CUSTOMER RELATIONSHIP MANAGEMENT FOR SALES AND MARKETING ANALYTICS

PROJECT WORK DONE AT
ALTECH STAR SOLUTIONS Pvt.Ltd,
CHENNAI

PROJECT REPORT

SUBMITTED IN PARTIAL FULFILLMENT OF THE
REQUIREMENT FOR THE AWARD OF THE DEGREE OF
M.Sc [APPLIED SCIENCE] SOFTWARE ENGINEERING
OF BHARATHIAR UNIVERSITY, COIMBATORE.

SUBMITTED BY
M.SUMANTH RAJ
Reg. No. **9937S0097**

UNDER THE GUIDANCE OF

External Guide

Mr.J.KANDHARAJ
ALTECH STAR SOLUTIONS
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Internal guide

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING
KUMARAGURU COLLEGE OF TECHNOLOGY
COIMBATORE – 641 006

OCT 2003 – MARCH 2004

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING
KUMARAGURU COLLEGE OF TECHNOLOGY
(Affiliated to Bharathiar University)
COIMBATORE – 641 006
OCT 2003 – MARCH 2004

CERTIFICATE

This is to certify that the project entitled
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DONE BY

M.SUMANTH RAJ
Reg No. **9937S0097**

SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS
FOR THE AWARD OF THE DEGREE OF

M.Sc [Applied Science] SOFTWARE ENGINEERING
OF BHARATHIAR UNIVERSITY

Professor and HOD

Internal Guide

Submitted to University Examination held on 30/03/04

Internal Examiner

External Examiner

ech Star Solutions Pvt. Ltd.
we make IT happen

February 28, 2004

TO WHOMSOEVER IT MAY CONCERN

This is to certify that **Mr. M. Sumanth Raj (Reg No.9937S0097)**, final year M.Sc. (Software Engineering), student of Kumaraguru College of Technology affiliated to Bharathiar University, Coimbatore was involved in a project in our organization for a period of three months, from **1-Dec-03 to 28-Feb-04**.

He was assigned a project on **"CRM – Sales & Marketing Analytics"** under our guidance. His performance and attendance in the above mentioned project was good. All the very best for all his future endeavors.

For Altech Star Solutions Pvt. Ltd.,

S. Srilatha
HR Executive

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DECLARATION

I hereby declare that the project entitled "CUSTOMER RELATIONSHIP MANAGEMENT FOR SALES AND MARKETING ANALYTICS " submitted to **Bharathiar University**, Coimbatore as the project work of **Master of Science Degree in Software Engineering**, is a record of original work done by me under the supervision and guidance to **Mr.Kandharaj [Project Lead],** Altech Star solutions Pvt. Ltd, Chennai **Prof.K.R.Baskaran, M.S. Asst. Professor & Course Coordinator [Software Engineering]** and **Mr.Ganesh Babu, MCA, Lecturer, Kumaraguru College of Technology**, Coimbatore and this project work has not found the basis of the award of any Degree/Diploma/Associate ship/Fellowship or similar title to any candidate of any university.

Place: Coimbatore

Date : 30/03/04

M. Sumanth Raj

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The satisfaction and Euphoria that accompany the successful completion of any work would be incomplete unless, I mention the name of the people, who made it possible whose constant guidance and encouragement served as a beckon light and crowned my effort with success.

I express my sincere prayers and my heartfelt thanks to my parents and all my friends for their support and loving prayers.

I am greatly thankful to Mr.Kandharaj Project leader of Altech Star Solutions pvt Ltd, Chennai for permitting me to take part in the project.

I extend my profound gratitude to Dr.K.K.Padmanabhan, B.Sc. (Eng), M.Tech, Ph.D., Principal, Kumaraguru College of Technology, Coimbatore for providing me an opportunity to do the project works as part of the curriculum.

I express my sincere thanks to Prof.Dr.S.Thangasamy, B.E. (Hons), Ph.D., Head of the Department, Computer Science and Engineering for his valuable suggestions and advice.

I am immensely thankful to my guide Mr.S.Ganesh Babu Lecturer, and course coordinator Mr.K.R.Baskaran, Dept of Computer Science and Engineering for the valuable guidance and support throughout my project.

M. Sumanth Raj

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SYNOPSIS

The project fully goes through the various process that are undertaken to manage the customer details and a detail study is done from the data acquired and information gathered. The system is being developed as per the demand of the organization and end user requirement needs.

This project entitled "Customer Relationship Management for Sales and Marketing Analytics" is developed using MS-Access as back end and JSP, Java Script, Java and Html as front end. The system helps to manage all details relating to the collection and maintenance of customer information and also various journal entries. The system can handle all process relating to Customer Relationship Management like

- Company
- Branch
- Journal
- Pipeline

The system is designed to overcome the problems in the organization without giving rise to ambiguity. The system is designed to operate in a healthy computer environment with the system being user friendly and guiding the user at each step.

1 Introduction

1.1 Organization Profile

Altech Star Solutions Pvt Ltd is a multinational software development company, which is incorporated by **Mr.Abdul Wadood** . Ever since the company has delivered high quality software products and services to discerning clients in the Global market place, carving a special niche for itself.

Altech Star Solutions is one of the fastest growing software companies. It has many branches and strategic alliances located all over the world; their world wide registered Global head office is located at Chennai. The branch offices are located globally with offices and development centered in the Middle East and the US.

Domain Expertise

Altech Star Solutions is currently having more than 200 strong, well-qualified team of Software and project management team, with well proven track record in handling large multinational projects and developing products for the global market place, with latest technology & tools, proven on-time delivery records, cost effectiveness and best of quality. The main domain expertise of the organization is health care, manufacturing, logistics, retail, banking and insurance.

SERVICES

- ✓ Enterprise Solutions
- ✓ WEB Enterprise Solutions
- ✓ Data warehousing & BI
- ✓ Application Development
- ✓ Application Management

Products

- ➢ BizClaire
- ➢ Value Insight
- ➢ Chartweaver
- ➢ FinAC
- ➢ Gastro Expert
- ➢ Gastroview
- ➢ MediView
- ➢ OB SCAN
- ➢ Stellar

1.2 Project Overview

This project has been developed for the Altech Star Solutions Pvt Ltd. This system facilitates storage, retrieval, processing and generation of all related data for the automation of a Customer Relationship Management.

Customer Relationship Management (CRM) can help you increase customer satisfaction, improve efficiency, create sales opportunities and increase revenue. CRM solutions provide automation of many day-to-day tasks for sales, customer service, and marketing professionals. Several integrated modules work together to form a fully-functional CRM system designed to maximize profitability, and increase customer satisfaction.

Customer Relationship Management (CRM) is a Web-based customer relationship management solution. The CRM application contains functionality in contact management, account management, sales management, time management, customer contact center, customer service, field service, telemarketing, marketing, knowledge management, business analytics, project management, and e-Business.

The Customer relationship management (CRM) is a system that is being developed in order to be able to efficiently manage and control the customer relationship in a software organization for sales and marketing analytics. It will serve as an efficient tool in the marketing and analysis of various customers and the necessity.

The overview of the project is

- System study of the requirements.
- Reference of the studies made.
- Rough design of the system.
- Testing of the design through the operation.
- Making the necessary changes.
- Obtaining the final design.
- Coding the project.
- Testing the system.
- Implementing the system.
- Documenting the project.

2 System Analysis

2.1. Existing System

Currently the Customer Relationship Management is done in Visual Basic. The software is not a web based solution provider and all data relating to the solution are maintained at the office. All related information that is to be passed on to higher authorities is done in the printed format.

2.2. Proposed System – Java Version

The new system has been developed in order to be able to make it a web based solution. Care has been taken to make it user friendly as possible. The system is menu driven providing the user options for selecting appropriate form for processing. The system is designed in such a way as to gain maximum software support. The use of proper validations and verifications is carried out to make it efficient.

Unauthorized entry into the system is prevented by passwords and login facilities, database security as well as application security is provided.

The front-end has been developed using Html and JSP. The various manipulations are carried out using java and validation is done using Java Script.

DETAIL DESCRIPTION

The Customer Relationship Management for sales and marketing analytics is software used to maintain and retrieve client's information's and their various marketing calls.

I. COMPANY DETAILS

This module is used in order to be able to maintain the various lists of companies and their branches and also retrieve and generate data.

There are different options provided like

- New companies are to be added into the database.
- The branch entry is filled up for each and every company as in every company must have at least one branch.
- Search options are provided according to the criteria and detailed options provided for generating data.
- Processing for inactive and qualify are carried out.

II. BRANCH INFORMATION

This module is used in order to be able to maintain various branches and their details

- New branch for an existing company has been opened and added.
- Modifications to existing branches are carried out and manipulated into the database.
- One or many of the branches of a company are closed or to be removed from the database.

III. JOURNAL INFORMATION

This module is used to be able to maintain the various journal entries of the sales and marketing calls. The journals are classified generally into

- Company Journal: - Every call to the prospective client is entered in the company journal according to the company details.
- Pipeline Journal: - A pipeline journal is a monthly update of the status of affairs of the interchange between the company and our team.

IV. PIPELINE INFORMATION

The various modifications and manipulations relating to the pipeline are carried out here.

All related data and information can be retrieved using the search options that have a list of criteria through which to search and retrieve data and also to be able to manipulate them.

3 Programming Environment

Computing Environment

3.1 Hardware Configuration

Processor	:	Intel Pentium III or higher
Clock Speed	:	300 MHz
RAM	:	128 MB
Hard Disk Space	:	20 GB

Software Configuration

Development Language / Tools	JAVA, Java Server Pages (JSP), JavaScript, HTML
Web server Software	Tomcat
Database Software	MS Access
Operating System	Windows 9x, Windows 2000,Windows NT Workstation
Web Browser	Internet Explorer 5.0, Netscape Communicator 4.6 or later

3.2 Technologies – Quick References

The following are the important as well as main factors for choosing the specific technologies and environment for developing the software.

JAVA

Java is a powerful but lean object oriented programming language. It has generated a lot of excitement because it makes possible to program for Internet by creating applets, programs that can be embedded in the web page. The context of an applet is limited only by one's Imagination.

For Example, an applet can be animation with sound, an interactive game or a ticker tape with constantly updated stock prices. Applets can be just little decoration to liven up web page, or they can be serious applications like word processors or spreadsheet. But Java is more than a programming language for writing applets. It is being used more and more for writing standalone applications as well. It is becoming so popular that many people believe standard language for both general purpose and Internet programming.

There are many buzzwords associated with Java, but because of its spectacular growth in the popularity, a new buzzword has appeared lubricious. Indeed, all indications are that it will soon be everywhere. Java builds on strength of C++. It has taken the best features of c++ and discarded the more problematic and error prone parts. To this lean core, it has added garbage collection (Automatic Memory Management), multi threading (The capacity for one program to do more than in time), and security capabilities. The result is that Java is simple, elegant, powerful and easy to use.

WHY JAVA IS IMPORTANT TO THE INTERNET

The Internet help catapult Java to the forefront of programming and Java intern has had a profound effect on the Internet. The reason is simple; Java responds the universe of objects. That can move about freely in cyberspace. In a network, there are two broad categories of object transmitted between the server and your personal computer, passive information and dynamic, active programs. For example, when you read your email, you are viewing passive data. Even when you download a program, the programmer's codes are still only passive data until you execute it. However, there is a second type of object that can be transmitted to your computer, a dynamic and self-executive program. Such program would be an active agent for the client computer, yet the server would initiate it.

As described as dynamic, networked programs are, they also present serious problems in the areas of security and portability. Prior to Java cyber space laws effectively closed to the entities now live there. Java addresses these concerns and doing so, as opened the door to an exiting a new form of program.

SERVLETS

A servlet is a body of Java code that is loaded into and runs inside a network service, such as a web server. It receives and responds to request from clients. For example, a client may need 1specific information from a database; a servlet can be written that receives the request, gets and processes the data as needed by the client, and then returns it to the client. The servlet API, which you use to write servlets, assumes nothing about how a servlet is loaded, the server environment

in which the servlet runs, or the protocol used to transmit data to and from the user. This allows servlets to be embedded in many different web servers.

Servlets are an effective substitute for CGI scripts: they provide a way to generate dynamic documents that is both easier to write and faster to run. They also address the problem of doing server-sides programming with platform-specific APIs. Servlets are developed with the Java servlet API, a standard Java extension. While it is not part of the core Java framework, which must always be part of all products bearing the Java brand, it will be made available with such products by their vendors as an add-on package. A few of the many applications for servlets include,

- Processing data posted over HTTP using an HTML form, including purchase order or credit card data. A servlet like this could be part of an order-entry and processing system, working with product and inventory databases, and perhaps an on-line payment system.
- Allowing collaboration between people. A servlet can handle multiple requests concurrently; they can synchronize requests to support systems such as on-line conferencing.
- Forwarding requests. Servlets can forward requests to other services and servlets. This allows them to be used to balance load among several servers that mirror the same content. It also allows them to be used to partition a single logical service over several servers, according to task type or organizational boundaries.
- Being a community of active agents. A servlet writer could define active agents that share work among each other. Each agent would be a servlet, and the agents could pass data among themselves.

JAVA SCRIPT

Role of Scripting

There is no definition of a scripting language. Sometimes the term is used to make a distinction from compiled languages. However, some languages like C or C++ can be used for scripting as well as full applications. The term scripting is also used because a language will react to, control, or "Script" a series of events. Even macro languages built into PC applications like spreadsheets, databases, word processors, and multimedia applications are now often called scripting languages.

The purpose of most scripting languages is to extend the capabilities of applications. Just as the authors of this book cannot imagine every creative use you will make of JavaScript, software authors cannot imagine every possible use of their applications. To make their products more versatile, they add a scripting language. With JavaScript you have a scripting language to use your imagination on the Web.

What is JavaScript?

JavaScript is an easy-to-use programming language that can be embedded in the header of your web pages. It can enhance the dynamics and interactive features of your page by allowing you to perform calculations, check forms, write interactive games, add special effects, customize graphics selections create security passwords and more.

What is the difference between JavaScript and Java?

Actually, the 2 languages have almost nothing in common except for the name. Java is an interpreted programming language, similar to C++. It is powerful enough to write applications and also insert them in a web page as a special object called an "applet." Java has been generating a lot of excitement because of its unique ability to run the same program on IBM, Mac, and Unix Computers. Java is not considered an easy-to-use language for non-programmers. JavaScript is much simpler to use than Java. With JavaScript, if you want check a form of errors, you just type an if-then statement at the top of your page. No compiling, no applets, just a simple sequence. The major difference between Java and JavaScript is as follows:

JAVASCRIPT	*Java*
Interpreted by client	Compiled by the author, run on client
Code integrated in HTML documents	Applets distinct from HTML document
Loose typing of data types	Strong typing of data types
Script limited to browser functions	Stand-alone applications
Works with HTML elements	Goes beyond HML (Ex: Multimedia)

JAVA SERVER PAGES (JSP)

While there are numerous technologies for building web publications that serve dynamic content, the one that has really caught the attention of he development community is Java Server pages TM (JSP TM) and not without ample reason either. JSP not only enjoys cross-platform and cross-Web-server support, but effectively melds the power

of server-side Java technology with the WYSIWYG features of static HTML pages. JSP pages typically comprise of; static HTML/XML components. Special JSP tags optionally, snippets of code written in the Java programming language called "Scriptlets." Consequently, you can create and maintain JSP pages by conventional HTML/XML tools. It is important to note that the JSP specification is a standard extension defined on top of the Servlet API. Thus, it leverages all of your experience with servlets. There are significant developers, but also by page designers, who can now play a more direct role in the development life cycle.

Another advantage of JSP is the inherent separation of presentation from content facilitated by the technology, due its reliance upon reusable component technologies like Java Beans ™ component architecture and Enterprise Java Beans ™ technology.

JSP Advantages

1. Separation of static from dynamic content.

With servlets, the logic for generation of dynamic content is an intrinsic part of the servlet itself and is closely tied to the static presentation templates responsible for the user interface. Thus, even minor changes made to the UI typically result in the recompilation of the servlet. This tight coupling of presentation and content results in brittle, inflexible applications. However, with JSP, the logic to generate the dynamic content is kept separate from the static presentation templates by encapsulating it within external Java Beans components. These are then created and used by the JSP page using special tags and scriplets. When a page designer makes any changes to the presentation template, the JSP page is automatically recompiled and reloaded into the web server by the JSP engine.

2. Write Once Run Anywhere

JSP technology brings the "Write Once, Run Anywhere" paradigm to interactive Web pages can be moved easily across platforms, and across web servers, without any major changes.

3. Dynamic content can be served in a variety of formats

There is nothing that mandates the static template data within a JSP page to be of a certain format. Consequently, JSP can service a diverse clientele ranging from conventional browsers using HTML/DHTML, to handheld wireless devices like mobile phones and PDAs using WML, to other B2B applications using XML.

4. Completely leverages the Servlet API

If you are a servlet developer, there is very little that you have to "unlearn" to move over to JSP. In fact, servlet developers are at a distinct advantage because JSP is nothing but a high-level abstraction of servlets. You can do almost anything that can be done with servlets using JSP—but more easily!

HYPER TEXT MARKUP LANGUAGE (HTML)

HTML is basically a scripting language that's mainly used to display static contents on the Internet and Intranet applications, using Browsers. As a formatting language, HTML utilizes SGML (Standard General Markup Language) declarations and the document type declarations (DTD). SGML document has three main parts. The first part defines the character set to be used and tells which characters in that set distinguish text from markup tags. Markup tags specify how the viewer

application, or browser, should present the text to the user. The second part of an SGML document specifies the document type and states which markup tags are legal. The third part of an SGML document, called the document instance, contains the actual text and markup tags. Because there is no requirement that the three parts of an SGML document reside in the same physical file, we can concentrate on the document instance. The web pages you create are document instances.

Most HTML browsers assume a common definition about the character set used, and about which characters distinguish text from markup tags. They also generally agree about a core set of legal markup tags. They then diverge on which additional new markup tags to permit. In terms of universality, HTML along with Hyper Text Transfer Protocol (HTTP), is a base scripting language that's mainly used for creating a Client-Server applications in internet/intranet arenas.

JAVA DATABASE CONNECTIVITY (JDBC)

You can run a java program on any java enabled platform without even recompiling that program. The java language is completely specified and by definition a java enabled platform must support a known core of libraries. One such library is JDBC which you can think of as a java version of ODBC, and is itself a growing standard. Database vendors are already busy creating bridges from the JDBC API to their particular systems. Java soft has also provided a bridge drive that translates JDBC to ODBC allowing you to communicate with the legacy database that have no idea that java exists. Using java in conjunction with JDBC provides a truly portable solution to writing database applications.

RDBMS: MS-ACCESS

Functionality

- Client/Server (distributed processing) environments.
- Large database and space management
- High transaction processing performance
- Portability and compatibility
- Easy and efficient performance

4 System Design

4.1. Screen Design

User Identification

The user will access the Customer Relationship Management through the network. The users will be able to login using a browser running on their PC's. The browser to be supported for this application is Internet Explorer. He is welcomed by a Home Page, which is the welcome page of the Customer Relationship Management.

Without proper user authentication the Customer Relationship Management will deny all attempts of unauthorized access.

Home Page

The user is welcomed by a home page containing a menu driven application

The user can perform the following operations

- Add Company and Branch Details.
- Add Journal and Pipeline Details.
- Search and retrieve data.
- Manipulate and operate on database.

Company Screen

The Company screen displays the information about the various details relating to the company and all details like its location and various information like the email address of the company and its website and the type of company and all necessary information relating to making a call to that company.

Branch Screen

This screen will be displayed on selecting Add More from the Company menu screen. All companies are assigned a branch and for companies with multiple branches this module is used to add branches or modify information from existing branches.

Search Screen for Company

This Screen will be displayed on selecting search from the Company menu. This displays a list of all the fields in the company module that can be selected as criteria for going into the search option. When a particular criteria is selected then all data relating to that field are displayed and what ever is necessary can be input to search and all records relating to the criteria are displayed.

Journal Detail Screen

The Journal Screen is the screen used to select the type of Journal entry to be carried out. There are basically two types of journal entries namely a company journal and a pipeline journal.

Company Journal Screen

The Company Journal screen is used to get the information regarding the particular journal for a specific company. Here each and every call to that particular company is entered into the database by the marketing executive.

Pipeline Journal Screen

The Pipeline Journal screen is used to get the information regarding the pipeline information that is to be specifically entered for each month.

Journal Search Screen

The search screen for the journal module is similar to the company module where in all the fields are displayed in as in as criteria and specific information is got through the user and search is carried out and the information is displayed accordingly.

4.2. Database Design

The term "DATABASE" is used to refer to any data available for information processing or retrieval operations, the term implies a particular structuring of the data, both conceptually and in physical storage.

The data records are physically organized and stored so as to promote share ability, availability, and integrity. The database approach is made operational by a database management system or DBMS or RDBMS, a software system, which performs the functions of defining, creating, revising, and controlling the database. It provides facilities for retrieving data, generating reports, revising data definitions, updating data and building applications.

NORMALIZATION

One of the issues in database design is achieving a well- defined model of data to avoid update anomalies. Normal forms and normalization rules aid this. The normal forms are easily understood in terms of relational database design. The relational database model describes the database as tables or relations. Each relation consists of row's (called tables) representing entities and columns representing attributes. Normalization is used to determine how to cluster data items.

Normalization is the process of refining the data model. Through normalization, a collection of data in a record structure is replaced by successive record structures that are simpler and flexible to manage.

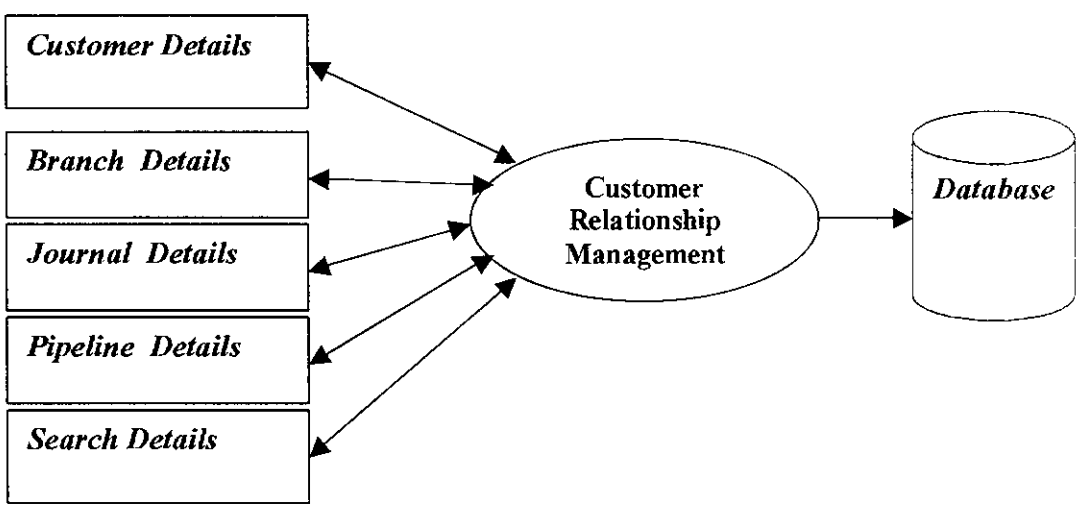
The reason why normalization is to be carried out is:

- To structure the data so that any pertinent relationships between entities can be represented.
- To permit simple retrieval of data in response to query and report requests.
- To simplify the maintenance of the data through updates, insertions and deletions.
- To reduce the need to restructure or reorganize data when new application requirements arise.

Hence from the conceptual data model to the physical database, the data structures have to go through a set of steps, namely the three steps of normalization that improve the quality of design of application.

4.3 Data Flow Diagram

Context Diagram



4.4. Table Design

Table Name : Company Table

Description : Stores Details of the new companies and information.

Primary Key : company_ID

Field Name	Field Type
company_ID	Number
companyname	Text
vertical	Text
remarks	Text
url	Text
seats	Number
turnover	Number
address	Text
address1	Text
city	Text
country	Text

Table Name : Branch Table

Description : Stores Details of the Branches.

Primary Key : person_contacted

Foreign Key : company_ID

Field Name	Field Type
company_ID	Number
contact_no	Text
person_contacted	Text
designation	Text
email_ID	Text
address	Text
address1	Text
city	Text
country	Text

Table Name : Journal Table

Description : Stores Details of the Journal entries.

Primary Key : person_contact

Foreign Key : company_ID

Field Name	Field Type
company_ID	Number
journal_date	Text
contact_type	Text
designation	Text
person_contact	Text
followup_action	Text
next_contactdate	Text
comments	Text
journal_type	Text

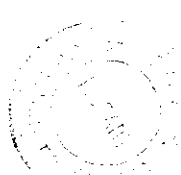


Table Name : Pipeline Table

Description : Stores Details of the Pipeline entries.

Primary Key : prospect_ ID

Field Name	Field Type
prospect_ ID	Number
prospect	Text
dw/vi	Text
industry	Text
engagement_type	Text
order_value	Number
active	Text
current_status	Text
follow_up	Text
location	Text
initiation_date	Date/Time
closure_date	Date/Time
less_than50%	Text
50%_to_75%	Text
75%_to_90%	Text
90%	Text
order_won	Text

Field Name	Field Type
comments	Text
decision_maker1	Text
decision_maker2	Text
decision_maker3	Text

5 System Development

So far, in the previous chapters the design of the system was discussed. This chapter gives a brief description of the Functional specification, System features, External interfaces and Coding standards for the whole system development.

5.1 Functional Specifications

The main data records are to be entered only be the administrator or an authenticated user so as to be able to maintain an efficient system. All processes are carried out in an orderly manner to be able to make the system a complete solution provider.

5.2 System Features

The Customer Relationship Management offers the following features:

Audit Trail

Audit trail for the entire user login related details would be available. All audit logs for the invalid id's, failed authorization, etc will also be available.

Error Messages and Error logs

The Application will have proper error messages and user messages. Error log information for all kind of breakdowns and other errors that occurred during service time are displayed using various options and error pages .

Data Validations

The Customer Relationship Management system will support data and fields relating to that particular data type and other types are not accepted. These validations have been carried out through Java script and error messages are given for wrong entries.

Intuitive Navigation & Screen flow

The Customer Relationship Management System will support intuitive navigation, so that the system is user friendly, as well as efficient in functioning.

5.3 Coding Standards

There are two main principal characteristics, which are standards to coding. (a) They force to maintain a methodical and disciplined approach to coding and (b) They constantly remained the internal quality of the code.

The very decision to use standards will affect the coding. By making it clear that the standards are mandatory rules, not mere guidelines, meeting standards is an integral part because standards are not guidelines, they should not be flexible.

Traditionally the coding standards are focused on the following topics: (a) Naming (b) Layout (c) Commenting and (d) Coding: Do's and Don'ts, such as error handling. The emphasis on writing code that's shareable, that's other programmers can also use it easily.

The proposed system is developed using the above-mentioned standards. Variables names are declared meaningful with respect to the information stored as well as the data type of the variable. Comments help the programmer what the module does or the set of statements do. Error handling is well taken care and error messages are meaningful and suggestive.

6 System Testing

6.1 Testing Concepts

Verification

Verification refers to the set of activities that ensure that the software correctly implements a specific function, imposed at the start of that phase. Testing activity focuses on verifying the correct implementation of business requirement and customer requirement.

Validation

Validation refers to the set of activities that ensure the software that has been built is traceable to customer requirements. Validation includes activities like Code-walkthrough to ensure that the software conforms to set standards.

Software Testing

Software Testing is a systematic activity aimed to uncover errors in a software program with respect to its specification to fulfill stated requirements.

Unit Testing

Unit testing refers to the testing of individual software units or related units, where a unit is the smallest functional part of an application. Unit testing makes heavy use of White box testing techniques along with Black box techniques.

In our environment, a typical screen and its associated components make a unit. White box testing measures like code-walkthroughs, control flow graphing are used extensively at this level apart from functional testing efforts like messages, boundary values etc,

Integration Testing

Integration testing refers to the testing in which software units of an application are combined and tested for evaluating the interaction between them. Black box test case designs are most prevalent during integration, though white box testing techniques like Control flow graphing and Execution tracing are also carried out.

Inter module and inter product integration issues are the prime focus areas here. We concentrate on the application's business rules and ensure they are validated across different modules.

System Testing

Testing conducted on a complete, integrated system to evaluate the system's compliance with its specified requirements. Software once validated for meeting functional requirements must be verified for proper interface with other system elements like hardware, databases and people. System Testing verifies that all these system elements mesh properly and the software achieves overall function performance.

We carry out Product audit and acceptance, performance testing as a part of system testing.

7 System Implementation

This chapter gives a brief description of how the system is deployed in the actual environment. Since there is now any existing system for this application a separate care should be given to test that the end users have reached there needs. The system should also save memory by not allowing redundancy and it should help in easily querying.

System Implementation

Before implementing the system, it's forced in to many server-testing phases. After the system clears all the tests, it's released for implementation. After the data has been initially set, the system is ready for use. The implementation type or the change over technique from the existing system is a step by process.

First a module in the part of the system is implemented and checked for suitability and the efficiency. If the end user related to the particular module is satisfied, the next step of implementation is processed with. That's modules related to the previous module are implemented.

User Training

Training is given to all the particular users from the client side. The training varies from user to user depending upon the information needed pertaining to the user. For example the application users need help only on ad-hoc queries and how to take suggestions based upon the reports, whereas data entry operators need only information's on how to key in suitable data.

Conclusion

The goal of the system is to be able to produce an complete web based solution for the organization to be able to efficiently manage and control the various customer related information and also to be able to handle the various journal and pipeline entries of the concern and to be able to maintain a complete marketing database and retrieve and display appropriate information to the management.

Customer Relationship Management (CRM) can help you increase customer satisfaction, improve efficiency, create sales opportunities and increase revenue. CRM solutions provide automation of many day-to-day tasks for sales, customer service, and marketing professionals. Several integrated modules work together to form a fully-functional CRM system designed to maximize profitability, and increase customer satisfaction.

8.1 Future Enhancements

Good software must be able to incorporate future modifications and enhancements. Throughout the maintenance phase changes keep cropping up and the system must be able to adjust itself to the changing situations. The system has been developed keeping this in mind. The system has been so developed that change in configuration leaves minimum impact on the performance. The application has been developed such that newer methods can be just added without affecting the other methods.

The application has been coded in a manner that any future enhancements to be made can be incorporated without much effort.

9 References

1. Patrick Naughton and Herbert Schildt, "Java Complete Reference", Tata McGraw Hill, Third Edition, 2000.

2. Mark C. Reynods, "Java Servlets", First Edition.

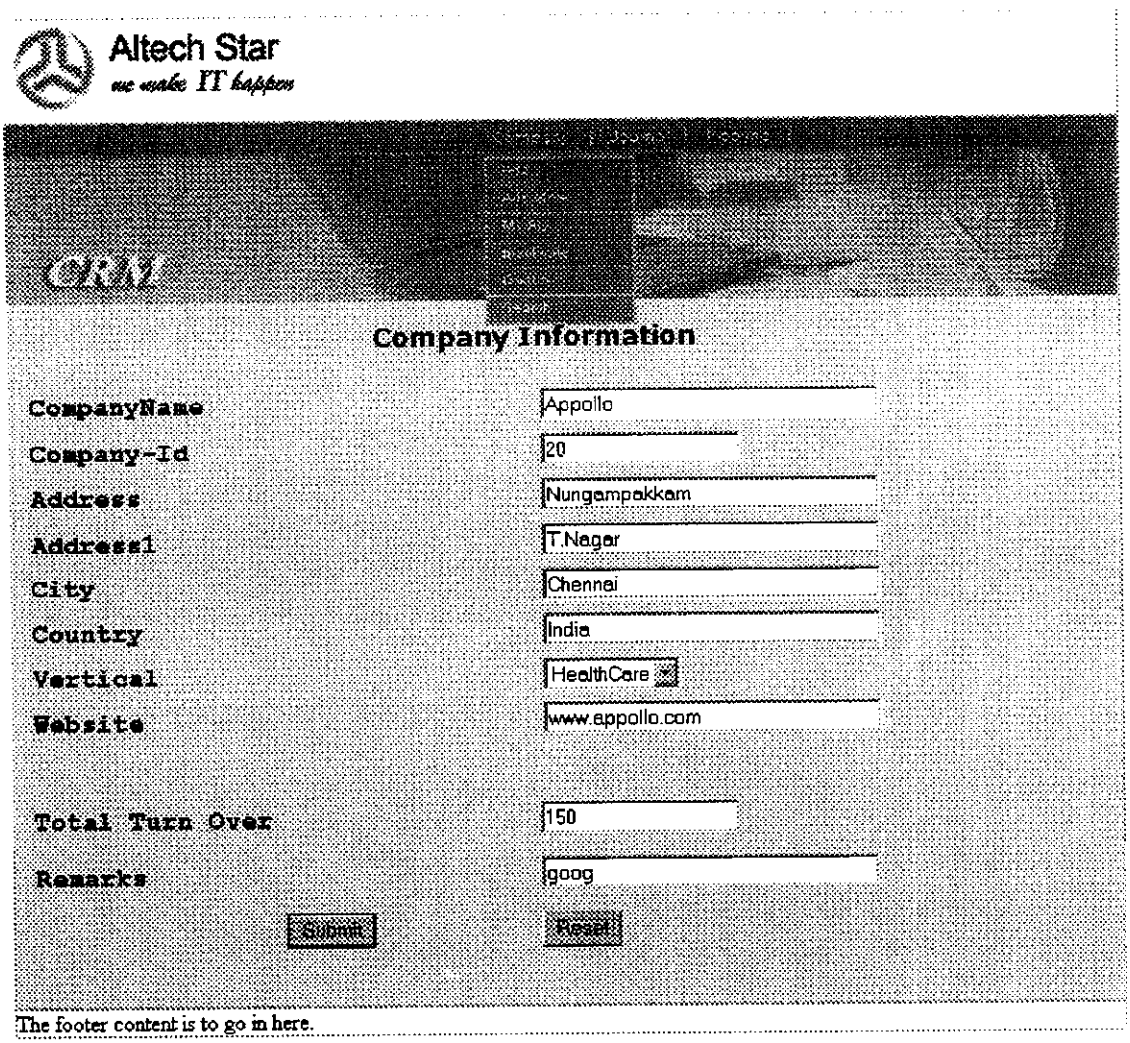
3. Rogers Pressman, "Software Engineering", Tata McGraw Hill Edition, 1998.

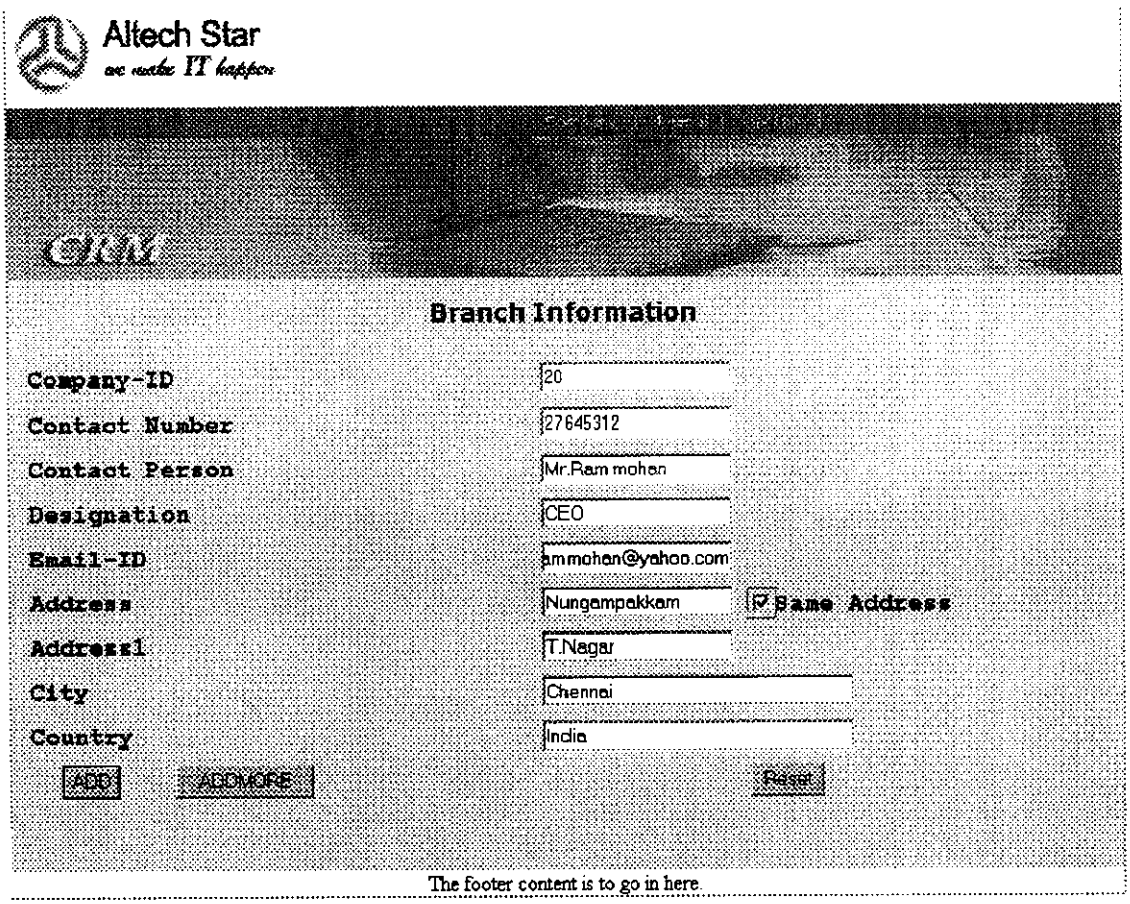
4. Laura Lemay and Michael G.Moncur, "Java Script", Prentice Hall.

5. Arnold Robbins and Daniel Gilly, "MsAccess in a Nutshell", Third Edition.

10 Appendices

10.1 Sample Forms




Altech Star
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Company-ID
20
Contact Number
27645312
Contact Person
Mr.Ram mohan
Designation
CEO
Email-ID
ammohan@yahoo.com
Address
Nungampakkam
Same Address
Address1
T.Nagar
City
Chennai
Country
India
ADD
ADDMORE
Reset
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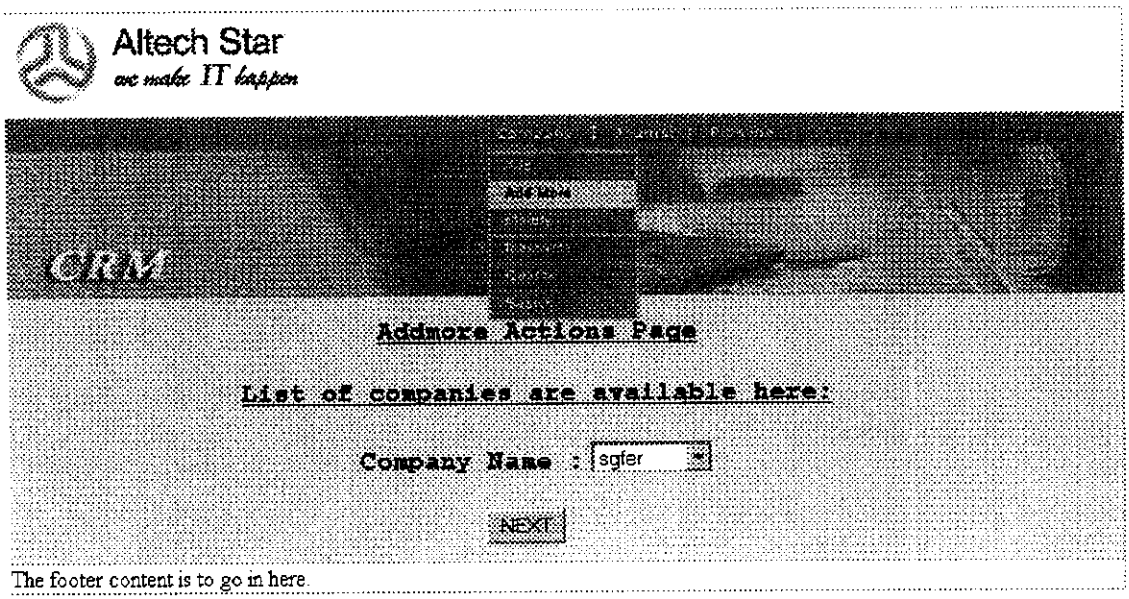
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we make IT happen
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Addmore Actions Page
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Company Name : sgfer
NEXT
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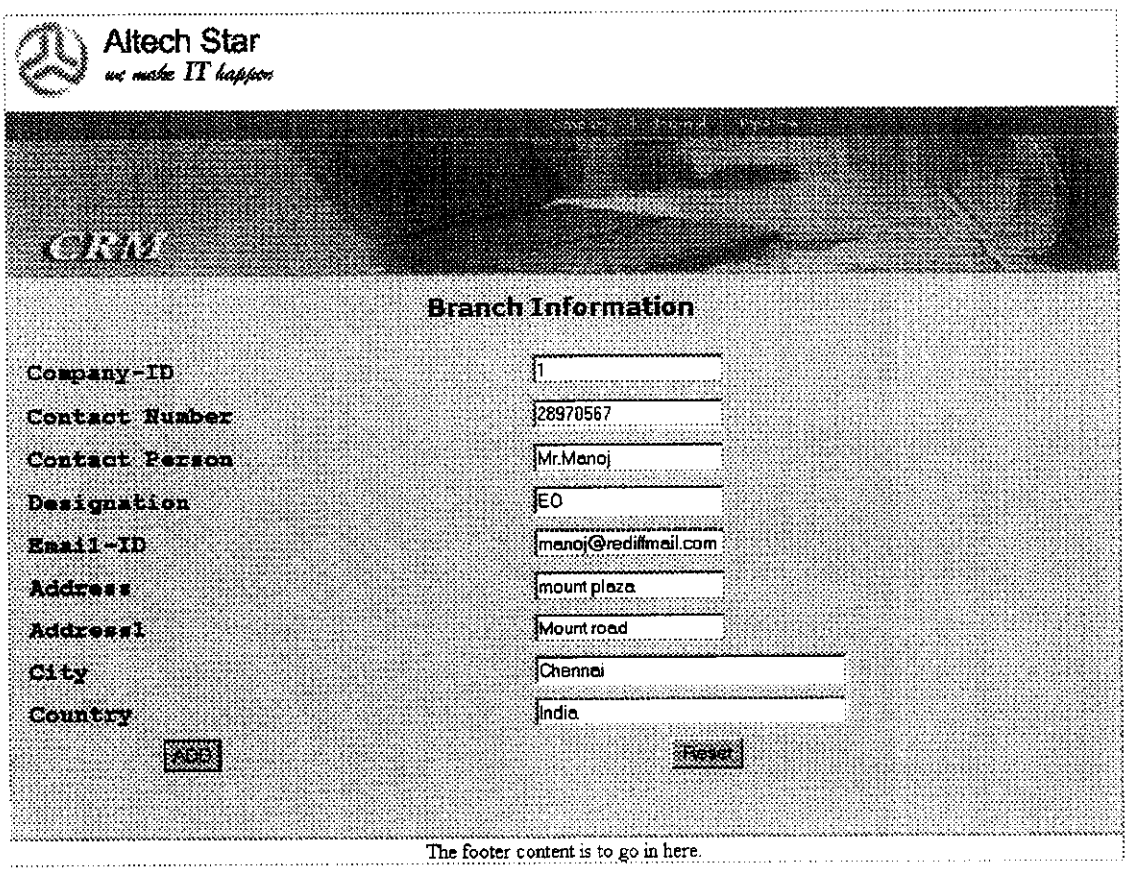
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we make IT happen
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Branch Information
Company-ID 1
Contact Number 28970567
Contact Person Mr.Manoj
Designation EO
Email-ID manoj@rediffmail.com
Address mount plaza
Address1 Mount road
City Chennai
Country India
Add
Reset
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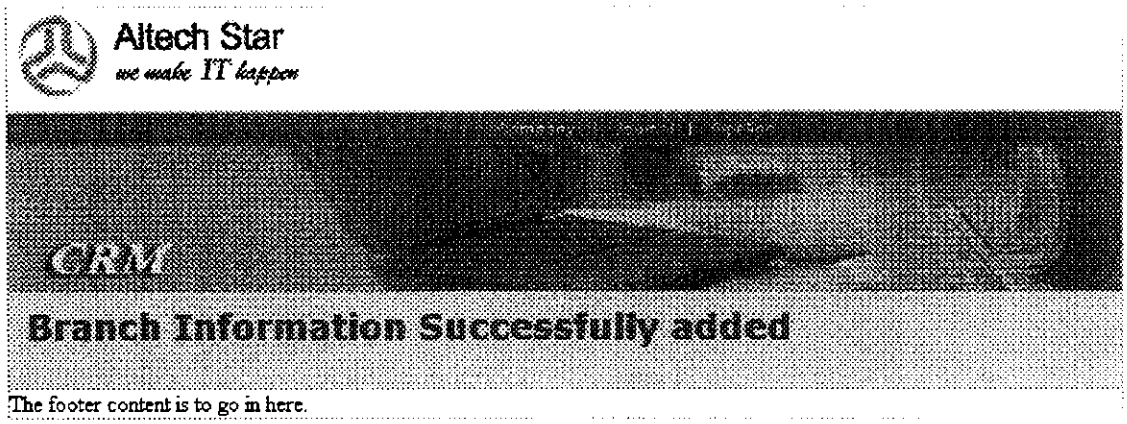
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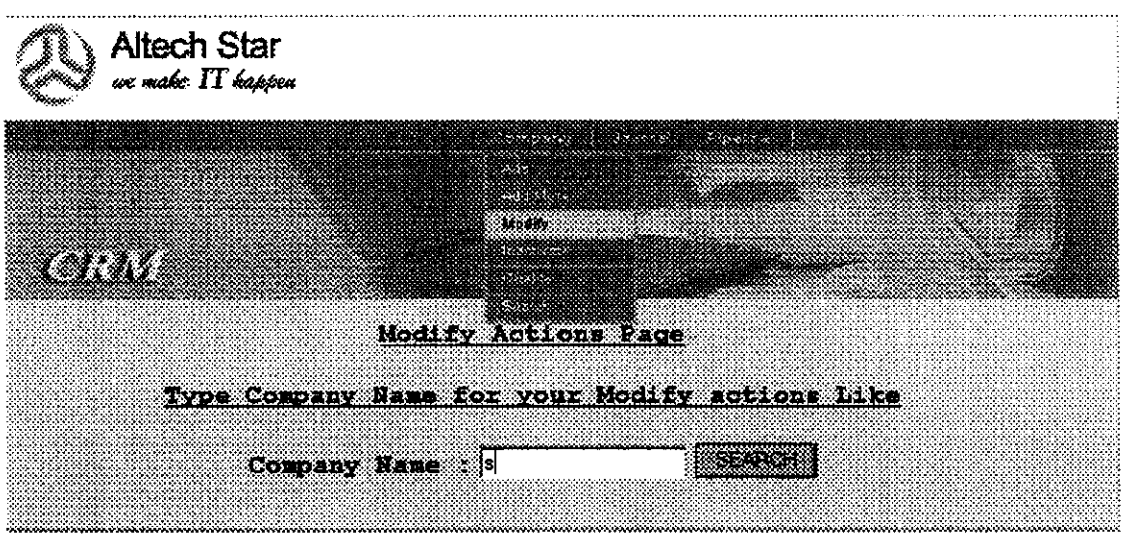
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we make IT happen
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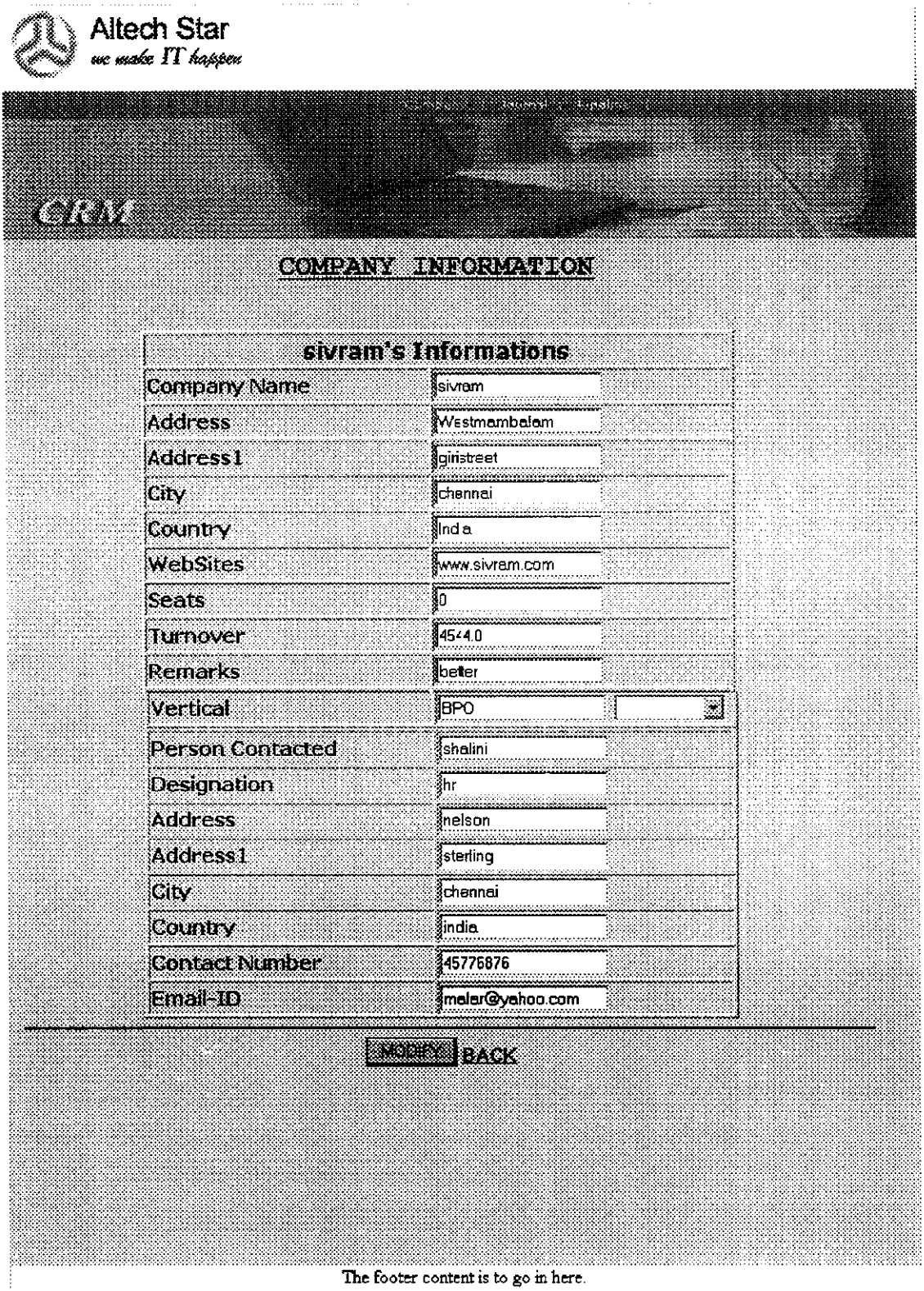
Modify Actions Page
Type Company Name for your Modify actions Like
Company Name : s
SEARCH


Altech Star
we make IT happen
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sivram's Informations
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sivram
Address
Westmambalam
Address1
giristreet
City
chennai
Country
India
WebSites
www.sivram.com
Seats
0
Turnover
45444.0
Remarks
better
Vertical
BPO
Person Contacted
shalini
Designation
hr
Address
nelson
Address1
sterling
City
chennai
Country
india
Contact Number
45776876
Email-ID
melar@yahoo.com
MODIFY
BACK
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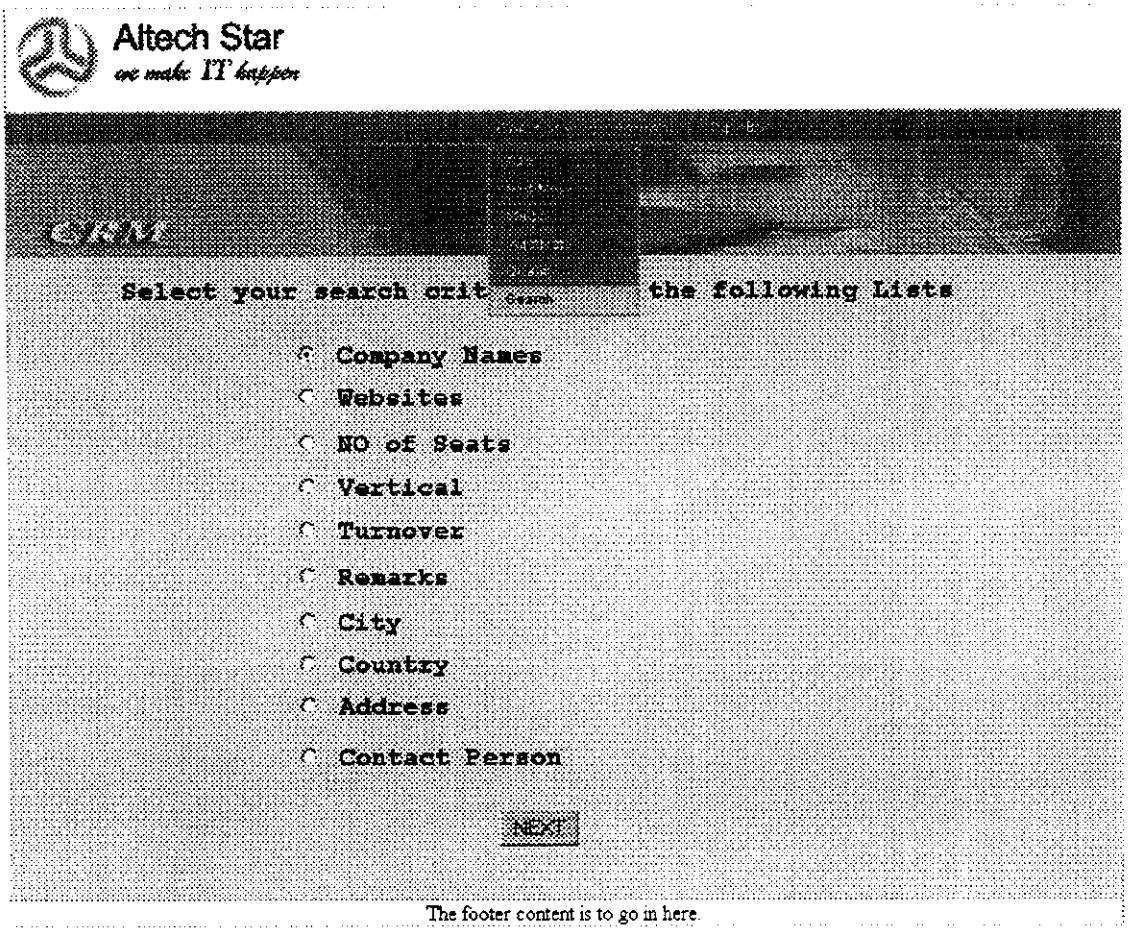
Altech Star
we make IT happen
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Select your search crit
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Websites
NO of Seats
Vertical
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Remarks
City
Country
Address
Contact Person
NEXT
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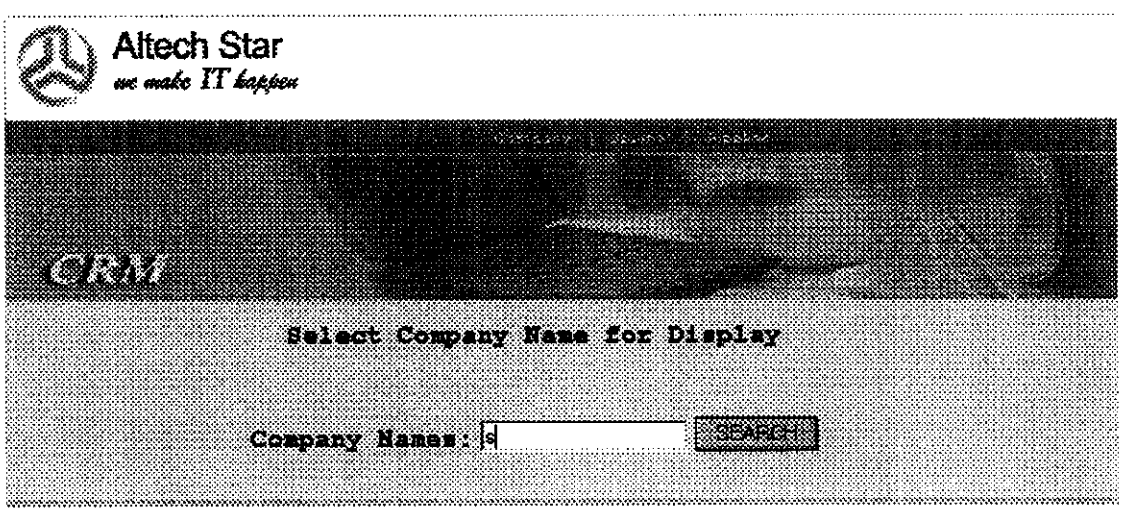
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we make IT happen
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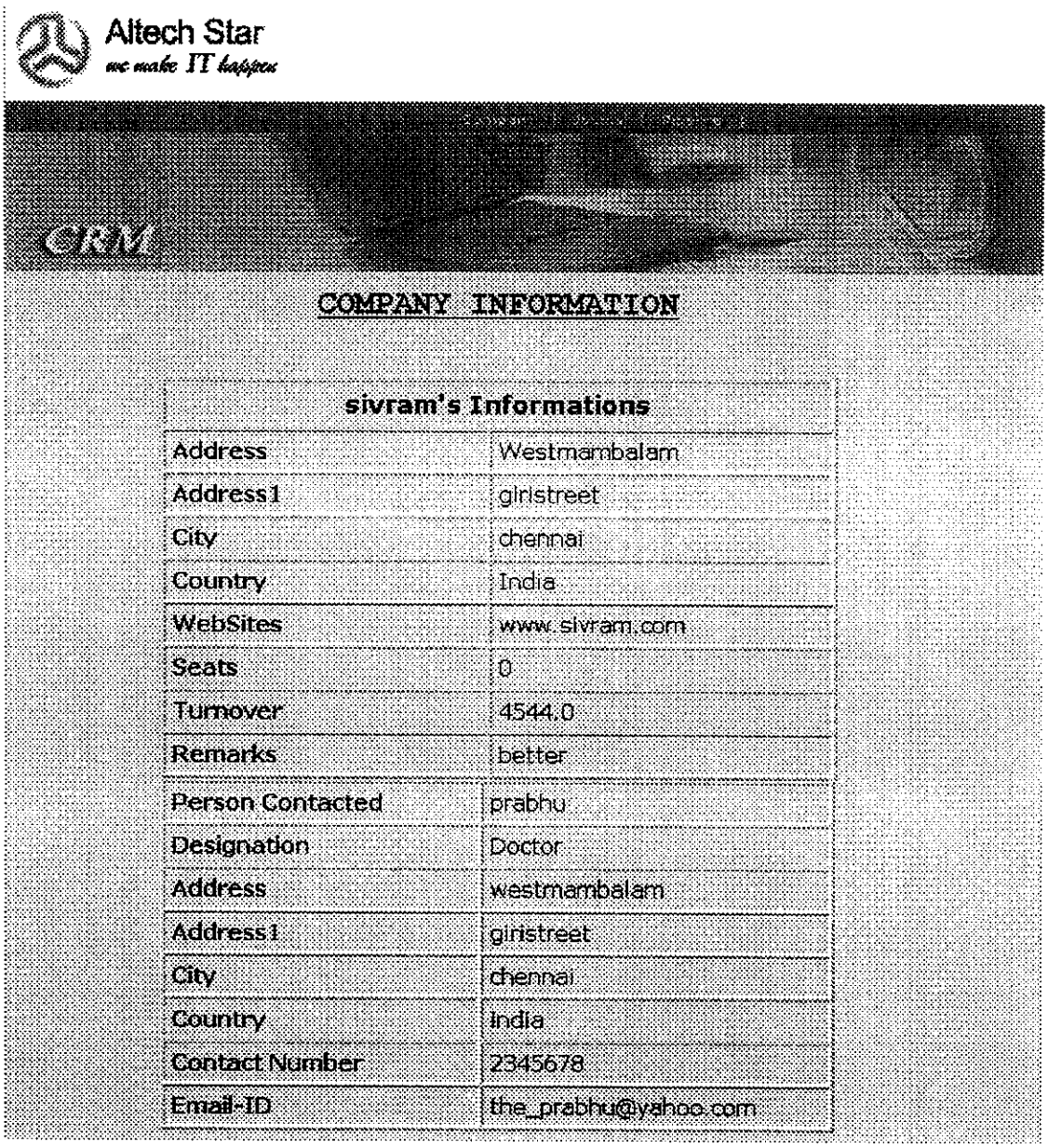
Select Company Name for Display
Company Names:
SEARCH


Altech Star
we make IT happen
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sivram's Informations
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Westmambalam
Address1
giristreet
City
chennai
Country
India
WebSites
www.sivram.com
Seats
0
Turnover
4544.0
Remarks
better
Person Contacted
prabhu
Designation
Doctor
Address
westmambalam
Address1
giristreet
City
chennai
Country
India
Contact Number
2345678
Email-ID
the_prabhu@yahoo.com

sathyam's Informations	
Address	Egmore
Address1	tambaram
City	chennai
Country	India
WebSites	www.satyam.com
Seats	98
Turnover	686.0
Remarks	good
Vertical	BPO
Person Contacted	shalini
Designation	hr
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Address1	sterling
City	chennai
Country	india
Contact Number	45776876
Email-ID	malar@yahoo.com

BACK

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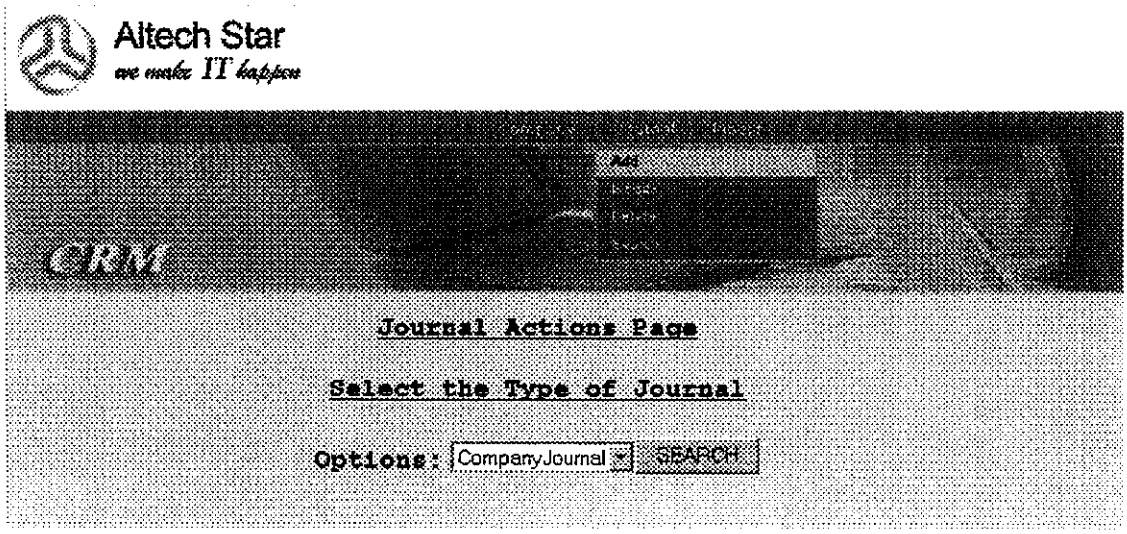
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we make IT happen
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Select the Type of Journal
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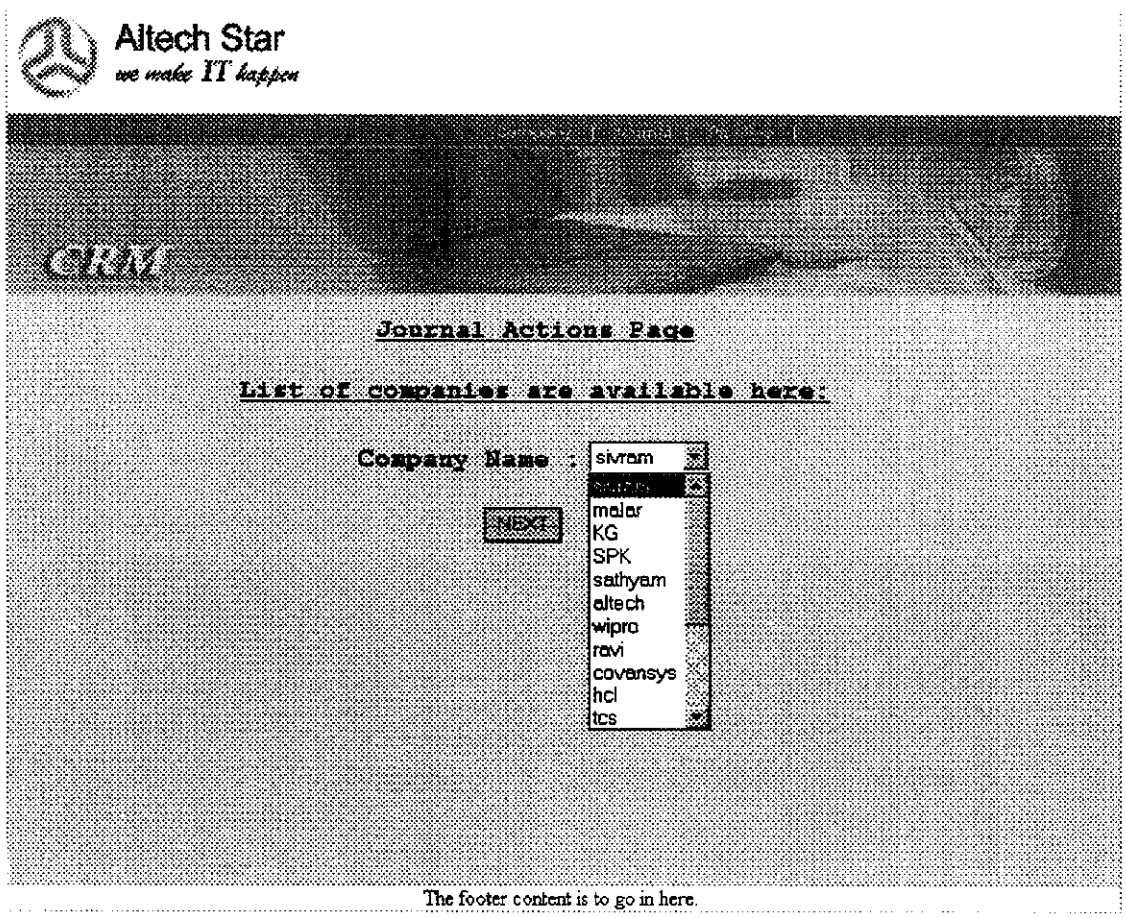
Altech Star
we make IT happen
CRM
Journal Actions Page
List of companies are available here:
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SPK
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ravi
covansys
hcl
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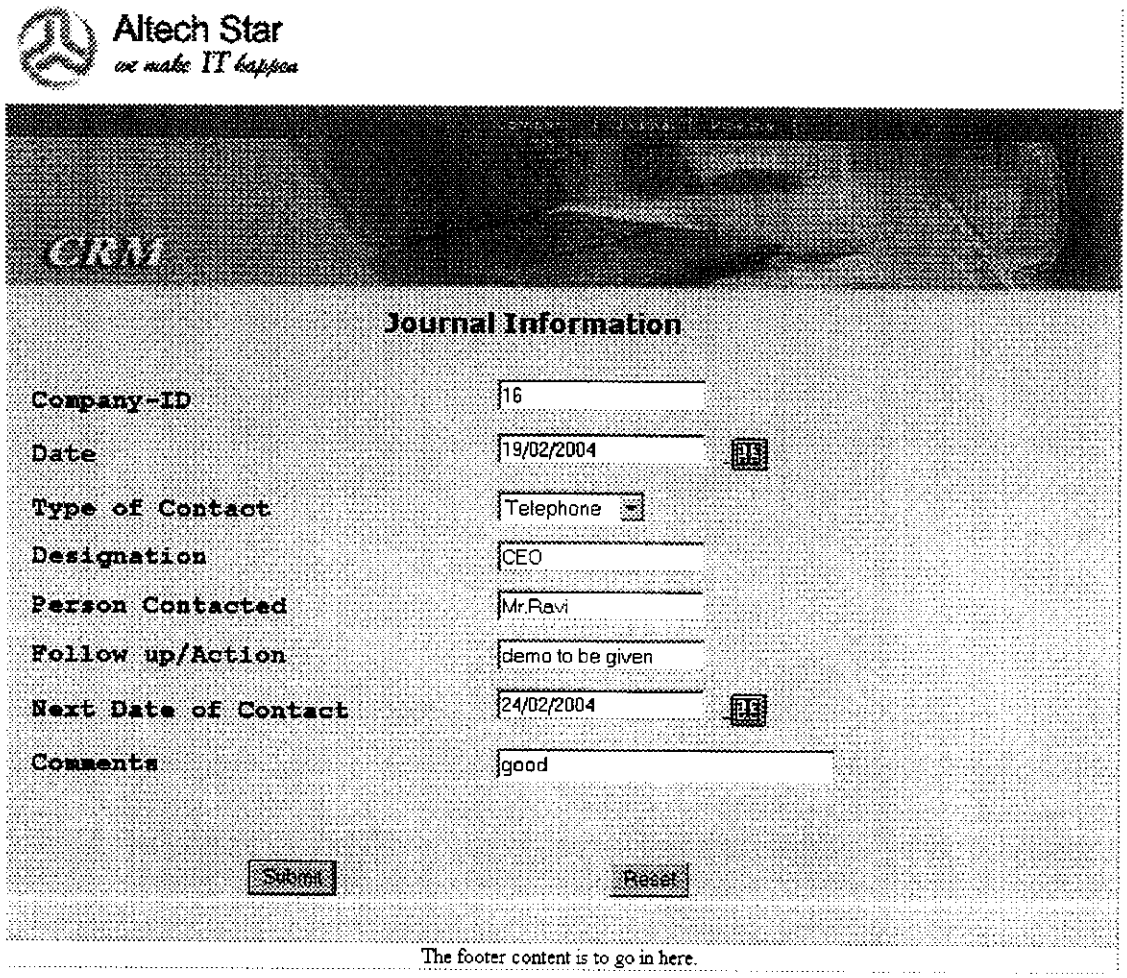
Altech Star
we make IT happen
CRM
Journal Information
Company-ID
16
Date
19/02/2004
Type of Contact
Telephone
Designation
CEO
Person Contacted
Mr.Ravi
Follow up/Action
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Comments
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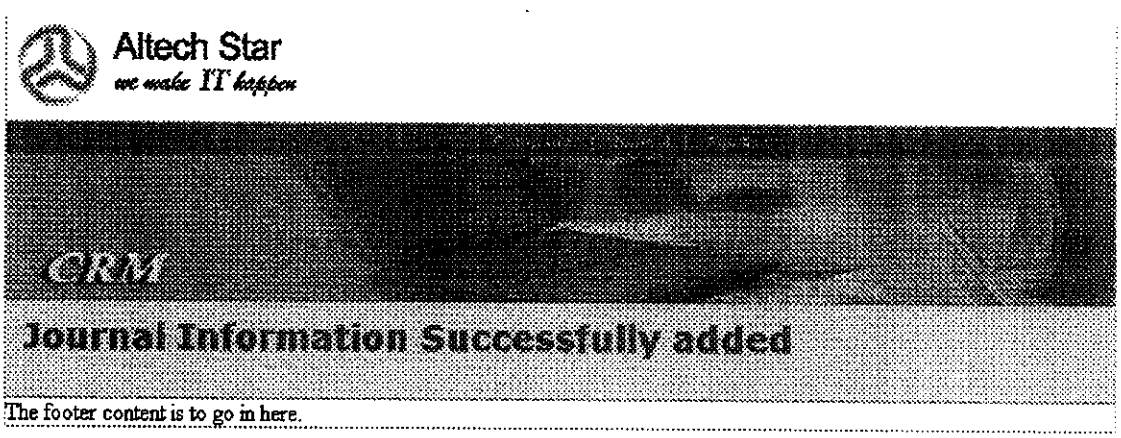
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we make IT happen
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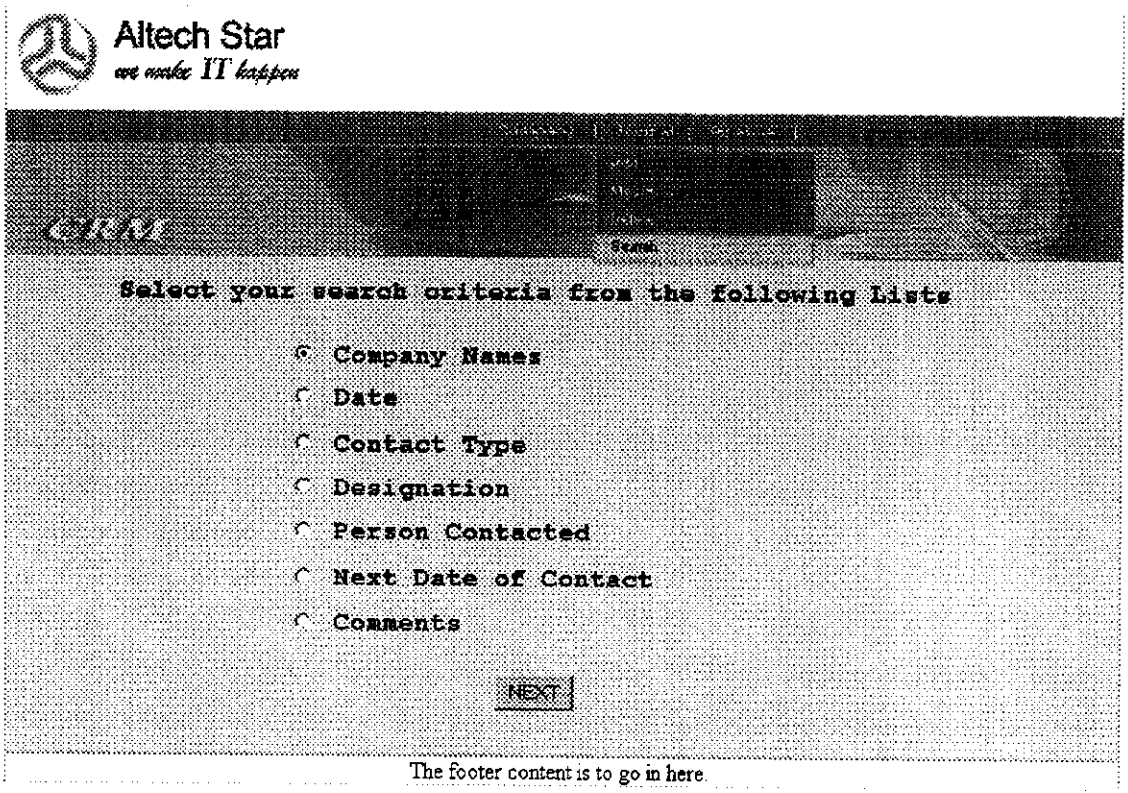
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we make IT happen
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Designation
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Comments
NEXT
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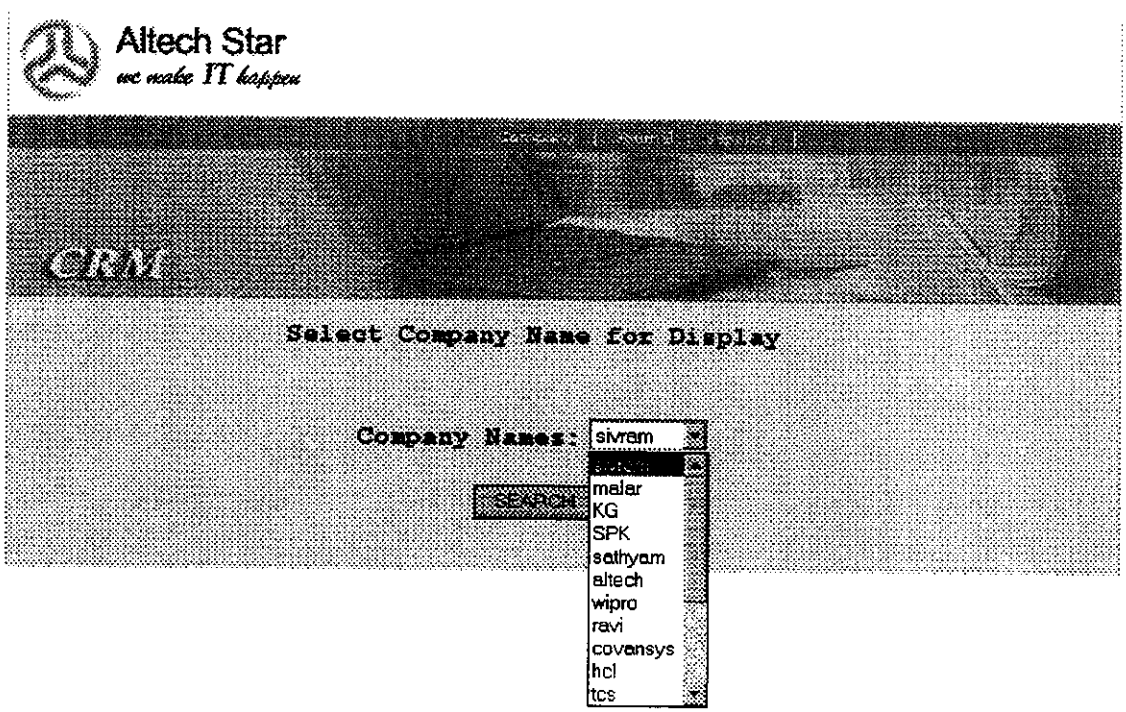
Altech Star
we make IT happen
CRM
Select Company Name for Display
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malar
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SPK
sathyam
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wipro
ravi
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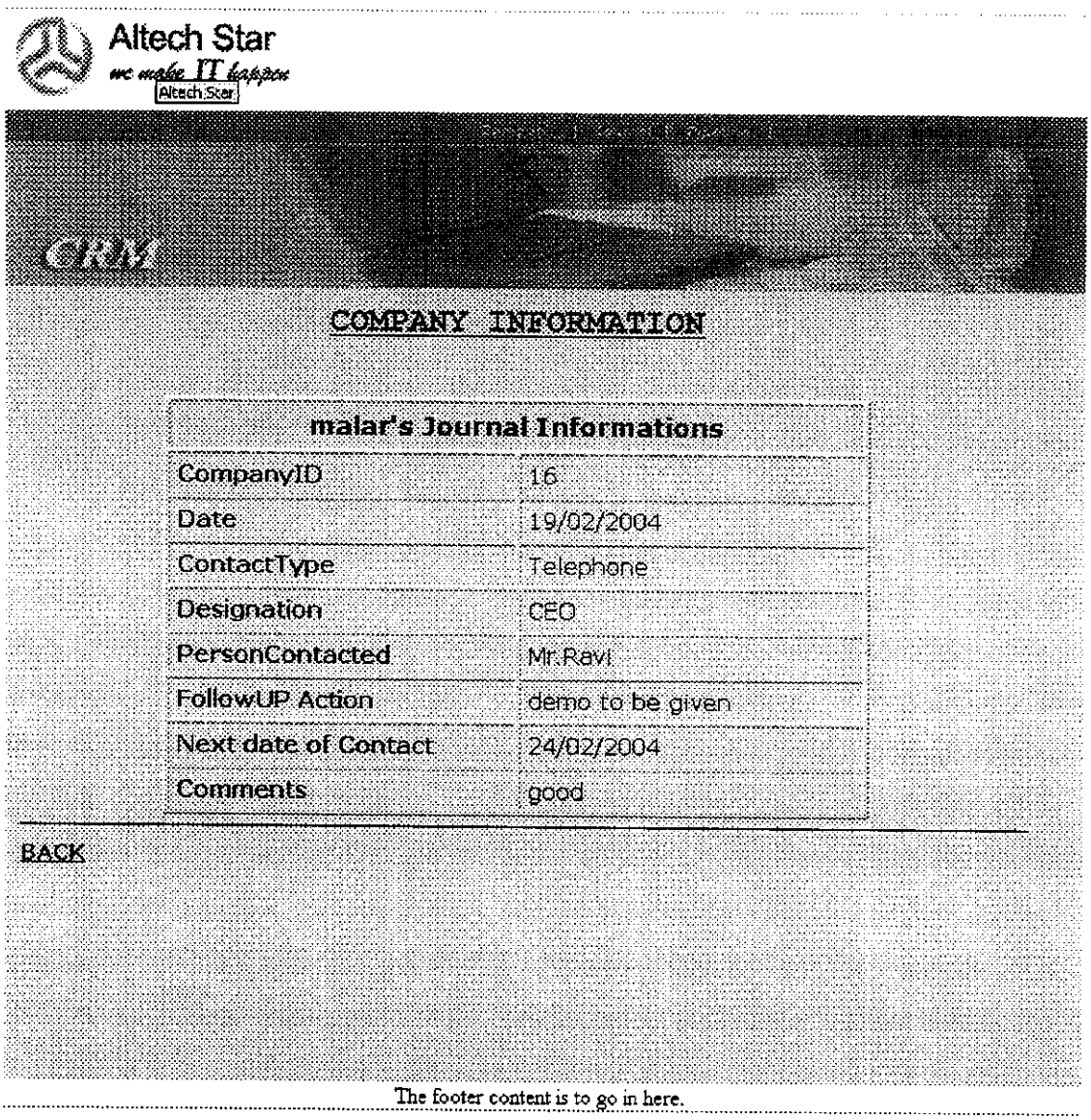
tcs
SEARCH


Altech Star
we make IT happen
Altech Star
CRM
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malar's Journal Informations
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PersonContacted Mr.Ravi
FollowUP Action demo to be given
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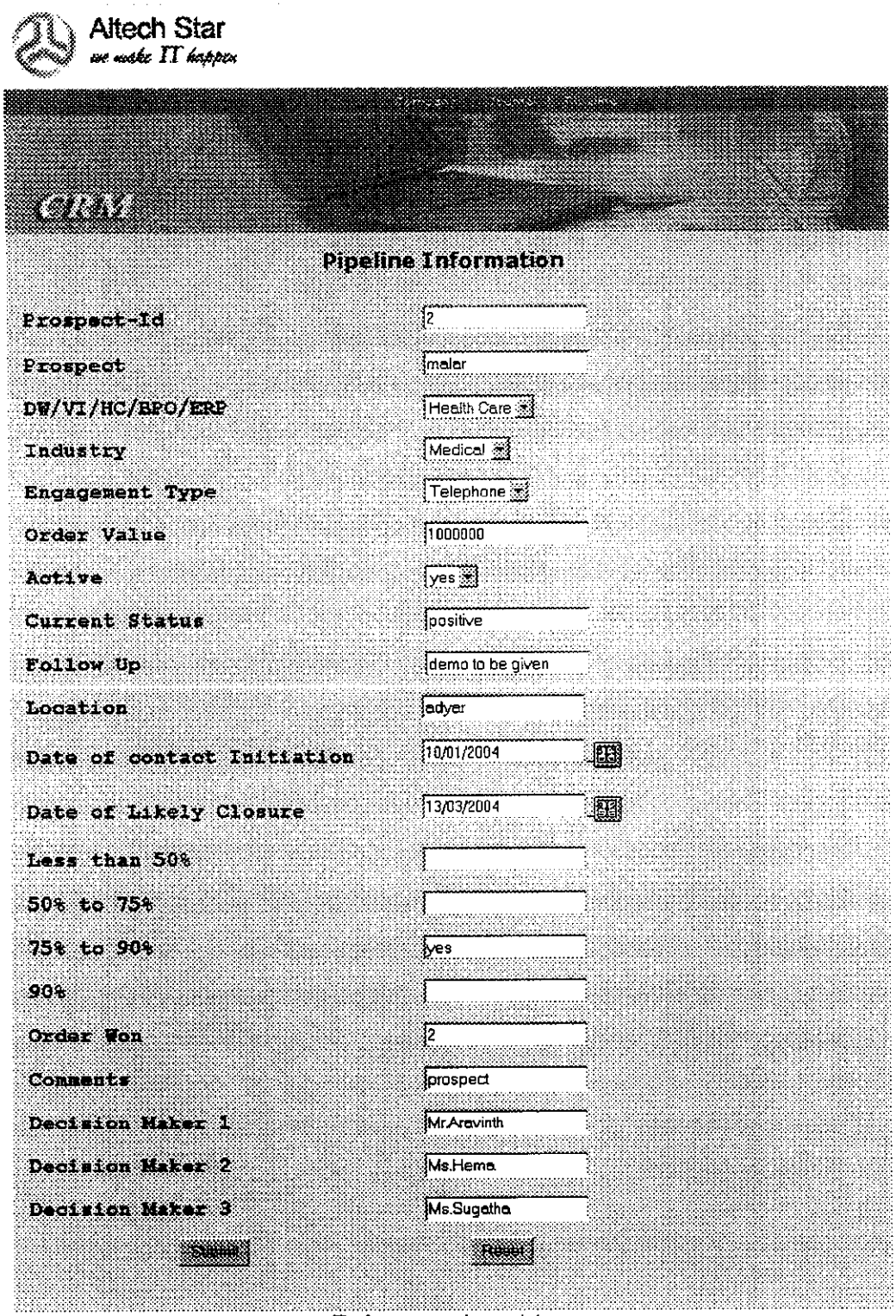

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