

**Faculty of Arts and Sciences**

**Department of Computer Science**

CMPS 253 – Software Engineering

Spring 2015 Class Project

Instructor: Mahmoud Bdeir

**Software Project Management Plan**

|  |  |
| --- | --- |
| Class Section | 2 |
| Project Name | Educo |
| Team Name | Educo Team |
| Team Members | Mhd Adnan Utayim - Samer AL Masri - Sarah Tabet |

**Revision History**

|  |  |  |  |
| --- | --- | --- | --- |
| **Version** | **Date** | **Update Comments** | **Author / Updated By** |
| 1.0 | 08/04/2015 | First Version | Educo Team |
| 2.0 | 02/05/2015 | Second Version | Educo Team |
|  |  |  |  |
|  |  |  |  |

Table of Contents

[1. Introduction 5](#_Toc415428397)

[1.1. Project Overview 5](#_Toc415428398)

[1.2. Project Scope 5](#_Toc415428399)

[1.3. Product Features 5](#_Toc415428400)

[1.4. Deliverables 6](#_Toc415428401)

[1.5. Milestones 6](#_Toc415428402)

[1.6. Required Resources 6](#_Toc415428403)

[1.7. Evolution of This Document 6](#_Toc415428404)

[1.9. References 7](#_Toc415428406)

[1.10. Definitions, Acronyms, and Abbreviations 7](#_Toc415428407)

[2. Project Organization 7](#_Toc415428408)

[2.1. Process Model 7](#_Toc415428409)

[2.2. Organizational Structure 7](#_Toc415428410)

[2.3. Organizational Boundaries and Interfaces 7](#_Toc415428411)

[2.4. Project Responsibilities 8](#_Toc415428412)

[3. Managerial Process 8](#_Toc415428413)

[3.1. Project Work Breakdown Structure 8](#_Toc415428414)

[3.2. Management Objectives and Priorities 9](#_Toc415428415)

[3.3. Assumptions, Dependencies, and Constraints 9](#_Toc415428416)

[3.4. Project Risks 10](#_Toc415428417)

[3.4.1. Risk Table 10](#_Toc415428418)

[3.4.2. Risk Information Sheet 11](#_Toc415428419)

[3.4.3. Discussion of Risks to be Managed 13](#_Toc415428420)

[3.4.4. RMMM Plan for each risk: 14](#_Toc415428421)

[3.4.4.1. Risk Mitigation 14](#_Toc415428422)

[3.4.4.2. Risk Monitoring 14](#_Toc415428423)

[3.4.4.3. Risk Management 15](#_Toc415428424)

[3.5. Change Management and Control 15](#_Toc415428425)

[3.6. Monitoring and Controlling Mechanisms 16](#_Toc415428426)

[4. Technical Process 16](#_Toc415428427)

[4.1. Methods, Tools, and Techniques 16](#_Toc415428428)

[4.2. Software Documentation 16](#_Toc415428429)

[4.3. Project Support Functions 16](#_Toc415428430)

[4.4. Quality Assurance and Control 16](#_Toc415428431)

[5. Work Packages, Schedule, and Budget 17](#_Toc415428432)

[6. Project Resources 18](#_Toc415428433)

[6.1. People 18](#_Toc415428434)

[6.2. Hardware and Software 18](#_Toc415428435)

# Introduction

## Project Overview

The traditional procedure of finding the right qualified tutor can be extremely stressful and time-consuming. Thus the purpose of the project is to automate the tutor-finding process in order to fasten it, get the most skilled match and make it easier for both the student and the tutor. Educo is a web application that establishes an original community between students and tutors. Hence, all tutors are interviewed before entering the community in order to deliver the best and most professional, innovative and effective experience to the customers. Students pick the tutor of their choice from a qualified list and can submit their rating after the session has ended so as to help increase the competency level and the tutors’ efficacy.

## Project Scope

The scope of the project is defined through a web interface for students, tutors and interviewers. The community includes four roles: student, tutor, applicant or administrator and a user can create sign up as either of the first two. All tutors are interviewed before being accepted and can be rated by students. Students can anonymously book an appointment with the tutor of their choice according to the tutor’s available time slots and have access to the tutor’s information and rating. Each user has a profile and can view his schedule. Search can be filtered by course or by tutor.

However, a tutor session can only include one student and a user cannot assume two roles simultaneously.

## Product Features

* Schedules and appointments
* Different roles have different kinds of accounts
* Rating system
* Interviewing tutor applicants
* News feed

## Deliverables

|  |  |  |  |
| --- | --- | --- | --- |
| **No.** | **Date** | **Deliverable** | **Responsible Party** |
| 1 | February 23, 2015 | Requirements | Educo Team |
| 2 | March 1, 2015 | Mockup screens | Sarah Tabet |
| 3 | March 9, 2015 | Prototype | Educo Team |
| 4 | April 15, 2015 | Database design | Mhd Adnan Utayim |
| 5 | April 27, 2015 | Test cases | Samer AL Masri |
| 6 | April 29, 2015 | Known bugs list | Samer Al Masri |
| 7 | May 4, 2015 | Finished product | Educo Team |

## 

## Milestones

|  |  |  |  |
| --- | --- | --- | --- |
| **No.** | **Date** | **Milestone** | **Responsible Party** |
| 1 | February 23, 2015 | Requirements complete | Educo Team |
| 2 | March 23, 2015 | Prototype accepted | Client |
| 3 | April 15, 2015 | Database design | Mhd Adnan Utayim |
| 4 | April 21, 2015 | Website design complete | Sarah Tabet |
| 5 | May 3, 2015 | Code freeze | Samer Al Masri |
| 6 | May 3, 2015 | Alpha – beta testing | Samer Al Masri |
| 7 | May 3, 2015 | Website done | Educo Team |

## 

## Required Resources

* Notepad ++
* Diagram software: draw.io
* Dreamweaver
* Adobe Photoshop
* JavaServer Pages (JSP)
* Servlets
* Eclipse IDE
* SQL Server

## Evolution of This Document

This document will be updated monthly. Updates are expected in the following sections:

* Deliverables and milestones dates
* Required resources
* References
* Organization structure
* Organizational boundaries and interfaces
* Project responsibilities
* Project work breakdown structure
* Assumptions, dependencies, and constraints
* Estimations and risks

## References

* CSS Tutorial. (n.d.), from www.w3schools.com/css/
* HTML & CSS. (n.d.), from www.codecademy.com/en/tracks/web
* JavaScript. (n.d.), from www.codecademy.com/en/tracks/javascript
* Stack Overflow. (n.d.), from stackoverflow.com/
* JQuery UI. (n.d.), from jqueryui.com

## Definitions, Acronyms, and Abbreviations

* JSP: JavaServer Pages
* SQL: Structured Query Language
* IE: Internet Explorer
* &: And
* PSP: Personal Software Process
* VoIP: Voice over Internet Protocol
* GUI: Graphical User Interface

# Project Organization

## Process Model

The process model for this project is Agile; specifically Scrum methodology. The project will be executed through series of sprints in a way that a milestone is completed after each sprint.

## Organizational Structure

|  |  |
| --- | --- |
| **Team Member** | **Role** |
| Sarah Tabet | Product Owner |
| Mhd Adnan Utayim | Scrum Master |
| Samer AL Masri | Developer |

## Organizational Boundaries and Interfaces

In order to have a better community, Educo Tutoring will be collaborating with the book finder company *BOOX*. Since many tutors find some resources more useful than the required by AUB, our collaboration aims to facilitate the process of finding common resources between students and tutors. In addition students will be able to easily search for a tutor or a book within the same website.

“BOOX is a web-based application designed to facilitate book exchange. BOOX aims at creating a simple, fast and efficient way for students to find affordable books that they need”. (BOOX team SPMP)

Educo will be working with uTest (http://www.utest.com/about-us) for quality control.

## Project Responsibilities

The basic responsibilities are listed in section 2.1. Educo team is self-organized and will constantly change roles. Thus, this document will be constantly updated with the latest roles:

|  |  |
| --- | --- |
| **Member** | **Role** |
| Mhd Adnan Utayim | Create and maintained the database functionality and implementing the data access layer |
| Samer AL Masri | Develop the server side and integrate it with the data access layer.  Client side: send request to the server and manipulate the data dynamically |
| Sarah Tabet | Design the CSS, HTML and GUI and take care of user experience |

# Managerial Process

## Project Work Breakdown Structure

* Educo Tutor Website:
  + Requirements & Analysis
    - Create requirement user stories
    - Create features
    - Distribute features and stories on different releases
  + Create design
    - Design pages according to user stories and features
    - Mockup screens
    - Prototype
    - Update prototype design and finalize it
    - Create Database design
  + Implement
    - Create Database
    - Create Database access layer
    - Create server-side servlets
    - Integrate the access layer with the servlets
    - Implement the client-side JavaScript
    - Alpha & Beta Testing
    - Deliver

## Management Objectives and Priorities

The current project is the first one for the organization, hence it is highly prioritized and intended to have its first version as soon as possible. However, Educo Team is intending to maximize the work not done and focusing on a simple, almost bug free primary version.

## Assumptions, Dependencies, and Constraints

The deadline of May 4th being close to final exams period will reduce the sprint velocity as team members will have less hours per day of actual work consequently less hours per day than predicted will be achieved near the deadline.

* Project assumptions:
  + Many users will be using the app (effective marketing team will market the project)
  + Reliable servers to process the multiple user requests simultaneously
  + Availability of team software
  + Users are near AUB
  + All time slots are of 60minutes
  + All time slots start at n-o’clock sharp
  + For our first release, we already have an interviewer so no need for an interviewer to sign up
* Project dependencies and constraints
  + Major constraints:
    - **Time**: the most common issue encountered was time constraint. Being only a team of four inexperienced students, that also have other courses with not less-demanding projects papers and exams, time was always ahead of us. We were thus not able to complete all the requirements wanted for the first release of our project and had to postpone some to release 2 in order to focus on the primary requirements.
    - **Continuity**: since we could not devote all our time for the Educo project and had each other obligations our work function could not adopt a continuous slope. We had to put the project on the side on occasions and get back to it later, causing delays in the predicted sprints.
    - **Programming Knowledge**: Most of the team members (3 out of 4) were not familiar with the programming languages required to develop the project and thus had to learn their basics quickly making implementation slower and uneasy.
    - **Optimism:** sometimes the team was over-optimistic on the number of features it could deliver in release 1. This led to wasting time in starting to implement unnecessary features and not being able to finish everything.
  + Other constraints:
    - Budget related constraints
  + Dependencies:
    - Client abundant and reliable internet connection

## Project Risks

## 3.4.1. Risk Table

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Risk Id** | **Risk** | **Category** | **Probability** | **Impact Value** |
| 01 | Customer changes his mind about idea | CC | Low | Catastrophic |
| 02 | Time Shortage | DE | High | Catastrophic |
| 03 | Illness or absence of team members | SS | Medium | Critical |
| 04 | System negative reaction to heavy load (many users) | BU | Medium | Catastrophic |
| 05 | Website not working flawlessly on all browsers | TB | High | Negligible |

|  |  |
| --- | --- |
| **Legend** | |
| **Risk Category**  PS: Product Size  BU: Business Impact  CC: Customer Characteristics  PD: Process Definition  DE: Development Environment  TB: Technology to be Built  SS: Staff Size and Experience | **Impact Value:**  1: Catastrophic  2: Critical  3: Marginal  4: Negligible |

## Risk Information Sheet

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Risk Information Sheet** | | | | | | | | |
| Risk ID | Date | Probability | | | Impact | | | |
| 001 | 4/7/2015 | Low | | | Catastrophic | | | |
| Description | | | | | | | | |
| Dr. Bdeir changing the idea of our project completely, this wouldn’t be convenient since we will need to repeat the whole design. | | | | | | | | |
| Refinement / Context | | | | | | | | |
| Redesign everything from the beginning | | | | | | | | |
| Mitigation / Monitoring | | |  |  | |  |  |  |
| Prioritize CMPS 253 over other courses | | | | | | | | |
| Management / Contingency Plan / Trigger | | | | | | | | |
| Work harder | | | | | | | | |
| Current Status | | | | | | | | |
| Risk is minimal | | | | | | | | |
| Originator | | Assigned | | | | | | |
| Samer AL Masri | | Samer AL Masri | | | | | | |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Risk Information Sheet** | | | | | | | | |
| Risk ID | Date | Probability | | | Impact | | | |
| 002 | 4/7/2015 | High | | | Catastrophic | | | |
| Description | | | | | | | | |
| Not having enough time to complete the implementation due to other courses’ loads. | | | | | | | | |
| Refinement / Context | | | | | | | | |
| Push the limits to maximizing work not done | | | | | | | | |
| Mitigation / Monitoring | | |  |  | |  |  |  |
| Time manage efficiently | | | | | | | | |
| Management / Contingency Plan / Trigger | | | | | | | | |
| Request a delayed deadline | | | | | | | | |
| Current Status | | | | | | | | |
| Started delaying from expected breakdown time | | | | | | | | |
| Originator | | Assigned | | | | | | |
| Sarah Tabet | | Sarah Tabet | | | | | | |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Risk Information Sheet** | | | | | | | | |
| Risk ID | Date | Probability | | | Impact | | | |
| 003 | 4/7/2015 | Medium | | | Critical | | | |
| Description | | | | | | | | |
| Sometimes, members are busy with other courses or personal engagements | | | | | | | | |
| Refinement / Context | | | | | | | | |
| Prioritize CMPS 253 over other courses | | | | | | | | |
| Mitigation / Monitoring | | |  |  | |  |  |  |
| Keep ahead of expected breakdown time | | | | | | | | |
| Management / Contingency Plan / Trigger | | | | | | | | |
| Heroic effort | | | | | | | | |
| Current Status | | | | | | | | |
| Risk is minimal | | | | | | | | |
| Originator | | Assigned | | | | | | |
| Samer AL Masri | | Samer AL Masri | | | | | | |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Risk Information Sheet** | | | | | | | | |
| Risk ID | Date | Probability | | | Impact | | | |
| 001 | 4/7/2015 | Medium | | | Catastrophic | | | |
| Description | | | | | | | | |
| An important risk the team’s taking is not knowing the server capabilities the software will be applied to, and not knowing whether it will be able to handle the amount of user requests at peak times. | | | | | | | | |
| Refinement / Context | | | | | | | | |
| Include backup servers in the budget planning | | | | | | | | |
| Mitigation / Monitoring | | |  |  | |  |  |  |
| Optimize the code we are writing for more efficiency | | | | | | | | |
| Management / Contingency Plan / Trigger | | | | | | | | |
| Redeploying to more powerful servers on the spot | | | | | | | | |
| Current Status | | | | | | | | |
| Not found yet | | | | | | | | |
| Originator | | Assigned | | | | | | |
| Samer AL Masri | | Samer AL Masri | | | | | | |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Risk Information Sheet** | | | | | | | | |
| Risk ID | Date | Probability | | | Impact | | | |
| 001 | 4/7/2015 | high | | | Negligible | | | |
| Description | | | | | | | | |
| Making a website that works flawlessly on all browsers is nearly impossible, however it’s not an important risk since most of the project’s users have the latest web browsers. | | | | | | | | |
| Refinement / Context | | | | | | | | |
| Fix bugs while developing (low priority for bugs) | | | | | | | | |
| Mitigation / Monitoring | | |  |  | |  |  |  |
| Always test code on an old version of IE | | | | | | | | |
| Management / Contingency Plan / Trigger | | | | | | | | |
| Code Freeze | | | | | | | | |
| Current Status | | | | | | | | |
| Risk is minimal | | | | | | | | |
| Originator | | Assigned | | | | | | |
| Mhd Adnan Utayim | | Mhd Adnan Utayim | | | | | | |

## Discussion of Risks to be Managed

The Educo team is taking multiple risks while developing Educo. However we are sure our agile scrum structure and self-organization will help us react instantly to risks in case our mitigation plan was not enough to minimalize the risk probability.

The risks will be managed by frequent meetings and sprinting. Although a rough plan is found to deal with risk triggers, the team will hold focus meetings to find the most optimized solution to every problem.

* *Customer changes his mind:* In that case, the scrum master will work on minimalizing the change in order not to affect the team drastically. However, the team will be ready for a change in design any minute and have the code optimized for modifiability.
* *Time shortage:* This is a normal risk faced by every software development team, however Educo team is trained to work under pressure and on time management, hence the team will always be ahead of time in order not to be effected drastically by time shortage.
* *Illness or absence of team members:* This risk is directly related to time shortage and will be solved using the same techniques.
* *System negative reaction to heavy load (many users):* This risk is more related to the business aspect of the project and can be handled while implementing the software for business. However, Educo Team is always one step ahead by optimizing the code for the most efficient usage.
* *Website not working flawlessly on all browsers:* There is no bug free code, hence this risk will never be negligible; however, Educo Team always supports and maintains the software and is ready to fix all reported bugs.

## RMMM Plan for each risk:

## Risk Mitigation

* *Customer changes his mind:* We use our experience is development to advise the customer the best way to implement his idea, however if the client found a better way to do it, we are always ready to change.
* *Time shortage:* Educo Team is always optimizing the way it works for a better and more exact time schedule by using PSP and learning from errors.
* *Illness or absence of team members:* Educo team is comfortable with working remotely through a VoIP.
* *System negative reaction to heavy load (many users):* Include backup servers in budget.
* *Website not working flawlessly on all browsers:* Educo is an experienced team who developed multiple websites before, and hence the team already have experience how to generalize the code for multiple browsers.

## Risk Monitoring

* *Customer changes his mind:* Our agile structures allows us to always show the customer his product which will make it more attracting to him and encourages him to combine his new idea with the already done webpage to make a better idea (instead of abandoning one completely).
* *Time shortage*: The Educo team doesn’t have a complete plan on time since it is not doing a plan driven process, however the team meets regularly to make sure the breakdown performance is good relative to the due dates set by the clients.
* *Illness or absence of team members:* This risk is directly related to time shortage and thus have the same risk-monitoring plan.
* System negative reaction to heavy load (multiple users): Monitor server usage daily at peek time, and make sure the server is not working more than 80%.

* *Website not working flawlessly on all browsers:* Educo is still getting bug reports from previous websites, the team will make sure the previous bugs won’t appear again.

## Risk Management

* *Customer changes his mind:* Our organized modifiable code always helps us react to sudden changes better.
* *Time shortage:* In case of time shortage, Educo team will try to extend the deadline and maximize the work not done to retain a high quality work.
* *Illness or absence of team members:* Educo team will always be able to re-self-organize for to adapt with specific circumstances.
* *System negative reaction to heavy load (multiple users):* Switch servers directly on trigger.
* *Website not working flawlessly on all browsers:* Educo team offers a maintenance of the code for 3 years after the website is launched, in addition the code will be easy to read and hence wouldn’t cost much to maintain later.

## Change Management and Control

By creating a simple and separated code (each function has its functionality), we can get a modifiable code that facilitates the change in a controlled way.

However the change will happen step by step in one or more sprints in order to have a smooth change:

1. Formal assessment of the pros/cons of the change, resulting with requirements of the change
2. Planning the change and taking into consideration the backward compatibility issue
3. Implementation of the code
4. Testing
5. Code freeze

## Monitoring and Controlling Mechanisms

Educo team may have different scrum masters, however all Educo members are always keeping track of the breakdown performance and using PSP to reflect and optimize their work in order to stay one step ahead of the client’s deadlines and risk triggers. As mentioned before, the team has frequent meetings to discuss risks and keep controlling the project.

# Technical Process

## Methods, Tools, and Techniques

Tools: Target Process, eclipse, draw.io, JUnit, Dreamweaver, Notepad++, Adobe Photoshop, Sybase power designer.

Methods and techniques: Incremental releases, Unit testing, Mockup screens, Prototyping, Integration testing, and generating data access layer directly from database design.

## Software Documentation

Comments, Release notes, User guide, Administration guide, and Maintenance guide.  
All software documentations will be reviewed to ensure completeness.

## Project Support Functions

* Communication Mechanism:

The team communicates with the client, and maintains a daily team communication channel via Slack.  
Requirements Management Tool: Requirements are gathered, maintained, categorized, and estimated using Target Process.

* Quality Assurance:

All documents will be tested to ensure that they are complete, specific, and follow the document style and notations.

## Quality Assurance and Control

Quality assurance: the Educo team has frequent meetings to make sure the team is doing the right thing. PSP also helps direct the team to the right choices.

Quality control: As mentioned before we will be collaborating with Testing Circle to test all our codes and make sure we deliver an almost bug free website.

# Work Packages, Schedule, and Budget

* Work packages:
  + Prototype: Delivering a hard coded prototype.
  + Database: Designing and implementing a good database that could support all the features.
  + Code: The implementation of the website.
  + Code freeze: The intensive bug fixes after testing.
* Schedule:
  + Prototype: March 9, 2015
  + Alpha and Beta testing: May 3, 2015
  + Final Release 1: May 4, 2015
* Budget:

|  |  |  |
| --- | --- | --- |
| **Phase** | **Man Hours** | **Percentage of total** |
| Requirements | 46 | 10.5% |
| Prototype | 34 | 7.8% |
| Implementation | 310 | 70.9% |
| Testing | 12 | 2.7% |
| Documentation | 35 | 8% |
| Total | 437 | 100% |

|  |  |  |
| --- | --- | --- |
| **Risk** | **Probability** | **Cost in man hours** |
| Customer changes his mind about idea | 0.1 | 80 |
| Time Shortage | 0.5 | 200 |
| Illness or absence of team members | 0.5 | 100 |
| System negative reaction to heavy load (many users) | 0.3 | 60 |
| Website not working flawlessly on all browsers | 0.9 | 180 |

Therefore, the project needs 437 man-hours to be done; which is roughly 5 hours/day for a team of 4 members.

# Project Resources

## People

* Team of 4 members
* 2 Salesmen, to be the liaisons with clients
* An Economic consultant

## Hardware and Software

The client needs to have the following software to be able to benefit from Educo Tutor:

* A PC/laptop/tablet
* An Internet connection
* Firefox/Google Chrome/IE
* Javascript & JQuery