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# TRAINING MANAGEMENT SYSTEM USING MVC ARCHITECTURE

By

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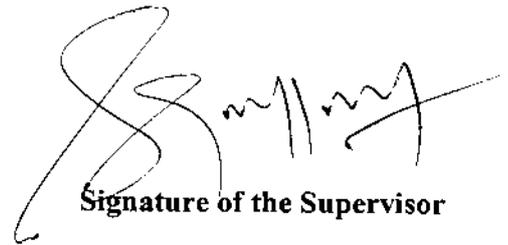


## BONAFIDE CERTIFICATE

Certified that this project report titled “**Training Management System using MVC Architecture**”, is the bonafide work of **REVATHI.J** who carried out the research under my supervision. Certified further, that to the best of my knowledge the work reported herein 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.

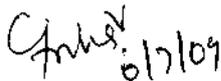


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## To whomsoever it may Concern

This is to certify that **Miss. Revathi J** a student of **Kumaraguru College of Technology** had undergone a project titled **Training Management System Using MVC Architecture** at **Cognizant Technology Solutions India Pvt.Ltd** under the guidance of **Mr. Swamy Nathan** (Assistant Manager Projects).

The duration of the project was from 01/11/08 and 01/05/09.

We wish her all the success for her future endeavors

For Cognizant Technology Solutions India Pvt. Ltd.

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May 10, 2009

## ABSTRACT

The “**Training Management System Using MVC Architecture**” is a web based application which is developed for performing various functionalities in the Training module. The main advantage of this site is that the employee himself can send request for undergoing a training. In this site the user can also know the various details like his/her personal details, Training schedule can perform the operations like new Training requesting , Training creation , giving feedback and team association. Currently, this system is been proposed by a knowledge Transfer team in our concern.

The Knowledge Transfer Team having the permission to offer a new training based on the requests from the Employees. And the Knowledge Transfer Team has the rights to assign training to the employees in the organization. Knowledge Transfer Team only can view the feedback from the trainee for the finished training Training.

Project Managers can make a request for the new training to the Knowledge Transfer Team. The Project Managers having the permission to view their team members (Software Engineer / Developer) and their training details. They can give feedback for particular training so that it will be easy to evaluate the trainers.

Software Engineer / Developer role is having very less functionality. They can have the access to view the scheduled training details. And they can request for any number of training based on their needs.

This application has been developed using J2EE, Struts-framework, Weblogic and Oracle as back end. This project is done for COGNIZANT technologies. This is one of the modules in the local intranet web portal in the above organization.

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## LIST OF ABBREVIATIONS

SL.NO	ABBREVIATIONS	DESCRIPTION
1	CGI	Common Gateway Interface
2	MVC	Model View Controller
3	HTML	Hyper Text Markup Language
4	HTTP	Hyper Text Transfer Protocol
5	JDBC	Java Data Base Connectivity
6	JSP	Java Server Pages
7	JVM	Java Virtual Machine
8	MVC	Model View Controller
9	SQL	Structured Query Language
10	XML	Extensible Markup Language
11	KTM	Knowledge Transfer Team
12	DFD	Data Flow Diagram
13	URL	Uniform Resource Locator
14	ISMS	Information Security Management System
15	API	Application Programming Interface

# CHAPTER 1

## INTRODUCTION

### 1.2 ABOUT THE ORGANIZATION

Cognizant is a leading provider of information technology, consulting, infrastructure and business process outsourcing services. Confidant's single-minded mission is to dedicate our business process and technology innovation know-how, our deep industry expertise and worldwide resources to working together with clients to make their businesses stronger. Value Proposition As a customer-centric, relationship-driven partner, we are redefining the way companies experience and benefit from global services via a unique delivery model infused by a distinct culture of high customer satisfaction. Cognizant delivers a trusted partnership, cost reductions and business results. Cultural Value Drivers Open, Transparent, Driven, Empowered, Opportunity filled, Flexible, Collaborative. Differentiation Factors 15 years of experience fusing the Two-in-a-Box™ Client Relationship Model with a seamless Global Delivery experience Multifaceted client partnership architecture yielding high customer value and continuous alignment with client teams Commitment to measuring full value of outsourcing with "Confidant's Return on Outsourcing™" proprietary methodology (ROO)<sup>1</sup> based on proven record of delivering results Financial success and sound management record resulting in continuous innovation, new services and higher value creation Key Attributes "Client-first" culture of customer satisfaction, resulting in unique "Cognizant customer experience" Distinct identity: Born-global corporation, multicultural work-force and management, entrepreneurial leadership & culture Dedicated to building deep, sustainable and long-term client relationships based on collaboration, customization and quality

## 1.1. ABOUT THE PROJECT

The “**Training Management System using MVC Architecture**” is a web based application which is developed for performing various functionalities in the Training module for the corporate sectors. This web portal is used to schedule the training Training for the software developers in an organization.

Each and every employee needs proper training for the regular period of time in order to improve their technical skills. So the training Training has been conducted for the employees. Organizing the training operations (such as Training offering and register for training) is time consuming task, when using plain HTML page and email.

The tool provides the separate login to the users based on their role in the organization. The Project Manager/Software Engineers can raise a request for new training for the required technology. After make the request they cannot remove the request. That is stored in to the request table which is only accessible for Knowledge Transfer Team.

The Knowledge Transfer Team views the request, schedule and offers the training. The Knowledge Transfer Team role is similar to administrator of this application. The Knowledge Transfer Team Only have the rights to decide the trainers and also assigning training to the employees. Finally, Knowledge Transfer team have to update the status of the participants.

The Developers can view the Training details and register for the training which is offered by the organization i.e. the employee can request for the training. The Developer has the permission to view the training details and their personal information only. Other then these Developers cannot access anything. The Project Manager can view their team members.

The Developers can give the feedback to Knowledge Transfer Team for the previously attended training Training. The Knowledge Transfer Team views the feedback of the training and the trainer. Based on the feedback information the Knowledge Transfer Team can evaluate the Training or the Trainer.

Information Security Management System (ISMS) is the key role of the all corporate companies. So the undergoing trainings and all the above activities should be abstracted. This tool provides the security for the transactions in the training module by using MVC architecture.

## **CHAPTER 2**

### **SYSTEM STUDY**

#### **2.1 INTRODUCTION**

In this chapter we are going to analyze the already existing system as well as the proposed system. We are going to differentiate the proposed system from the existing system by focusing on the drawbacks in the existing system that can be overcome in the proposed system.

#### **2.2 PROBLEM DEFINITION**

All corporate companies to conduct some good training programs to keep their staff motivated. The purpose of human resource training in the work situation is to develop the abilities of the individual and satisfy the current and future human resources needs of the organization.

So companies regularly develop new training programs for the requirements. A tool needs to manage the activities in the training module, such as schedule the training, view the training information and to whom the training is assigned.

The tool provides the separate login to the users based on their role in the organization. The Project Manager can raise a request for new training for the required technology. After make the request the Project Manager cannot remove the request. That is stored in to the request table which is only accessible for Knowledge Transfer Team.

The tool helps to know the employees need of training. The knowledge transfer team views those request and takes it to consideration and then assign training to the requested employees.

The Employees can also send feedbacks for the finished training. It helps the Knowledge Transfer Team to evaluate the trainers. The Status of finished training can be set by the knowledge Transfer team and can be viewed. And all organizations need to keep their ISMS (Information Security Management System) policies. So the tool should provide the security for all transactions.

### **2.3 EXISTING SYSTEM**

In the existing system the training schedule is announced by normal HTML web page. Each and every modification needs manual corrections on the page. The nomination can be performed through e-mail only. It does not have any separate web space. The operations (registering, scheduling etc) are performed asynchronously. Thereby, maintenance of this process is very difficult.

#### **Problems with Existing System**

- Data maintenance adopted by the present system is not accurate
- Inaccurate result in case of duplicating, delay and inconsistency in reporting
- Generating consolidated reports is more difficult in manual system and it may not be consistent.
- The transactions are very time consuming
- There is no facility for the users to know whether the data is entered is valid or not. This disadvantage is the major cause of errors in transaction.
- It is not user friendly

## **2.4 PROPOSED SYSTEM**

The proposed system provides the login specification to all users. The changes can be easily updated to the web pages without any re-written codes. It is more secured and specific to that organization. The Transactions are perfectly synchronized and the trainings offered in the organization are globally accessed for performing the operations. The perfect MVC architecture is maintained in the proposed system.

### **Objectives of Proposed System**

Manual system only yields slow processing of operating. Moreover wastage of time is the main drawback. To solve those problems an efficient method is needed which control all activities or flow of information. The new system mainly focuses on time maintenance, which needs higher priority.

### **Advantages with Proposed System**

- User friendliness is the keyword for all the new software in the market. The proposed system incorporates this concept into itself to guide the user.
- In this web application two way communication is been achieved by all type of users.
- Maximum number of process is been focuses on reusability and will be concentrating on avoiding rework on each and every process handled.
- The proposed system is also expected to reduce the amount of paper work involved. The hard copies of only necessary documents need to be taken the rest can be avoided.

## **2.5 SYSTEM SPECIFICATION**

The selection of hardware is very important in the existence and proper working of any of the software. When selecting hardware, the size and capacity requirements are also important.

### **2.5.1 Hardware Specification**

The system is spread on the server side as well as the client side. The server has to run a server program. The server also has to make use of the application program. The client has to run a browser. The minimum hardware requirements that the server and client should process are listed below.

#### **Minimum Hardware Requirements for Client/Server**

- Processor : Pentium IV 800 MHz
- RAM : 512 MB
- Disk Drives : 2 GB Hard Disk
- Monitor : 17" color monitor
- Keyboard : Standard 104 keys
- Mouse : Three Button Mouse

### **2.5.2 Software Specification**

The server and client have to run different application to run the system. The server holds the database that the client access. The client runs the browser on which the online booking is displayed. The software used is displayed below.

**Server – side Software**

- Operating System : Windows XP
- Server Software : WEBLOGIC 8.1
- Database : ORACLE
- Application Designing Software : JSP, STRUTS, HTML

**Client – side Software**

- Operating System : Windows XP
- Browser : Microsoft Internet Explorer

**2.6 SOFTWARE OVERVIEW****Struts Overview****Model-View-Controller (MVC) Design Pattern**

In the MVC design pattern, application flow is mediated by a central Controller. The Controller delegate's requests - in our case, HTTP requests - to an appropriate handler. The handlers are tied to a Model, and each handler acts as an adapter between the request and the Model. The Model represents, or encapsulates, an application's business logic or state. Control is usually then forwarded back through the Controller to the appropriate View. The forwarding can be determined by consulting a set of mappings, usually loaded from a database or configuration file. This provides a loose coupling between the View and Model, which can make applications significantly easier to create and maintain

### **The Model: System State and Business Logic JavaBeans**

The Model portion of an MVC-based system can be often be divided into two major subsystems -- the **internal state** of the system and the **actions** that can be taken to change that state.

In grammatical terms, we might think about state information as **nouns** (things) and actions as **verbs** (changes to the state of those things).

Many applications represent the internal state of the system as a set of one or more JavaBeans. The bean properties represent the details of the system' state. Depending on your application's complexity, these beans may be self contained (and know how to persist their own state), or they may be facades that know how to retrieve the system's state from another component.

### **The View: JSP Pages and Presentation Components**

The View portion of a Struts-based application is most often constructed using Java Server Pages (JSP) technology. JSP pages can contain static HTML (or XML) text called "template text", plus the ability to insert dynamic content based on the interpretation (at page request time) of special action tags. The JSP environment includes a set of standard action tags, such as `<jsp: useBean>` whose purpose is described in the Java Server Pages Specification. In addition to the built-in actions, there is a standard facility to define your own tags, which are organized into "custom tag libraries."

### **The Controller: ActionServlet and ActionMapping**

The Controller portion of the application is focused on receiving requests from the client (typically a user running a web browser), deciding what business logic function is to be performed, and then delegating responsibility for producing the next phase of the

user interface to an appropriate View component. In Struts, the primary component of the Controller is a servlet of class `ActionServlet`.

This servlet is configured by defining a set of `ActionMappings`. An `ActionMapping` defines a path that is matched against the request URI of the incoming request and usually specifies the fully qualified class name of an Action class. All Actions are subclassed from `org.apache.struts.action.Action`. Actions encapsulate calls to business logic classes, interpret the outcome, and ultimately dispatch control to the appropriate View component to create the response.

### **Struts Control Flow**

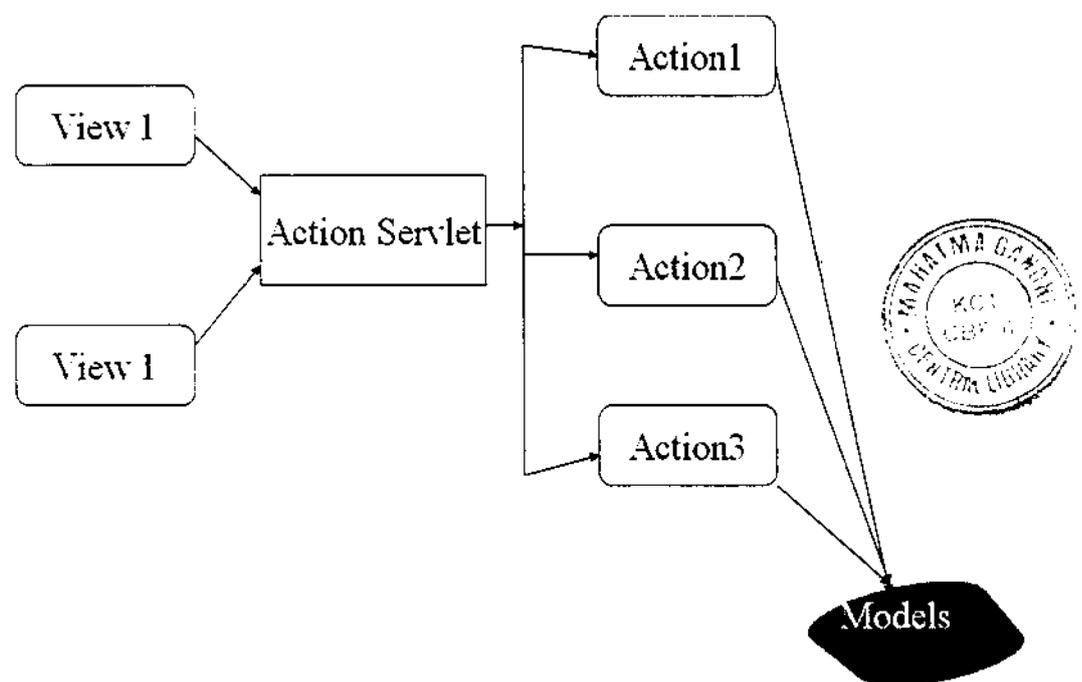
The Struts framework provides several components that make up the **Control** layer of a MVC-style application. These include a controller servlet, developer-defined request handlers, and several supporting objects.

The Struts custom tag libraries provide direct support for the **View** layer of a MVC application. Some of these access the control-layer objects. Others are generic tags found convenient when writing applications. Other taglibs, including JSTL, can also be used with Struts. Other presentation technologies, like Velocity Templates and XSLT can also be used with Struts

The **Model** layer in a MVC application is often project-specific. Struts is designed to make it easy to access the business-end of your application, but leaves that part of the programming to other products, like JDBC, Enterprise Java Beans, Object Relational Bridge, or Simper, to name a few.

When initialized, the controller parses a configuration file (`struts-config.xml`) and uses it to deploy other control layer objects. Together, these objects form the **Struts Configuration**. The Struts Configuration defines (among other things) the `ActionMappings` [`org.apache.struts.action.ActionMappings`] for an application.

The Struts controller servlet consults the ActionMappings as it routes HTTP requests to other components in the framework. Requests may be forwarded to Java Server Pages or Action [org.apache.struts.action.Action] subclasses provided by the Struts developer. Often, a request is first forwarded to an Action and then to a JSP (or other presentation page). The mappings help the controller turn HTTP requests into application actions.



An individual ActionMapping [org.apache.struts.action.ActionMapping] will usually contain a number of properties including:

- a **request path** (or "URI"),
- the **object type** (Action subclass) to act upon the request, and
- other properties as needed.

The Action object can handle the request and respond to the client (usually a Web browser) or indicate that control should be forwarded elsewhere. For example, if a login succeeds, a login action may wish to forward the request onto the mainMenu page.

Action objects have access to the application's controller servlet, and so have access to that servlet's methods. When forwarding control, an Action object can indirectly forward one or more shared objects, including JavaBeans, by placing them in one of the standard contexts shared by Java Servlets.

For example, an Action object can create a shopping cart bean, add an item to the cart, place the bean in the session context, and then forward control to another mapping. That mapping may use a JavaServer Page to display the contents of the user's cart. Since each client has their own session, they will each also have their own shopping cart. In a Struts application, most of the business logic can be represented using JavaBeans. An Action can call the properties of a JavaBean without knowing how it actually works. This encapsulates the business logic, so that the Action can focus on error handling and where to forward control.

JavaBeans can also be used to manage input forms. A key problem in designing Web applications is retaining and validating what a user has entered between requests. With Struts, you can define your own set of input bean classes, by subclassing ActionForm [org.apache.struts.action.ActionForm]. The ActionForm class makes it easy to store **and validate** the data for your application's input forms. The ActionForm bean is automatically saved in one of the standard, shared context collections, so that it can be used by other objects, like an Action object or another JSP.

The form bean can be used by a JSP to collect data from the user ... by an Action object to validate the user-entered data ... and then by the JSP again to re-populate the form fields. In the case of validation errors, Struts has a shared mechanism for raising and displaying error messages.

Another element of the Struts Configuration are the `ActionFormBeans` [`org.apache.struts.action.ActionFormBeans`]. This is a collection of descriptor objects that are used to create instances of the `ActionForm` objects at runtime. When a mapping needs an `ActionForm`, the servlet looks up the form-bean descriptor by name and uses it to create an `ActionForm` instance of the specified type.

Here is the sequence of events that occur when a request calls for an mapping that uses an `ActionForm`:

- The controller servlet either retrieves or creates the `ActionForm` bean instance.
- The controller servlet passes the bean to the `Action` object.
- If the request is being used to submit an input page, the `Action` object can examine the data. If necessary, the data can be sent back to the input form along with a list of messages to display on the page. Otherwise the data can be passed along to the business tier.
- If the request is being used to create an input page, the `Action` object can populate the bean with any data that the input page might need.

The Struts framework includes custom tags that can automatically populate fields from a `JavaBean`. All most `JavaServer Pages` really need to know about the rest of the framework is the field names to use and where to submit the form.

Other Struts tags can automatically output messages queued by an `Action` or `ActionForm` and simply need to be integrated into the page's markup. The messages are designed for localization and will render the best available message for a user's locale. Support the internationalization features built into the Java platform. All the field labels and messages can be retrieved from a message resource. To provide messages for another language, simply add another file to the resource bundle.

Internationalism aside, other benefits to the message resources approach are consistent labeling between forms, and the ability to review all labels and messages from a central location.

For the simplest applications, an Action object may sometimes handle the business logic associated with a request. However, in most cases, an Action object should invoke another object, usually a JavaBean, to perform the actual business logic. This lets the Action focus on error handling and control flow, rather than business logic. To allow reuse on other platforms, business-logic JavaBeans should not refer to any Web application objects. The Action object should translate needed details from the HTTP request and pass those along to the business-logic beans as regular Java variables. In a database application, for example:

- A business-logic bean will connect to and query the database,
- The business-logic bean returns the result to the Action,
- The Action stores the result in a form bean in the request,
- The JavaServer Page displays the result in a HTML form.

Neither the Action nor the JSP need to know (or care) from where the result comes. They just need to know how to package and display it.

## **JSP Overview**

Java Servlets are a key component of server-side Java development. A Servlet is a small, pluggable extension to a server that enhances the server's functionality. Servlets allow developers to extend and customize any Java-enabled server—a web server, a mail server, an application server, or any custom server—with a hitherto unknown degree of portability, flexibility, and ease. But before we go into any more detail, let's put things into perspective.

While servlets can be used to extend the functionality of any Java-enabled server, today they are most often used to extend web servers, providing a powerful, efficient replacement for CGI scripts. When you use a Servlet to create dynamic content for a web page or otherwise extend the functionality of a web server, you are in effect creating a web application. While a web page merely displays static content and lets the user navigate through that content, a web application provides a more interactive experience. A web application can be as simple as a keyword search on a document archive or as complex as an electronic storefront.

Web applications are being deployed on the Internet and on corporate intranets and extranets, where they have the potential to increase productivity and change the way that companies, large and small, do business. To understand the power of servlets, we need to step back and look at some of the other approaches that can be used to create web applications.

### **Common Gateway Interface**

The Common Gateway Interface, normally referred to as CGI, was one of the first practical techniques for creating dynamic content. With CGI, a web server passes certain requests to an external program. The output of this program is then sent to the client in place of a static file.

The advent of CGI made it possible to implement all sorts of new functionality in web pages, and CGI quickly became a defector standard, implemented on dozens of web servers. It's interesting to note that the ability of CGI programs to create dynamic web pages is a side effect of its intended purpose: to define a standard method for an information server to talk with external applications.

This origin explains why CGI has perhaps the worst life cycle imaginable. When a server receives a request that accesses a CGI program, it must create a new process to run the CGI program and then pass to it, via environment variables and standard input,

every bit of information that might be necessary to generate a response. Creating a process for every such request requires time and significant server resources, which limits the number of requests a server can handle concurrently.

### **Server Extension APIs**

Several companies have created proprietary server extension APIs for their web servers. For example, Netscape provides an internal API called NSAPI (now becoming WAI) and Microsoft provides ISAPI.

Using one of these APIs, you can write server extensions that enhance or change the base functionality of the server, allowing the server to handle tasks that were once relegated to external CGI programs, server extensions exist within the main process of a web server. Because server-specific APIs use linked C or C++ code, server extensions can run extremely fast and make full use of the server's resources. Server extensions, however, are not a perfect solution by any means. Besides being difficult to develop and maintain, they pose significant security and reliability.

## **ORACLE Overview**

### **Role of Oracle in Database**

ORACLE 9i is one of the many database services that plug into a client / server model. It works efficiently to manage resources, a database information, among the multiple clients requesting & sending.

### **Structured Query Language (SQL)**

SQL is an inter-active language used to query the database and access data in database. SQL has the following features:

1. It is a unified language.
2. It is a common language for relational database
3. It is a non-procedural language.

## **Introduction to Oracle**

ORACLE is a comprehensive operating environment that packs the power of a mainframe system into user microcomputer. It provides a set of functional programs that user can use as tools to build structures and perform tasks. Because application developed on oracle are completely portable to environment and then move it into a multi user platform. Users do not have to be an expert to appreciate ORACLE, but the better user understands the programmer, the more productivity and creativity you will use the tools it provides.

## **The Oracle Environment**

ORACLE is modular system that consists of the ORACLE database and several functional programs. ORACLE tools had four kinds of works:

- Database management
- Data access and manipulations
- Programming
- Connectivity

## **Weblogic**

Weblogic Server is part of the BEA Weblogic Platform and supports Oracle, DB2, Microsoft SQL Server, MySQL Enterprise and other JDBC-compliant databases. The other parts of WebLogic Platform are:

- Portal which includes Commerce Server and Personalization Server
- Weblogic Integration
- BEA Workshop, an Eclipse IDE for Java, SOA and Rich Internet applications
- JRockit, a JVM for Intel CPUs.

Weblogic Server includes .NET interoperability and supports the following native integration capabilities:

- Native enterprise-grade JMS messaging
- Java EE Connector Architecture
- WebLogic/Tuxedo Connector
- COM+ Connectivity
- CORBA connectivity
- IBM WebSphere MQ connectivity

BEA Weblogic Server Process Edition also includes Business Process Management and Data Mapping functionality. Weblogic supports security policies managed by Security Administrators. The BEA Weblogic Server Security Model includes:

- Separate application business logic from security code
- Complete scope of security coverage for all J2EE and non-J2EE components

## **CHAPTER 3**

### **SYSTEM DESIGN**

#### **3.1 INTRODUCTION**

Design is the first step in the development phase for any engineered product or system. Design is a creative process; a good design is the key to effective system. The term “Design” is defined as “The process of applying various techniques and principles for the purpose of defining a process or a system in sufficient detail to permit its physical realization”. Software design sits at the technical kernel of the software engineering process and is applied regardless of the development paradigm that is used.

From a project management point of view, software design is conducted in two steps. Preliminary design is concerned with the transformation of requirements into data and software architecture. Detail design focuses on refinement to the architectural representation that lead to detail algorithm data structure and representation of software.

Design starts with the system requirement specification and converts it to a physical reality during the development. Important design factors such as reliability, response time, throughput of the system, maintainability, expandability etc should be taken into account.

#### **3.2 PROJECT DESCRIPTION**

The “**Training Management System Using MVC Architecture**” implementation process is designed to be user friendly for the user. The process identifies the need of the user for functionality.

The implementation project typically consists of minor configuration and customized format. This process requires a trail run process to test the critical

requirements of the client. The trail run gives an opportunity to discover and explore the package capabilities in an environment similar to the target environment.

In the trail run, the software is installed and the features are tried out to check the consistent functionality. The software runs successfully without having any flaws and the features worked out well. As the initial step, the project involved a manual load to enter the data.

In this project we have taken three modules as a base .They are,

### **Modules**

- **Software Engineer**
  - Can see Scheduled training
  - Nominate for training
  - Cancel the nomination
  - Can give the feedback for the finished training
  
- **Project Manager**
  - Can see Software Engineer list
  - Assign any Software Engineer from his team to any training
  - Cancel nomination of any Software Engineer in his team
  - Raise a request for new training
  
- **Knowledge Transfer Team**
  - Can view the raised training form project managers
  - Initiate and schedule new training
  - Cancel the existing training
  - Assign Software Engineer to training

- Cancel nomination of any Software Engineer
- Read the feedback from the software Engineer

In this chapter we are going to represent a clear view of a system design with the basis of Data Flow Diagram, System Flow Diagram.

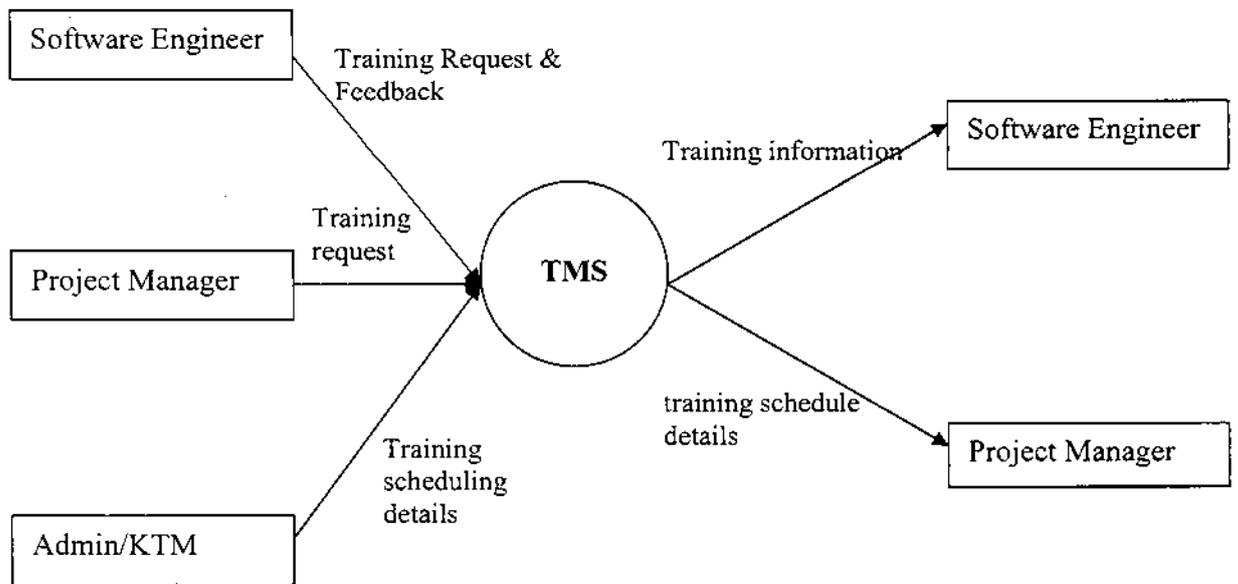
### 3.3 DATA FLOW DIAGRAM

Data flow diagram is used to define the flow of the system and its resources such as information. Data flow diagrams are a way of expressing system requirements in a graphical manner. Data flow diagrams represent one of the most ingenious tools used for structured analysis. A data flow diagram or DFD as it is called, is also known as a bubble chart. It has the purpose of clarifying system requirements and identifying major transformations that will become programs in system design. It is the major starting point in a design phase that functionally decomposes the requirement specification down to the lowest level of detail.

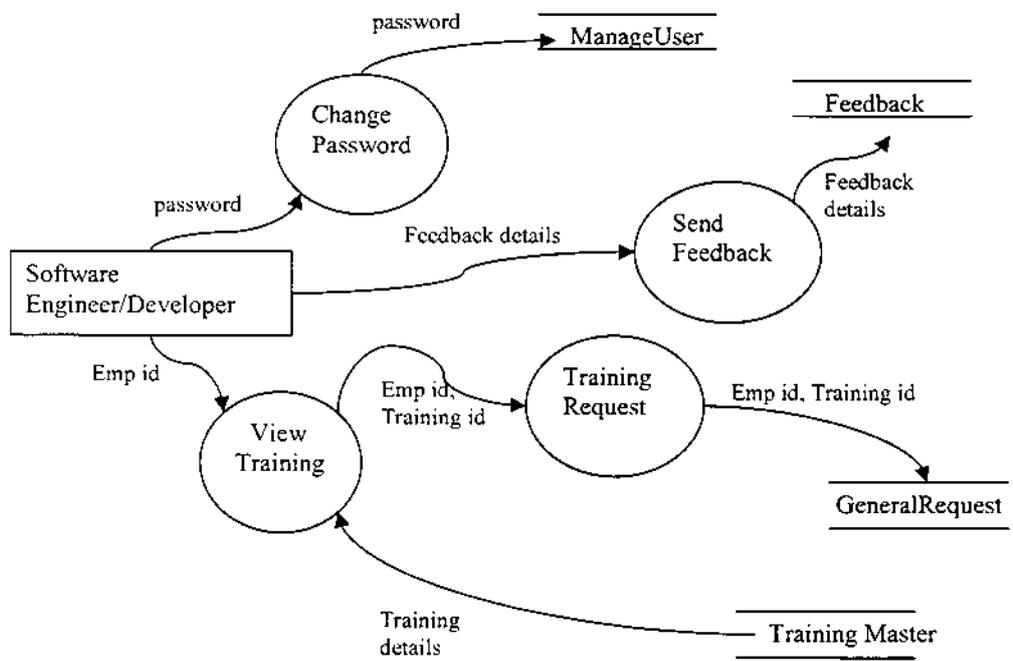
A DFD consists of a series of bubbles joined by lines. The bubbles represents data transformation and lines represents flow in the system, in the normal convention, a DFD has major symbols.

- **Square**, which defines source or destination of data
- **Arrow**, which shows data flow
- **Circle**, which represents a process that transforms incoming data into outgoing flow
- **Open rectangle**, which shows the data store

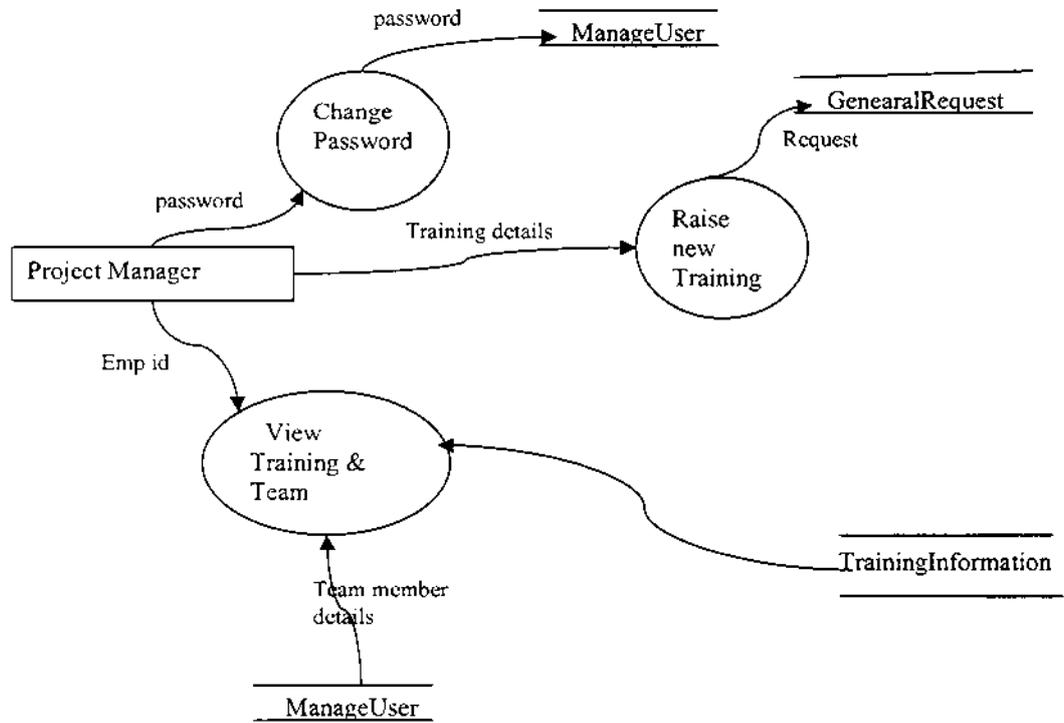
The DFD at the simplest level is referred in simple words a “CONTEXT ANALYSIS DIAGRAM”. These are expanded by level, each explaining its process in detail. Processes are numbered for easy identification and are normally labeled in a block letters. Each data flow is labeled for easy understanding.



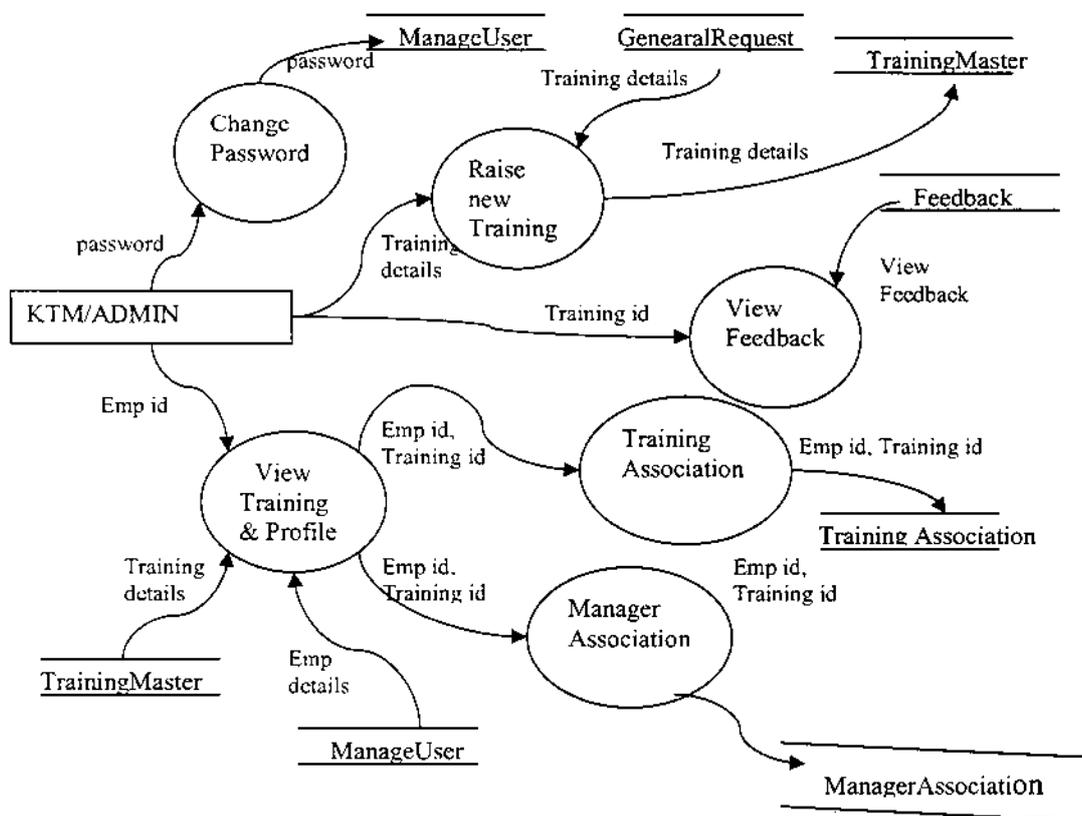
**Fig. 3.1 Level 0 Diagram**



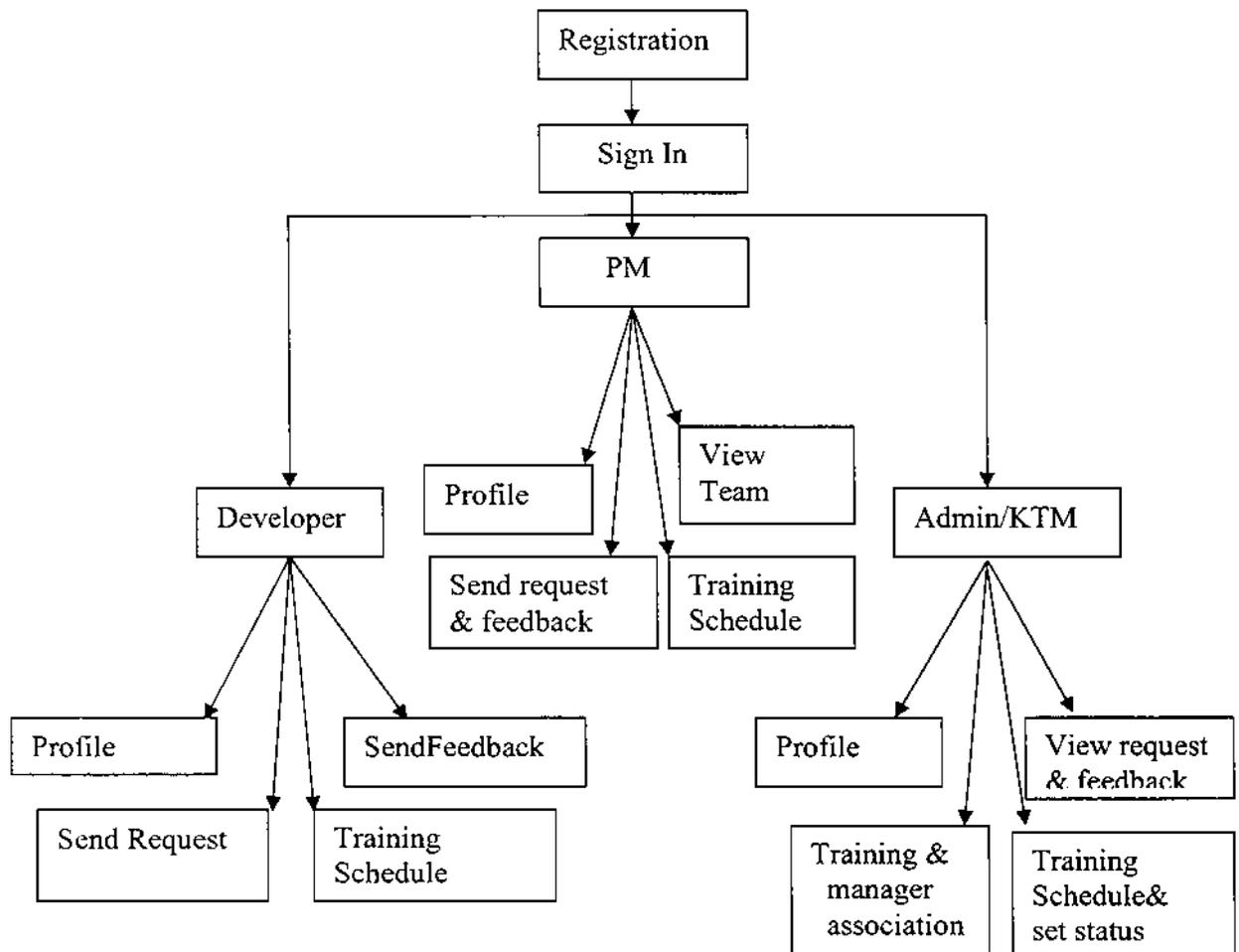
**Fig 3.2 Developer / Software Engineer's Module Diagram**



**Fig 3.3 Project Manager's Module Diagram**



**Fig. 3.4 Knowledge Transfer Team’s Module Diagram**



**Fig. 3.5 Module Integration Diagram**

### 3.4 INPUT DESIGN

Input Design is the part of overall system design, which requires very careful attention. Often the collection of input data is the most expensive part of the system. In terms of both the equipment used and the number of people involved in it is the point of most contracts for the user with the computer system and it is prone to error.

If data going into system is incorrect, then processing the output will magnify these errors. Input design is the process of converting an external user oriented description of the input system into a machine-oriented format.

Objectives of Input Design:

- To produce cost effective method
- To get a highest level of accuracy
- To ensure that input of acceptable and understandable by people who are using it

The major activities done with this is:

- Data are collected from its source
- Data Transcription to an input form is done
- Data is converted into computer acceptable form
- Converted data is verified
- Validation of input data

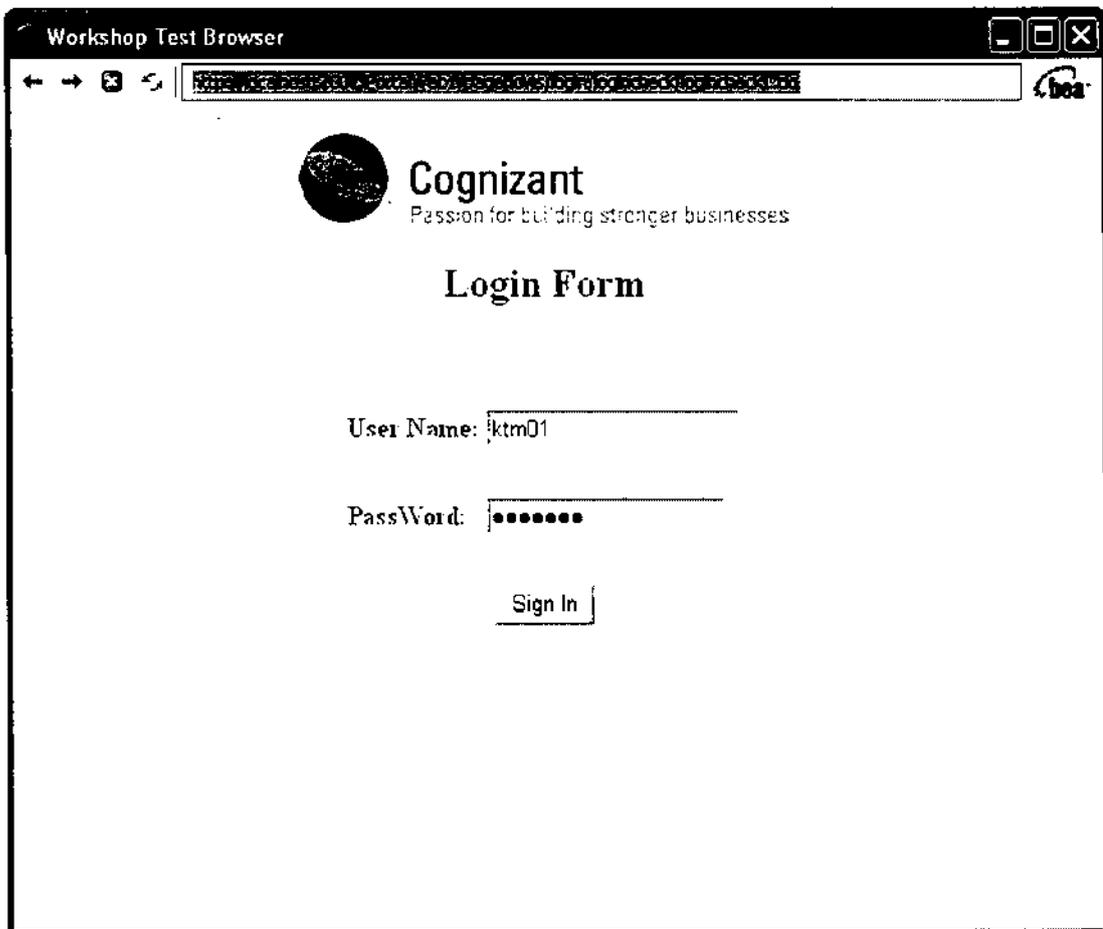


Fig. 3.6 Login Page

Workshop Test Browser

Cognizant  
Passion for building stronger businesses

## Manage User

Welcome success !!!

User ID: ktm02

Password: .....

Employee Name: sabitha.v

Email Id: sabi@ymail.in

Date Of Birth: 2-10-84

Date Of Joining: 10-1-09

Department: Knowledge Transfer

Job Title: Admin

Save Cancel

My Profile

Manage User

Team Association

Training Schedule

Training Association

Training Information

View Feedbacks

View Training Request

Set Status

View Status

Home

About Us

Fig. 3.7 Employee's Registration Page

Workshop Test Browser

Cognizant  
Passion for building stronger businesses

## Training Scheduler

Welcome success !!!

Training ID:

Training Name:

Training Description:

Training Date:

Training Time: Hour:  Minute:  AM

Trainer Type:

Trained By:

External Trainer Name:

Total HRs:

Total No. of Participants:

My Profile  
Manage User  
Team Association  
Training Schedule  
Training Association  
Training Information  
View Feedbacks  
View Training Request  
Set Status  
View Status

Home  
About Us



Fig. 3.8 New Training Page



Fig. 3.9 Training Association Page



Fig. 3.10 Set Status Page

Workshop Test Browser

Cognizant  
Passion for building stronger businesses

## Training Feedback

Training Name: j2ee

Comments: really informative

Send

Home

About Us

Fig. 3.11 Feedback Page

### 3.5 Output Design

One of the most important features of an information system for users is the output that is produced. Without quality output the entire system might appear to be so unnecessary that users will avoid using it, possibly causing the system to fail, right output must be developed while ensuring the output element is designed so that people will find the system easy to use effectively.

Output design is the direct source of information to the user. Efficient, intelligible output design should improve the system's relationship with the user and it helps to make the decision.

The outputs may be the processed data or sometimes the retrieval of the stored data. The outputs that are generated should be accurate, reliable and free from errors. A major form of the output is the hard copy from the printer. Outputs should be designed according to the requirements of the user.

Output screens are the tools to convey information to the users since the design of the output screen is very important for attracting the users; the output screens are designed in such a way that it is very interactive and informative. The outputs from the computer systems are primarily to communicate the results of processing to users.

Workshop Test Browser  
 http://localhost:7001/Portal/Web1/pageflows/login/logincheck/RetrieveInformation.do

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## Training Information

Welcome success !!!

Select Training Name

Training Name	java	Training Date	6/20/2009
Training Time	10:00 AM	Trainer Type	Internal
Trained By	Mr Swaminathan	Total HRS	10
Planned Participants	25		

**Participant's Details**

Employee Name	Department	Role
Revathi	Dev	SE
success	HR	Admin
sabitha.v	KT	Admin

My Profile  
 Manage User  
 Team Association  
 Training Schedule  
 Training Association  
 Training Information  
 View Feedbacks  
 View Training Request  
 Set Status  
 View Status

Home  
 About Us



**Fig. 3.12 Training Information Page**

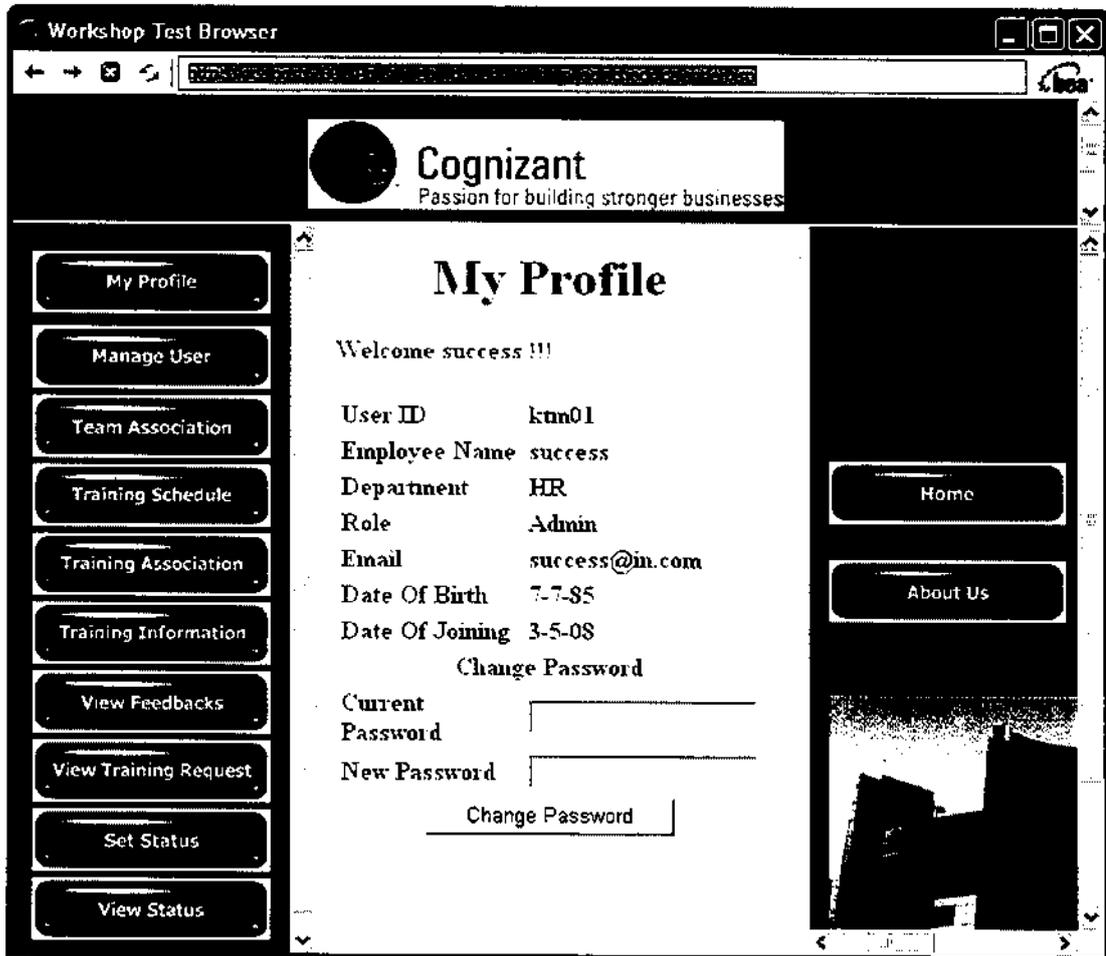


Fig. 3.13 Profile Page

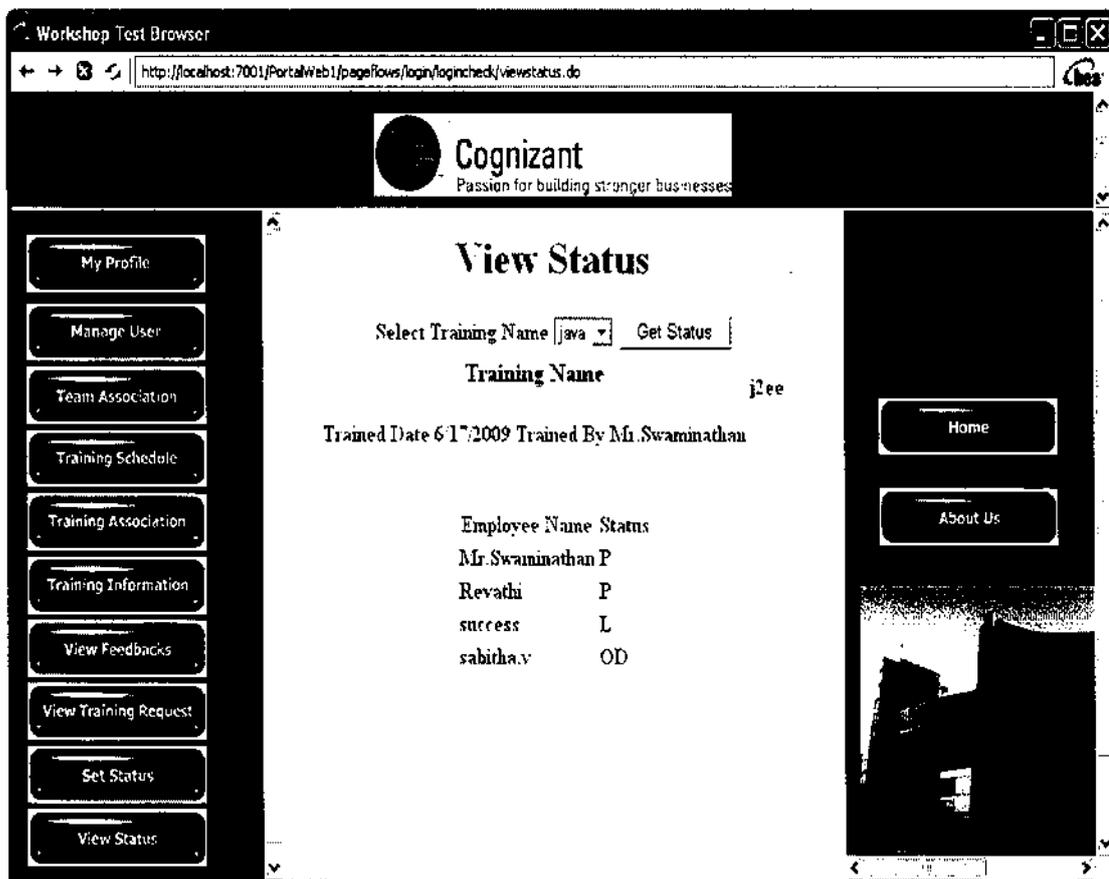


Fig. 3.14 View Status Page

Workshop Test Browser

http://localhost:7001/PortalWeb1/pageflows/login/logincheck/viewfeedback.do

**Cognizant**  
Passion for building stronger businesses

## View Feedback

Select Training Name

Training Name

Trained Date 6/17/2009 Trained By Mr.Swaminathan

Commented By	Department	Comments
Mr.Swaminathan Dev		really informative

My Profile

Manage User

Team Association

Training Schedule

Training Association

Training Information

View Feedbacks

View Training Request

Set Status

View Status

Home

About Us

Fig. 3.15 View Feedback Page

### 3.6 DATA BASE DESIGN

Data base is an integrated collection of data and provides a centralized access to the data for the program send it makes possible to treat data as a separate resource. Using an Oracle can create a client/server application as easily as a file server application. To create an application and access the data to connect the access project to SQL server database by using the database wizard.

The Seven tables used in making this project are listed below.

- ManageUser Table
- ManagerAssociation Table
- TrainingMaster Table
- TrainingAssociation Table
- Feedback Table
- General request Table
- Status Table

**Table Name** : ManageUser Table

**Description** : It contains the personal information about the users.

Field Name	Data Type	Constraints	Description
USERID	VARCHAR2(5)	PRIMARY KEY	Employee Code
PASSWORD	VARCHAR2(8)		Password
EMPNAME	VARCHAR2(30)		Employee Name
DEPT	VARCHAR2(9)		Password
EMAIL	VARCHAR2(30)		Email ID
DOB	DATE		Date of Birth
DOJ	DATE		Date of Joining
ROLE	VARCHAR2(15)		Designation

### 3.1 ManageUser

**Table Name** : ManagerAssociation Table

**Description** : It contains the Team Association Details

Field Name	Data Type	Constraints	Description
MGRID	VARCHAR2(5)	FOREIGN KEY	Manager Code
EMPID	VARCHAR2(5)	FOREIGN KEY	Employee Code

### 3.2 ManagerAssociation

**Table Name** : TrainingMaster

**Description** : It contains the details about the created Training.

Field Name	Data Type	Constraints	Description
TRAININGID	VARCHAR2(5)	PRIMARY KEY	Training ID
TRAININGNAME	VARCHAR2(15)		Training Name
TRAININGDESC	VARCHAR2(40)		Trainer Name
TRAININGDATE	DATE		Scheduled Date
TRAININGTIME	DATE		Scheduled Time
TRAINERTYPE	VARCHAR2(10)		Trainer Type
TRAINEDBY	VARCHAR2(25)		Trainer
TOTALHRS	NUMBER(28)		Duration
NOOFPART	NUMBER(28)		Participants Count

### 3.3 TrainingMaster

**Table Name** : TrainingAssociation Table

**Description** : It contains the Training Association Details.

Field Name	Data Type	Constraints	Description
TRAININGID	VARCHAR2(5)	FOREIGN KEY	Training ID
EMPID	VARCHAR2(5)	FOREIGN KEY	Employee Code

### 3.4 TrainingAssociation

**Table Name** : Feedback Table

**Description** : It contains the feedback values about the finished Training.

Field Name	Data Type	Constraints	Description
TRAININGID	VARCHAR2(5)	FOREIGN KEY	Training ID
EMPID	VARCHAR2(5)	FOREIGN KEY	Employee Code
COMMENTS	VARCHAR2(40)		Comments

### 3.5 Feedback

**Table Name** : GeneralRequest Table

**Description** : It holds the new Training request information.

Field Name	Data Type	Constraints	Description
REQUESTID	VARCHAR2(5)	NOT NULL	Request ID
TRAININGNAME	VARCHAR2(10)		Training name
TRAININGDESC	VARCHAR2(40)		Training Description
REQUESTEDBY	VARCHAR2(5)	FOREIGN KEY	Employee code

### 3.6 GeneralRequest

**Table Name** : Status Table

**Description** : It contains the Completed Training details.

Field Name	Data Type	Constraints	Description
TRAININGID	VARCHAR2(5)	FOREIGN KEY	Training ID
EMPID	VARCHAR2(5)	FOREIGN KEY	Employee code
STATUS	VARCHAR2(30)		Status

### 3.7 Status

## **CHAPTER 4**

### **SYSTEM DEVELOPMENT**

#### **4.1 INTRODUCTION**

System development is a series of operations performed to manipulate data to produce output from computer system. This aim at translating the design of the system produced during the design phase into code in user programming language. A modular approach is used for the development of the software.

The development phase for the project was created from the specifications created during the design phase. A principal activity of the development phase is coding and testing the computer program that make up the computer program component of the overall system. Other important activities include implementation, planning, equipment acquisition and system testing. The development phase concludes with the report and review.

#### **4.2 MODULE DESCRIPTION**

The **“Training Management System using MVC Architecture”** implementation process is designed to be user friendly for the user. The process identifies the need of the user for functionality.

The implementation project typically consists of minor configuration and customized format. This process requires a trail run process to test the critical requirements of the client. The trail run gives an opportunity to discover and explore the package capabilities in an environment similar to the target environment.

In the trail run, the software is installed and the features are tried out to check the consistent functionality. The software runs successfully without having any flaws and the

features worked out well. As the initial step, the project involved a manual load to enter the data.

In this project we have taken three modules as a base .They are,

1. Knowledge Transfer Team Module
2. Project Manager Module
3. Software Engineer Module

#### **4.2.1 Knowledge Transfer Team Module**

The Knowledge Transfer Team can schedule the training and assign training based on the requests. And he can nominate/denominate the users who are registered in the application. He can view the feedback submitted by the trainee for a particular trainer. Finally, He have to update the status of the completed training.

#### **4.2.2 Project manager Module**

Project manager can request for a new training. He can also lead the team members associated under him. He can see their team members and his profile. He can also send the feedback of particular training.

#### **4.2.3 Software Engineer / Developer Module**

Software Engineer / Developer can have the access to the training that are scheduled and he can request for any number of training based on his needs and he can also send feedback for the trainings.

## **CHAPTER 5**

### **SYSTEM TESTING AND IMPLEMENTATION**

#### **5.1 INTRODUCTION**

Testing is the process of detecting errors. Testing performs a very critical role for quality assurance and for ensuring the reliability of software. The results of testing are used later on during maintenance also.

#### **Psychology of Testing**

The aim of testing is often to demonstrate that a program works by showing that it has no errors. The basic purpose of testing phase is to detect the errors that may be present in the program. Hence one should not start testing with the intent of showing that a program works, but the intent should be to show that a program doesn't work. Testing is the process of executing a program with the intent of finding errors.

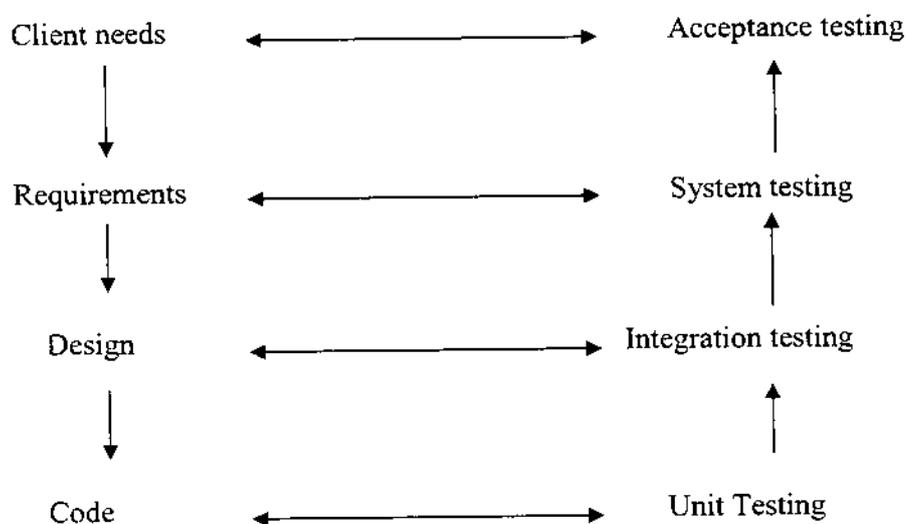
#### **Testing Objectives**

The main objective of testing is to uncover a host of errors, systematically and with minimum effort and time. Stating formally, we can say,

- Testing is a process of executing a program with the intent of finding an error.
- A successful test is one that uncovers an as yet undiscovered error.
- A good test case is one that has a high probability of finding error, if it exists.
- The tests are inadequate to detect possibly present errors.
- The software more or less confirms to the quality and reliable standards.

## 5.2 LEVELS OF TESTING

In order to uncover the errors present in different phases we have the concept of levels of testing. The basic levels of testing are as shown below...



## 5.3 TYPES OF TESTING

### 5.3.1 Unit Testing

Unit testing focuses verification effort on the smallest unit of software i.e. the module. Using the detailed design and the process specifications testing is done to uncover errors within the boundary of the module. All modules must be successful in the unit test before the start of the integration testing begins.

In this project each service can be thought of a module. There are so many modules like Login, Knowledge Transfer Team, Project Manager and Software Engineer. Giving different sets of inputs has tested each module. When developing the module as

well as finishing the development so that each module works without any error. The inputs are validated when accepting from the user.

In this application developer tests the programs up as system. Software units in a system are the modules and routines that are assembled and integrated to form a specific function. Unit testing is first done on modules, independent of one another to locate errors. This enables to detect errors. Through these errors resulting from interaction between modules initially avoided.

### **5.3.2 Integration Testing**

After the unit testing we have to perform integration testing. The goal here is to see if modules can be integrated properly, the emphasis being on testing interfaces between modules. This testing activity can be considered as testing the design and hence the emphasis on testing module interactions.

In this project integrating all the modules forms the main system. When integrating all the modules I have checked whether the integration effects working of any of the services by giving different combinations of inputs with which the two services run perfectly before Integration.

### **5.3.3 System Testing**

The philosophy behind testing is to find errors. Test cases are devised with this in mind. A strategy employed for system testing is code testing.

#### **Code Testing**

This strategy examines the logic of the program. To follow this method we developed some test data that resulted in executing every instruction in the program and module i.e. every path is tested. To ensure that the coding is perfect two types of testing is performed or for that matter is performed or that matter is performed or for that matter is performed on all systems

### **5.3.4 Acceptance Testing**

Acceptance Test is performed with realistic data of the client to demonstrate that the software is working satisfactorily. Testing here is focused on external behavior of the system; the internal logic of program is not emphasized.

In this project 'Online training management system using MVC architecture', have collected some data and tested whether project is working correctly or not. Test cases should be selected so that the largest number of attributes of an equivalence class is exercised at once. The testing phase is an important part of software development. It is the process of finding errors and missing operations and also a complete verification to determine whether the objectives are met and the user requirements are satisfied.

#### **Criteria Satisfied By Test Cases**

1. Test cases that reduced by a count that is greater than one, the number of additional test cases that much be designed to achieve reasonable testing.
2. Test cases that tell us something about the presence or absence of classes of errors, rather than an error associated only with the specific test at hand.

## TEST CASES

S.No.	TestCase Name	TestCase Description	Expected Result	Actual Result	Test Script Status
1	Employee login	When the 'SIGN IN' button is clicked, checks the id and password, particular employees profile will be displayed.	Employee Details should be displayed.	Employee Details is displayed	Pass
2	Adding new Users	By clicking Manage User button, Entire details should be entered and the form should be submitted. User id is verified and data will be added. Accepted entry	All the details should be added in the database.	Details are saved in the database	Pass
3	Training Information	From the Training combo box, a training name is selected.	The selected training details will be displayed.	Selected training information is displayed.	Pass
4	Training Schedule	Full training details should be entered and trainer type should be chosen. Then the form is submitted.	Training Information should be saved in database.	Entire detail is saved in the database	Pass
5	Training Association	Training Name is chosen, Employees to be trained are selected from the list and it is	Employees should be added to training list.	Employees Name is added to particular	Pass

		submitted.		training list	
6	Training Request	The training Name is selected from the combo box and enter request id and click on the send request button.	Request will be added in the database	Request is saved in the database.	Pass
7	Training Feedback	Training id is selected and the comments are entered and click on the send comments button.	Feedback should be added to feedback list.	Feedback is added to the list.	Pass
8	Request code	The Request id text box contains a null value	Error message will be displayed	Error message is displayed	Pass
9	Number of participants	The Number of participants text box contains special characters such as \$,&,#	Error message should be displayed	Error message is displayed	Pass
10	Number of participants	The Number of participants text box contains number and characters such as 3MC	Error message should be displayed	Error message is displayed	Pass
11	Number of participants	The Number of participants text box contains a number only such as which is a valid number	Accepted entry	Accepted entry	Pass
12	Total Hours	Total hours text box contains a number	Accepted entry	Accepted entry	Pass
13	Training Association	Training which will be engaged by external	Error message	Error message is	Pass

		trainer is chosen from the combo box and the employees are chosen. If more number of employees are associated than planned participants.	should be displayed	displayed	
14	Training Status	Training Name is chosen from combo box	Selected Training status will be displayed.	Training status is displayed	Pass
15	Set Training Status	Training and Trainer is chosen and Status is entered in text box and Save button is clicked	All the details should be saved in the database	Details are saved in the database	Pass

## 5.2 SYSTEM IMPLEMENTATION

Implementation is the realization of an application. Implementation encompasses all the processes involved in getting new software or hardware operating properly in its environment. So that the system is tested successfully on various web browsers such as Internet explorer, Netscape navigator, Opera and Mozilla Fire Fox. And it is tested in various operating systems with machines of different configurations.

The system can be implemented only after testing. This method offers the greatest security since the old system can take over if the errors are found or inability to handle certain type of transactions while using the new system. The training management module is added into the local intranet web portal of the organization Cognizant Technologies

## **CHAPTER 6**

### **CONCLUSION AND SCOPE FOR FUTURE ENHANCEMENT**

#### **6.1 CONCLUSION**

The project “**Training Management System Using MVC Architecture**” mainly focuses on the training module in an organization where the training is being targeted for the developers. In this the developers are free to enroll for a Training through online which is already scheduled.

The Project Manager, who heads the developers, can view the training information. And also can raise a request for a new training program to the Knowledge Transfer Team.

The Knowledge Transfer Team is the one who monitors the overall training schedule. The Knowledge Transfer Team views the raised Trainings from the Project Manager and scheduled new Trainings. And got the feedback information from the developer and evaluate the training and the trainer. Thus, this project is an easy tool for a training session to be conducted in an organization in an effective manner.

#### **6.2 SCOPE FOR FUTURE ENHANCEMENT**

It can be suitable for globally across all the organizations maintaining the W3C Standards. With small modification this project works on the existing database of any company which maintains the perfect transaction on the above mentioned functionalities.

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