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An Online project & portfolio management application: Implementing project selection and prioritization model to resolve priority conflicts and to build strong linkages between projects and the strategic plan

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Capstone Project Report

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An Online Project & Portfolio Management Application: Implementing project selection and prioritization model to resolve priority conflicts and to build strong linkages between projects and the strategic plan

“Submitted as a Capstone Project Report in partial fulfillment of a Master of Science Degree in Professional Studies at the Rochester Institute of Technology”

Table of Contents

Abstract.....	3
Problem Background or Literature Review	4
Project Description or Approach to Solving the Problem or Methodology.....	10
Project Results or Project Findings.....	13
Conclusion and Recommendation	25
Limitations	34
References Cited	35
Appendix A: Action Plan.....	39
Appendix B: Gantt Chart	41
Appendix C: Work Breakdown Structure.....	43
Appendix D: Context Diagram	45
Appendix E: Architecture Diagram	47
Appendix F: Entity Relationship Diagram	49
Appendix G: Class Diagram	51
Appendix H: Sequence Diagram Assign Work	53
Appendix I: Sequence Diagram Prioritize Projects	55
Appendix J: Test Case Prioritize Projects.....	57
Appendix K: Test Case Assign Work.....	59

Abstract

This Capstone Project will address two important problems. The first problem concerns resolving priority conflicts over the projects among the managers in an organization and the second problem concerns the gap between the projects and the organizational strategies. To complete this project, I have developed an online project and portfolio management application by using the software development life cycle methodology and project management methodology. The outcome of this project is a software product that helps in obtaining a general consensus as to which project has the highest priority. This priority awareness helps in resolving conflicts among the managers. This product will force organizations to use the consistent computerized model, the model that helps the organizations to select and prioritize the projects based on their goals and strategic plans.

Problem Background or Literature Review

The project priority conflict is a very common problem affecting many organizations. As mentioned by Egeland (2009), the conflict in any kind of organization is always a certainty; either the organization is matrix type, pure project oriented type or functional type (Dealing with Conflict on the Project, para. 1). Egeland (2009) states that the conflict over project priorities is one of the most common conflicts in an organization (Controlling Conflict on the Project, para.2). The organization, Exforsys Inc (2009), has ranked the sources of conflicts. According to this organization, the top most reason for conflict is schedule; after schedule, the project priority; and after project priority, there are manpower resources conflicts (Common Conflicts During Project Management, para. 5-6). This clearly indicates that the project priority is a major cause of conflicts within an organization. The President and CEO of *Business Improvement Architects*, Stanleigh (2008), has mentioned on the *Business Improvement Architects* website that according to various researchers, the major sources of conflict within an organization are different project goals, lack of transparency on project priorities, and conflicting work schedules. According to him, this is not a surprise as many organizations today “run multiple projects and employees often find themselves serving on a variety of project teams” (Dealing with Conflict in Project Teams, para. 1). The conflict among the priorities of the different projects originates from different managerial goals and objectives in an organization. As explained by Meredith and Mantel (2009), the senior managers, program managers, project managers, and line managers have different goals and expectations. The senior manager’s goal is to fix time, cost, and performance parameters of the project. The program manager’s job is to finish multiple projects in the given timeframe. The project manager’s goal is to finish the project within the

given parameters and the line manager's goal is to perform the operational functions (p. 171).

The difference of interests creates priority conflicts among the managers. Another cause of conflict over priorities is lack of communication. If the project priorities are not properly communicated to the managers by the senior executives, there are chances that managers will have a lack of understanding about the project priorities. As stated by the organization, *ProjectConnections* (2000): "poor communication and unclear expectations often being a contributing cause of conflicts over priorities" (the principal suspects and some solutions, para. 2). There are many consequences of conflicts in project-oriented organizations as pointed out by author Richman (2002): it decreases productivity and effectiveness, and creates disruption, chaos, and lack of cooperation (p. 125). Functional organizations involved in multiple projects often have the problem of resource competition among the projects. There is a possibility for the managers to optimize their individual interests on the resource assignment with little regard to organizational goal. As stated by Youker (1977), conflicts arise inevitably over the priorities of the projects in the competition of resources (Functional Organizations, para. 4).

The project priority conflicts problem needs to be resolved because the problem is persistent throughout the project life cycle. Verma (1998) states that "priorities rank highly as a source of conflict throughout the project life cycle" (Resolving Conflicts, para. 2). As a result, they may lead to project failure if they are not managed properly. The *Cramby River* consultants, Cram and Mac Williams (1998), have listed the consequences of unresolved conflicts within an organization on their website. The consequences are excessive employee turnover, low morale, reduced productivity, quality problems, delayed and missed deadlines, increased supervision overhead, increased stress, reduced collaboration, fractionated activities, passive/aggressive behavior, abusive behavior, damaged management credibility, decreased

customer satisfaction, negative upward attention, split alliances (factions & cliques), and distrust (The Cost of Conflict in the Workplace, para. 6). The PMP certified project manager, Irwin (2006), has also listed the consequences of conflicts in the projects. The conflict could either evolve negatively or evolve positively in a project. The negative side of conflict polarizes people or teams, undermines morale, leads to irresponsible behavior such as gossip, and deflects attention from more important tasks (p. 5). Professors Holahan and Ann Mooney (2004) of Stevens Institute of Technology Management have illustrated the paradoxical nature of conflict on decision making and project outcomes. Conflict can improve teams' decision making quality. However, "it can also degrade the decision making". The conflict is multi-dimensional; it is either constructive or destructive (p. 2). The project priority conflicts can affect the decision making of the project managers or program managers or even line managers. So it is absolutely very crucial to manage the conflicts in a constructive form.

The problem of gap between the organizational goals and the projects is still visible in many organizations that are not mature in the project management field. The main source of this problem is due to the organizations' ignorance of strategic management in selecting and prioritizing the projects. Benko and McFarlan (2003) state that "80 percent of IT projects" are being selected by many organizations without assessing them against a strategy plan (p. 2). The consequence of not aligning organizational goals with the selection of projects may result in sacred cow projects. These projects are selected by the senior executives of the organization. Sifri (2003) points out that the consequence of nonexistence of any priority system would result in the selection of the projects that are sometimes politically approved by senior leaders (Need for a project selection and priority system, para. 2). Another consequence is where organizations make the mistake of taking up a large number of projects without taking into consideration the

strategic plan which creates many problems for the projects. As Kerzner (2010) explains, there is a tendency for many organizations to take up a huge number of projects, more than what can be managed; “as a result, highly-skilled resources ended up working on multiple projects” which, in turn, creates schedule delays, inefficient productivity, and project conflicts (p. 494-495).

Also, not many projects reach the termination phase of the project cycle if an organization takes up too many projects beyond its resource capacity. As pointed out by Kendall (2009), for organizations which take up more projects than their capacity, “the longer the duration of each project... the fewer will be the number of projects completed” (Deactivate / Kill Many Projects, para. 1). The *Denizon* organization (2011) has stated in one of its articles the presence of a gap between IT investments and organization’s goals. Many organizations are spending tons of money in the Information Technology sector. The growth and advantages of IT has pursued many companies to spend lots of money in automating processes. Unfortunately, many IT investing companies are “misguided as to which initiatives are really contributory to reaching their organization’s goals”. As a result, many of the investments end up underutilized or “become white elephants altogether”. Also, the absence of alignment makes IT investments more complex. It becomes very difficult for the organizations to spot the IT investments that are successfully integrated into daily operations and have little effect on the organization’s growth and efficiency (Align IT Investments With Organization Goals, para. 2). The technology consultant, Brown (2007), has stated that the culture and behavior aspect of organizational alignment means how to do things whereas the strategic aspect means what needs to be done. The values, behaviors, and processes for completing the things in an organization are handled by the Project Management Office (PMO): “Many organizations have implemented PMO’s to standardize project management methodologies”. Most PMO offices overlook the process of

how to complete things (Organizational Alignment and Project Success, para. 6-7). This article points out that many organizations do have strategic plans but do not have any tool or standardized model to align projects with corporate strategy.

The problem of gap between organizational goals and strategy plan needs to be resolved for the effective use of resources and also to ensure that resources are not being overloaded. As pointed out by Saunders (2008), strategy planning and aligning builds a perfect balance between opportunities and proper resource usage (Prioritize projects to align with strategic plan, para. 11). This problem can be addressed by using a consistent scoring model within an organization. The scoring model is known as weighted scoring model. The author Kerzner (2009) has listed some of the potential criteria that can be used by any organization to weigh and score its projects using the weighted scoring model. In the domain of top management, the potential categories are capital requirements, competitive reaction, ROI (Return on Investment), payout time, and Wall Street impacts. In the domain of engineering, the potential categories are requirement equipment, availability of personnel, design difficulty, equipment availability, and piping layouts. In the domain of research, the potential categories are patentability, likelihood of success, project costs, availability of personnel, and availability of laboratory. In the domain of marketing, the potential categories are the length of product life, product advantage, suitability of sales force, size of market, and number of competitors. In the domain of production, the potential categories are processability and equipment availability (p. 496). All of the above mentioned categories may help an organization in building a strong scaling model. The scaling model can be used to terminate and prioritize projects based on the scoring model. The nonexistence of scoring and scaling models may cause a lot of problems for an organization, for example, handling too many projects, insufficient resources, conflicts within the teams, less

productivity, etc. As described by the employee of *Collegiate Project Services*, Hughes (2007), the absence of a strong linkage between organizational goals and project selection, especially in the case of Information Technology, may lead to unnoticed risks associated with IT investments, lack of a strong baseline for performance measurement, and the mistake of treating individuals and system IT infrastructure as different components and not as a whole which may ultimately lead to integration issues (p. 2). In one of the “Expert Series” articles published on *PM Solution’s* website, experts Crawford and Brewin (2005) have clearly mentioned that if project results are not properly aligned with organization strategy plans, then project participants and stakeholders will find it very tough to understand the organization’s vision. This lack of transparency would result in less productivity and high levels of de-motivation and frustration. The gap between organizational goals and strategy plans may result in a lack of strategic focus by the senior executives. It has been estimated by the *Balanced Scorecard Collaborative* that 80 percent to 90 percent of strategic plans are never carried out (p. 1). Information Technology/Telecom industries project manager, Seay (2009), has mentioned that if an organization does not have any strong strategic planning, then the success ratio of the organization comes down. Organizations must ensure that project results are aligned with their strategic goals. The gap between the goals and results leads to failed projects and resources allocated to the projects do not add any value to the organization mission (Symptoms of Defective Strategic Planning, para. 1).

Project Description or Approach to Solving the Problem or Methodology

I have developed an online project and portfolio application in order to solve the problem of priority conflicts over projects and the problem of gap between the organizational goals and projects. The application has two basic functionalities; one is “Prioritize Projects” and another one is “Assign Work”. The “Prioritize Projects” functionality is a computerized weighted scoring model functionality that lies in the domain of portfolio management. This functionality will bridge the gap between the organizational goals and projects. This model will be used by the senior managers of the organization to select and prioritize the projects within the organization. This model is a numeric model which uses multiple factors or criteria to prioritize the projects. Each factor will have a weight of its own which is basically the numeric estimate of the relative importance of the factor. All the organizational strategies can be used as factors in the model. This way, the model ensures that projects are being selected and prioritized based on the organizational goals and objectives. As a result, managers are being forced by the application to select and prioritize the projects based on organizational strategies. The senior managers will be scoring all the factors using the application weight scoring model functionality. The final score will be computed by the application. The project with the highest score will be treated as being of highest priority. The “Assign Work” functionality within the application will help organizational managers to manage their project work. This functionality lies in the domain of project management. This functionality will solve the problem of priority conflicts over the projects. The application will be a centralized source for storing the project priorities of all the projects within an organization. All these organizational projects will be prioritized by the senior managers using the computerized weighted scoring model functionality. This application will be used as a source of communication for program managers, project managers, and line managers

concerning the project priorities. The project management priority conflict control functionality of the application will allow senior managers to assign multiple high priority projects to program managers. It will allow program managers to assign single projects to project managers and also, program managers will be able to move team members from one project to another project. It will allow project managers to assign team members to the projects. It will allow line managers to remove team members from the projects so that the removed team members can be used for functional jobs. This application will ensure that team members cannot be moved from a high priority project to a low priority project either by the program manager or by the line manager. In this way, conflict over priorities among managers will be controlled by the application.

I followed the project management methodology as the first step towards the “An Online Project and Portfolio Management Application” project. The project management methodology involves building a Work Breakdown Structure and Action Plan for the project. The purpose of the WBS is to assist in more accurately and specifically defining and organizing the scope of the total project. In addition to this, the WBS serves as a foundation in assigning responsibilities, resource allocation, monitoring the project, and controlling the project. This is accomplished by defining so that the project team knows exactly what has to be accomplished within each deliverable. This also allows for better estimating of cost, risk, and time because you can work from the smaller tasks back up to the level of the entire project. The WBS for “An Online Project and Portfolio Management Application” project has been broken down into individual work packages. Each task within the WBS has been assigned a WBS code provided by MS Project. The WBS has been broken down to three levels. The first level represents milestone events upon the successful completion of the level two tasks. Level two tasks will consist of review agendas conducted following the successful completion of their respective level three

assigned work packages. All tasks and work packages have individuals assigned to them. Please refer to [Appendix C: Work Breakdown Structure](#) for the application project's WBS. The purpose of the Action Plan is to provide a detailed, scheduled plan of the required steps in the implementation process needed to be developed. This Action Plan includes all required resources and their associated costs. The Action Plan for this project has been formatted in MS Project. Within MS Project, start to finish links have been assigned to corresponding work package sections. Dependent and predecessor links have been assigned to required level three work packages. Milestone events have been assigned to the completion of the level one tasks. The Action plan has only one resource with my name as "Rohit Gupta" and also does not have any cost because all the tools and technologies that are used to build the application are open source and free. Please refer to [Appendix A: Action Plan](#) for all the tasks that are involved in the project. Please refer to [Appendix B: Gantt Chart](#) for the Gantt Chart developed using the MS Project. The first task in the Action Plan is "Research" and this task involved researching and gathering information regarding the organizational goals of the information technology companies. The researched data was used to implement a computerized weighted scoring model as application functionality. The collected data was from the Project Management Body of Knowledge (PMBOK) book. This book is the guide for all the project managers. The Project Management Institute (2008) has listed the various types of organizational goals for the projects and the strategic planning in the PMBOK guide. The types of goals are market demand, strategic opportunity/business need, customer request, technological advance, and legal requirements (p. 10). After "Research", the next four tasks in the Action Plan are created based on the software methodology and the final step is "Capstone Report/Presentation".

I followed the software development methodology to complete the project. The Action Plan's four major tasks -analysis, design, implementation, and testing - were created based on the software development life cycle.

Phase I (Analysis): The analysis document that was created in this phase contains the Requirements, Context Diagram, Scenarios, and Use cases of the application. The each use case includes use case name, description, actors, pre-conditions, post-conditions, normal course of action, alternate courses, excludes, and includes.

Phase II (Design): The design document that was created in this phase contains the Class Diagram, Sequence Diagrams for each Use Case, Architectural Diagram, and the Entity Relationship (ER) Diagram of the application. The ER Diagram describes the entity relationship between the tables of the database.

Phase III (Implementation): The implementation document that was created in this phase contains the well commented Source Code and User Interface Screen Shots of the application. The final step in this phase was the deployment of the application to the RIT server.

Phase IV (Testing): The testing document that was created in this phase contains the Test Data Scripts, Test Plans, and Test Results of the application.

Project Results or Project Findings

The outcome of the capstone project resulted in a working prototype of project and portfolio management application that will help in resolving the project priority conflicts and in resolving the gap problem between organizational goals and the projects. The artifacts that were created as the deliverables for this project are described below. There are four artifacts: analysis, design, implementation, and testing document.

The analysis document of the project contains the context diagram. The context diagram displays the system, the actors, and the implemented use cases. Please refer to [Appendix D: Context Diagram](#) for the context diagram of the application. The analysis document of the project contains the application requirements. The requirements are defined below in **Table A: Requirements**.

<i>Requirements</i>
<ul style="list-style-type: none">• There will be five types of users that will be using the application (Team Member, Project Manager, Line Manager, Program Manager, and Senior Manager). The application will have a pre-defined list of organizational goals and their weights.• Senior Managers will be able to prioritize the projects using the weighted scoring model.• Senior Managers will be able to assign multiple projects to the program managers.• Program Managers will be able to assign the projects to the project managers.• Program Managers will be able to reassign team members from low to high priority project tasks.• Program Managers will not be able to reassign team members from high priority to low priority project tasks.• Project Managers will be able to assign the tasks to the team members.• Line Managers will be able to reassign team members from low to high priority project tasks.• Line Managers will not be able to reassign team members from high priority to low priority project tasks.

Table A: Requirements

The analysis document of the project contains the following application scenarios. The scenarios are defined below in **Table B: Scenarios**.

<i>Scenarios</i>

Scenario One, Use Case One

Ronald Scillone, aged 32, is a senior manager at IBM. There has been a significant rise in the number of projects that are taken by the IBM Company. Ronald is looking to prioritize all the projects and pick the top three projects that are to be completed this year. Ronald logs into the “Online Project and Portfolio Management Application” using his credentials (userid and password). He sees two main functionalities on the application; one is to “Prioritize Projects” and the other is to “Assign Work”. Ronald selects the “Prioritize Projects” functionality. The system responds by showing the prioritization screen, the screen that has a list of available projects. Ronald picks the first project from the list of available projects from the prioritization screen. He inputs the score for each and every organizational goal for that project. After completing the scoring form, he submits the form to be prioritized. The system informs him of the total score of that project. Ronald follows the same process again to prioritize all the projects. As a result, he sees the priority score for each and every project. Ronald picks the top three projects that have the highest priority scores. He is satisfied with the results and logs out of the application.

Scenario One, Use Case Two

Deanne Rollo, aged 38, is a senior manager at EDS/HP company. She has been recently asked by her company leadership to complete three projects for this year. She logs into the “Online Project and Portfolio Management Application” using her credentials (userid and password). She sees two main functionalities on the application; one is to “Prioritize Projects” and the other is to “Assign Work”. She selects the “Assign Work” functionality. The system responds by showing the assign work screen, the screen that has a list of available projects and a list of program managers who are available to take up the work. She selects the project with the highest priority and assigns that project to the program manager from the list. She repeats the process for the other two projects. She assigns all three projects to the same program manager. She is satisfied with the results and logs out of the application.

Scenario Two, Use Case Two

Francis Drake, aged 38, is a program manager at EDS/HP company. His senior manager is Deanne Rollo. His senior manager has recently assigned him three new projects. His job is to assign a project manager to the projects. He logs into the “Online Project and Portfolio Management Application” using his credentials (userid and password). He sees the “Assign Work” functionality on the screen. He selects the “Assign Work” functionality. The system responds by showing the assign work screen, the screen that has a list of available projects that are being assigned to him and a list of project managers who are available to take up the work. He selects the project from the list and assigns that project to the project manager from the list. He repeats the process for the other two projects. He assigns all three projects to different project managers as a project manager can handle only one project. He is satisfied with the results and logs out of the application.

Scenario Three, Use Case Two

John Smith, aged 27, is a project manager at EDS/HP company. His program manager is Francis Drake. His program manager has recently assigned him to a new project. His job is to assign team members to the project task. He logs into the “Online Project and Portfolio Management Application” using his credentials (userid and password). He sees the “Assign Work” functionality on the screen. He selects the “Assign Work” functionality. The system responds

by showing the assign work screen, the screen that shows the project that is assigned to John, the list of tasks of the project and a list of team managers who are available to take up the work. He selects the team member from the list and assigns the project task. He repeats the process for all the tasks of the project. He is satisfied with the results and logs out of the application.

Scenario Four, Use Case Two

Rohit Gupta, aged 22, is a line manager at EDS/HP company. He has been recently asked by his department to assign some research and development work to the security practice team member. The security practice team member has already been actively working on some high priority project. The priority of the research and development project is much lower than that of the project on which the security practice team member is actively working. Rohit's job is to assign the team member to the project task. He logs into the "Online Project and Portfolio Management Application" using his credentials (userid and password). He sees the "Assign Work" functionality on the screen. He selects the "Assign Work" functionality. The system responds by showing the assign work screen, the screen that shows the list of projects, the list of tasks of each project, and the list of team managers. He selects the security practice team member and tries to assign him to the research and development project task. The system responds by throwing a validation message on the screen: "Cannot move from high priority to low priority project". Rohit picks some other team member and assigns the research and development project task to the selected team member. He is satisfied with the results and logs out of the application.

Table B: Scenarios

The analysis document of the project contains the following use cases. The use cases are defined below in **Table C: Use Cases**.

<i>Use Cases</i>	
Use Case One	
	Use Case Number: 1
	Use Case Name: Prioritize Projects
	Primary Actor: An Online Project and Portfolio Management Application User
	Description: User wants to prioritize the projects.
	Pre-Condition: <ul style="list-style-type: none"> ❖ Senior managers are already defined in the system to use the application. ❖ User is a senior manager. ❖ User has logged into "Online Project and Portfolio Management Application". ❖ User has pre-defined list of projects in the system. ❖ User has pre-defined list of organizational goals along with their weight score in the system.
	Post-Condition: <ul style="list-style-type: none"> ❖ User views the priority score of the project.

	<p>Normal Course of Action:</p> <ol style="list-style-type: none">1. System displays the “Prioritize Projects” and “Assign Work” functionalities on the application screen.2. User requests to prioritize the project.3. System displays the projects [projects (pre-defined list in the system)].4. User selects the project from the list.5. System displays the organizational goals [goal] and their weight score [weight (1 to 10)].6. User enters the score [entered_score (1to 10)] for the organizational goals [goal] of the selected project.7. User submits the request to prioritize the project.8. System validates to ensure score is entered for each organizational goal of that project and also, the score is entered between 1 and 10.9. System calculates the prioritization score of the project [total_score=Σ(1 to n goals) entered_score of the goal* weight of the goal].10. System responds by displaying the priority score [total_score] of the project. <p>Alternate Course of Action:</p> <p>8 a. System validation fails and shows a validation message to the user: “Please enter the score for each organizational goal before submitting the request”. Go to step 6.</p> <p>8 b. System validation fails and shows a validation message to the user: “Please enter the score for each organizational goal between 1 and 5”. Go to step 6.</p> <p>Assumptions:</p> <ul style="list-style-type: none">❖ The score for each organizational goal is assumed to be between 1 and 5 for all the organizations that will be using this application.
Use Case Two	
Use Case Number: 2	
Use Case Name: Assign Work	
Primary Actor: An Online Project and Portfolio Management Application User	
Description: User assigns either project to program managers/project managers or assigns tasks of each project to team members.	
Pre-Condition:	
<ul style="list-style-type: none">❖ Senior managers are already defined in the system to use the application.❖ Program managers are already defined in the system to use the application.❖ Project managers are already defined in the system to use the application.❖ Line managers are already defined in the system to use the application.❖ Team members are already defined in the system to use the application.❖ User has logged into “Online Project and Portfolio Management Application”.❖ Pre-defined list of projects in the system.❖ Pre-defined list of tasks for each project in the system. This list is not required if user is a program manager or senior manager.	

	<p>Post-Condition:</p> <ul style="list-style-type: none"> ❖ If user is a senior manager, then user assigns project to program managers. ❖ If user is a program manager, then user assigns project to project managers. ❖ If user is a project manager, then user assigns project task to team members. ❖ If user is a line manager, then user assigns project task to team members. <hr/> <p>Normal Course of Action:</p> <ol style="list-style-type: none"> 1. If user type [type (senior manager, program manager, project manager, team members)] is senior manager, then system displays the “Prioritize Projects ” and “Assign Work” functionalities on the application screen. If user type is program manager or project manager or line manager, then system displays the “Assign Work” functionality on the application screen. 2. User submits the assign work request to the system. 3. If user type is senior manager, then system displays the list of unassigned projects [unassigned_projects] in the system and the list of available program managers in the system [program_managers]. If user type is program manager, then system displays the list of projects [projects_for_program_manager] assigned to program manager and the list of unassigned project managers [unassigned_project_managers]. If user type is project manager, then system displays the assigned project to the project manager [project_for_project_manager], the list of available tasks for that project [project_tasks], and the list of unassigned team members in the system [unassigned_team_members]. If user type is line manager, then system displays the list of available projects [projects] in the system, the list of available tasks [project_tasks] for the project, and the list of team members in the system [team_members]. 4. If user type is senior manager, user selects the unassigned project from the unassigned list of projects and program manager from the available list of program managers and submits the add request [request_type (add)]. If user type is program manager, user selects one of the projects that is assigned to the program manager and selects the unassigned project manager from the list of unassigned project managers and submits the add request [request_type (add)]. If user type is project manager, user selects the task of the project, selects the unassigned team member from the list of unassigned team members, and submits the add request [request_type (add)]. If user type is line manager, user selects the source project, selects the source assigned task, selects the team member, selects the destination project, selects the unassigned destination task, and moves the team member from assigned source task to unassigned destination task [request_type (move)]. 5. System validates the request. 6. System responds by displaying the results on the screen. <hr/> <p>Alternate Course of Action:</p> <ol style="list-style-type: none"> 1. <ol style="list-style-type: none"> a. If the request [request_type] is add system throws a successful message on the screen, go to step 6. b. If the request [request_type] is move system validates that team member is being moved from low priority project to high priority project and
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	<p>throws a successful message on the screen, go to step 6.</p> <p>c. If the request [request_type] is move system validates that team member is not moved from high priority project to low priority project and throws a failure message, “Cannot move team member from high priority project to low priority project” on the screen, go to step 4.</p>
	<p>Assumptions:</p> <ul style="list-style-type: none"> ❖ The line managers have the authority to pull out team members from one project and allocate their time to another project.

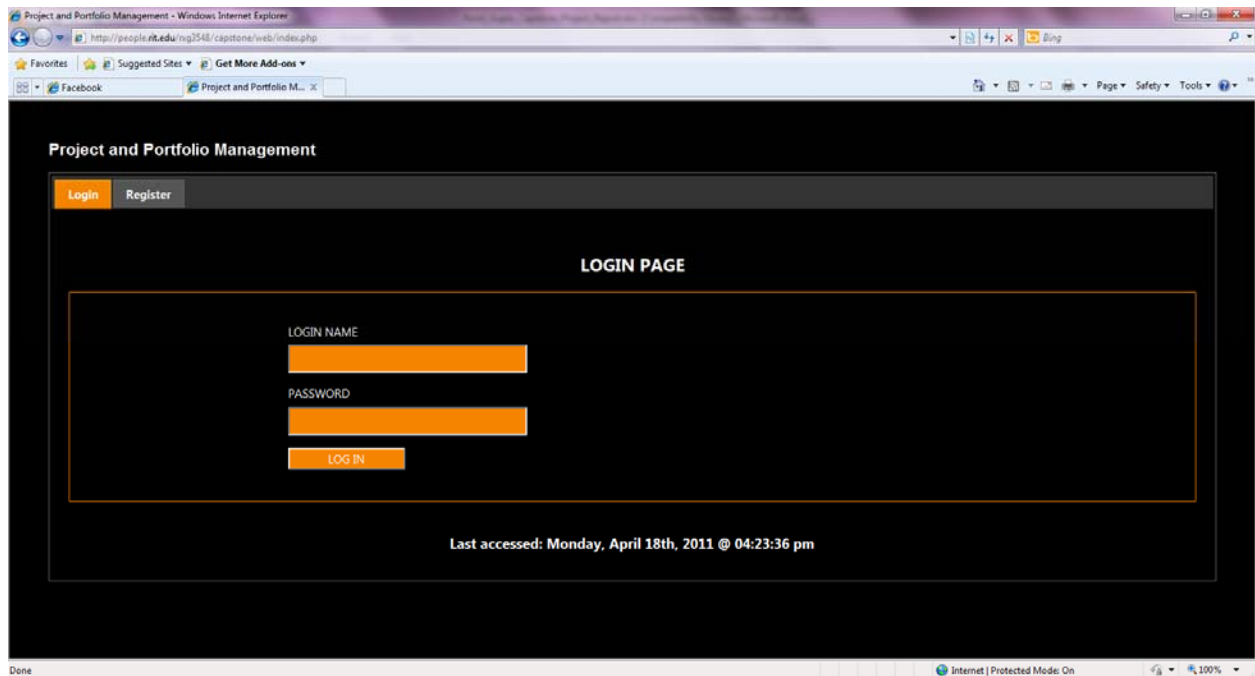
Table C: Use Cases

The design document of the project contains the architecture of the application. The architecture of this project has five layers: presentation layer, messaging layer, business layer, transformation layer, and data layer. The presentation layer uses HTML 5 and CSS 3 features like transition and transformation. This layer has a two-way communication with the messaging layer. The messaging layer uses AJAX Technologies. The XMLHttpRequest will always be used to get and push data using the business logic layer. The business layer basically derives all the business logic of the application. This layer makes requests to the data layer. The data layer sends the response to the transformation layer. The transformation layer sends the transformed data to the business layer. The business layer sends data to the messaging layer after getting the response from the transformation layer in HTML String format. The messaging layer sends the data to the HTML presentation layer. This transformation layer transforms the database data received from the data layer to the HTML String format and sends it back to the business layer. The data layer gets the request from the business layer either to push the data or pull the data. The data layer uses model objects to create, update, and delete the data. The model objects are Goals, Users, Projects, Tasks, UserProjects, UserTasks, and ProjectTasks. Please refer to [Appendix E: Architecture Diagram](#) for the architecture of the application. The design document of the project contains the class diagram. The class diagram is a logical representation of the ‘things’ in a system, a static picture of the pieces in a system and the relationships to other

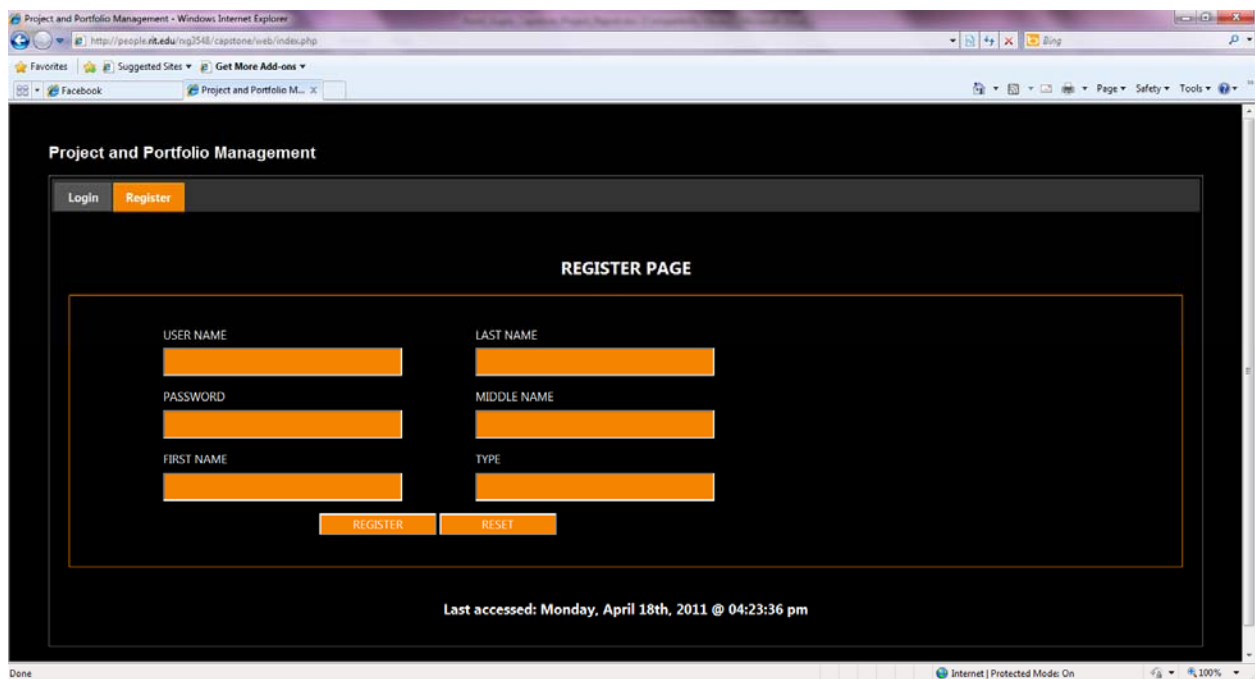
pieces. It is a good tool for team design. It helps developers see and plan the structure before the code is written. It helps to ensure an optimum design from the beginning. Please refer to [Appendix G: Class Diagram](#) for the analytical and the design view of the class diagram. The design document of the project contains the sequence diagram. It is a map of messages in time ordered sequence. It represents objects along the x-axis and messages sequentially ordered along the y-axis. It represents the use cases. Please refer to [Appendix H: Sequence Diagram Assign Work](#) for the analytical and the design view of the sequence diagram for the use case “Assign Work”. Please refer to [Appendix I: Sequence Diagram Prioritize Projects](#) for the analytical and the design view of the sequence diagram for the use case “Prioritize Projects”. The design document of the project contains the Entity Relationship of the database tables. The ER diagram describes the length, name, and constraints of each column in a table. It also shows the relationships between the tables. Please refer to [Appendix F: Entity Relationship Diagram](#) for the ER diagram of the application’s SQLite database.

The implementation document contains the screen shots of the application. The capstone project resulted in an application that has multiple user pages. All these pages are intended to be used by the managers of the organization. The pages are designed as part of application development. The functionalities “Assign Work” and “Prioritize Projects” are embedded into the user interface pages to make a complete interactive online application.

Login Page:



Register Page:



Prioritize Project Page:

Welcome **SAMUEL MCQUADE**
Role: **SENIOR MANAGER**


Project and Portfolio Management LOGOUT

Prioritize Projects **Assign Work**

PRIORITIZE PROJECT PAGE

Available Projects

ONLINE PROJECT AND PORTFOLIO MANAGEMENT APPLICATION

PROJECT ID	PROJECT NAME	PROJECT DESCRIPTION	PROJECT PRIORITY	ACTION
1	ONLINE PROJECT AND PORTFOLIO MANAGEMENT APPLICATION	This Capstone Project will address two important problems. The first problem concerns resolving priority conflicts over the projects among the managers in an organization and the second problem concerns the gap between the projects and the organizational strategies.	90	

Organizational Goals Page:

Weighted Scoring Model

http://people.nit.edu/~ng2548/capstone/web/prioritize.php/projectId=1

Organizational Goals

ORGANIZATIONAL GOALS PAGE

You are prioritizing project **ONLINE PROJECT AND PORTFOLIO MANAGEMENT APPLICATION**

GOAL ID	GOAL NAME	GOAL DESCRIPTION	GOAL WEIGHT	RATING SCORE
1	Market Demand	The project is in market demand.	3	1 ● 2 ● 3 ● 4 ● 5 ●
2	Business Need	There is a business need for the project.	2	1 ● 2 ● 3 ● 4 ● 5 ●
3	Customer Request	The customer is requesting for the project.	6	1 ● 2 ● 3 ● 4 ● 5 ●
4	Technology Advance	The project is for technology advancement.	5	1 ● 2 ● 3 ● 4 ● 5 ●
5	Legal Requirements	The project is for legal requirements.	8	1 ● 2 ● 3 ● 4 ● 5 ●

RESET **CALCULATE PRIORITY**

Assign Work Page:

Prioritize/Assign Page - Windows Internet Explorer

http://people.nit.edu/ng3548/capstone/web/application.php

Assigned Projects

ONLINE PROJECT AND PORTFOLIO MANAGEMENT APPLICATION

PROJECT ID	PROJECT NAME	PROJECT DESCRIPTION	ASSIGNED TO PROJECT MANAGER	ASSIGNED BY PROGRAM MANAGER	ACTION
1	ONLINE PROJECT AND PORTFOLIO MANAGEMENT APPLICATION	This Capstone Project will address two important problems. The first problem concerns resolving priority conflicts over the projects among the managers in an organization and the second problem concerns the gap between the projects and the organizational strategies.	ROHIT GUPTA	ABBY BERNER	REASSIGN MANAGER

Project Tasks

DESIGN OF APPLICATION

TASK ID	TASK NAME	TASK DESCRIPTION	ASSIGNED TO TEAM MEMBER	ASSIGNED BY MANAGER	ACTION
1	DESIGN OF APPLICATION	The design phase will include architectural, database and class diagrams of the project.	CHRIS DUKE	ABBY BERNER	REASSIGN TEAM MEMBER

Done

Internet | Protected Mode: On

100%

Assign Manager Page:

Assign Managers - Windows Internet Explorer

http://people.nit.edu/ng3548/capstone/web/assign.php?projectId=1

Welcome **ABBY BERNER**

Role: PROGRAM MANAGER

Selected project: ONLINE PROJECT AND PORTFOLIO MANAGEMENT APPLICATION

Existing Manager: ROHIT GUPTA

[GO BACK](#)

Assign Managers

[Assign/Reassign](#)

ASSIGN MANAGERS WORK PAGE

You are assigning project **ONLINE PROJECT AND PORTFOLIO MANAGEMENT APPLICATION** to a manager.

Available Project Managers

LARRY KELLEY

USER ID	FIRST NAME	LAST NAME	TYPE
5	LARRY	KELLEY	PROJECT MANAGER

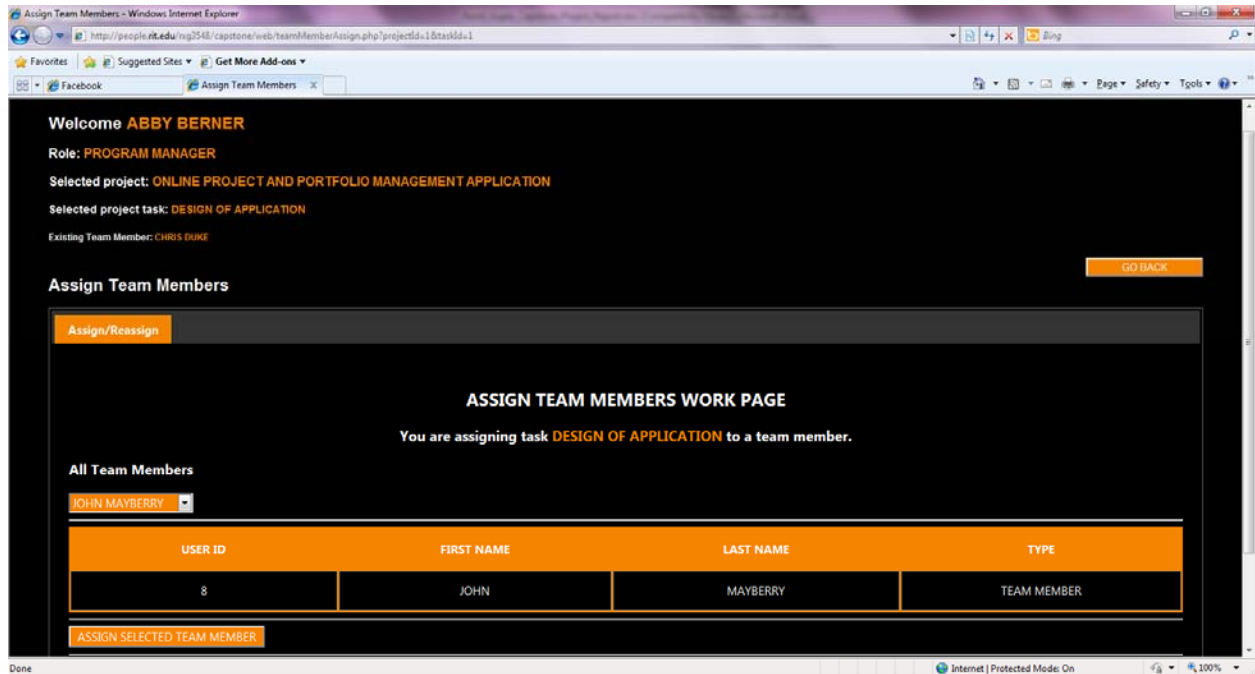
[ASSIGN SELECTED MANAGER](#)

Done

Internet | Protected Mode: On

100%

Assign Team Member Page:



The testing document of the project contains two test cases. The first test case is on the prioritize project functionality. Please refer to [Appendix J: Test Case Prioritize Projects](#) for the details. The second test case is on the assign work functionality. Please refer to [Appendix K: Test Case Assign Work](#) for the details.

Conclusion and Recommendation

Recap of the Nature and Extent of the Problem

The problem of project priority conflict is very steady and inevitable in all kinds of organizations irrespective of the structure and the type of organization. The constant existence of this problem in organizations makes it more desired to be resolved. Sometimes, the priority of the projects is not properly communicated by high level managers to low level managers which makes it even more difficult for the low level managers to understand the importance of the successful completion of the high priority projects for the organization. The managers are always worried about the projects for which they are responsible whereas the organization is more inclined towards the successful outcome of the high priority projects. The difference of goals among the managers causes project priority conflicts. The expert from the *ProjectMinds* organization, Singh (2002), has mentioned the three categories of conflicts within the project. Conflicts in projects typically fall into three categories: conflict over different objectives and expectations, unclear roles and uncertainty about who has the decision-making authority, and interpersonal conflicts among people (Resolving Conflicts, para.1). The project priority conflict arises from the first category where high level managers and low level managers have different objectives and expectations. The conflict among managers on resources, for example, the conflict between the line managers and the project managers, could put the project as well as administrative work in jeopardy. The risk of conflict is very high in any organization. The repercussion of this problem is very severe as it could lead to the failure of the projects. The failed projects can degrade the company's image. It is important to recognize this problem and assess the critical nature of the problem. It is very important to mold the conflicts into a

constructive form that would not only increase the efficiency and performance of the organization but also increase the morale of the employees.

The problem of gap between organizational goals and the selection of projects degrades the performance, efficiency, and the project results of the organization. Failed projects or terminated projects due to a poor or inconsistent selection model cause loss of business revenue which, in turn, brings down the whole business structure. Not only is there a risk of failure of the projects but also a case of handling more projects than the organization can handle. The overloading of projects put too much pressure on the limited resources. As a result, the organization suffers from the consequences of slippage in schedule and budget overruns and conflicts among team members. It is worth putting time and effort into selecting the right type and number of projects for any organization, for example, if an organization is launching a new product and this new product project is not properly evaluated against other products which are already out there in the market, then it is highly unlikely that the project would be successful. It would be better for the organization to evaluate the projects using some criteria, such as competitive or comparative analysis, and then select the project; otherwise, it is bound to fail. Russell and Brown (2008) have described the importance of getting projects to meet organizational goals: “In the past, a project that was on time and on budget was considered a success”. The organizational goals are rapidly evolving and changing; it is very crucial for project managers and senior managers to understand how to connect strategy to projects (Getting Your Projects to Meet Strategic Goals, para.2). The linkage between the strategic plans and the selection of projects builds a strong framework for the successful projects. The non-existence of strategic plans and the selection model could allow senior managers or leaders within the organization to select the projects based on their power and influence.

Summary of overall accomplishments, findings, and project solution(s)

The Information Systems analyst, Ohlendorf (2001), has described in one of her articles the five ways to resolve conflict in an organization. The five types are smoothing, forcing, avoiding, confronting, and compromising (Conflict Resolution in Project Management, para.4). The application that I have developed will bring the sixth type and that will be automating. The application will alert the managers about the conflict situations when resources are being reassigned from one project to another project. The project oriented organizations could benefit a lot from this application in terms of resolving project priority conflicts among project managers, program managers, and line managers. The team members of the organization would not be overloaded with work and this would help the organization to improve its efficiency and performance. The selection of projects using an application which has an automated scoring model would not only help organizations to select the projects using a consistent model but would also help in selecting the projects using the organizational goals. There are many web based project and portfolio management applications that provide some kind of automation in terms of time management by team members or project tracking by project managers or generation reports for the senior managers. The existing web based applications do not provide any automated scoring model to prioritize the projects. The “Online Project and Portfolio Management Application” provides a technology advancement over their web based products in the market. The application also provides a centralized source of project priority. In this way, all the users of this application would know the priority of the project on which they are working. Many organizations struggle to communicate the project priority from high level to low level. In other words, team members or project managers working on the projects are usually unaware of the project priority.

The capstone project application would help the organizations to enforce the weighted scoring model to select the projects. This enforcement of selection model would prevent the mixing of politics with the project management, for example, if an organization does not have any selection model, then most of the projects in the organization are selected by senior leaders or sponsors without any evaluation criteria. The senior leaders use their power and influence to select the projects. These kind of selected projects are known as sacred cow projects. As described by the organization, *Info Source*, politics are inevitable in every organization and can have a big effect on all kinds of decisions from selection to termination of projects. The priority and budgeting of the project are determined by the politics within the organization. The politics in an organization may be defined as actions by senior managers or groups of managers to attain, develop, and use power and other resources in order to obtain preferred outcomes when there is uncertainty or disagreement over choices. The existence of political behavior is much more likely to occur when competition among the projects for the scarce resources is high and also, the selection models are highly uncertain. If this is the case, project selection is ripe for politics given the uncertainty surrounding the feasibility of projects and the competition between projects for funding: “Such selection will be based not so much on facts and sound reasoning, but rather on the persuasiveness and power of the people presenting the facts” (Project Selection and Organizational Politics, para. 2). The application that I have developed ensures the existence of a consistent selection model that would definitely help the firm keep politics away from the selection of the projects and of course, prioritize the projects based on the model, not on politics. The application enforces top management to select the projects based on the automated web application which results in reducing the impact of internal politics on the selection and prioritization of the projects.

Recommendations regarding project solution

The application that has been developed as an outcome of this capstone project can be used by all the project oriented organizations. Organizations using this application can add admin functionality to the application. The functionality would allow administrators to add, modify, and remove the organizational goals from the system. This functionality would give flexibility to the organizations to customize and configure the organizational goals of the weighted scoring model. The strategic plan of the organization keeps on changing from time to time, so addition of the admin functionality would be a good add to the application. The admin functionality could also be used to create new projects within the system. This would allow organizations to add new projects to the application system and make them available to be prioritized by the senior managers. Currently, this application does not provide team members of the project to log into the application and log the number of hours worked on the project tasks. The organization could modify the application to provide a time logging functionality for the team members of the project. The functionality would allow team members to enter working hours not only on the weekdays but also on the weekends. As we have seen, due to a lot of work pressure, many employees end up working on the weekends. This would help the project managers to distribute the workload appropriately among the team members. This functionality would allow project managers to keep track of their projects in terms of hours and days. This would help project managers to generate billing reports for the senior managers. Currently, this application does not allow the project managers to divide the projects into tasks using the web page. Organizations using this application could develop a new web page for the project managers to create new tasks for the projects that are being assigned to them.

The artifacts that are developed and designed as the outcome of this project, for example, class diagram, sequence diagram, architecture diagram, and entity relationship diagram, could be used by the organizations to understand and enhance the functionality of the application. There are many things that could be added to this application to make it competitive with other web based project and portfolio management products. Nowadays, the auditing and reporting features of a product are the most required and used features. With the introduction of a new table within the existing database, the capstone project application could be extended to have an auditing and reporting feature. The new table could be used to record all the actions taken by the managers and team members, for example, time logging or assignment of team members to the project or prioritization of the project. The logged actions can be used for the reporting feature. The reporting feature could be made available either in Adobe portable document format or Microsoft excel format. To make this application competitive with other web based applications, organizations could provide the language bundles to support multiple languages on the application. With globalization, many organizations have their branches spread all over the globe. The addition of a multiple languages support could allow the users of the application to select the language on the login page of the application. This functionality would definitely increase the number of audiences who will be using the application and also, users will feel much more comfortable in using and understanding the functionality in whatever language they are comfortable with.

There are a few things that I would have done differently when completing this project if I had the chance to do it over again. One of the main areas I would look at is making rich user interface web pages. There are so many user rich interactive functionalities provided by Hyper Text Markup language 5 (HTML 5) and Cascading style sheet 3 (CSS 3) technologies which

could be used to make web pages that are user friendly and appealing to the eyes. The functionalities like drag and drop could be used instead of the simple drop down list selection. The reassigning and assigning of team members or managers functionality within the application could be enhanced with drag and drop features of new versions of HTML and CSS technologies. The other thing that I would have done is to introduce a feedback web page. The feedback page would have helped to constantly evolve and improve the application based on the end user's experience.

My advice to other students or professionals taking the capstone course is to start planning for your capstone project from the day you join the graduate program. It is very important to have a vision and goal. Make sure that you use the "Context & Trends" course as the foundation step for the final capstone project. I had a vision from the start of integrating the project management field with the information technology field. Therefore, it became easy for me to write the proposal and finish my capstone project on time. The one thing I would caution students is that it is absolutely crucial to determine the scope of the project. Sometimes, the nature of the capstone project could lure students into doing too much and may cause timeline issues. So make sure the scope creep problem does not creep into your project.

Course Concentrations:

Concentration A: Project Management

Course	Course Number	Credit Hours
Project Management	0681.710.90	4
Advanced Project Management	0681.711.70	4
International Project Management	0681.712.90	4
Total:		12

Concentration B: Computing and Information Sciences

Course	Course Number	Credit Hours
Web Site Design & Tech	4004.737.70	4
Programming For Www	4004.739.01	4
Web-Database Integration	4004.751.70	4
Object Technologies	4002.710.39	4
Total:		16

Electives, Pre-requisites and Required Courses

Course	Course Number	Credit Hours
Geodatabase Development & Implementation	0693.704.70	4
Intro Geograph Info Sys	0693.701.70	4
Security Technology Management	0696.700.90	4
Context & Trends	0699.705.70	4
Java For Programmers	4002.714.70	-
Capstone Project	0699.775.90	4
Total:		20

The project management concentration courses laid out the framework for completing my capstone project. The process of following the project management methodology helped me to complete the capstone project on time without any slippage. I was able to keep track of project tasks and finish the project tasks before the deadline dates. The deadline dates were laid out in an MS project plan and this plan was designed as part of the project management methodology. The knowledge that I obtained from this concentration helped me to design the Work Break Down Structure for my capstone project. I learnt how to use software MS Project and this software helped me to write the action plan for my project.

The Computing and Information Science courses helped me to design, develop, and implement the “Online Project and Portfolio Management Application”. The course “Website Design & Tech” was focused on designing the user interfaces for the websites. It was through this course that I obtained knowledge of end-user website pages. I implemented this obtained knowledge in my capstone project and as a result, I implemented user pages for my application. I learnt the server side language PHP from the course “Programming for Ww”. I used this language to write the business logic for my application. I learnt the designing of SQLite database and also the integration of PHP application with SQLite database from the course “Web-Database Integration”. I used this course knowledge to integrate and design SQLite database with my project application. The object oriented concepts that I obtained from the course “Object Technologies” helped me to write the source code of my application in a way that can be easily expanded for more functionalities and also can be changed based on the organization’s requirements. Finally, with the help of the “Contexts and Trends” course, I was able to integrate the knowledge from both concentrations and solve real world problems.

Limitations

There are many limitations for this prototype application. The first limitation is that application doesn't support multiple selection models to select and prioritize the projects. Currently, the developed prototype supports only weighted scoring model. The application could be extended to support multiple numerical and non-numerical models to prioritize the projects. This would allow senior managers to select the model based on the organizations' requirement. The second limitation is that it doesn't allow the senior managers to change the weight of the organizational goals. The functionality of making organizational goal customizable would allow senior managers to adjust the weight of the organizational goal which could vary from time to time. The third limitation is that application does not provide team members of the project to log into the application and log the number of hours worked on the project tasks. The addition of this functionality provides project managers to track the working hours on project tasks. The fourth limitation is that application does not allow the project managers to divide the projects into tasks using the web page. The fifth limitation is that application doesn't have any multiple language support, the developed prototype supports only English language. The sixth limitation is that auditing and reporting functionality is missing. Addition of this functionality could be helpful for the auditors to do their job and also to find out if there is any compliance violation on the organizational policy. As far as user interface is concerned the application limitation is on the new features on HTML and CSS technologies. The application could be enhanced to include drag and drop features or thick box features. The last limitation is the absence of the feedback web page. The addition of this webpage would help the organizations to improve this product based on the end user's feedback.

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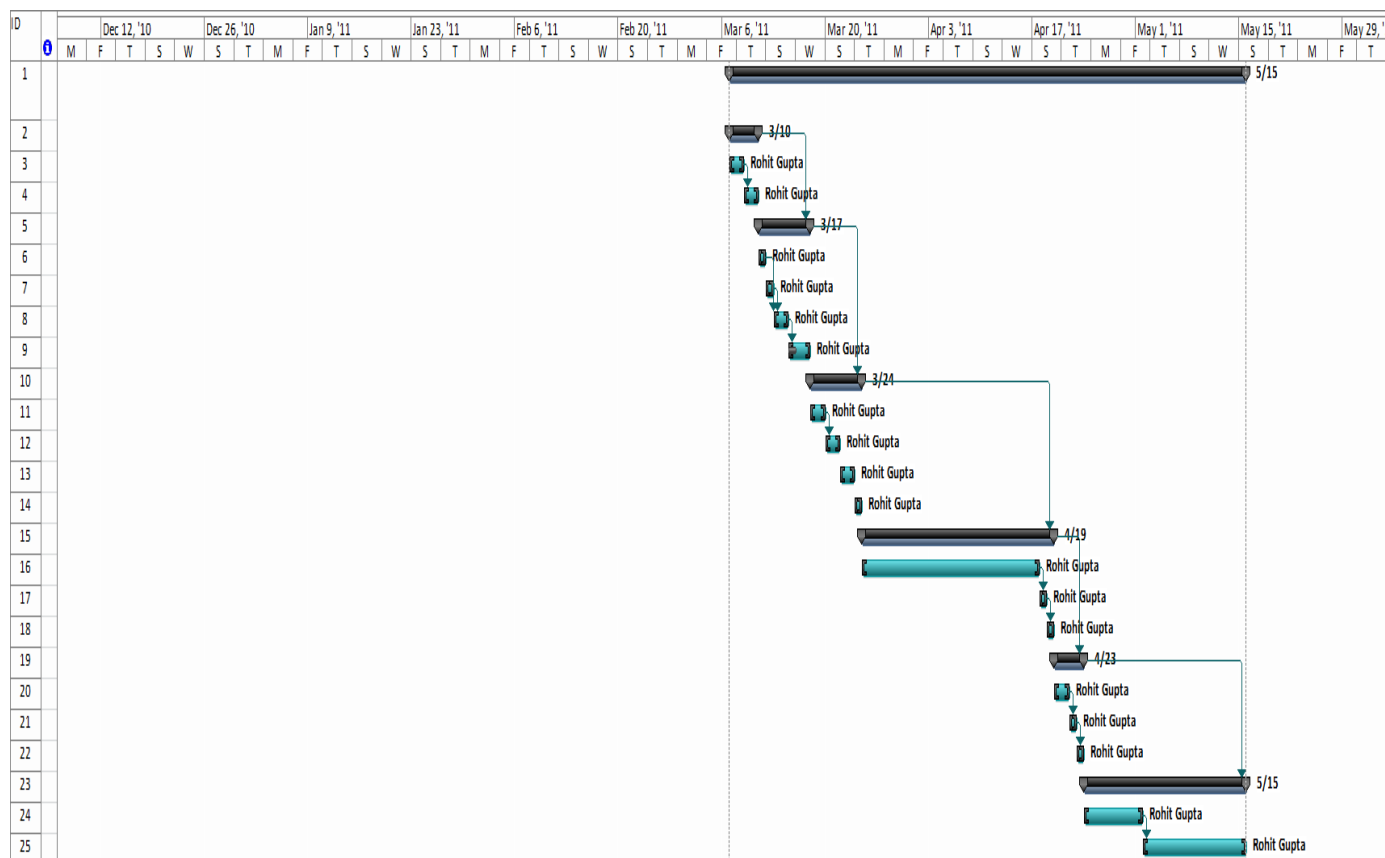
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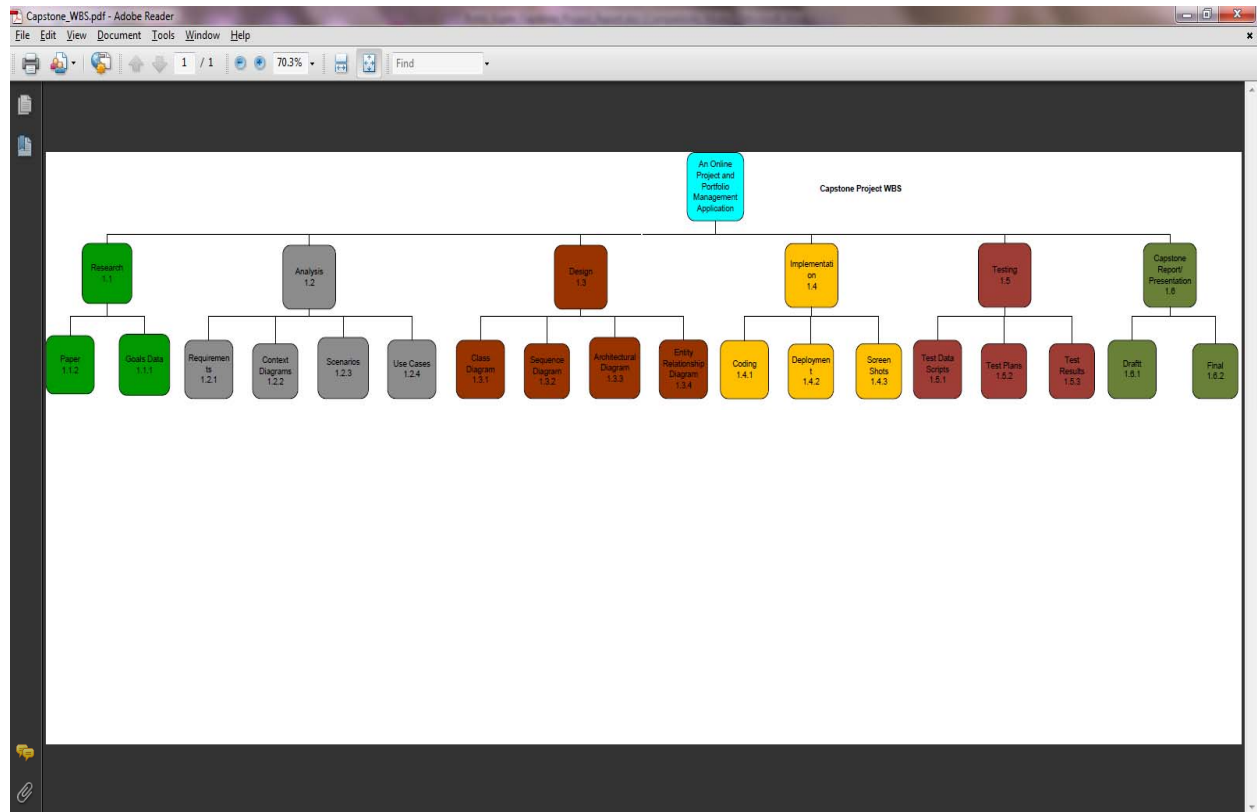
Appendix A: Action Plan

ID	Task Mode	Task Name	Duration	Start	Finish	Predecessors	Resource Names																
								1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
								Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May
1		An Online Project and Portfolio Management	70 days	Mon 3/7/11	Sun 5/15/11																		
2		Research	4 days	Mon 3/7/11	Thu 3/10/11																		
3		Goals Data	2 days	Mon 3/7/11	Tue 3/8/11		Rohit Gupta																
4		Paper	2 days	Wed 3/9/11	Thu 3/10/11	3	Rohit Gupta																
5		Analysis	7 days	Fri 3/11/11	Thu 3/17/11	2																	
6		Requirements	1 day	Fri 3/11/11	Fri 3/11/11		Rohit Gupta																
7		Context Diagram	1 day	Sat 3/12/11	Sat 3/12/11		Rohit Gupta																
8		Scenarios	2 days	Sun 3/13/11	Mon 3/14/11	7,6	Rohit Gupta																
9		Use Cases	3 days	Tue 3/15/11	Thu 3/17/11	8	Rohit Gupta																
10		Design	7 days	Fri 3/18/11	Thu 3/24/11	5																	
11		Class Diagram	2 days	Fri 3/18/11	Sat 3/19/11		Rohit Gupta																
12		Sequence Diagram	2 days	Sun 3/20/11	Mon 3/21/11	11	Rohit Gupta																
13		Architectural Diagram	2 days	Tue 3/22/11	Wed 3/23/11		Rohit Gupta																
14		Entity Relationship Diagram	1 day	Thu 3/24/11	Thu 3/24/11		Rohit Gupta																
15		Implementaion	26 days	Fri 3/25/11	Tue 4/19/11	10																	
16		Coding	24 days	Fri 3/25/11	Sun 4/17/11		Rohit Gupta																
17		Deployment	1 day	Mon 4/18/11	Mon 4/18/11	16	Rohit Gupta																
18		Screen Shots	1 day	Tue 4/19/11	Tue 4/19/11	17	Rohit Gupta																
19		Testing	4 days	Wed 4/20/11	Sat 4/23/11	15																	
20		Test Data Scripts	2 days	Wed 4/20/11	Thu 4/21/11		Rohit Gupta																
21		Test Plans	1 day	Fri 4/22/11	Fri 4/22/11	20	Rohit Gupta																
22		Test Results	1 day	Sat 4/23/11	Sat 4/23/11	21	Rohit Gupta																
23		Capstone Report/Presentation	22 days	Sun 4/24/11	Sun 5/15/11	19																	
24		Draft	8 days	Sun 4/24/11	Sun 5/1/11		Rohit Gupta																
25		Final	14 days	Mon 5/2/11	Sun 5/15/11	24	Rohit Gupta																

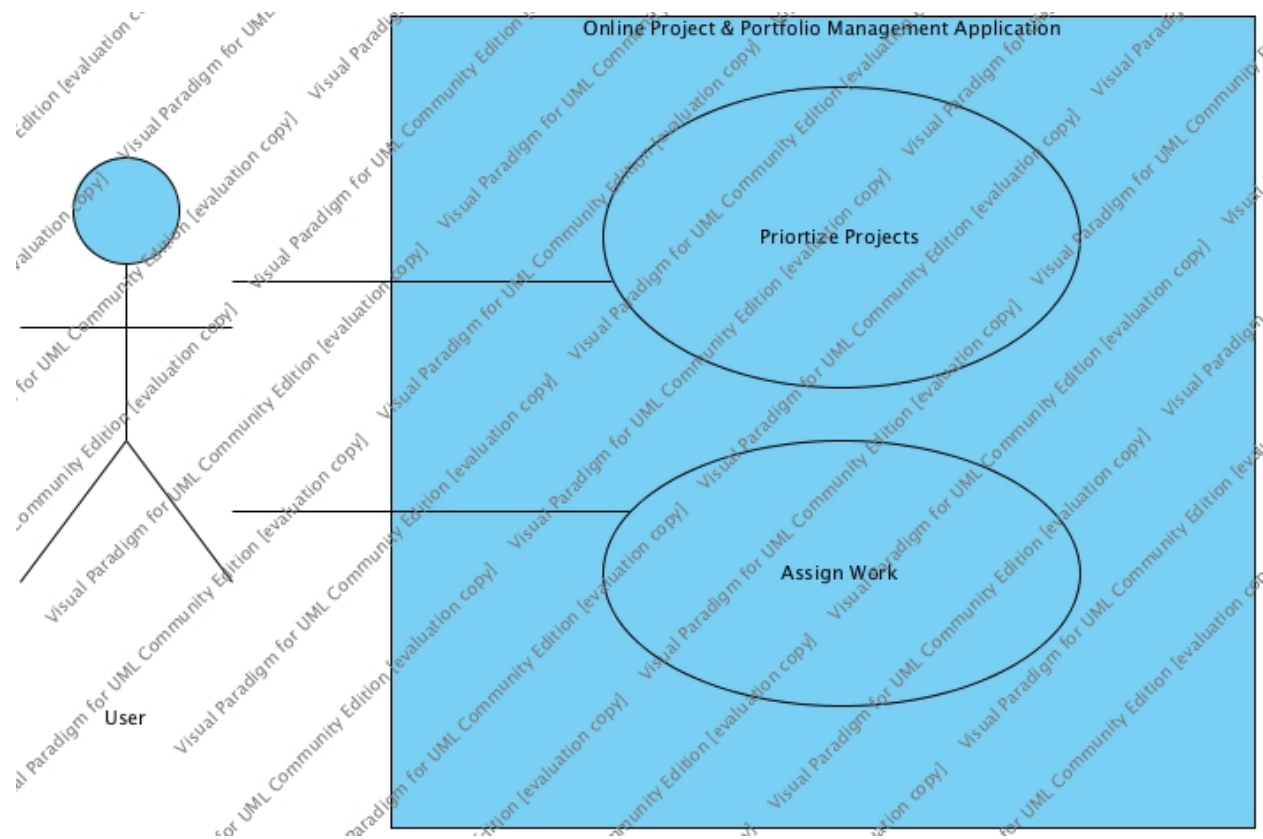
Appendix B: Gantt Chart



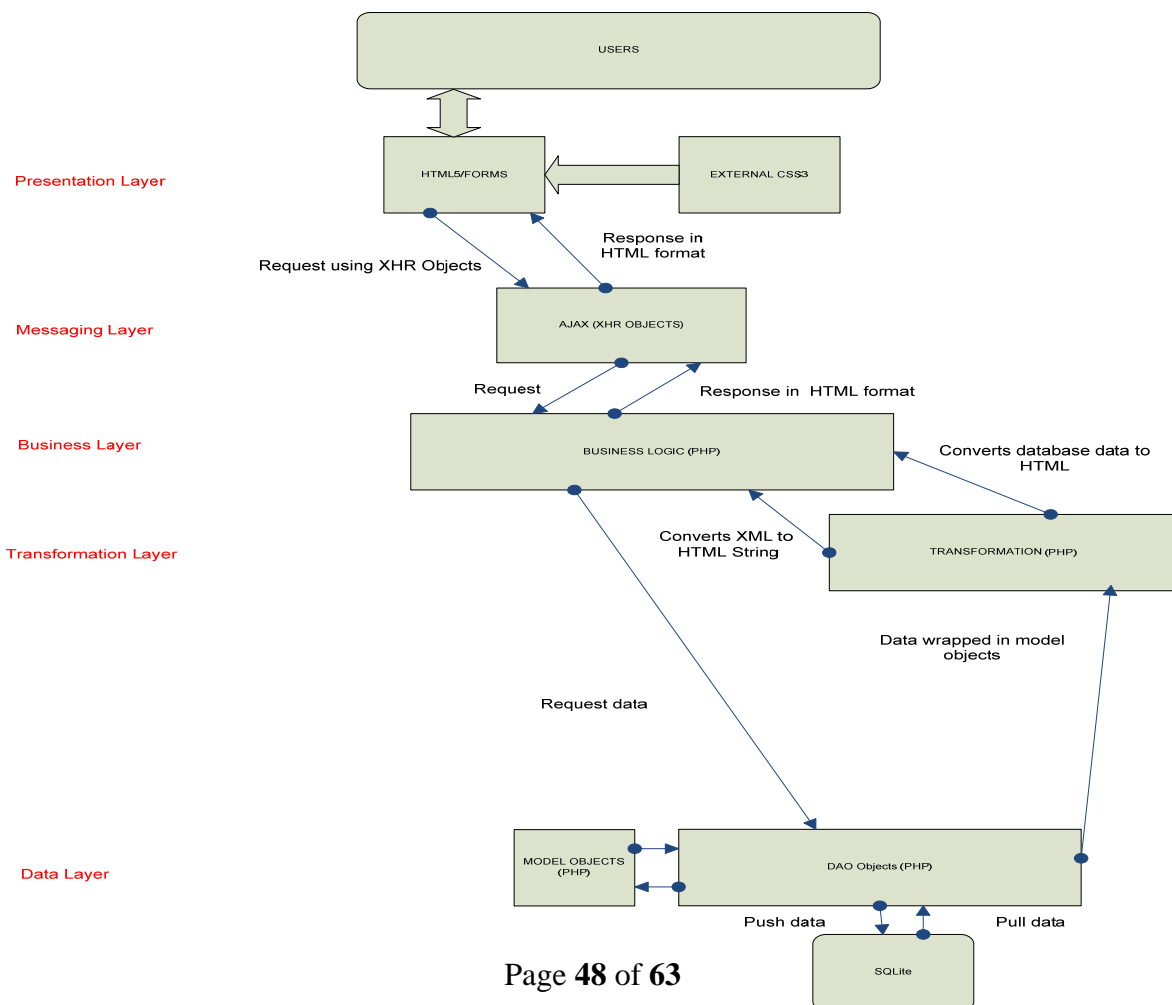
Appendix C: Work Breakdown Structure



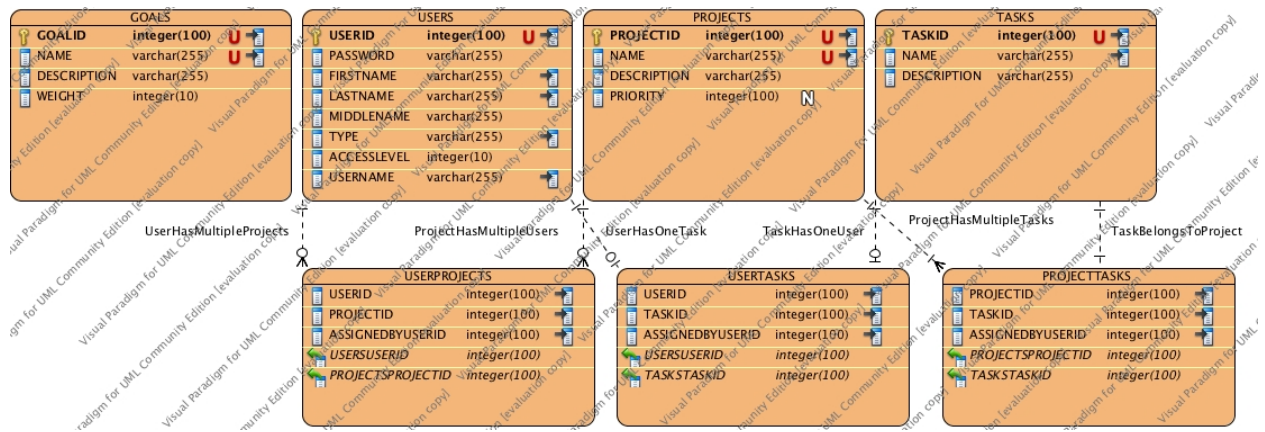
Appendix D: Context Diagram



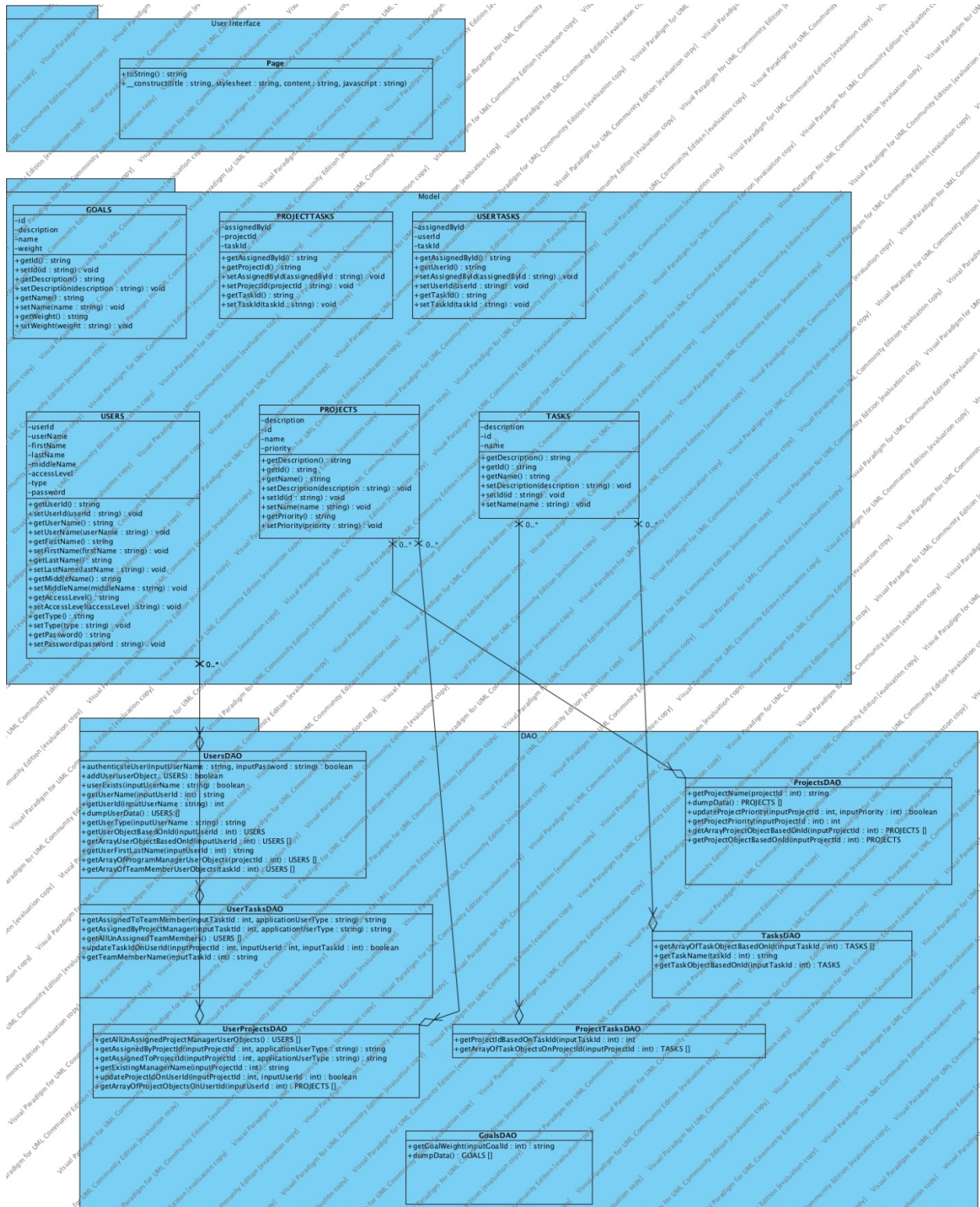
Appendix E: Architecture Diagram



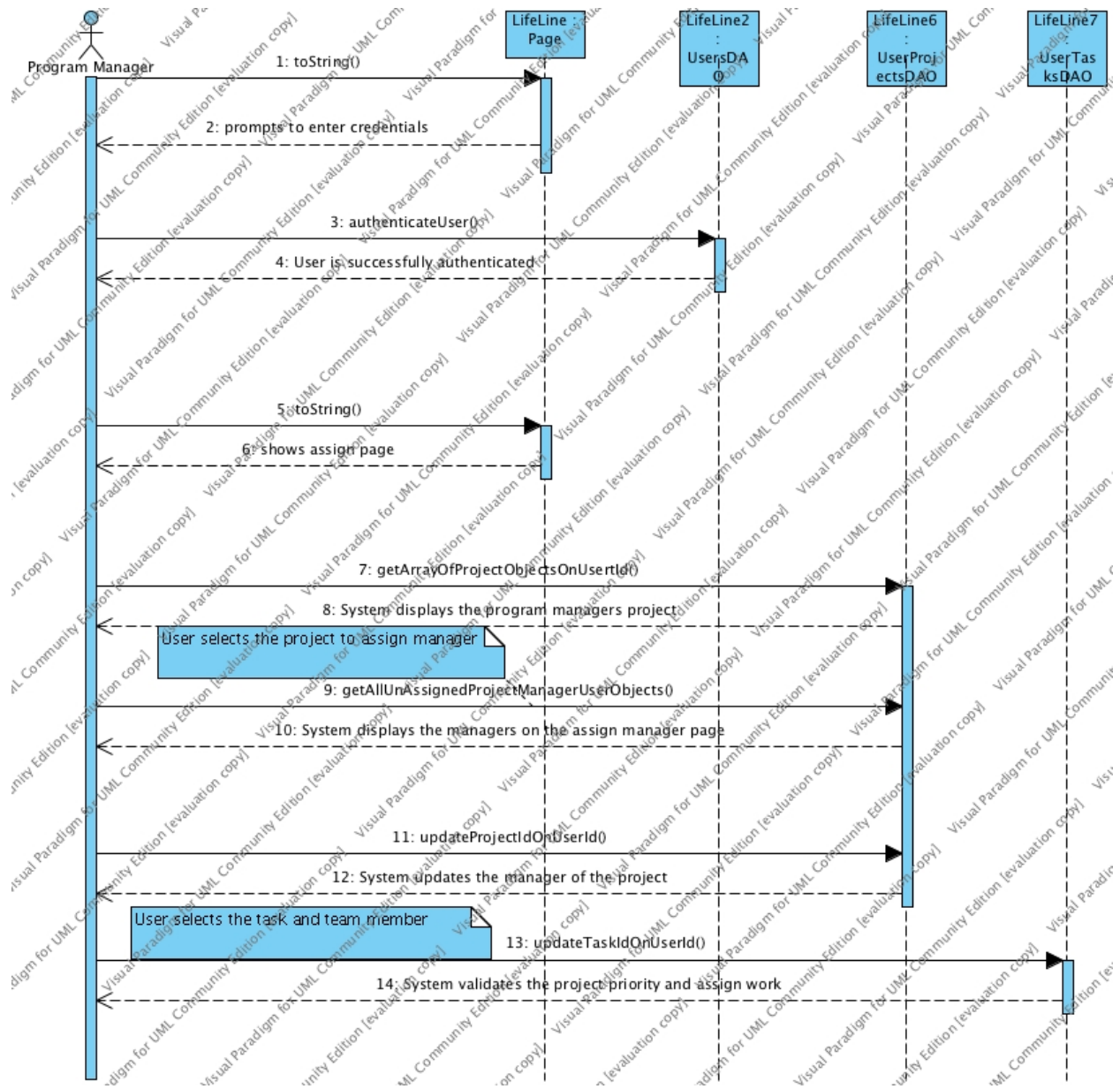
Appendix F: Entity Relationship Diagram



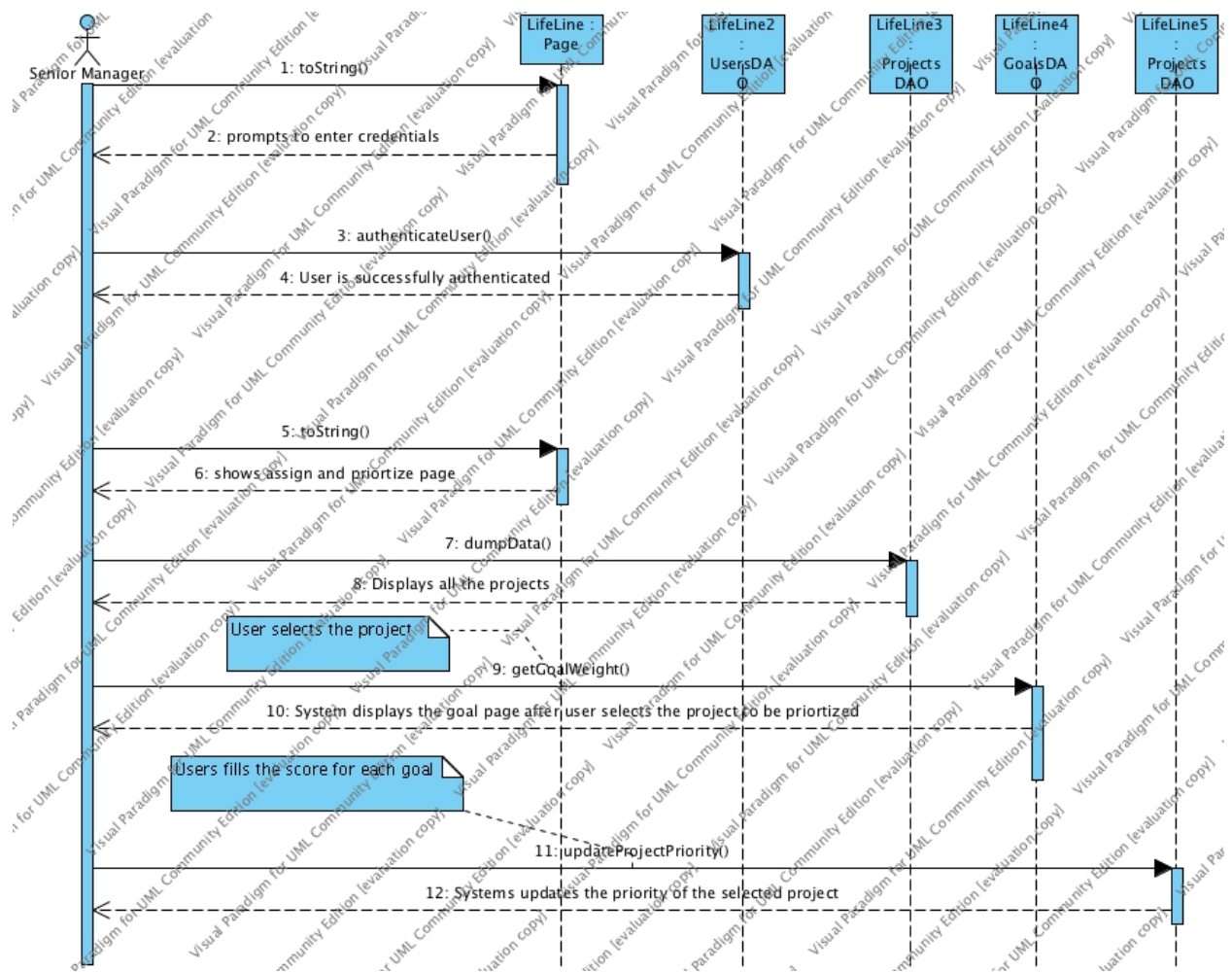
Appendix G: Class Diagram



Appendix H: Sequence Diagram Assign Work



Appendix I: Sequence Diagram Prioritize Projects



Appendix J: Test Case Prioritize Projects

Task Number	Task	Responsibility
1	<p>Senior Manager logs into an “Online Project and Portfolio Management Application”.</p> <p>LOGIN NAME: SAM</p> <p>PASSWORD: CAPSTONE</p> <p>URL: http://people.rit.edu/rxg3548/capstone/web/index.php</p> <p>Validate that the senior manager is successfully logged into the system with the above mentioned credentials.</p>	Senior Manager
2	Validate that senior manager sees the “Assign Work” and “Prioritize Projects” functionalities.	Senior Manager
3	<p>Validate that senior manager sees projects mentioned below.</p> <ul style="list-style-type: none"> • Online Project and Portfolio Management Application. • Increasing Internet Presence Through Social Media. • Oxygen Management System. 	Senior Manager
4	Validate that senior manager is redirected to the “ORGANIZATIONAL GOALS PAGE” once senior manager selects the “Increasing Internet Presence Through Social Media” project and submits the “PRIORITIZE” button.	Senior Manager
5	Validate that priority of the selected project is calculated and shown to senior manager on the “ORGANIZATIONAL GOALS PAGE” once senior manager fills the score card of the organizational goals.	Senior Manager
6	Validate that new priority of the selected project is shown to senior manager on the “PRIORITIZE PROJECT PAGE” once senior manager submits the “GO BACK” button on the “ORGANIZATIONAL GOALS PAGE”.	Senior Manager

Appendix K: Test Case Assign Work

Task Number	Task	Responsibility
1	Senior Manager logs into an “Online Project and Portfolio Management Application”. LOGIN NAME: SAM PASSWORD: CAPSTONE URL: http://people.rit.edu/rxg3548/capstone/web/index.php Validate that the senior manager is successfully logged into the system with the above mentioned credentials.	Senior Manager
2	Validate that senior manager sees the “Assign Work” and “Prioritize Projects” functionalities.	Senior Manager
3	Validate that senior manager sees projects mentioned below. <ul style="list-style-type: none"> • Online Project and Portfolio Management Application. • Increasing Internet Presence Through Social Media. • Oxygen Management System. 	
4	Validate that the senior manager is redirected to the “ASSIGN MANAGERS WORK PAGE” once senior manager selects tab “Assign Work”, selects the project “Online Project and Portfolio Management Application”, and submits the “ASSIGN MANAGER” button.	Senior Manager
5	Validate that senior manager sees “ABBY BERNER” and “ELLEN HAMLIN” as the listed program managers on the “ASSIGN MANAGERS WORK PAGE”.	Senior Manager
6	Validate that new selected manager is shown as “Existing Manager: ABBY BERNER” to the senior manager on the “ASSIGN MANAGERS WORK PAGE” once senior manager selects the ABBY BERNER from the available program managers list and submits the “ASSIGN SELECTED MANAGER” button on the “ASSIGN MANAGERS WORK PAGE”.	Senior Manager
7	Validate that new selected manager is shown to the senior manager on the “ASSIGN WORK PAGE” once senior manager submits the “GO BACK” button on the “ASSIGN MANAGERS WORK PAGE”.	Senior Manager
8	Repeat Steps 4 to 7 Select Project: Increasing Internet Presence Through Social Media Select Program Manager: ABBY BERNER	Senior Manager
9	Repeat Steps 4 to 7 Select Project: Oxygen Management System Select Program Manager: ELLEN HAMLIN	Senior Manager
10	Validate that system is redirected to login page once senior manager submits “LOGOUT” button.	Senior Manager
11	Program Manager logs into an “Online Project and Portfolio Management Application”. LOGIN NAME: ABBY PASSWORD: CAPSTONE URL: http://people.rit.edu/rxg3548/capstone/web/index.php	Program Manager

	Validate that the program manager is successfully logged into the system with the above mentioned credentials.	
12	Validate that program manager sees the “Assign Work” functionality.	Program Manager
13	Validate that program manager sees projects mentioned below. <ul style="list-style-type: none"> Online Project and Portfolio Management Application. Increasing Internet Presence Through Social Media. 	Program Manager
14	Validate that the program manager is redirected to the “ASSIGN MANAGERS WORK PAGE” once program manager selects tab “Assign Work”, selects the project “Online Project and Portfolio Management Application”, and submits the “ASSIGN MANAGER” button.	Program Manager
15	Validate that program manager sees “LAURIE PLANTS”, “LARRY KELLEY”, and “ROHIT GUPTA” as the listed project managers on the “ASSIGN MANAGERS WORK PAGE”.	Program Manager
16	Validate that new selected manager is shown as “Existing Manager: ROHIT GUPTA” to the program manager on the “ASSIGN MANAGERS WORK PAGE” once program manager selects the ROHIT GUPTA from the available project managers list and submits the “ASSIGN SELECTED MANAGER” button on the “ASSIGN MANAGERS WORK PAGE”.	Program Manager
17	Validate that new selected manager is shown to the program manager on the “ASSIGN WORK PAGE” once program manager submits the “GO BACK” button on the “ASSIGN MANAGERS WORK PAGE”.	Program Manager
18	Repeat Steps 14 to 17 Select Project: Increasing Internet Presence Through Social Media Select Project Manager: LAURIE PLANTS	Program Manager
19	Validate that system is redirected to login page once program manager submits “LOGOUT” button.	Program Manager
20	Project Manager logs into an “Online Project and Portfolio Management Application”. LOGIN NAME: ROHIT PASSWORD: CAPSTONE URL: http://people.rit.edu/rxg3548/capstone/web/index.php Validate that the project manager is successfully logged into the system with the above mentioned credentials.	Project Manager
21	Validate that project manager sees the “Assign Work” functionality.	Project Manager
22	Validate that project manager sees projects mentioned below. <ul style="list-style-type: none"> Online Project and Portfolio Management Application. 	Project Manager
23	Validate that the project manager is redirected to the “ASSIGN TEAM MEMBERS WORK PAGE” once project manager selects tab “Assign Work”, selects the project “Online Project and Portfolio Management Application”, selects the task “DESIGN OF APPLICATION”, and submits	Project Manager

	the “ASSIGN TEAM MEMBER” button.	
24	Validate that project manager sees “JOHN MAYBERRY”, “DENNIS SCHMIDT”, “ALAN KOTAS”, and “CHRIS DUKE” as the listed team members on the “ASSIGN TEAM MEMBERS WORK PAGE”.	Project Manager
25	Validate that new selected team member is shown as “Existing Team Member: JOHN MAYBERRY” to the project manager on the “ASSIGN TEAM MEMBERS WORK PAGE” once project manager selects JOHN MAYBERRY from the available team members list and submits the “ASSIGN SELECTED TEAM MEMBER” button on the “ASSIGN TEAM MEMBERS WORK PAGE”.	Project Manager
26	Validate that new selected team member is shown to the project manager on the “ASSIGN WORK PAGE” once project manager submits the “GO BACK” button on the “ASSIGN TEAM MEMBERS WORK PAGE”.	Project Manager
27	Repeat Steps 23 to 27 Select Project: Online Project and Portfolio Management Application Select Team Member: ALAN KOTAS Available Team Members: ALAN KOTAS, DENNIS SCHMIDT, CHRIS DUKE Select Task: DEVELOPMENT OF APPLICATION	Project Manager
28	Validate that system is redirected to login page once program manager submits “LOGOUT” button.	Project Manager
29	Repeat Steps 20 to 26 LOGIN NAME: LAURIE PASSWORD: CAPSTONE URL: http://people.rit.edu/rxg3548/capstone/web/index.php Project : Increasing Internet Presence Through Social Media Select Team Member: CHRIS DUKE Available Team Members: DENNIS SCHMIDT, CHRIS DUKE Select Task: INTERNET MARKETING PLAN	Project Manager
30	Repeat Steps 23 to 27 Project : Increasing Internet Presence Through Social Media Select Team Member: DENNIS SCHMIDT Available Team Members: DENNIS SCHMIDT Select Task: SOCIAL MEDIA RESEARCH	Project Manager
31	Repeat Step 28	Project Manager
32	Program Manager logs into an “Online Project and Portfolio Management Application”. LOGIN NAME: ABBY PASSWORD: CAPSTONE URL: http://people.rit.edu/rxg3548/capstone/web/index.php	Program Manager

	Validate that the program manager is successfully logged into the system with the above mentioned credentials.	
33	Validate that program manager sees the “Assign Work” functionality.	Program Manager
34	Validate that program manager sees projects mentioned below. <ul style="list-style-type: none"> • Online Project and Portfolio Management Application. • Increasing Internet Presence Through Social Media. 	Program Manager
35	Validate that the program manager is redirected to the “ASSIGN TEAM MEMBERS WORK PAGE” once program manager selects tab “Assign Work”, selects the project “Increasing Internet Presence Through Social Media”, selects the task “INTERNET MARKETING PLAN”, and submits the “REASSIGN TEAM MEMBER” button.	Program Manager
36	Validate that program manager sees validation message “You are not allowed to reassign from high priority to low priority project” once program manager selects “JOHN MAYBERRY” from the listed team members and submits the button “ASSIGN SELECTED TEAM MEMBER”.	Program Manager