

Software Requirement Specification on COURSE GAME DA-IICT

Prepared by Group #02

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1. Introduction

1.1 Purpose

Use of educational games is increasing in education everywhere in classroom and also for people learning at home. Few years back when there was less amount of choices for educational games finding relevant game to use was a difficult task so people used the game which was available even if it was not proper or they didn't used one. Today however, finding relevant games has become a daunting task as the amount of possible games to choose from has increased severely, and so we have also decided to contribute a Course game for the student of DAIICT and also for people outside DAIICT who wish to play this game which will make the learning for the students interesting in a new way and help them to relate real life scenario while applying the theoretical knowledge learned in the classroom.

1.2 Scope

1.2.1 Course Game Application

- User management
- Course Selection
- Mobile Game
- View Announcements
- View Tutorials

1.2.2 Content Management System

- User Management
- Course Management
- Unit and Game Management
- Manage Material
- Manage Notification

1.3 Definition, acronyms, and abbreviations

1.3.1 Definition

- CMS/Web interface – Content management system/ web interface is used by the faculty to manage the content that is the unit, game, material, announcement which is going to be displayed in the mobile application used by the students.

- Mobile Application – It's the application used by the students to enrol in the courses available, view its unit, materials, play the games, view the visualization and receive important notifications about the announcements made by the faculty.
- User – User here is referred to as registered student who wishes to avail the basic functionality of the mobile application.
- Faculty – Another User of our system is Faculty who is the creating the course for the students and managing its content.
- Unit– Courses provided by a particular faculty contains description of course, various unit and each unit contains unit related material, games and announcement.
- Game – Each unit consists of games/visualization which is made available to the user (Student) by the faculty.
- Material – Help can be provided to the student in the form of material provided by the faculty such as Visual and textual data.

1.3.2 Abbreviations/ Acronym

Abbreviations/ Acronym	Full form
CMS	Content Management System
App	Application
API	Application Programming Interface
GUI	Graphical User interface
JS	Java Script

1.4 References

- <https://medium.mybridge.co/12-free-resources-learn-to-code-while-playing-games-f7333043de11#.c0npvarua>
- <http://www.ccebot.com/colobot/index-e.php>
- <http://stackoverflow.com/questions/3948444/an-educational-game-for-learning-programming>
- <https://codecombat.com/play/level/shadow-guard>
- <https://coronalabs.com/>
- <https://createjs.com/>
- <https://play.google.com/store/apps/details?id=com.gamefulgrowth.sortattack.android&hl=en>

1.5 Technologies to be used

- Node JS for Backend
- No SQL (Mongo DB) for Database
- Create Js for Game Development
- Angular JS for Web
- Android Application for Mobile Application.

1.6 Overview

1.6.1 Functional Requirements

1.6.1.1 *Course Game Application*

FR1 User Management

FR1.1 Register- Application provides registration for Student to avail the basic functionality. Students can view the various tutorial, unit and can also register to access the course.

FR1.2 Login- Registered students need to login into the application in order to use the functionalities of the system such as play a game, view tutorial etc.

FR1.3 Manage Profile- Registered students can manage or update their own profile as and when required. They can also change their password.

FR2 Course Selection

FR2.1 View Available Courses- User will be able to view the available active courses by default when he/she opens the application. User can view all the set of active courses available and open for them that is Newly Added Courses, Enrolled Courses etc.

FR2.2 Register/Enrol for a course- After selection of a particular course, User can register in it directly (if it is open) after logging in the application.

FR2.3 Unroll/Deregister Course- User can deregister for any course which he/she has registered and is no more willing to continue for the same. Attempted games for that course will still be visible in user's history.

FR3 Mobile Game

FR3.1 View Unit- Unit are visible to the student only after registering for that course. Each and every active and available unit belong to particular course they have registered for.

FR3.2 Select Unit- Student can select a particular unit from the list of available units. Units contain Games and materials/tutorial.

FR3.3 View and Play Game- Student can view the list of active games and can also play a game or can view the visualization provided to learn a particular unit. Game can have different difficulty level. Student will also be provided with various tutorials, videos as help.

FR4 View Tutorials

FR4.1 View and access Tutorials, Videos etc. - Student can view various tutorials, videos and other stuff uploaded in order to gain some information regarding the course or in order to gain some knowledge for the same. Materials will be provided to the student as help to cross a particular game.

FR5 View Announcements

FR5.1 View announcements - Student can view announcements made by the faculty.

1.6.1.2 Content Management System

FR1 User management

FR1.1 Login- Admin need to login into the System in order to avail the functionalities of the system such as adding a course, unit , managing the course information etc. Admin have all the rights and can manage and access all the facilities provided to him/her.

FR1.2 Register- Faculty can register in order to interact with the students by providing them with all the necessary information, material, game etc in an easy and interactive way.

FR1.3 Manage Profile- Registered faculties can manage or update their own profile as and when required. They can also change their password.

FR2 Course Management

FR2.1 Add Course- Faculty can add a new course if he/she has not added the same course earlier. User can select the batch to which the course will be made available and various other parameters related to course.

FR2.2 Update Course- Faculty can update a particular course i.e. they can change various parameters set for a course while creating the course.

FR2.3 Deactivate Course- Faculty who created the course can deactivate the course anytime if they feel that the course is no longer helpful to anyone.

FR3 Unit and Game Management

FR3.1 Add Unit- Admin can add a new unit. Unit has predefined parameters such as number of weeks the unit will last, Start Date, End date and so on.

FR3.2 Update Unit - Admin can update various parameters of the unit or update or upload various games for the particular unit.

FR3.3 Add Game- Faculty can add a game from the list available. Instructor can set the game for the specific week. And there are multiple games available for a particular unit. If instructor checked any game or material, so only that will be visible in the mobile application. Instructor can open or close a game at any time. Depending upon a particular unit, instructor can open a particular game.

FR3.4 Update Game- Faculty can update a game from the list available as and when required i.e he/she can change the start date, end date desc etc..

FR4 Manage Materials

FR4.1 Add Material- Admin can add material in order to provide guidance to the user stuck on a particular level or materials that provide the basic knowledge about the course. Admin can add various type of materials such as Tutorials, Videos, Code snippet etc..

FR5 Manage Notifications- Admin can send notification related to the course to all the registered students.

1.6.2 Non-Functional Requirements

1.6.2.1 Performance

Data retrieval should be fast, thereby reducing the overall system overhead.
System should be robust.

1.6.2.2 Privacy

Each user of the system requires privacy for one's personal information.

1.6.2.3 Security

The system should not disclose the given login credentials while making calls by encrypting the credentials.

1.6.2.4 Backup and Recoverability

The primary purpose is to recover data after its loss, be it by data deletion or corruption. The application should ensure basic data recoverability.

1.6.2.5 Usability

Application will be user friendly so any user can understand application structure and we will also provide help manuals.

2. Overall Description

2.1 Product Perspective

The perspective of the product is to develop interest in the students to learn things in a new way by playing a game for a particular course and learning things practically and not just theoretically. Providing a platform to the students to test their analytical skills. The idea to develop this application is new and is not based on any existing software's.

2.1.1 System Interface

The system doesn't depend on any third party tool right now but in future it might need API dependencies for certain functionalities of the application. The system is a web-enabled system, so all user interaction is done through a web browser. The System interfaces required on the system server are the following:

- Network interface to a network with a well-established internet connection.
- Mongo DB interface- in order to interact with the database various interfaces and packages of the node JS are to be used.

2.1.2 Software Interface

- Web browser is used for web application to run.
- For Coding we have used: - Visual studio, Sublime text, Notepad++, brackets.
- For game development and web application we have used: - Create JS and Angular JS.
- Operating System – Windows 8 and Linux
- For mobile application we have used Android
- For testing we have used Selenium IDE, JMeter, Espresso.
- For API validation we have used Rest API client(postman)

2.1.3 Hardware Interface

- Since the application must run over the internet, all the hardware shall require to connect internet will be hardware interface for the system. As for e.g. Modem, WAN – LAN, Ethernet Cross-Cable and Computer or Mobile.
- Laptop or PC for web application and Mobile (Android smart phone) for mobile application.

2.1.4 User Interface

- A mobile application provided to the user will be downloaded and installed from the play store. The interface provided will be easy, flexible, sleek and interactive.
- A web interface provided to the faculty will run in a web browser. Using the web interface faculty can manage things that will be seen by the students in the mobile application.

2.2 Product Function

2.2.1 Course Game Mobile Application

Mobile app is the platform for the student, in which student can play the game and watch visualization to understand the basic concept of a topic in a course. Mobile app contains following functionalities:-

- Registration/Login facility for the students
- Enrolment for the courses.
- Student can have units of levels that are provided by instructor.
- Student will play the available game for the particular unit.

- Some tutorials, materials and announcements are available for the reference study.

2.2.2 Web Application (Content Management System)

Web app is for the Instructor in which he/she can manage the game portal (mobile app), there are number of functionalities in this Web App:-

- Registration/Login for the Instructor.
- Can create and manage the courses.
- Can manage the units.
- Can provide material/tutorial for study reference for a particular unit.
- Can select the game from number of available games for the unit, and that game will be now visible in the mobile app.
- Can send important announcement about the course.
- Instructor will have the list of students who have registered for the particular course

2.3 User Characteristics

2.3.1 Faculty

- Faculty can register and login with specific detail and also can manage their profile.
- Faculty can add new course by adding basic information about course.
- Faculty can allow user or student to enrol or self-enrol for the course provided.
- Publish or provide material to student.
- Can add particular unit within the course and also will make the games available under a specific topic as and when required.
- Also make important announcements for the course.

2.3.2 User

- User as a Student can register and login with specific detail and also can manage their profile.
- In this user can view tutorial and play various games.
- User needs to complete the game in given number of steps.
- User can play any already played again.
- User can view the various announcements made by the faculty.

2.4 Constraints and Assumptions

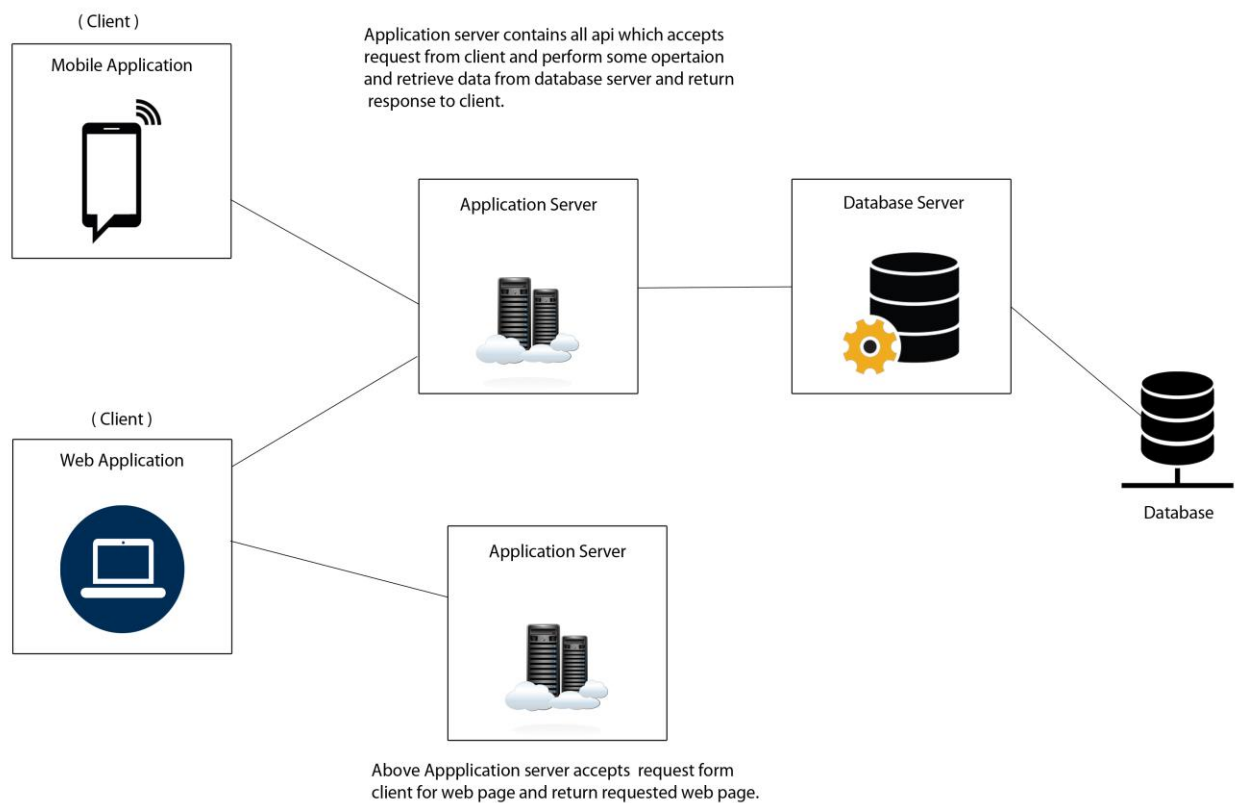
2.4.1 Constraints

- Mobile application which contains the game is targeted to the users or the students who have knowledge in that particular subject such as Data Structures. So, other users having no knowledge of this area cannot play the game.
- The game will be limited for a particular subject for the time being.
- Prerequisites such as topic should be covered before playing the game, basic knowledge of the topic should be their etc.
- Web interface will be for the instructor only.

2.4.2 Assumptions

- Continuous synchronization will be done between Web interface and mobile application.
- Faculty will be logged in for adding any game, important notice or material.
- Student will be logged in to play any game, view notification or material.
- Every student registered has a good internet connection and a smart phone to play the game.
- Application will be able to balance the load of multiple student playing at the same time.

2.5 Architecture Design



2.6 User Stories

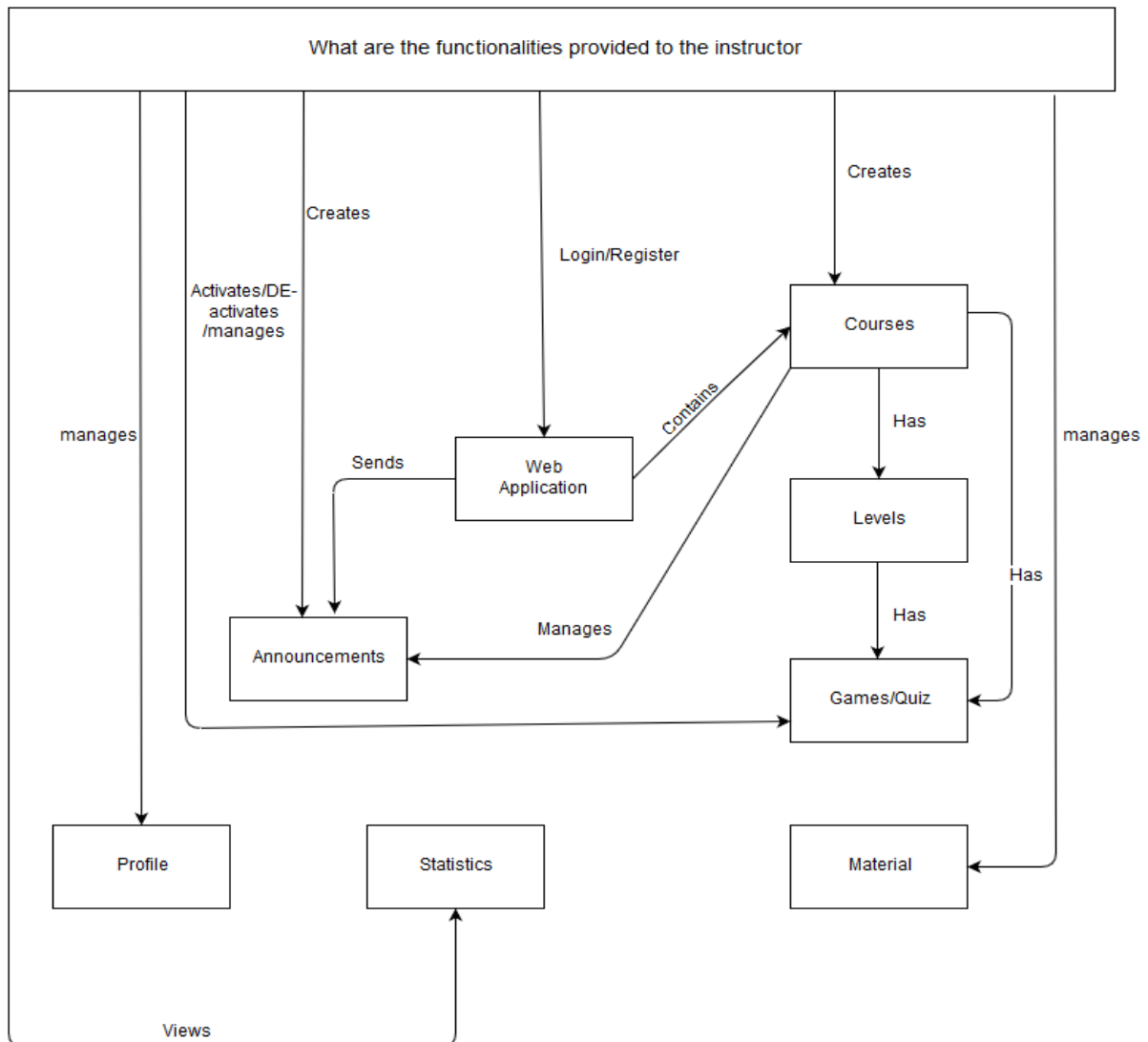
As a/an...	I want to	So that...
Faculty	Web application interface	I can manage the content of the mobile application provided to the registered student.
Faculty	Register and login with the web app	I can publish materials/games and notify students about important things with the help of the application.
Faculty	Manage my profile	I can change the username, password or any required details whenever needed.

Faculty	Create a new course by entering basic information about the course	Users (students) can register in the course and gain application level knowledge about the same.
Faculty	Allow students for self-enrolment	they can get enrolled on the spot.
Faculty	I can publish material to the students	They can refer it and learn from it.
Faculty	I can publish a game unit wise	It is visible to the students in the application and they can play it as and when directed.
Faculty	I can post important information about the course	Student get a notification about the same and get informed about it.
Faculty	I can add new units in a course	Student can play and learn in depth of a course by playing multiple games visible in a particular unit.
Faculty	Optimized web application and mobile application	The synchronization and the interaction between the both is easy, flexible and fast.
User	Mobile application that provides me with tutorial and basic game to understand the concept of the course	I can relate the course with the visualization provided with the theoretical knowledge.
User	Interactive, easy and flexible UI	Learning experience becomes more easy and interesting
User	Visual and textual type of tutorial	Understanding the concepts becomes easy
User	The prerequisite of the game to be covered	I have basic understanding of the concept working on
User	Play the level again	

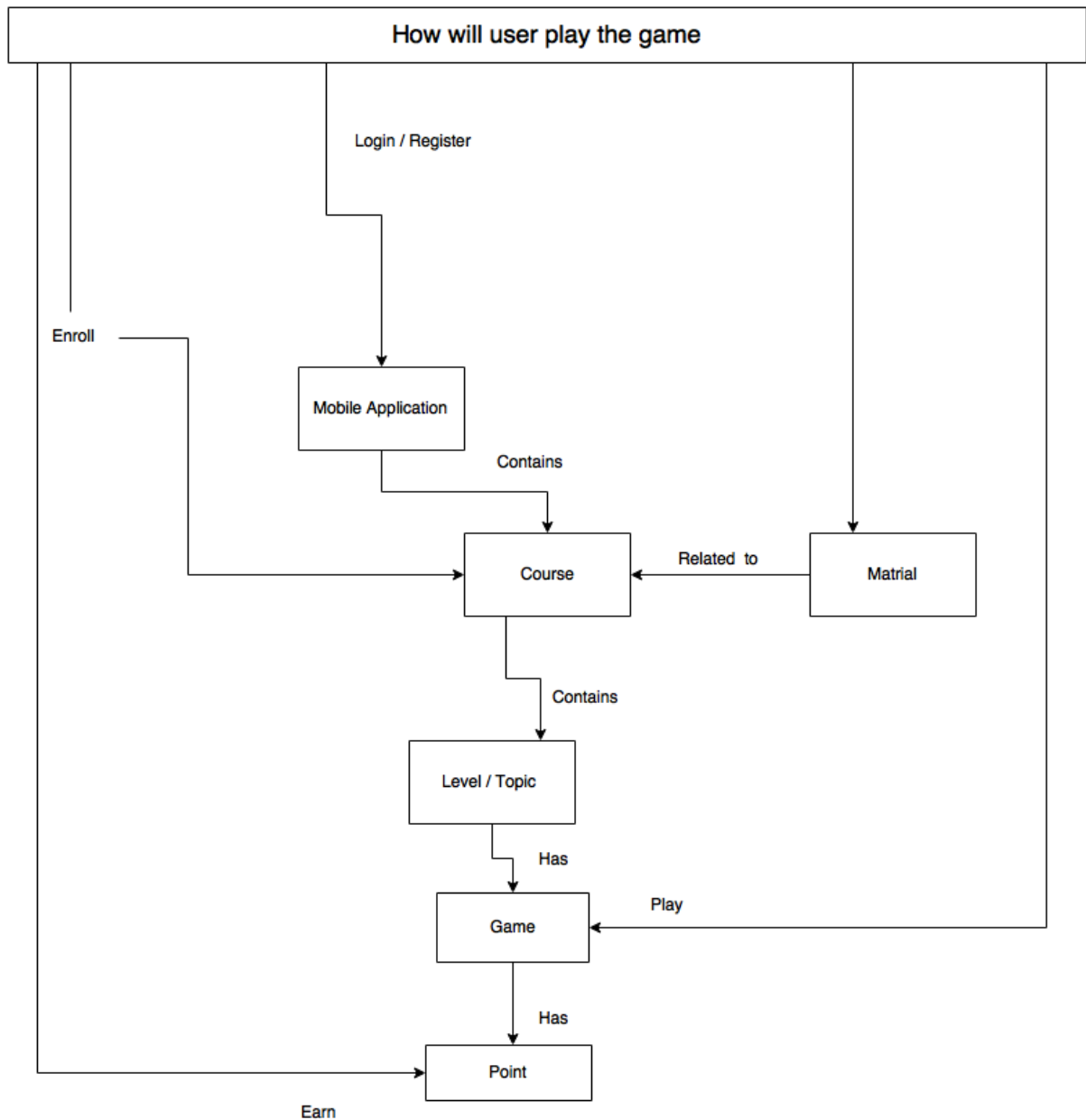
User	My data to be secured	Confidentiality is maintained
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Appendix A: Concept Map

A1. What are the functionalities provided to the Instructor?



A2. How will user play the game?



Appendix B: Original Problem Specification

Following the typical trend of attending lectures and giving the exam is quiet old and student don't find it interesting and so they don't take the effort to go deep into a particular subject apart from just academics. Theoretical knowledge is all what a student gains in classrooms and also it becomes difficult for the student to understand the basic concepts of the course. To make this interesting for a student and introducing a new way of teaching and understanding is needed. Even it is difficult for the faculties to judge the understanding of the students before they appear for any examination.

A course game needs to be developed to make things innovative for students so that they learn things in a better way and have a good understanding of the concepts related to a course

they have registered. Also it helps with Fast Strategic Thinking & Problem-Solving. Clear understanding of the course i.e. Doubts that don't occur during studying, may be solved while attempting the various games or viewing the.

Wikipedia Page

Link - <http://coursegame.esy.es/>