FEASIBILITY REPORT on
COURSE GAME
DA-IICT

Prepared by Group #02

For DA-IICT

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The Group

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TABLES OF CONTENT

1. Problem Statement

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. To make this interesting for a student and introducing a new way of teaching and understanding is needed. A course game needs to be developed to make things interesting for students so that they learn things in a better way and have a good understanding of the course.

2. Introduction

2.1 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.

2.2 Benefits

- Decreases the workload of the Instructor as well of the Student in a way that everything can be transmitted and accessed through an online medium.
- Helps learning basic concept in an easier manner and with the help of visualization.
- Clear understanding of the course- Doubts that don't occur during studying, may be solved while attempting the various application level games presented in an innovative manner.

3. Preliminary Requirement Analysis

3.1 Functional Requirements

3.1.1 *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.

3.1.2 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.

3.2 Non Functional Requirements

3.2.1 Performance

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

3.2.2 Privacy

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

3.2.3 Security

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

3.2.4 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.

3.2.5 Usability

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

3.3 Technical Requirements

3.3.1. Database Server

Application data will requires a scalable server to store a large amount of data. We prefer using MongoDB server to host our database.

3.3.2. Web Server

Web server is required host system API and web pages.

3.3.3. Mobile Device and Web Browser

We are building android application and a web application for users. So, it requires Android OS and a web browser for the web application.

3.3.4 Internet Connectivity

As the application is hosted online it requires internet connectivity for faster retrieval of the data and provide a smooth user interaction.

3.4 Scope

3.4.1 Course Game Application

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

3.4.2 Content Management System

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

4. Suggested Deliverables

4.1 Management Deliverables

4.1.1 Resource document

A document which describes the resources available with the team to carry the project. It includes Project manager and skill that lead the team to decide that project manager. Individual skills, team skills, application domain where the team would like to make their project and contribute to that domain.

4.1.2 Minutes of meeting (MOM)

A written document about what was discussed and what happened during a meeting. The meeting minutes are generally taken or recorded during the meeting so that participants have a record of what happened during the meeting. It Minutes usually include meeting called for, names of the participant and absents, decisions made by the participants, the roles committed to by participants and any other events or discussions worth documenting for future review or history.

4.1.3 Product Backlog

A document which consists of   list of everything that might be included in a product. The Product Owner creates, maintains, and regularly re-orders the Product Backlog. The Product Owner uses the Product Backlog to adapt to emerging requirements, client feedback.

4.1.4 Sprint Backlog

A document containing all activities required to be completed from the Scrum Product Backlog are stored. All details of what a particular person will do in what time and what all tasks are remaining to be completed. The Sprint Backlog is updated on a daily base. At the end of the day all remaining tasks and completed tasks are updated and this defines how much work is left until the Sprint Goal is reached.

4.1.5 User Stories

Requirements collected by the clients are written as user stories. A user story is a description consisting of one or more sentences in the everyday or business language of the end user or user of a system that captures what a user does or needs to do as part of his or her job function.

4.1.6 Source Code

A document, presentation along with the source code of the final completed project. It includes the implementation of the project as discussed with the client during the requirement analysis phase.

4.2 Technical Deliverables:

4.2.1 Database

A database with the required tables, stored procedures to support the Game. Describe file structures and their locations. Explain how data may be structured in the selected DBMS, if applicable.

4.2.2 Android Application

Android application allows student to register for a course, play the game, view different materials and get notification regarding the course.

4.2.3 Web Application/ Web Interface

Web application provides a content management system to the users(Faculties) in order to manage the Android application effectively.

5. Software Development Life Cycle- Scrum

Scrum is an iterative and incremental agile software development framework for managing product development. A key principle of Scrum is during product development, clients can change their requirements about what they want and need and that unpredicted challenges cannot be easily addressed in a traditional predictive or planned manner.

5.1 Reason for using Scrum

- Changes in requirements can be inculcated and new features can be added in every phase. Thus, it maximizes responsiveness to changing customer needs.
- Requirements change frequently, even from month to month or week to week.

- Work requires constant invention, so all steps are not known in advance, and estimates are not expected to be reliable.

- Process is cyclic: It repeats every Sprint, and planning for next Sprint overlaps with the work on the current Sprint

- Incremental models are used for large complex systems which includes very drastic requirement changes and our project is not being developed on a large scale.

6. Outline Plan/Milestones (Sprint Backlog)

1. Sprint Backlog (Aug 21, 2016)-Requirement Analysis

Analysis of the requirements gathered in the 1st sprint by various means. Deciding the functional and non-functional requirements and analysing the feasibility of the requirements gathered.

2. Sprint Backlog-product Backlog

Identification of the product backlog i.e. list of all the features to be included in the application. Identification of the Software development life cycle that is suitable to our requirements.

3. Sprint Backlog-Feasibility Study

Assessment of the practicality of a proposed plan, method or requirements analysed. Discussing the Scope, purpose, risk analysis, Deliverables, outline plan, business considerations etc.

4. Sprint Backlog-Database Design

Deciding the technology of the database to be implemented and thereafter, studying the technology and creating a basic design.

5. Sprint Backlog (Oct 14, 2016) Technical requirements.

Working on the various decided software and Technologies such as Create JS and Corona Sdk.

7. Visibility Plan

External: In person meetings and emails would be the primary form of communication to keep the client updated with the project. The Group will conduct meetings with the Client to discuss progress and for the purpose of two way feedback. Since Scrum model is used, the client will constantly monitor the product backlog and if the client is making entries or adjustments to the project throughout the project process the group is responsible for developing the client's requests. MOM and detailed documentation of every meeting will be sent to the client in order to keep the client updated with the progress of the project.

Internal: The group will meet at least twice a week. MOM and detailed documentation of every meeting will be maintained and sent to every group member via google drive for reference. Any additional communication will be done via email or WhatsApp. Group have decided do research regarding the tasks given before conducting the meetings and during the meeting progress will be compared to it.

8. Risk Analysis

8.1 Change in Requirements

- **Risk:** "You know it, When you see it" Client may change the requirements after looking at the prototype of the system implemented. Because of uncertain situation client may demand some changes which may result into fluctuating cost and submission time.
- **Solution:** Clear visibility of the requirements gathered from the client with the help of various Requirements elicitation techniques and also by having frequent meetings with the client.

8.2 Miscommunication:

- **Risk:** Due to wrong interpretations the communication between client and group member can create conflict.
- **Solution:** To reduce the possibility of this occurring, the Group needs to establish scrum master for gathering requirements and communication.

8.3 Specification Delay:

- **Risk:** Specification of essential interfaces are not available on Schedule.
- **Solution:** Reminder to client for required specifications of interface.

8.4 Incomplete Requirements:

- **Risk:** Due to lack of mutual understating among team and client and also due to lack of resources, the implemented set of requirements may not fully matches with the desired output.
- **Solution:** The Group's interpretation of the Client's requirements will be presented back to the Client to get a confirmation on whether the Group has understood the Client. Frequent client updates and a high level of visibility will also help call attention to any misunderstandings.

8.5 System Integration:

- **Risk:** Due to fast changing technology it is possible that server configuration or client environment may not match with on hand software product.
- **Solution:** Proper Understanding of the configurations required in the project should be made as early as possible.

8.6 Lack of Resources:

- **Risk**: Lack of Resources involve technologies available to the team for their use. Also lack of manpower, knowledge about certain technologies, time etc.
- **Solution:** Proper resources planning need to be done before starting implementation. Currently, to keep costs at a minimum, the team is considering open-source software, which is available without charge.

8.7 Lack of Manpower:

- **Risk:** As the project deals with the development of Game and the members of the team are not technically sound in any of the game development technologies, problems related to same may arise in future.
- **Solution:** Skill development activities such as learning and discussing the game development tool to be carried out in parallel to other activities. For these reason the Group is looking forward for slow design and implementation phase and are planning accordingly.

9. Conclusion

According to the feasibility study, we have considered the points that are feasible to implement by our team with the resources we have with us. The purpose of the project is well stated for the reason to implement this project. A course game will be developed which will help the user to learn more about the course with interest.