



IN APP QUIZ AS A TEACHING TOOL FOR COELIAC DISEASE

Functional Specification

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Date: 03/12/2020

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Introduction

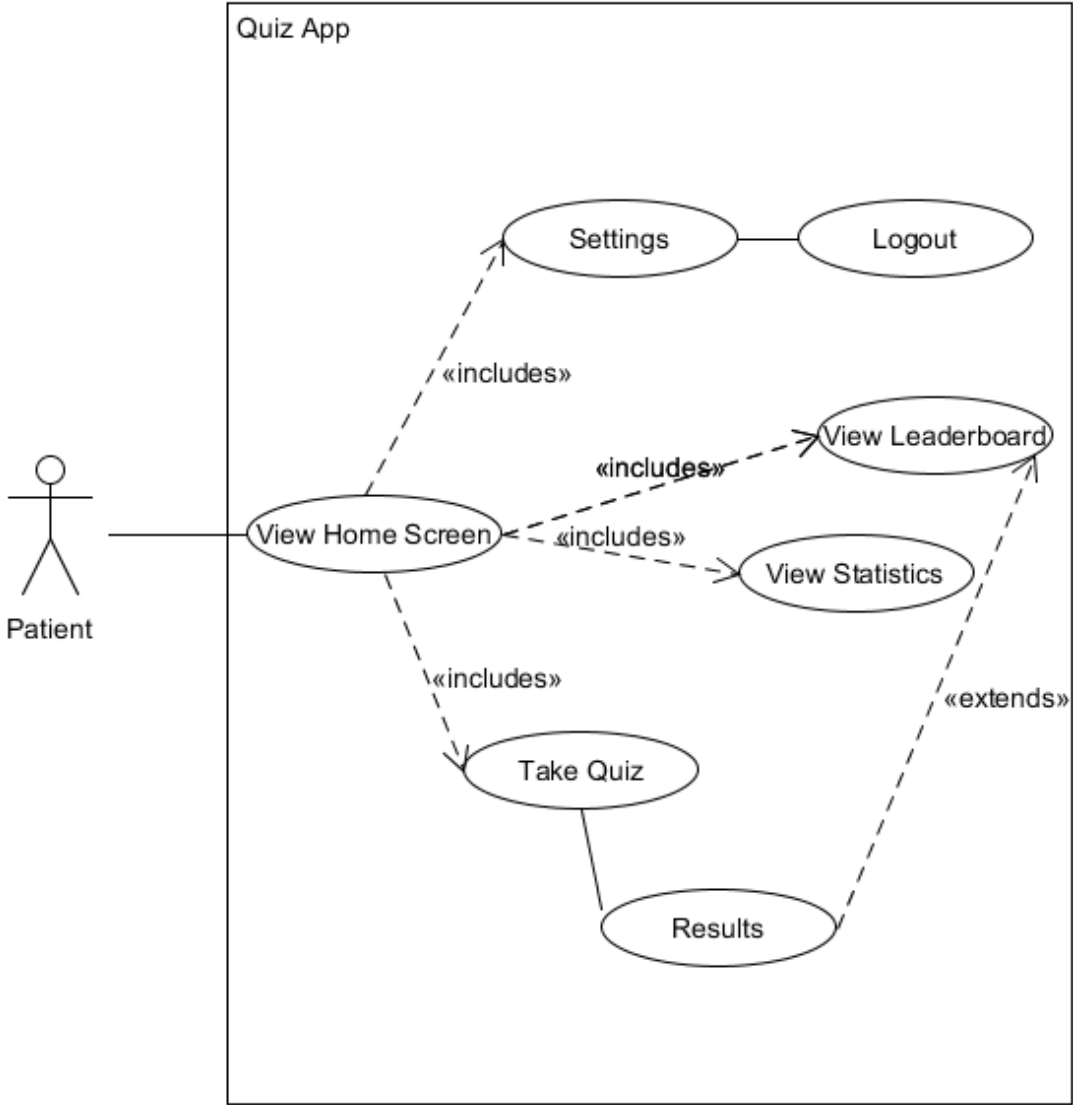
The following document will introduce the features and the functionality of the in-application quiz for people suffering from Coeliac Disease. This quiz is aimed at educating coeliac sufferers as to what is safe to eat to improve their quality of life. It will show what the product is, what the application is supposed to do, and the functionality of the application. It will include use case diagrams and detailed use cases, and an outline of the mobile application's requirements using the FURPS+ method.

Purpose

The in-application quiz for people suffering from Coeliac Disease is part of larger project created by the Erasmus+ program that aims to assist people with Coeliac disease to adhere to a gluten free lifestyle. This quiz is aimed at educating Coeliac sufferers as to what is safe to eat to improve their quality of life. The quiz will use gamification elements to incentivise the user to return to the application. Using popular gamification techniques such as Points, Badges and Leaderboards, alongside other techniques such as Streaks and Boosts and a Reward structure, this application is attempting to keep the users attention in order for them to learn more about Coeliac Disease.

Use Cases

Use Case Diagram



Detailed Use Cases

Name	Register
Actors	Patient
Preconditions	The user has installed and opened the application.
Activity	This use case begins when the user opens the application and is prompted to either log in or register their details. The user will select log in if they have previously registered. If they have not registered, they will select the register option. They will be prompted to enter their username, email, password and to confirm the password. This information will be securely stored in the database.
Postconditions	The user is registered with the system.
Alternative	The user enters an invalid email address. The passwords entered do not match.

Name	Log in
Actors	Patient
Preconditions	The user has successfully registered with the application.
Activity	This use case begins when a registered user wants to log into the application. The user enters their email address and password. This information is validated by the system. If this data is correct the user gains entry to the application.
Postconditions	The user successfully logs into the application and is directed to the home screen.
Alternative	The user enters incorrect information and must re-enter this data. The user enters incorrect information three times and is locked out of the application. The user must verify their details via the given steps to access their account.

Name	Forgot Password
Actors	Patient
Preconditions	The user is at the login page.
Activity	This use case begins with the user not logged into the application. The user selects the forgot password option. They are prompted to enter their email address. An email is sent to the user. The user clicks the link in the email. The user enters a new password and the user's old password is overwritten in the database with the new password.
Postconditions	The user has changed their password.
Alternative	The users' new passwords do not match. The user is prompted to enter matching new passwords.

Name	Log out
Actors	Patient
Preconditions	The user is successfully logged into the application.
Activity	This use case begins when the user is logged into the application and selects the logout option. The user is logged out of the application and redirected to the login screen.
Postconditions	The user is logged out of the application and cannot access any aspect of the application apart from the login screen.

Name	View Streaks
Actors	Patient
Preconditions	The user is logged into the application and navigated to the Profile page.
Activity	This use case begins with the user already successfully logged into the application and has navigated to the Profile page. The user selects the Streaks option.
Postconditions	The user is successfully brought to the Streaks page.

Name	View Statistics
Actors	Patient
Preconditions	The user is logged into the application and navigated to the Stats page.
Activity	This use case begins with the user already successfully logged into the application and has navigated to the Stats page.
Postconditions	The user is successfully brought to the Statistics page and the statistics are available to view.

Name	View Badges
Actors	Patient
Preconditions	The user is logged into the application and navigated to the Profile page.
Activity	This use case begins with the user already successfully logged into the application and has navigated to the Profile page. The user selects the Badges option.
Postconditions	The user is successfully brought to the Badges page and can select a badge to see how it was earned.

Name	Take Quiz
Actors	Patient
Preconditions	The user is logged into the application.
Activity	This use case begins with the user already successfully logged into the application and has navigated to the Quiz page. The user will select the begin quiz button. The user is prompted with a series of questions they must answer. Once the user has completed all of the questions, they are brought to the Results screen.
Postconditions	The user is brought to the results page which will display how many questions that they got correct, the answers that were incorrect, as well as navigation to the Leaderboard and restart the quiz.
Alternative	The user exits the application during the quiz. The user will have to repeat the quiz from the start. If the user has earned a badge, this will be displayed along with the rest of the results page.

Name	Access Leaderboards
Actors	Patient
Preconditions	The user is logged into the application.
Activity	This use case begins with the user already successfully logged into the application. The user selects the Leaderboards option.
Postconditions	The user is successfully brought to the Leaderboards page.

Users

The users that CeliApp is aimed towards is teenagers (12 – 19) suffering with Coeliac Disease. According to a study by Grażyna Czaja-Bulsa, where frequency and cause of diet failure in children treated between 2016 and 2017 (54 children) and between 2006 and 2007 (48 children) were compared. The study shows “that one-third of patients fail to follow a Gluten-Free Diet (GFD), more often 10 years ago than now (40% vs. 26%), mainly children aged 13–18 (54% vs. 40% now)” (Bulsa, 2018).

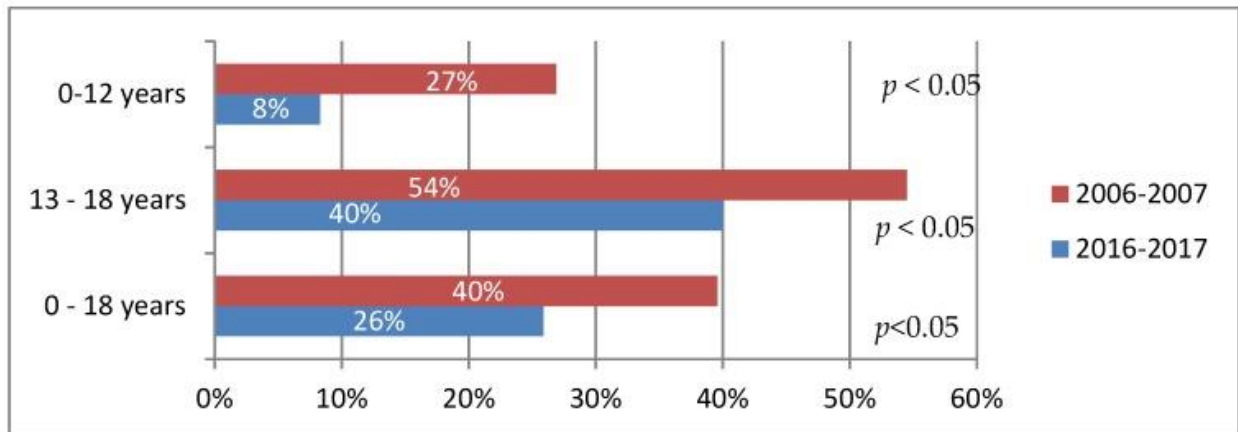


Figure 1: Proportion of children failing to adhere to gluten-free diet (GFD) by age and time of study.

As the study shows, a larger proportion of teenagers are not adhering to gluten-free diet, which can lead to health complications. Although compared to earlier data the number of teenagers not adhering is dropping, there is still at least one quarter of the population who is not.

In any given day, “teenagers average more than six and a half hours (6:40) of *screen media* a day” (Rideout, 2015). With such a large amount of time per day being spent using a device with a screen, primarily a mobile device, an app would make sense as an outlet for maintaining a Gluten-Free Diet.

FURPS+

FURPS+ is an acronym representing a model, developed at Hewlett-Packard was first publicly elaborated by Grady and Caswell, for classifying software functional and non-functional requirements:

- Functionality – Capability, Reusability.
- Usability (UX) - Human Factors, Aesthetics, Consistency, Documentation, Responsiveness.
- Reliability – Availability, Failure Extent & Time-Length, Predictability, Accuracy.
- Performance - Speed, Efficiency, Resource Consumption, Throughput, Capacity, Scalability.
- Supportability - Testability, Flexibility, Localizability.
- '+' – Security, Implementation constraints, Interface constraints.

Functionality

The mobile application described in this document must allow the user to take a quiz that will help them better understand Coeliac Disease.

This quiz must serve the primary purpose of encouraging Coeliac patients to comply with a gluten free diet.

This will come in the form of using gamification techniques to positively reinforce their understanding of Coeliac Disease.

Usability

The UX design can and does change over time due to continuous user feedback.

The users should be able to login to the application within ten seconds, 99% of the time.

The users should be able to change passwords within one minute, 95% of the time.

Registration should take no longer than one minute, 80% of the time.

The application should be intuitive to use and easily navigable between screens.

Once logged in, the user should remain logged in on the application until they choose to log out.

The user should be able to instinctively navigate and complete a quiz without need of a tutorial.

Reliability

If the application loses internet connection, the user should still be able to navigate the user interface.

Any failures should be recoverable, 95% of the time.

The application must have 99% up-time.

Performance

The application user interface should load for the user in under thirty seconds.

The quiz should load in no longer than 5 seconds, 95% of the time.

Supportability

The application must allow access from any Android mobile device.

The application should be able to take updates without encountering failures.

‘+’

The cloud database and connection to the application should be secured as to not allow unauthorised access.

All code used should meet current standards for each language respectively.

Bibliography

Bulsa, G., 2018. Adherence to Gluten-Free Diet in Children with Celiac Disease. *Nutrients*, 4 October, pp. 106-115.

Rideout, V., 2015. *The Common Sense Census: Media Use by Tweens and Teens*, San Francisco: COMMON SENSE MEDIA INC.

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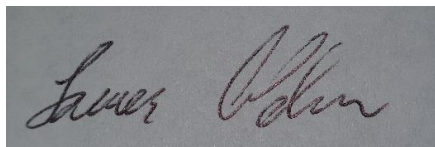
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