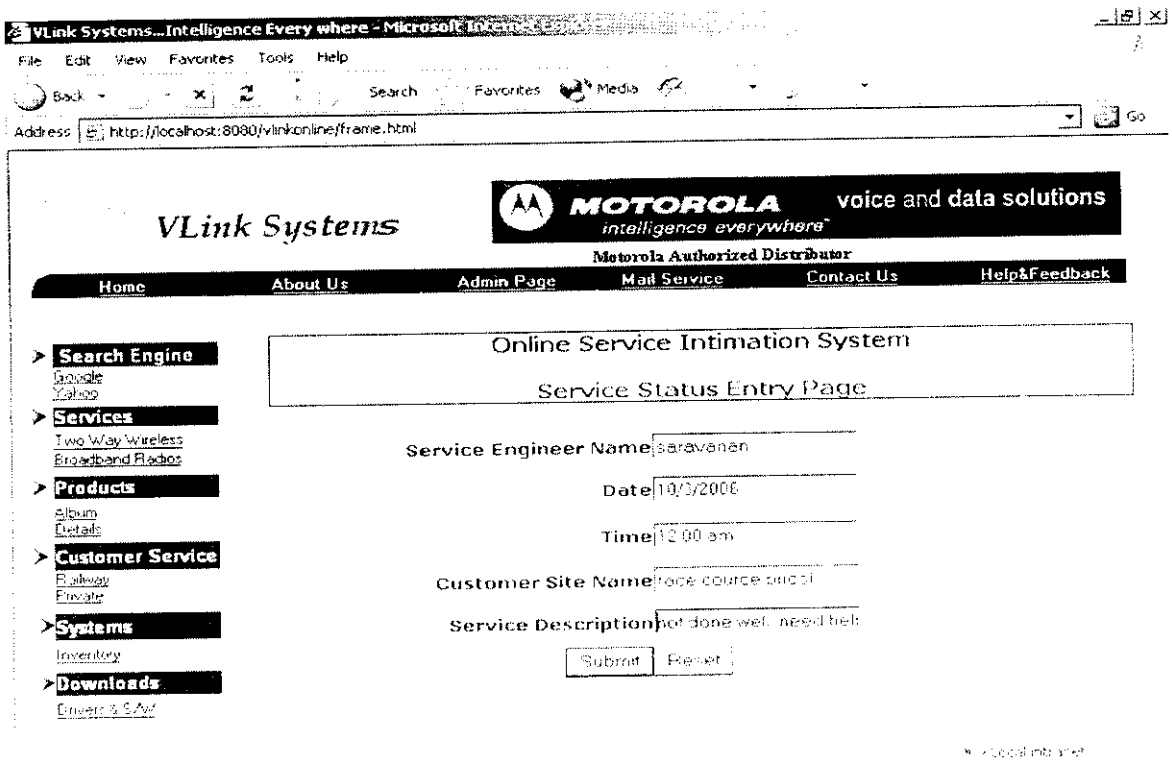


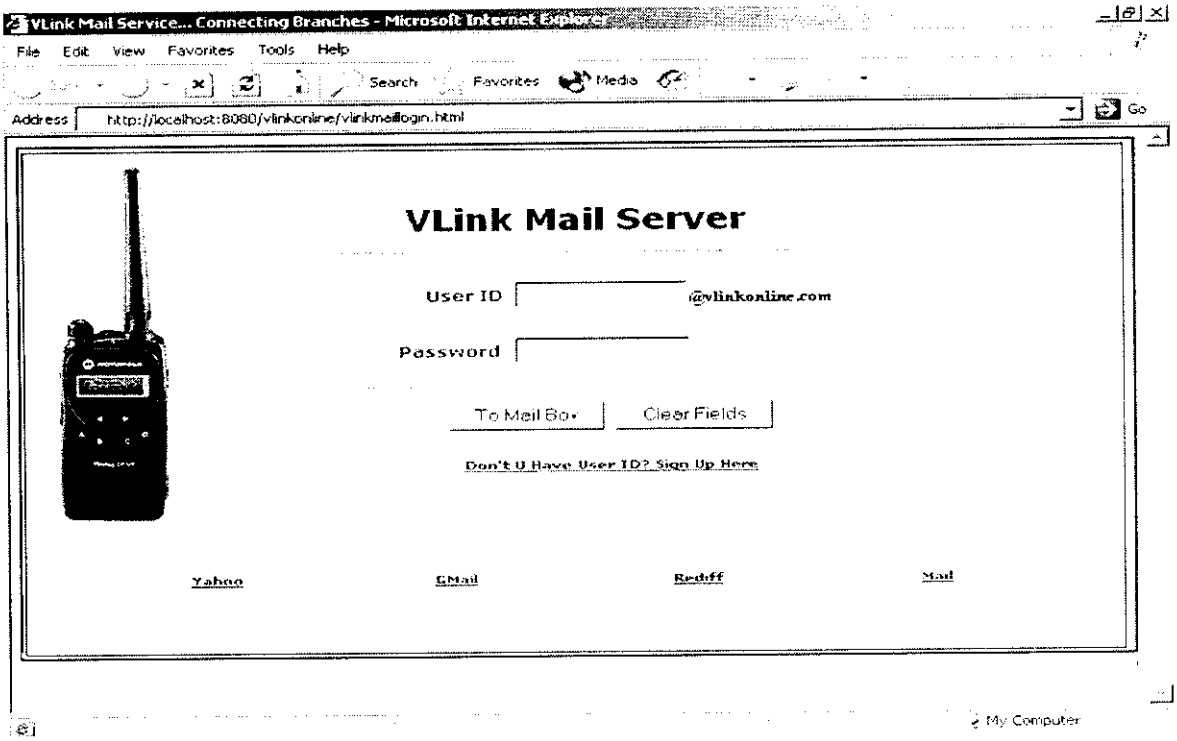
Device Driver Repository



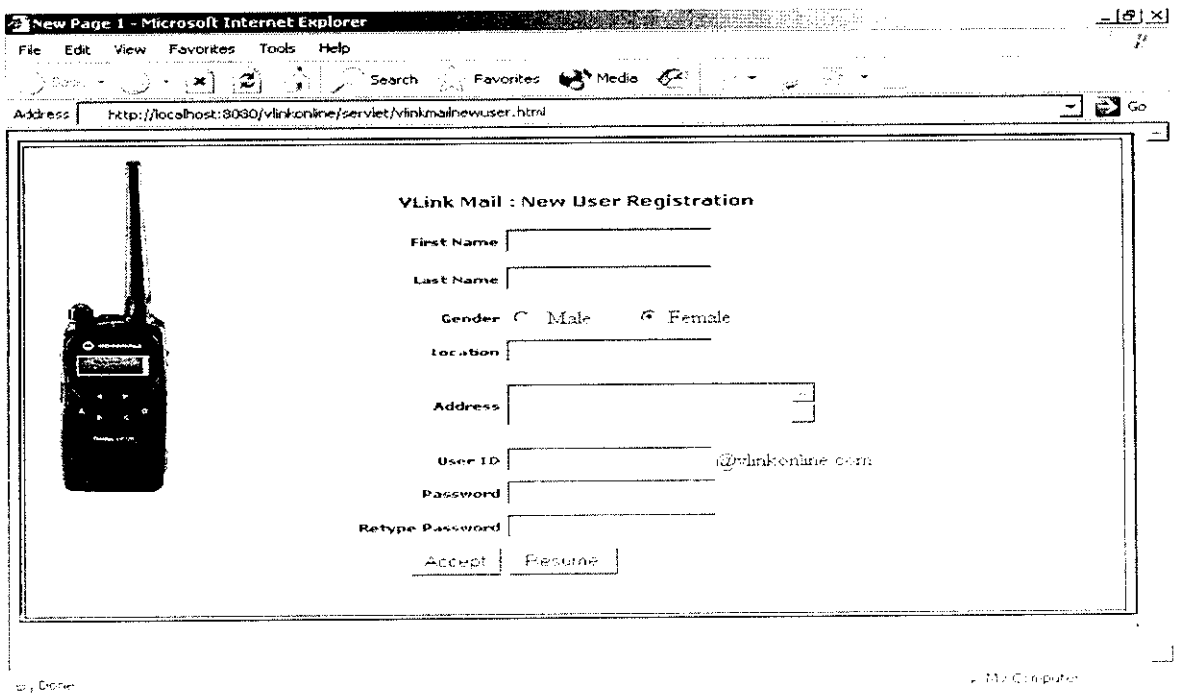


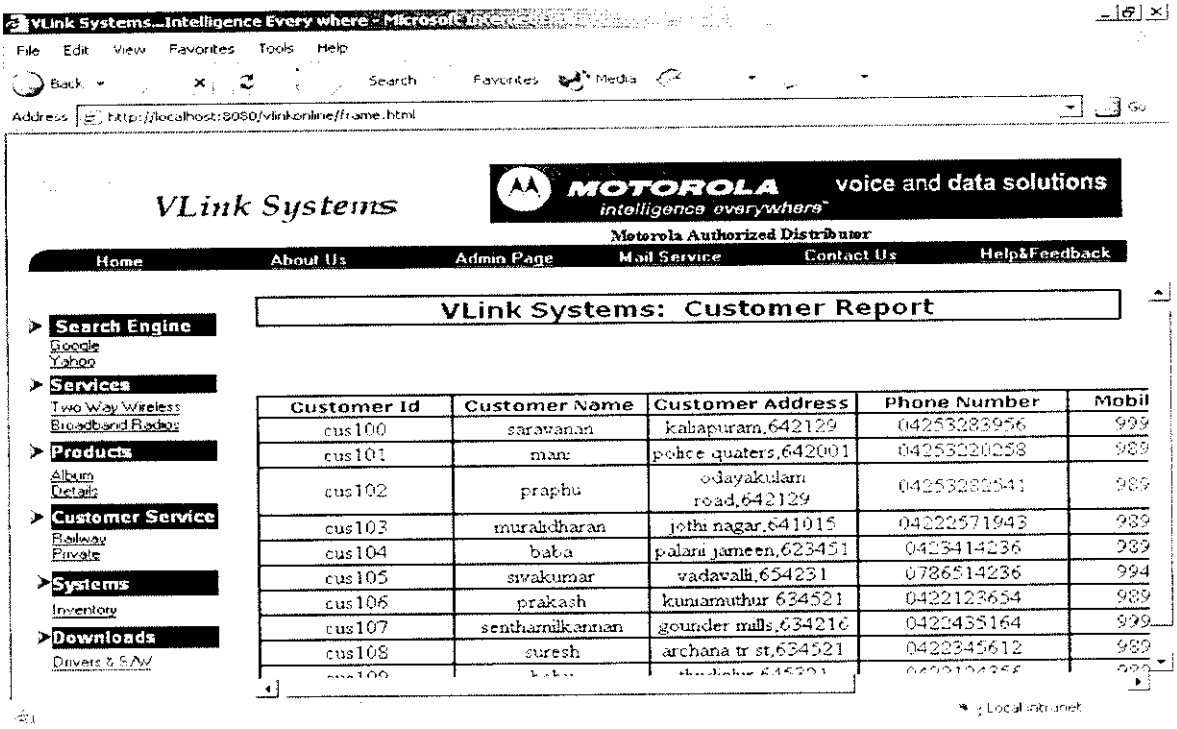
Online Service Intimation Systems



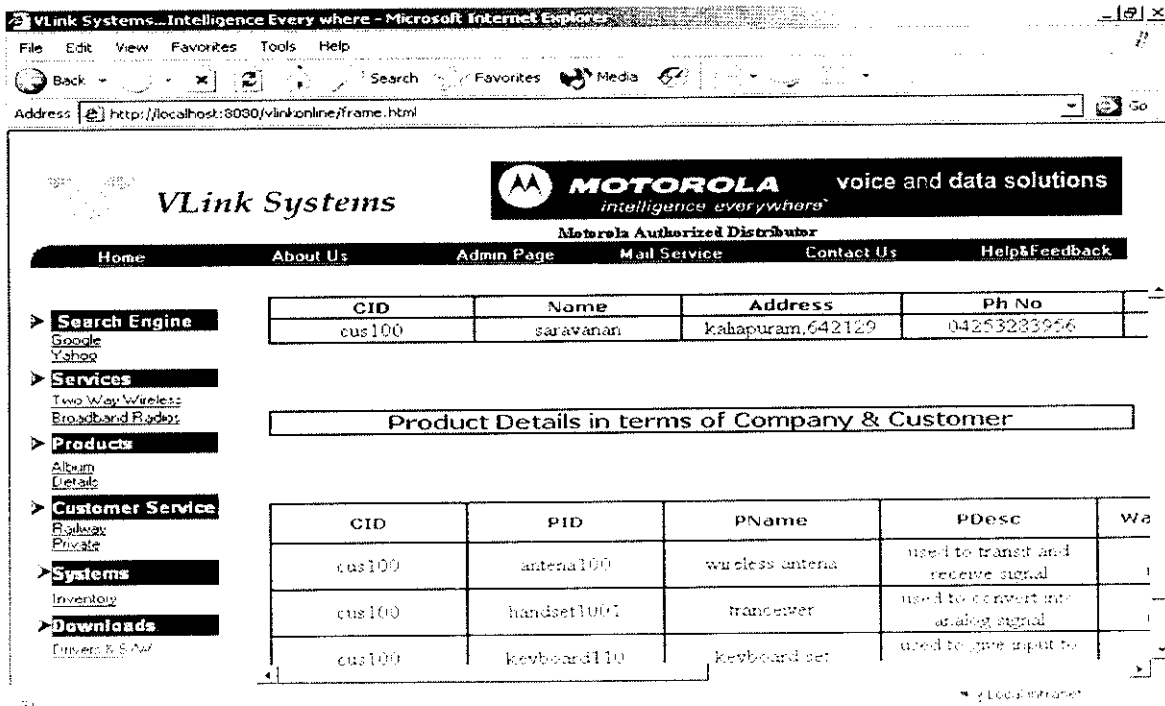


VLink System Mail Server-Login Page

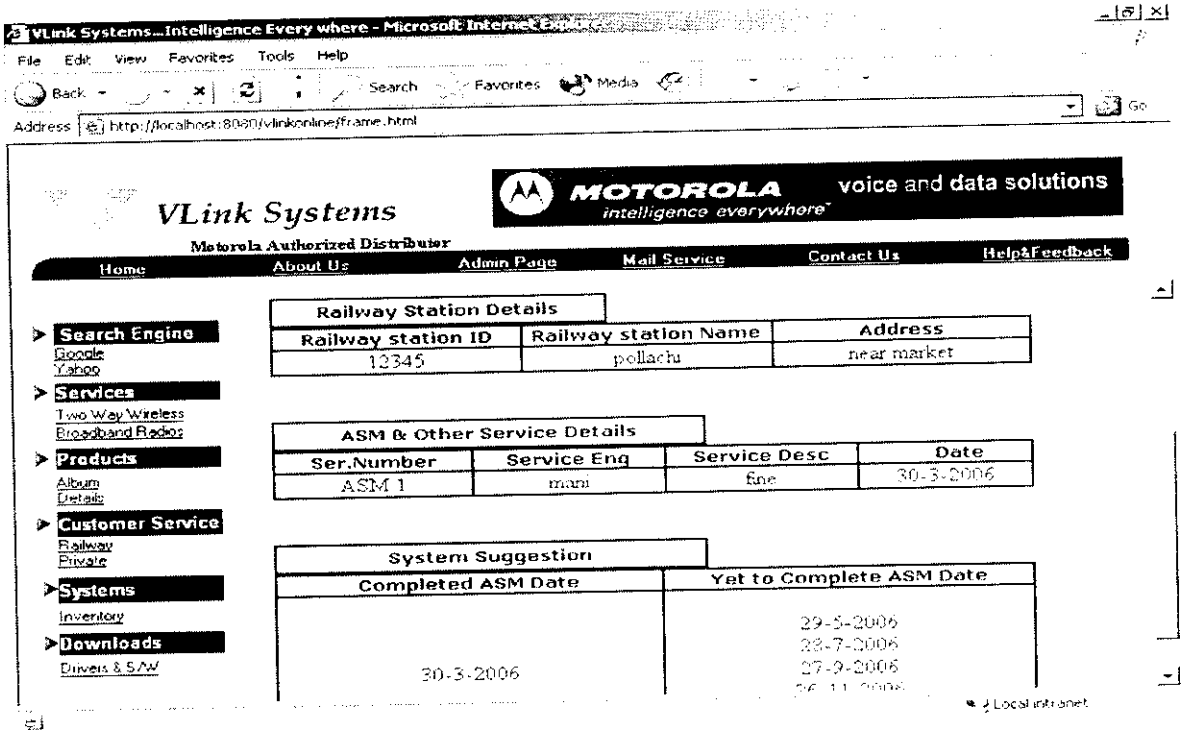




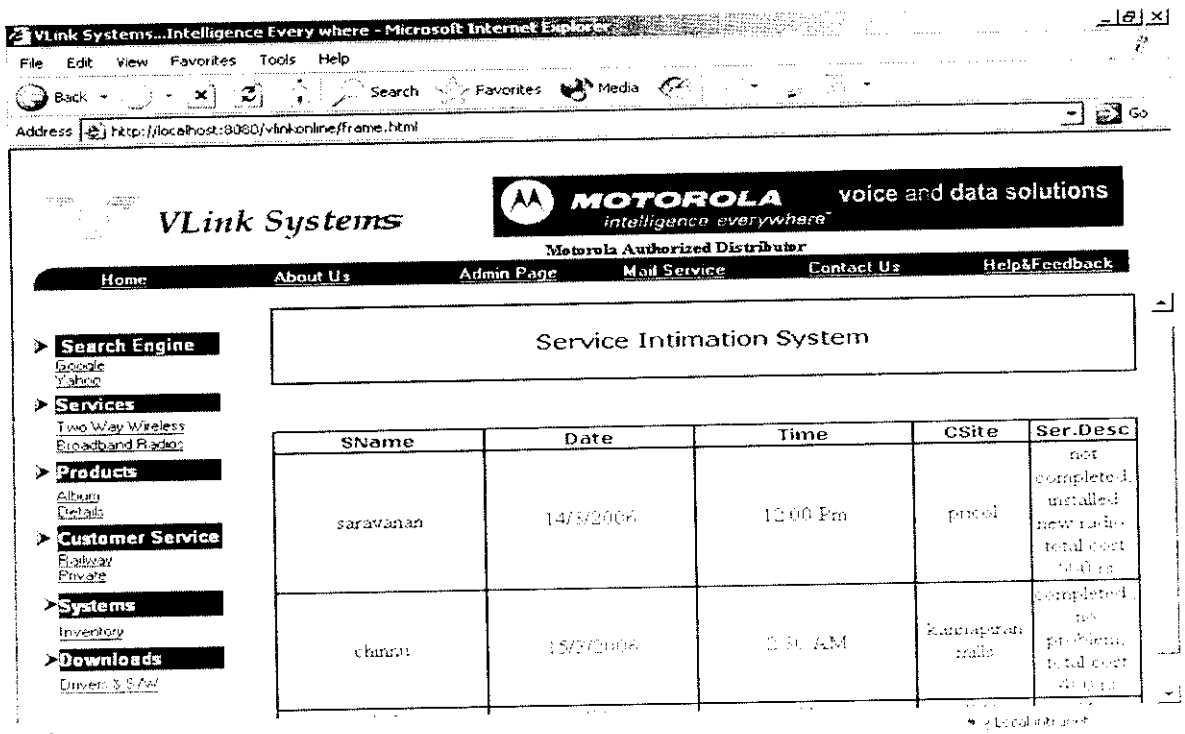
Inventory Control System - Customer Report



Inventory Control System - Customer wise Reports



ASM Control System: Railway Station wise Reports



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Specifications

RFC821 SMTP Specification