A Hierarchical Tree Based Online Web Portal

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Abstract - Information hierarchies are the best way to organize and manage most complex information of an organization. These tree based structures are used to define web site organization in a hierarchy which makes it easy to understand for the users. Now a day, Web applications cover the whole business market and the dynamic nature of web applications not only provide quality to the users but also make it more reliable and flexible.

In this work the hierarchical and modular web based online portal is developed in PHP, HTML5/CSS3 with latest technology paradigms like Bootstrap, Responsive designs, ORMs, Frameworks and MYSQL database which facilitates various services to the users to make this system dynamic in nature. In addition, Administrator of the portal has the full access rights and responsibilities to manage whole system data and modules as well assign roles and privileges to the employees at user level. Users of the portal are placed in the different modules through which they can access the application.

Keywords: object oriented paradigms, web application design and development, software engineering.

I. INTRODUCTION

Modular programming follows a top down design strategy in which a program is divided into various subsections called module. Modules are the basic building blocks which can be easily loaded into the memory and can be reused in other section of code whenever required. Modularity of web design makes the complex system to be manageable for implementation and maintenance [1]. The hierarchical structure can be used to unify the disparate modules and create a super structure for organizing them [1, 2]. The hierarchical representation technique is used to divide the large and complex classes into smaller modules. In this paper, the modular structure of this system not only manages the services of one organization but also facilitate the various services to its all branches or units located on different geographical location [1, 2, 3]. In an organization, loosely coupled forms enable its users to achieve greater flexibility and higher modularity makes the system easy to adapt changes.

II. OBJECTIVES

The objectives of this paper are as follows:

• To provide feasible and modular system to many companies through which it eliminates the need of paper work.

- To identify the complexity of software in dynamic web engineering in order to improve performance [4].
- To design a GUI-based dynamic web application framework and components [3, 5, 6].
- Access services and store data in the defined format which leads to consistency in the current system.
- To update employee's data without redundancy and collision.

III. DESIGN ARCHITECTURE & PATTERN

Hierarchical MVC architectural design pattern is used to achieve highly organized modularity [1, 2, 4, 7]. The decomposition of client tiers results into the hierarchy of parent-child MVC layers. The triad can function from one another as well it can request access to another triad by their controllers. This allows the application to be distributed over multiple locations. The main advantage of using HMVC is the layering of triads which reduces the dependencies between the disparate parts of the program and encourages reuse of code and modules [1]. The key benefits of using HMVC reveal the advantages of object orientation which help to improve software quality and reduce development time [1, 7, 8, 9].

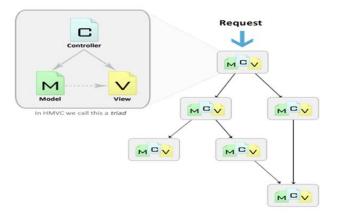


Fig 1: Hierarchical Model View Controller Pattern

HMVC pattern based architecture standardizes the presentation layer of web application. It helps to contribute in user interface consistency, interaction among various sub-components, extensible code and application flow [10, 11].

IV. PROPOSED WORK

In this work, A dynamic hierarchical web based intranet portal is designed and implemented in PHP, HTML5, CSS3 and MYSQL database with latest technology paradigms Bootstrap, ORMs Framework and responsive web design which provides an ease to access and switch into the modules within the organization at user level [8, 12, 13, 14]. Administrator assigns various roles and access rights so that users in the portal can interact with other modules by which they belong to.

A typical hierarchy of HR management system is shown in the given company graph where a company is at root level and its head office is at Level 1. Further all leaf nodes are arranged according to their given parent node. All non leaf nodes have no children. All departments of the company can be placed at different geographical location.

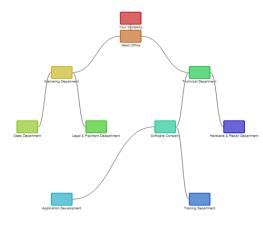


Fig 2: Hierarchical Structure of company V. ANALYSIS AND RESULTS A. Adding new employee in the company

While adding a new employee in a company with the following information, an employee is added to the system and a valid username and password is sent to the user via authentication mail. When the user verifies that email, he/she will be able to login with the given credentials.

<div class="row error" id="field_employee_id"></div> <div class="row error" id="field_first_name"></div> <div class="row" id="field_middle_name"></div>



<div class="row" id="filed_last_name"></div> <div class="row" id="field_nationality"></div> <div class="row" id="field_gender"></div> Fig 3: Adding employee in the company <button class=\"saveBtn btn btn-primary pull-right\"><i class=\"fa fa-save\"><\/i> Save<\/button>\n\t\t \t\t<button class=\"cancelBtn btn pull-right\" style=\"margin-right:5px;\"><i class=\"fa fa-times-circle-o\"><\/i> Cancel<\/button>\n\t\t \t<\/div>

Joined Date*	8	2014-05-01				
Confirmation Date	爸	2014-08-01				
Department*	Tec	nnical Department				
Supervisor*	Company Admin					
			 Cancel 	Save 3		

Fig 4: Adding new employee in the company

B. Grant permissions to the employees at user level

After adding an employee, administrator provides access rights and permissions mentioned below in the figure-"admin", "manager" and "employee". According to that he/she will be able to enter into the system with the given privileges.

```
<div class="row" id="field_username"> </div>
<div class="row" id="field_email"></div>
<div class="row" id="field_employee"></div>
<div class="row" id="field_user_level"></div>
<select type="select-one" class="form-control"
id="user_level" name="user_level">
<option value="Admin">Admin</option>
<option value="Employee">Employee</option>
<option value="Employee">Employee</option>
<option value="Manager">Manager</option>
</select>
```

Users		
User Name*	pooja	
Email*	pooja2489@gmail.com	
Employee*	Pooja Sabnani	
User Level*	Manager	
Save Cancel Change Password	Admin Employee	
	Manager	

Fig 5: Grant permissions to the employee at user level

If the "admin" user role is assigned to the employee then an administrator of the company is responsible to manage whole system data, user roles and manage modules of the system. In addition, administrator of the company will provide the access rights to the employees at user level "manager" or "employee".

When administrator of the company assigns the access rights at manager level then he/she will be able to manage a given set of functions provided by the admin. The manager of the company can manage the project milestones and employee's routine work as well he/she can approve employee's leave applications working under his/her supervision.

C. Admin Dashboard with updated information

User dashboard will be displayed on the home page where a user can look into the updated information about current/ pending/submitted projects, leaves, attendance and reports.

BITS HRM	=			E C Switch & Company - Ories	Basic Information Personal Info	omation		
Company Admin	Dashboard Adres				My Details Company			
Admin * P Dashboard I Compeny Resistore D Job Details Setup	People 4 Employees	10 Company Ministers Hanage Company O	Users 3 Ukers Hamage Ukers G	3 Active Projects Update Clands, Projects G		Company Admin Ectimo Upoed Profile Image (Delete Profile Image Change Password	
Qualifications Setup Projects/Client Setup Lower SetUreps Drophyses ¹	Attendance	1 Uproving Lances	Reports Verv / Deventioned Registeries	Settings Configure Kathes		Employee Id EMP001	NIC Number 294-38-3535	EPF/CPF N
porta f	Heritor Attandance O	Louis Hatagonist O	Creaty a Report O	Update Settings O	Personal Information	Other Id	Birth Day	Gender
vesonal information (Nationality Canadian	294-38-3535 Marital Status Married	March 17th, 1984 Joined Date August 3rd, 2005	Male
laavet (Contact Information	Married	August and, 2005	
Inne Hanagement I Nocuments I					Address 1 2722 Pipun Street Pestal Code 44094 Work Email icohrm+admin@web-stall.com	Address 2 Willioughby Home Phone 440-953-4578 Physics Imail Icehrm+admin@web-stall.com	City Willoughby Mobile Phone 440-953-4578	Country United State Work Phone 440-953-451
					Job Details			
	F	ig 6: Admin Dash	board		Job Title Chief Executive Officer Department Your Company	Employment Status Full Time Permanent	Supervisor	Subordinater Pooja Sabna

D. Manage Permissions

At specific user level, admin provides permissions to the users to perform a set of functions into the system.

Permissions				
filler T				bearch
Joer Level	Module	Permission	Value	
reneper .	Admin Quelifications Setup	Add Certifications	795	
Vanager	Admin Qualifications Setup	Eck Certifications	745	2
Hanager	Admin Qualifications Setup	Delete Certifications	No	
nanager .	Admin Qualifications Setue	AddLanguages	Yes.	
itanaper	Admin Qualifications Setup	Edit Languages	785	
Vanager	Admin Qualifications Setue	Delete Languages	200	
lanager	Personal Information Dependents	Add Dependents	Vec.	
Hanager	Personal Information Dependents	Edit Dependents	200	28
lianaper	Personal Information Dependents	Delete Dependents	785	
Imployee	Personal Information Dependents	Add Dependents	745	
Implayee	Personal information Dependents	Kilk Dependents	140	A .
Employee	Personal Information Dependents	Delete Dependents	145	38
lienager	Documents Hy Documents	Add Documents	Yes .	
fanager	Documents Hy Documents	Edit Documents	741	

Fig 7: Manage Permissions

E. Manage Modules

Modules of the system will be managed by users according to their roles given by administrator.

Modules					
				Search	
Name	Gravp	Order	Status		
Monitor Attendence	admin		Enabled		
Company Structure	admin	2	Endline		
Decklored	admin	1	Enabled		
Document Hanagement	admin	2	Enabled	4	
Employees	admin		Enabled		
Job Details Setup	admin	3	Enabled		
Law-e Calendar	admin	4	Endine	- A	
Leave Settings	admin .		Enabled	A	
Company Loans	admin	,	Enabled		
Nanage Hetadata	admin	4	Enabled	A	
Nanage Hodules	admin	3	Enabled		
Nanage Permissions	admin	4	Enabled		
Projects/Client Setup	admin		Erabled	3	
Qualifications Setup	admin		Enabled		
Reports	admin	1	Enabled		

Fig 8: Manage Modules

F. View/Edit Personal Information

Users can edit their personal information including job and contact details.

The employee of the company can also track the l information about his/her subordinates and supervisor.

Fig 9: Basic information of an employee

VI. CONCLUSION

The conclusion of using hierarchical intranet online portal is to provide an ease and flexible environment to manage whole data about deliverables and milestones at one place in a systematic manner. The hierarchy of system data and information are fully managed in this web based online portal which makes the system highly modularized and dynamic in nature [4, 10, 11, 15].

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