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**Development of an Web based ERP module for an Educational Institute: A case of
Training & Placement (TNP) Cell**

Lalit Gehlod*

* Computer Science Engineering Department, Institute of Engineering & Technology, Indore, India

Abstract

This paper deals with the Development of an Web based Enterprise Resource planning (ERP) module for an Educational Institute: A case of Training & Placement (TNP)cell. An ERP system contains various modules in any educational organization in this case TNP module is being taken which is developed using JSP SERVLET technology.

Keywords: TNP, ERP, JSP SERVLET.

Introduction

An Enterprise is a group of people with a common goal, which has certain resources at its disposal to achieve goal. In the enterprise way the entire organization is considered as a system and all the sections are its subsystem [1]. ERP that earlier used as stand-alone applications include: Manufacturing, Supply Chain, Financials, Customer Relationship Management (CRM), Human Resources, Warehouse Management and Decision Support System [2]. The modules of the institute ERP system are Administration, Result, HR, Result, Transport, Inventory, Examination, TNP cell, Exam, Faculty Management, Library, and Hostel [3]. The paper deals with the development of an web based ERP module for an educational institute. The case taken is of Training and Placement Cell.

Literature Review

Many researchers have worked in the area of development of Web based & Mobile ERP systems and is the thrust area of work. Naveed Hussain [4] discussed in his research about the growth of mobile or unwired usage which has increased globally for last few years. Karl Kurbel [5] introduced a multi-tier architecture for a mobile ERP system. A mobile user interface for an ERP system is developed by Karl Kurbel, Anna Maria Jankowska and Kamil Nowakowski [6]. Octavian et al [7] has explored the mobile applications landscape and also proposes an architecture model for the mobile services starting from the necessary functionalities for a portal of mobile services. Andrzej Dabkowski et al [8] introduced a comprehensive framework for mobile ERP applications and presented a multi-tier

architecture for them. Stephan Karpischek et al [9] developed a Mobile Sales Assistant (MSA) for mobile product information system for retailers based on a combination of Near Field Communication (NFC) and the Electronic Product Code (EPC). Péter Cserkúti et al [10] introduced SmartWeb, a proxy-based content re-authoring system for HTML pages. André Calero Valdez and Martina Ziefle [11] have studied the impacts of ageing and domain knowledge on user interaction using the example of diabetes and also they developed and implemented software for the monitoring of diabetes on a PC first.

System Requirements

Software Interface/module requirement Tools:

- a) IDE Eclipse (If site is not hosted/tested mode, then to run site at local host a cross platform apache is used)
- b) Apache Tomcat 7.0 for web server
- c) IBM Rational Rose (for Modeling)
- d) SQLyog - a MYSQL fronted.
- e) PC Operating system: Any.

Hardware Interface/module requirement

Processor: Pentium 4 or above @ 1.7 GHz or above.
128 MB RAM (Recommended: 128 MB RAM or greater)

Development Of Web Based Erp Module

In the design step for TNP cell module of Institute ERP design two use cases is done.

There are following three actors in the system namely
Student

TPO

USE CASE DESIGN

A use case model is a model of the system's functionality and it is a contract between user and system. Each use case presents a single functionality when an actor interacts with the system. Following are the use cases diagram in present work.

Use Case Design for Student Actor

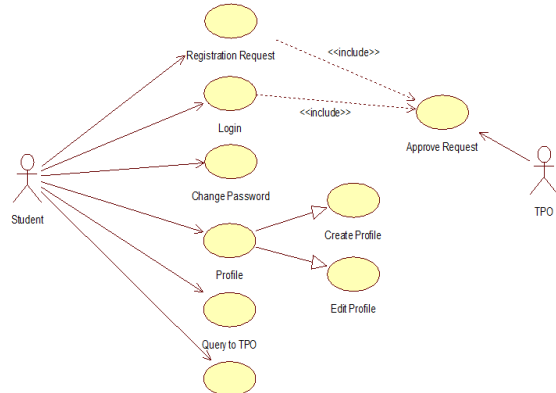


Figure 1: Use Case for Student

Use Case Design for TPO Actor

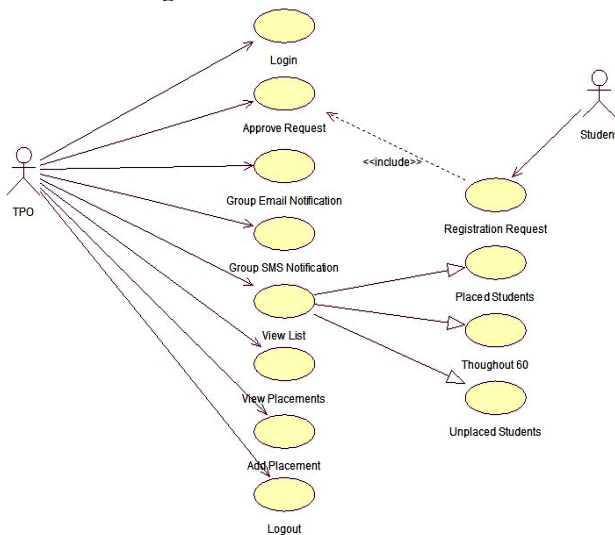


Figure 2: Use Case for Student

ACTIVITY DIAGRAM

Activity diagram describes the work flow behaviour of the training and placement cell of an educational institute. Number of activity diagrams are developed representing the various activities involved in TNP cell. One of the activity diagram is represented in the figure 3 below. This shows how the registration is carried out by the student.

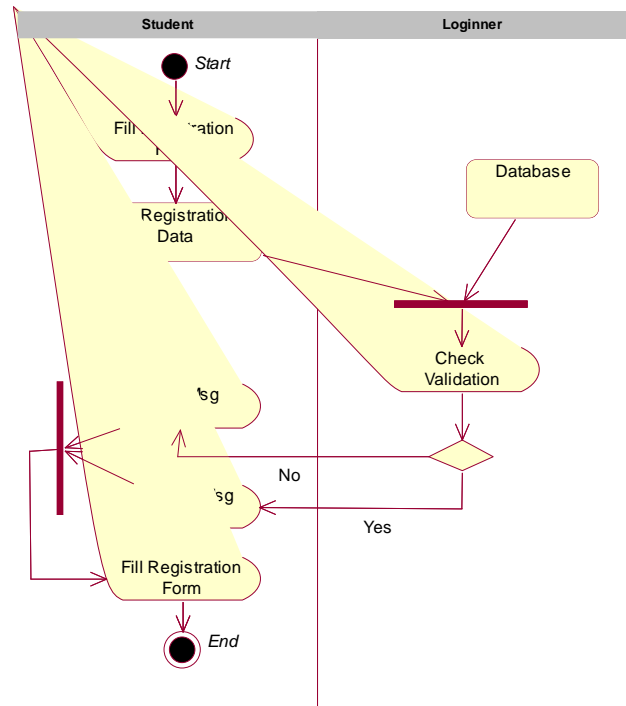


Figure 3: Student Registration Activity

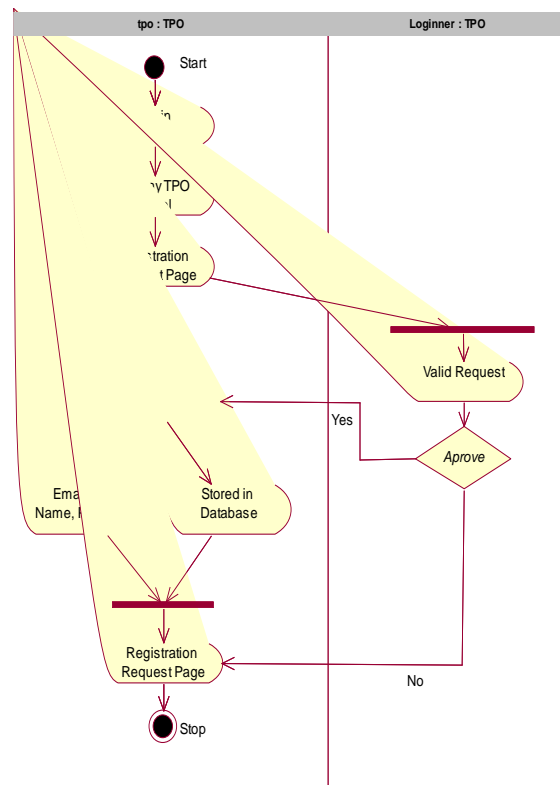


Figure 4: Approve Request Activity
 The figure 4 represents the Activity Diagram for TPO Actor

SEQUENCE DIAGRAM

Sequence diagram describe the flow of logic within the system in a visual manner. In this TNP cell module number of sequence diagrams are developed. One of the developed sequence diagram is shown in the figure 5

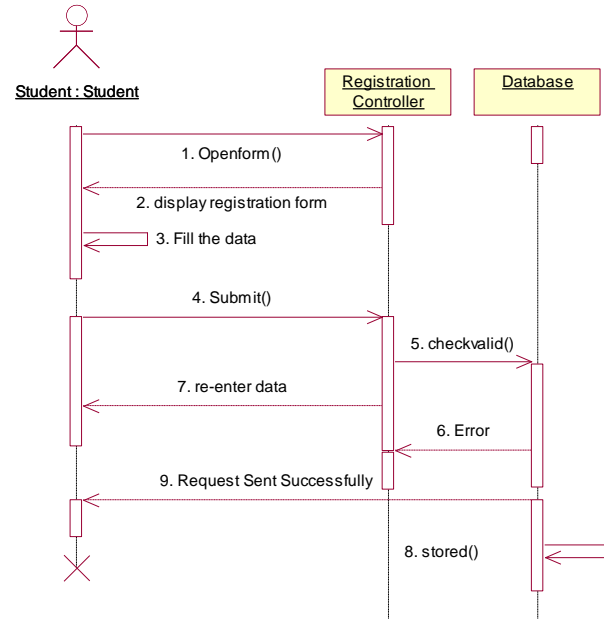


Figure 5: Sequence Diagram for Registration request

CLASS DIAGRAM

Class diagram defines a group of object in detail. It shows the state, behaviour and relationship with other object that are mandated for each object that instantiates the class. Figure 6 depicts the class diagram for student.

IMPLEMENTATION OF FRONT END

Implementation is the process of design and development of software. In the implementation process of this application JSP, SERVLET is used. MVC architecture is followed during implementation in which SERVLETS serves as a controller. HTML is used to design the graphical user interface. The Login page is common for Student as well as TPO. The figure 7 and 8 shows the front end developed for the students registration and the login form for the training and placement officer.

IMPLEMENTATION OF BACK END(MYSQL)

The application database is constructed in MYSQL. The centralized database is created named as "cell". For this application tables created are

login

This table stores the login account details of users such as their username and password. The type column describes the type of user. For student type is

1 and for TPO it is 2.

placementinfo

This table stores the placement information of students. The placement company name will be provided for intended student.

regrequest

This table stores the registration request sent by the student to register into application. This contains an attribute status, when request is not approved the value of status is set "p" for pending; if approved the value is set to "a" for approved.

studentprofile

This table stored the particulars and academics of student. When a student registered in to application it is first unplaced hence by default the attribute placedin is set to "unplaced". After his placement information is stored in placementinfo table; the value of attribute placedin is set to "placed". This need not to be done manually it is automatically updated when placement information is stored.

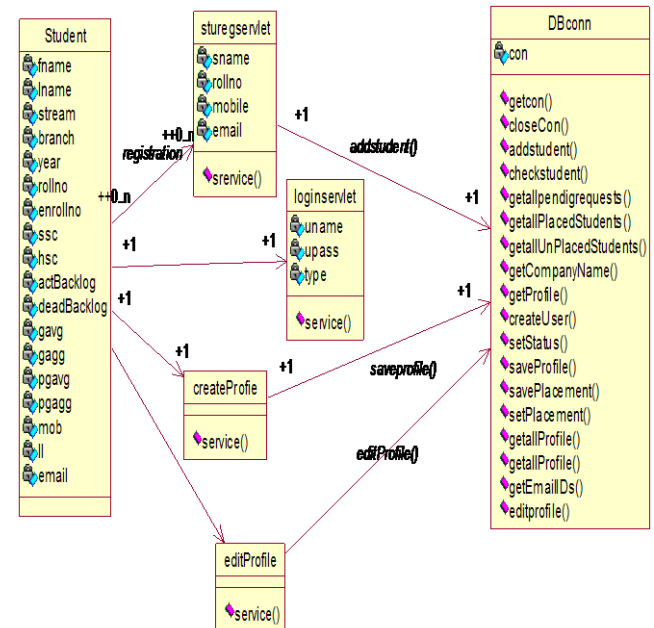


Figure 6: Class Diagram for Student

TESTING METHODOLOGY USED
Figure 7: Registration Request page
*Figure 8: TPO Login Page***White Box Testing**

White box testing considers system to be like a white box, which means that everything about the system is

known to us.

Black Box Testing

Black box testing is carried out by the end users.

Unit Testing

“Focuses on individual software units, group of related units.” In this testing method test the each and every components of Project work. Test the validation of Each Control.

Test the Proper Message display to user.

Test the exception Handling when it occur.

Test the performance time.

Test the data in database to store in proper way.

Test the all required of the client that are cover or not in project.

Integrated Testing

“Integration testing is done to find out even though the components were individually satisfactory, the combination is correct and consistent or not.”

TEST CASES

- 1) **Invalid user can not login:** If is incorrect username or password given, then user is not allowed to login.
- 2) **Incomplete or Invalid user information:** If user has left some fields empty or the information provided is not according to the constraints than appropriate message must be display.
- 3) Consistency and proper navigation must be maintained through all user interfaces.
- 4) Appropriate error message must be displayed according to user action.
- 5) Data should be stored and retrieved correctly through database.
- 6) The system should be tested in client's environment.

CONCLUSION

The prototype Implementation of an web based ERP module is developed for TNP cell activity of an institute. The design module of the developed system successfully accesses the ERP module and TNP data. The activity of TNP cell is modulated into the web based application which is design and implemented and tested accordingly. The web based module is capable of sending Emails and SMS. The system developed can be applied to any Educational Institute. The system is powerful and user friendly as it gives wider flexibility of using and updating knowledge.

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