Chalmers Tekniska Högskola
LSP310 Kommunikation och ingenjörskompetens

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Requirements and Analysis Document for IDGI (RAD)

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1 Introduction

1.1 Purpose of application

The purpose of the application is to give teachers a platform for uploading videos and exercises, as well as a forum for students to discuss, share knowledge, ask questions, etc. The idea is to realise the "flipped classroom" model, allowing for more efficient learning.

1.2 General characteristics of application

The application targets Android devices, and will feature lessons consisting of a video, a comment section and a quiz.

The user will be able to both browse and search for schools, subjects, courses and lessons. If the user is a teacher, she can create/add new schools, subjects, courses and lessons. There is also a page for the user to view their own information and statistics. When users watch videos or completes quizzes, they are awarded with points that are displayed in their respective statistics page. Furthermore, the user unlocks hats at certain point milestones.

1.3 Scope of application

The application does not include any video-processing software. Instead, it relies on YouTube for playing videos. Moreover, there is a limited amount of functionality available for teachers. Basic functionality, such as adding schools, subjects, courses and lessons is available, but one can not edit these after having created them. The application also does not include functionality that makes it possible to use it in offline-mode.

1.4 Objectives and criteria of the project

- Students should be able to find content without any major obstacles, and should be able to interact with that content in a way that does not distract them from using it for educative purposes.
- Students should be able to interact with each other and discuss the content of the application.
- Students should be able to view statistics on their usage, such as their awarded points and finished quizzes.
- Teachers should be able to add new content to the application for other users to view without complications.

1.5 Definitions, acronyms and abbreviations

- **Lessons:** Objects containing a video, a comment section and a possible quiz.
- **GUI:** Graphical User Interface.
- **OS** Operating System.
- **Android:** An operating system used on mobile devices.
- **Statistics:** A user's finished courses, started courses, viewed videos, finished quizzes, placed comments, and achieved points.

2 Requirements

2.1 Functional requirements

Students should be able to:

- Log in to the application and have data associated with their user.
- Navigate to desired content, either through global searching or through browsing clear lists.
- View videos.
- Engage in discussion with other users through a comment section.
- Interact with quizzes, and be able to interpret the results of the quiz without ambiguity.
- View their statistics.
- Log out and still have statistics associated with their user.

Teachers should be able to:

- Do most of the things students can do (except for achieving points), but mainly add new data for students to access, as well as viewing said data in their user-page.

2.2 Non-functional requirements

2.2.1 Usability

Usability is a high priority in this project, as learning how to work the software should not be an obstacle in the students' learning. Viewing videos and posting comments should be very straight-forward, the purpose of the quiz should be clear, with specific questions, good alternatives and a clear specification of input format. Tests will be used to make sure necessary data and functionality works for the user in a good enough manner.

2.2.2 Reliability

N/A.

2.2.3 Performance

Videos should not be lagging, quizzes should load quickly. Navigation between pages should be done seamlessly, and searching should not take longer than at most a few seconds.

2.2.4 Supportability

The application will be implemented to be run on mobile devices with Android OS. The application should be implemented in such a way that adding new features is not difficult.
Automated tests should cover all use cases involving data and features, but GUI-aspects cannot be tested automatically. The GUI should be tested manually thoroughly before launching the application.

2.2.5 Implementation

The application will be developed with Java, specifically tailored for Android OS.

2.2.6 Packaging and installation

N/A.

2.2.7 Legal

N/A.

2.3 Application models

2.3.1 Use case model

See APPENDIX for UML diagram and textual descriptions.

2.3.2 Use case priority

1. View a video.
2. Take a quiz.
3. Select a quiz answer.
4. Navigate to lessons through search.
5. Create account.
6. Log in.
7. Comment on a lesson.
8. View statistics.
9. Create a lesson (teachers).

2.3.3 Domain model

See APPENDIX.

2.3.4 User interface

The GUI will be fixed (non skinnable, non themable), and will follow Google's guidelines for material design. To accommodate for different screen sizes, density pixels will be used for dimensions of GUI components.

2.4 References

N/A.

APPENDIX

Use case texts

Use case 1: View a video

Summary: User is presented with a page containing a YouTube video.
Priority: High.

Actor	System
1 Clicks on play video.	
	Plays an embedded youtube video.
	If video has been removed, inform the user with an appropriate message.
	If a certain amount of time has passed and the logged in user is of type Student, give points to the user (done every x seconds).
2 Clicks on pause/rewinds in the video.	
	Pauses/rewinds the video.

Use case 2: Take a quiz

Summary: User is presented with a page displaying a quiz related to a video.
Priority: High.

Actor	System
1 Selects an answer.	
	See #3 Select a quiz answer
1.1 Clicks on the question area for a hint.	
	Flip the question area to show a hint.
1.1.2 Clicks on the question area when it is displaying a hint.	
	Flip the question area to show the question again.
2 Clicks on next.	
	Shows whether or not the selected answer(s) was/were correct. Display the correct answer(s).
Exceptional Events	
1 Clicks on the "back" button.	
	Displays a dialog prompt: "Exit quiz?"
1.1.1 Clicks on "exit quiz".	
	Stops the quiz.
	Discards the progress made. (user will have to start over upon retaking the quiz).
1.1.2 Clicks on "no".	
	Removes the dialog.
	Resumes the quiz.

Use case 3: Select a quiz answer

Summary: User selects a quiz answer.

Priority: High.

Actor	System
1 Clicks on an answer	
	Marks the answer as selected.
	Enables the next button if no answer has been selected previously.
1.1 Clicks on an already selected answer	
	Deselects the answer.
2 Clicks on next	If there are now no selected answers, disable the next button.

Use case 4: Create account

Summary: Create an account.

Priority: Low.

Actor	System
1 Enters account information. Clicks “done” button.	
	Checks whether the information is in a valid format.
	If format is correct: Create account. Else : display an error message.
Exceptional Events	
1 Switches scene. (not by using “done” button)	
	Saves the current information in the fields.

Use case 5: Comment on a lesson

Summary: User makes a comment on a lesson.

Priority: Low.

Actor	System
1 Type a comment. Clicks the ”Comment” button.	
	Publish comment.
	Clear comment field.
1.1 User is not logged in.	
	Comment field is disabled. Displays ”Log in to comment” message.
Exceptional Events	
1 Switches scene.	
	Saves the current comment in the comment field.

Use case 6: Create a lesson (for teacher)

Summary: Create a lesson.

Priority: Low.

Actor	**System**
1 Selects a school	
	Show the selected school
1.1 Selects a subject	
	Show the selected subject
1.3 Selects a course	
	Show the selected course
1.4 Provides a lesson name and a video link.	
1.4.1 Creates a quiz for the lesson	
	Associates the quiz with the lesson.
1.5 Clicks on create	
	Creates the lesson and changes activity to the newly created lesson.
	Clears the data in the widgets in the lesson creation activity.
Exceptional Events	
1 Switches scene.	
	Saves the currently selected data.

Use case 7: Log in

Summary: Log in using account information stored in the database.

Priority: Mid.

Actor	**System**
1 Enters information and clicks on ”log in”.	
	If the entered information is valid, set the user as logged in. Otherwise, inform the user that the entered information is incorrect.
Exceptional Events	
1 No Internet connection is available.	
	Inform the user that login can not be completed because the Internet can’t be reached.

Use case 8: Navigate to a lesson through search

Summary: Use the search function to search for a lesson, find it, and navigate to it through the search activity.

Priority: Mid.

Actor	System
1 Enters a search text and starts the search.	
	Switches activity to the search activity.
	Presents any items matching the search query.
2 Clicks on a lesson among the search results	
	Switches activity to the selected lesson.

Use case 9: View statistics

Summary: Go to the statistics page to see information about usage.

Priority: Mid.

Actor	System
1 Clicks on the navigation drawer icon in the top-left corner.	
	Displays the navigation drawer.
2 Clicks on the "My statistics" option in the navigation drawer.	
	Switches activity to the statistics activity, filling it with usage data for the logged in user.
Exceptional Events	
1 User is not logged in.	
	Inform the user that he or she must be logged in to access statistics.
	Present the user with the possibility of navigating straight to the login activity.

Fig. 1: Overview of use cases. Teachers have access to an extra use case.

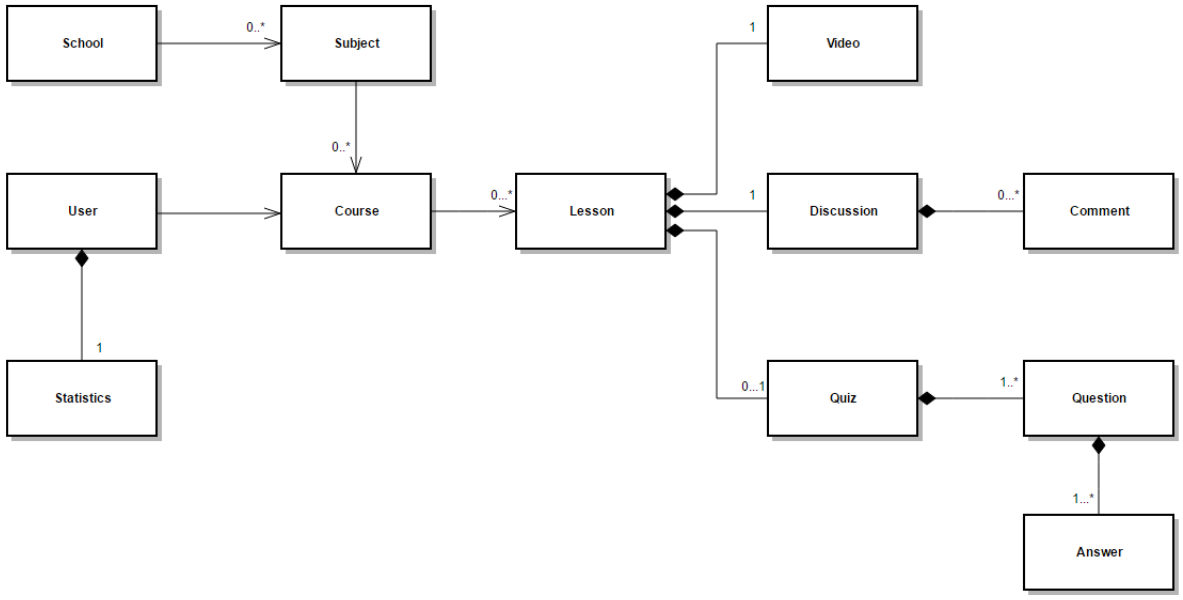

Fig. 2: Domain model UML