Software Requirements Specification

for

Learn&Joy

Version 1.0

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Table of Contents

Revision History

Name	Date	Reason For Changes	Version
SRS	20.05.2022	First Version Created	1.0
			1.1
			1.2

1. Introduction

1.1 Purpose

This document has been prepared to specify the requirements of the "Learn&Joy" software project, which enables users to test themselves on the subjects they want and shows the results to the user. Users will be able to learn new information and check their old information thanks to the application.

1.2 Product Scope

Learn&Joy is an online test application that helps users to measure their knowledge in the selected field. A test can include quiz questions(multiple selection/single selection) or True/False questions. The application will be for free. Users will need to create an account to use the application. Users should be able to see their scores for each test in a list. Admin will create the tests for different categories and users will select a category and a test to start the test.

1.3 Definitions, Acronyms, and Abbreviations

L&J: Learn&Joy

1.4 References

> 1. "IEEE Guide for Software Requirements Specifications," in *IEEE Std 830-1984*, vol., no., pp.1-26, 10 Feb. 1984, doi: 10.1109/IEEESTD.1984.119205.
> 2. BRUSAW, C. T., ALRED, G. and OLIU, W., Handbook of Technical Writing, New York, St. Martin's Press, 1976.

1.5 Overview

This SRS contains all requirements and constraints of L&J project.

- Section 2 describes the general factors that affect the product and its requirements.

- Section 3 contains all the details the software developer needs to create the software.

- Section 4 defines technologies, infrastructure, performance, scalability, quality attributes, and other non-functional requirements.

2. General Description

2.1 Product Perspective

L&J is a free mobile and web application where users test their knowledge and can be accessed from any device. User registration is required.

2.2 Product Functions

This product will have the functions below:

1. The user and administrator are shown a screen where they can register or log in.

2. Categories are displayed to the user.

2. After the user selects the category, the tests under the category are shown to the user.

3. After the user selects the test, the questions of the test are displayed in order.

4. The user can stop the test at any time and continue from where he left off later.

5. After the test is over, it displays the mistakes made by the user and the test score.

6. The administrator selects or adds the appropriate category to add tests.

7. The administrator enters the questions of the test in order.

8. After the administrator calculates the score of the test, it publishes the test.

9. The administrator checks the status of the published test.

2.3 Users and Characteristics

Admins and users can use the application after registering once without paying a membership fee. Any user over the age of 18 who can use a technological device can use the L&J application.

2.4 General Constraints

a. This product will be developed both as a web and mobile application.
b. User and administrator must be registered to use the product.
c. The default two languages of the product will be "Turkish and English", but since other languages will be added in the future, the language infrastructure should be designed as extensible.
d. The product must support the SQL server infrastructure.
e. It is thought that 1000 people will use the product per hour and this number may increase in the future, so the product must be suitable for this.
f. Information will be retained until users delete their account.
g. Each test can contain up to 50 questions.
h. There will be no time constraints on the tests.
i. Preliminary information about tests or questions and answers can be written or visual.
j. If the test has started to be solved, no changes can be made by the admin.
k. The visual content in the product cannot exceed 100 mb.
l. The color theme of the product will be green.

2.5 Assumptions and Dependencies

The security of the account information of users and admins will be provided by the software developed by the doftdare company. It does not allow third-party security apps.

3. The Specific Requirements

3.1 External Interface Requirements

3.1.1 User Interfaces

3.1.1.1 Sign In Page and Sing Up Page

The sign-in page is a place where the user and administrator can login to the application. In order to log in to the product, an e-mail address and password are obtained from the user or admin. This part is for logging into the product only. Image 1 is the wireframe design of the page.

The sign-up page is a place where the user or admin registers to the system. Here, the user's name, surname, e-mail, password, and phone number are taken; and the registration process is performed. Image 2 is the wireframe design of the page.
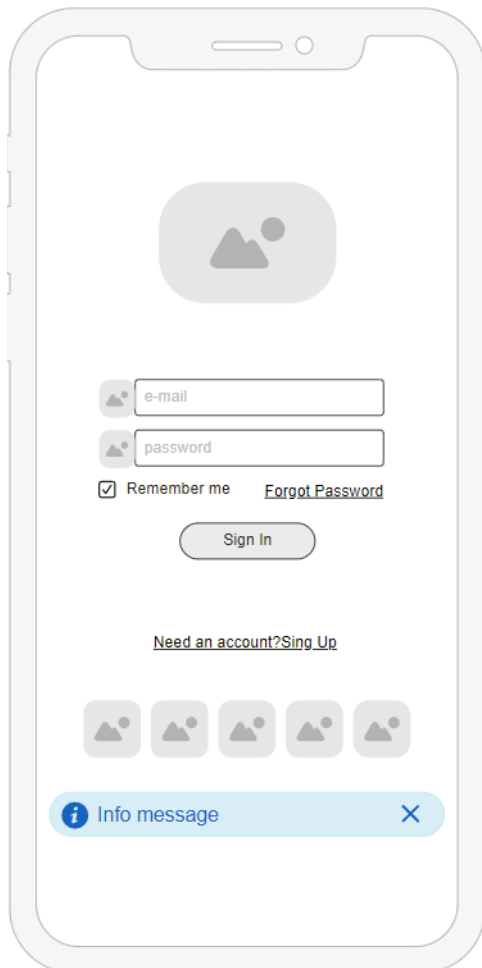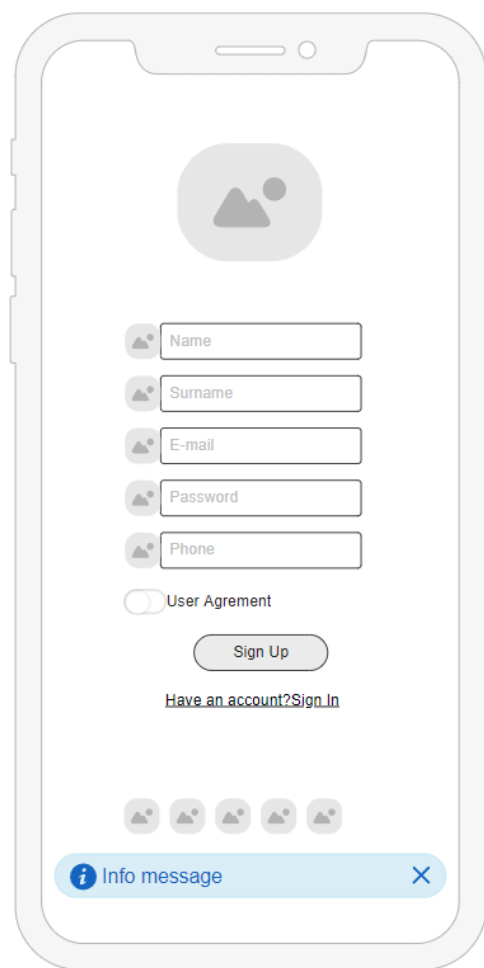
Image 1: Sign-In Page Wireframe

Image 2: Sign-Up Page Wireframe

3.1.1.2 Landing Page

The landing page is the part where the user and the admin see the most popular tests. Here, they can get information about the tests they have left (ongoing test) and the latest tests they have done. Image 3 is the wireframe design of the page. In addition, there are two main buttons for the admin to add and edit tests on this page. Image 4 is the wireframe design of the page.

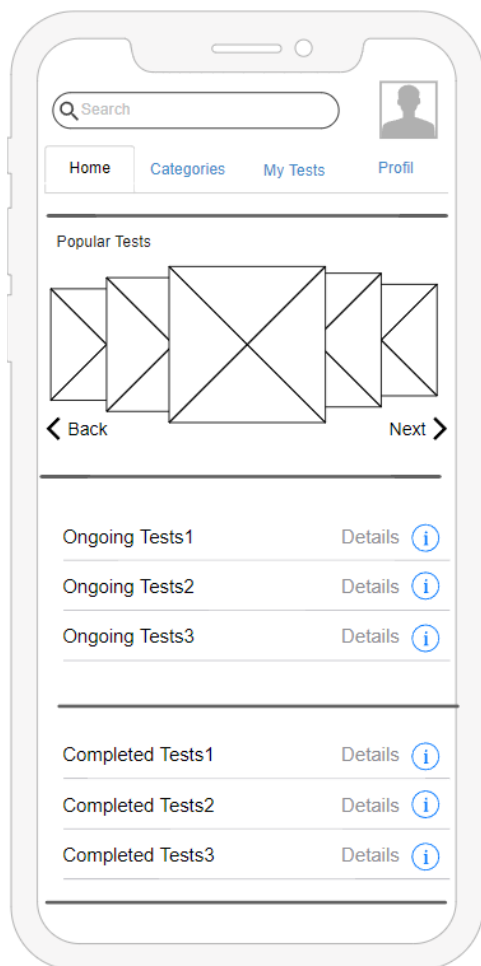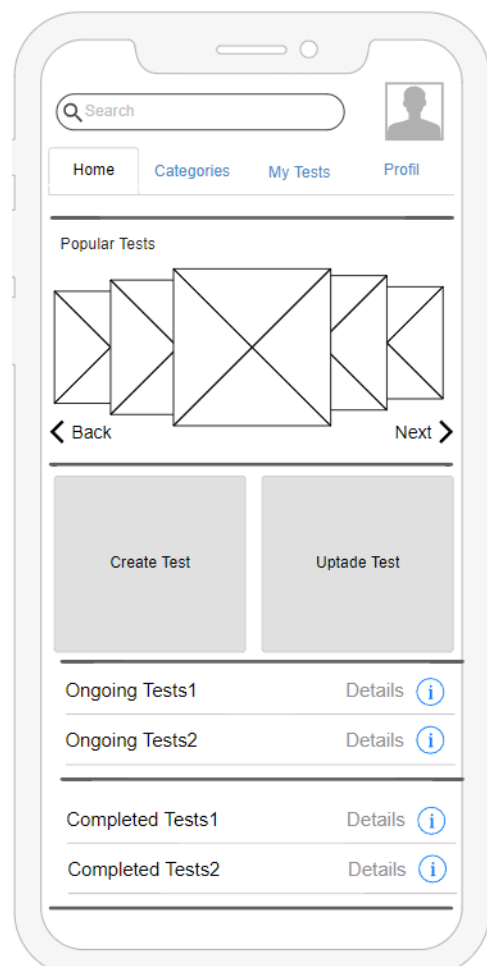Image 3: Landing Page for User Wireframe

Image 4: Landing Page for Admin Wireframe

3.1.1.3 Category Page and Test Page

The category page is the part where the user and the admin can choose from the pre-created categories. Image 5 is the wireframe design of the page.

After selecting the category, the test page is the part where the user and the admin can choose what they want from the tests that appear on the screen. This page contains the name, publication date and evaluations of the tests. Image 6 is the wireframe design of the page.
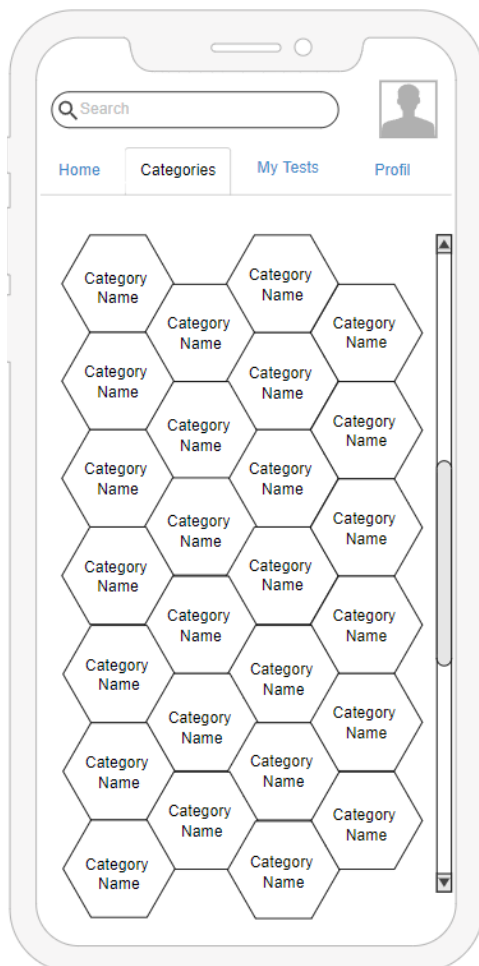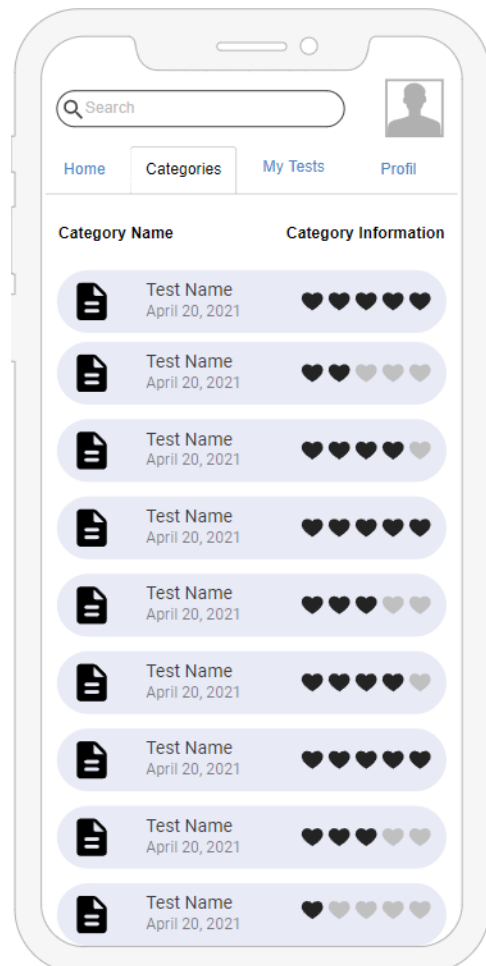
Image 5: Category PageWireframe   Image 6: Test Page Wireframe

3.1.1.4 Taking Test Page and Questions Pages

After the user and admin have selected the test, the taking test page with information about the test they have chosen opens. This page can contain information about the test. (slides, photos and videos.) Mandatory parts are the name of the person who made the test, the publication date of the test, the number of questions and the score of the test. The user can start the test with the start button at the bottom of the page. Image 7 is the wireframe design of the page.

In the multiple-choice question screen, there is a text box for the user or admin to read the question. Visual content related to the optional question can also be added. Then the options will be listed sequentially under the question. There will be buttons that can toggle between questions for user or admin. When the user and admin option is checked, the color of the marked part will change. There will be a test stop button at the bottom of the page. Here the user can pause the test and resume it later. Image 8 is the wireframe design of the page.

In the true-false question screen, there is a text box for the user or admin to read the question. Visual content related to the optional question can also be added. Then the options will be listed under the question in order. (True/False). There will be buttons for user or administrator who can switch between questions. When the user and admin option is checked, the color of the marked part will change. There will be a test stop button at the bottom of the page. Here the user can pause the test and resume it later. Image 9 is the wireframe design of the page.
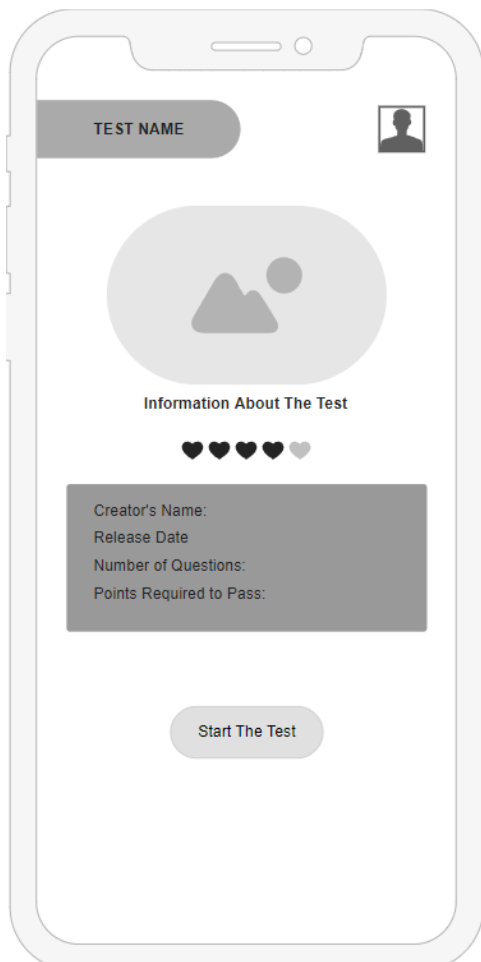
Image 7: Taking Test PageWireframe

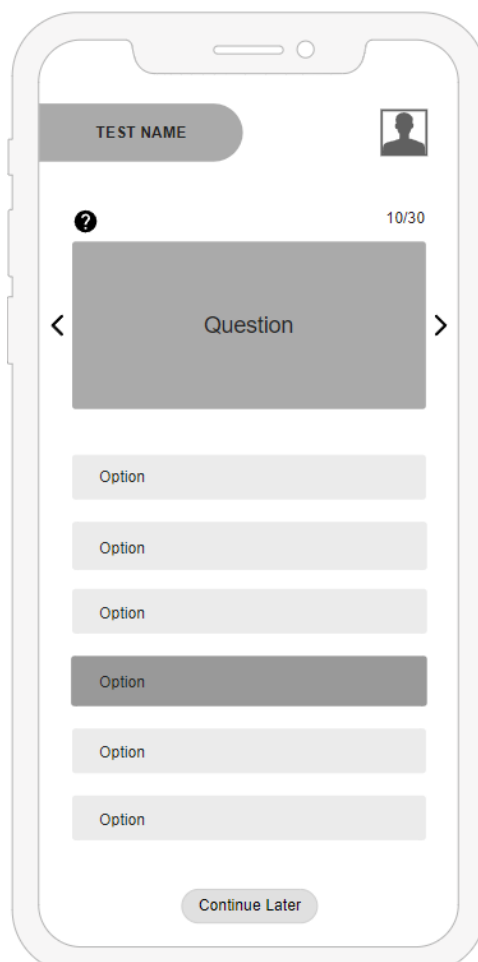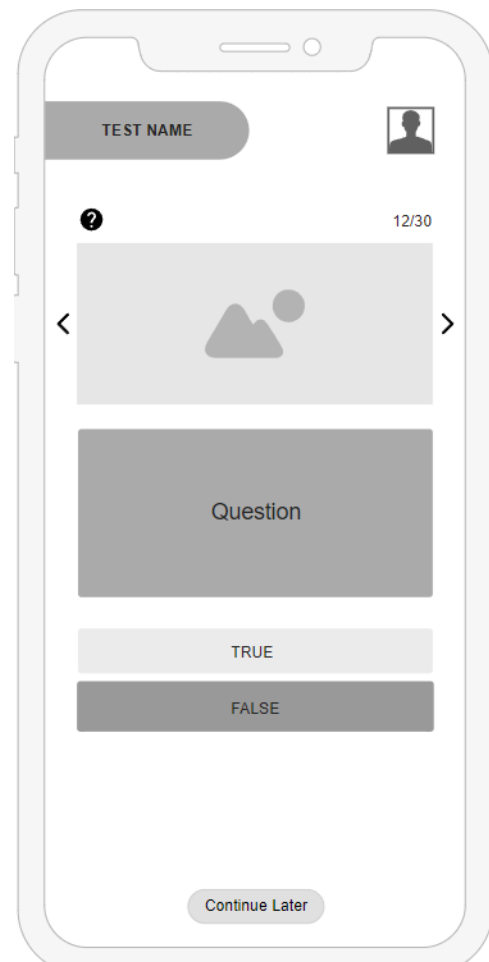Image 8: Multiple-Choice PageWireframe

Image 9: True/False PageWireframe

3.1.1.5 Result Page

The result page is the part where the user and the admin can see how many true, false and blank in the test they have solved. Here they will be able to see how many minutes they finished the test and the score they got from the test. In addition, there will be buttons at the bottom of the page where they can view the answers to the test and share the test. Image 10 is the wireframe design of the page.

Image 10: Multiple-Choice Page Wireframe
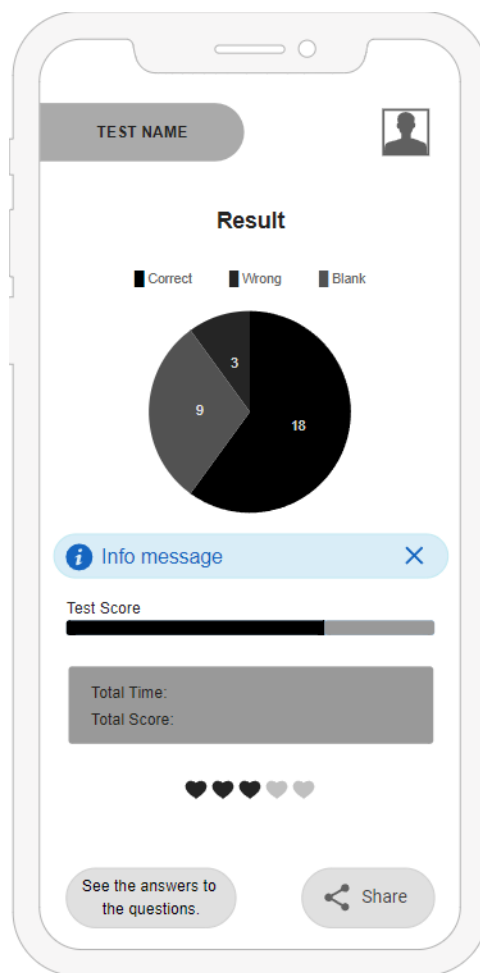
3.1.1.6 Create Test Page

The create test page is the part where there are two boxes where the admin can first enter the test name and preliminary information about test. After entering them, the admin can choose from previously created categories or create a new one in the add category section. After selecting the category, the administrator clicks on the add question button. Performs the process of adding questions on the opened screens. Added questions are listed at the bottom of the page. After all processes are completed, the administrator can publish the test. Image 11 is the wireframe design of the page.

Image 11: Create Test Page Wireframe

3.1.1.7 Create Question Pages

In the multiple-choice question creation screen, the admin enters the question. Optionally, the admin can add visual content for question. These will appear at the top of the page. After the question adding process is finished, he clicks on the option add option button. Here admin does the necessary actions. Added options are listed below. After the option insert is finished, the admin takes the correct option and places it in the correct option box. Then admin enters the score of the question. After clicking the add question button, the question will be added to the test. Image 12 is the wireframe design of the page.

In the option creation screen, the admin enters the option. Optionally, the admin can add visual content for option. These will appear at the top of the page. After clicking the add option button, the option will be added to the question. Image 13 is the wireframe design of the page.

In the true-false question creation screen, the admin enters the question. Optionally, the admin can add visual content for question. These will appear at the top of the page. After the question adding process is finished, admin can add options. (True/False). Options are listed below. After the option create is finished, the admin selects the correct option. Then admin enters the score of the question. After clicking the add question button, the question will be added to the test. Image 14 is the wireframe design of the page.

Image 12: Create Multiple-Choice Page Wireframe

Image 13: Create Option Page Wireframe

Image 14: Create True/False Page Wireframe

3.1.2 Hardware Interfaces

3.1.3 Software Interfaces

3.1.4 Communications Interfaces

This product has account-based authorization or authentication. User and admin do not use the product without creating an account. The only important content here is the account information of the user and admin. These will be given priority security. On the other hand, security is not that important for the tests inside the product.

3.2 Functional Requirements

In this part, the functional requirements for the "Learn&Joy" project will be defined by system features and the major services provided by the product. The use-case diagram below (Image 15) demonstrates the users and their operations in high level.

Image 15: Learn&Joy Use-Case Diagram
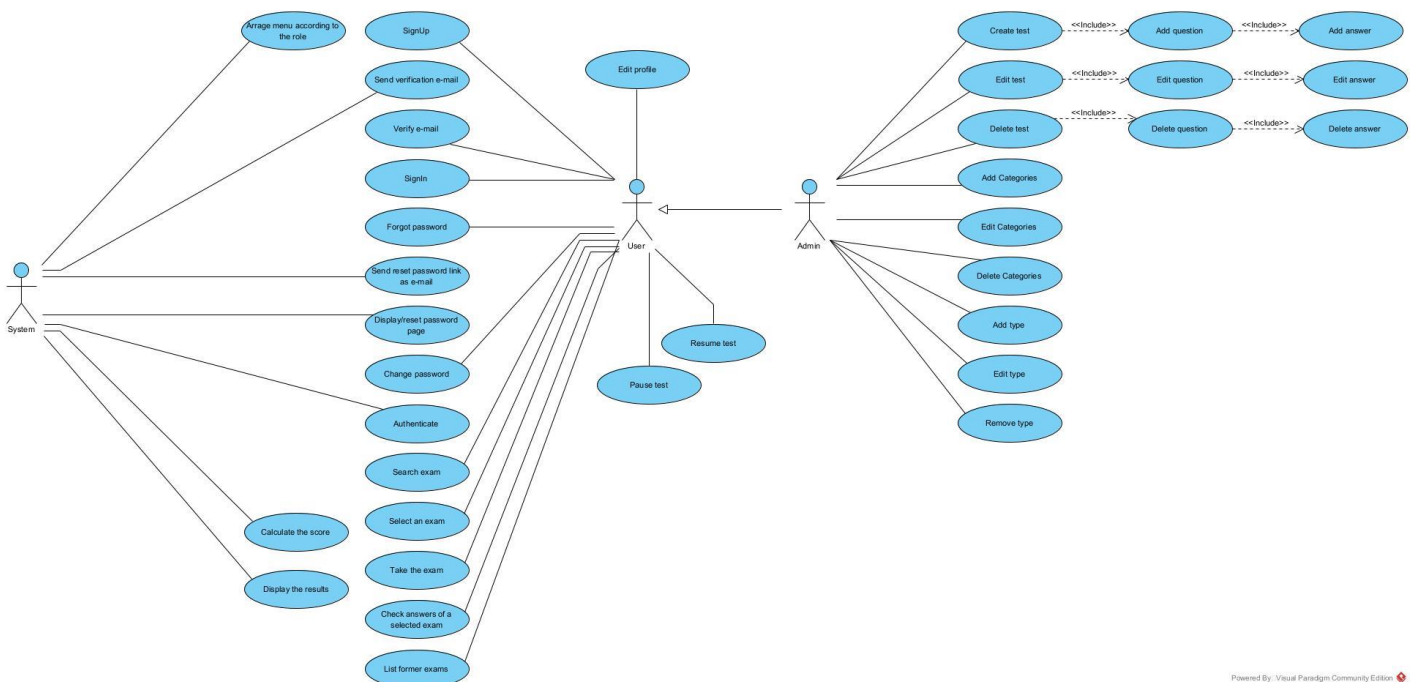
Image 16: Learn&Joy Data Model

RolePermission
- ID
- Role_ID
- Permission_ID

Permission
- ID
- Permission_Name

Role
- ID
- Role_Name

UserRole
- ID
- User_ID
- Role_ID

User *
- ID
- User_Name
- User_Surname
- User_Mail
- User_PhoneNumber
- User_Password

Notification
- ID
- User_ID
- Notification_Text
- Sent_Time
- Is_Read

UserTest *
- ID
- User_ID
- Test_ID
- Is_Complete
- Score
- Start_Date
- End_Date
- Time_Spent
- Review

Test *
- ID
- Test_Name
- Category_ID
- Description
- Information_ID

CategoryTest *
- ID
- Category_Name
- Category_Date
- Information_ID

Information *
- ID
- InformationText
- InformationVisual

Answer *
- ID
- Question_ID

Question *
- ID
- Test_ID
- Type_ID
- Question_Text
- Question_Image
- Question_Point

Type *
- ID
- Type_Name

AnswerOfUser *
- ID
- User_ID
- Answer_ID

TrueFalseQuestion *
- ID
- Type_ID

MultipleChoiceQuestion
- ID
- Type_ID
- Option_ID

Option *
- ID
- Organization
- Option_Text
- Option_Visual

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3.2.1 Solve Test

3.2.1.1 Description and Priority

In the test-solving feature, it is the place where the user selects a category and solves the test. It's not very important for security.

Image 18: Solve Test Activity Diagram

3.2.2.2 Stimulus/Response Sequences

Sequences of user actions and system responses is listed below:

1. User: Clicks the "Start Test Button"
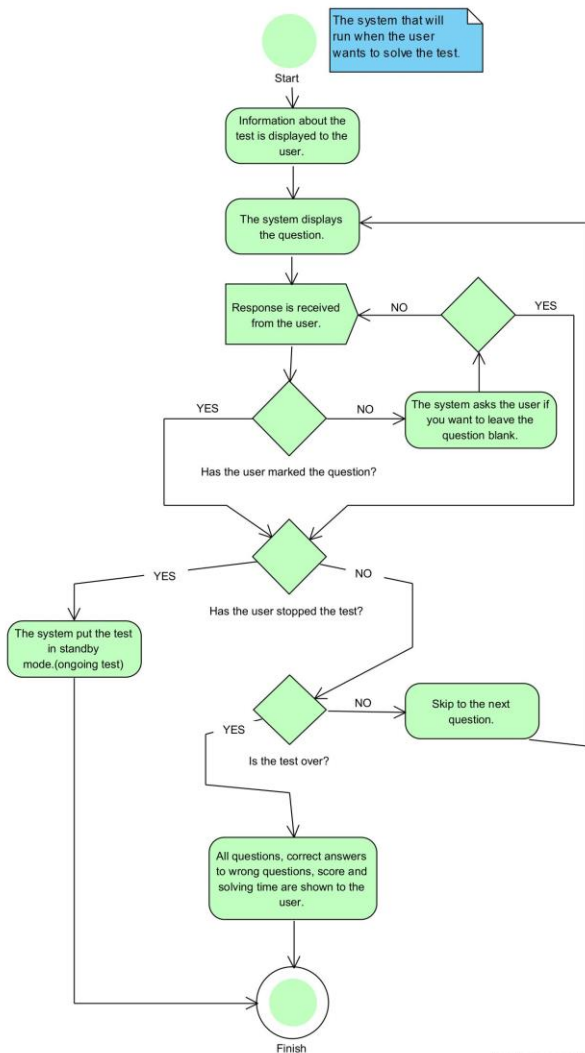2. User: Selects an option or leaves the question blank
3. System: Warns the user if the question is empty but the system allows if the user wants to continue with the question blank (Do you want to leave the question blank?)
4. User: Clicks stop button if user wants to stop the test
5. System: If the user test has stopped, it saves the test in the ongoing tests category and exits the test (Test paused!)
6. System: Follows the steps above until all questions are finished. (Test finished!)
7. Shows the results to the user when the exam is over.

3.2.2.3 Functional Requirements for Solve Test

Functional requirements associated with the "Solve Test" feature is listed below:

REQ-1: The system displaying information about the test to the user.

REQ-2: The system displays the question.

REQ-3: User selects an option or leaves the question blank.

REQ-4: The system warns the user if the question is empty.

REQ-5: The system allows if the user wants to continue with the question blank.

REQ-6: If the user test has stopped, system saves the test in the ongoing tests category and exits the test.

REQ-7: The system follows the steps above until all questions are finished.

REQ-8: The system shows the results to the user when the exam is over.

REQ-9: The system finishes the test.

3.2.2 Create Test

3.2.2.1 Description and Priority

In the test creation feature, the admin enters the properties of the test and publishes the test. It's not very important for security.

Image 19: Create Test Activity Diagram
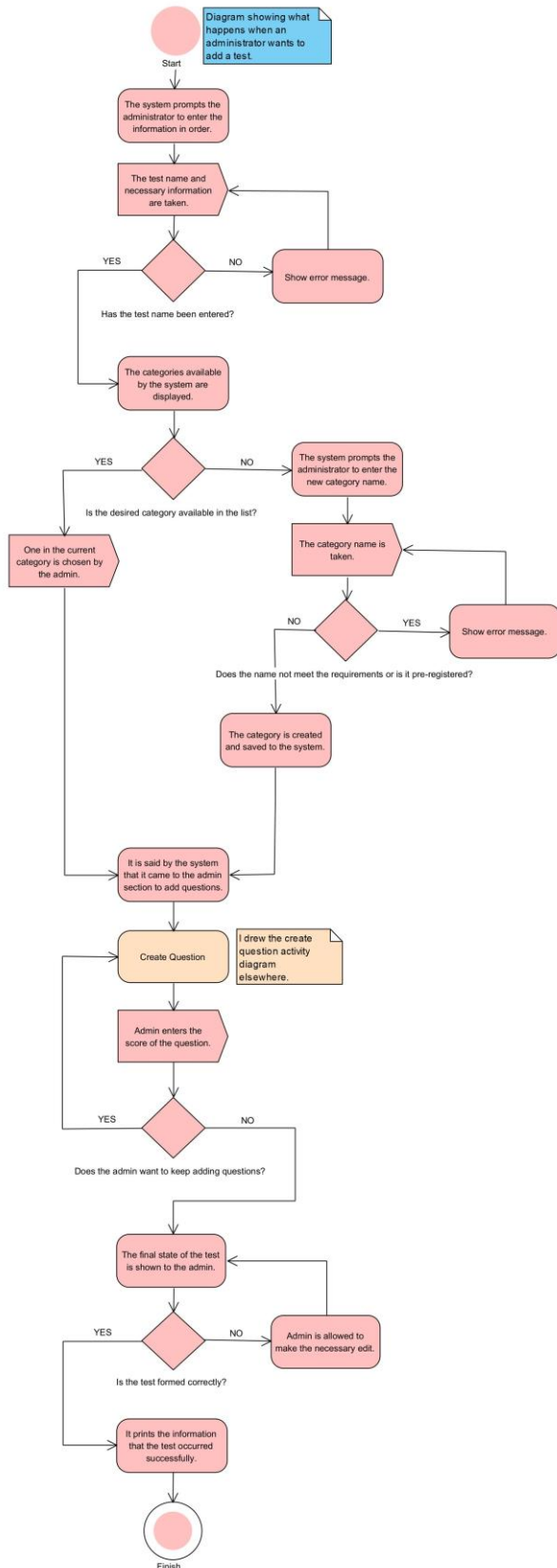
3.2.3.2 Stimulus/Response Sequences

Sequences of user actions and system responses is listed below:

1. Admin: Enters the name of the test and information about the test
2. System: Displays a warning message if the test name is empty (The test name cannot be left blank. Please enter test name!)
3. Admin: Selects category or add new category
4. System: Displays a warning message if the category name is not selected (Please select the category name!)
5. System: Show a warning message if the category that the admin wants to add is already registered to the system (The category you want to add is available in the system. Please add a new category or select from existing categories.)
6. System: Adds a new category in the system
7. Admin: Adds question
8. Admin: Enters the score of the question
9. System: If the administrator continues to add questions, the above add question step will be applied. (Do you want to keep adding questions?)
10. System: Shows the final version of the test to the admin.
11. Admin: Clicks the "Publish Button"
12. System: Publishing the test.

3.2.3.3 Functional Requirements for Create Test

Functional requirements associated with the "Create Test" feature is listed below:

REQ-1 The system prompts the admin to enter the information in order.
REQ-2 Admin enters the name of the test and necessary information about the test.
REQ-3: The system checks the name of the entered test. If the test name is not entered, the system will show an error message.
REQ-4: The system tells the admin to enter or select the category of the test.
REQ-5: If the admin will choose a category, the system will show the available categories. Admin chooses the one they want.
REQ-6: If the category is not selected, the system displays an error message.
REQ-7: If the admin wants to add a new category, the admin enters the new category name.
REQ-8: The system checks whether the category name is already registered in the system. If it is registered, the system will show an error message.
REQ-9: The system tells the admin to add a question.
REQ-10: Admin adds questions.
REQ-11: Admin enters the score of the question.
REQ-12: If admin wants to continue adding questions, the system repeats the adding question step.
REQ-13: The system shows the last version of the test to the admin.
REQ-14: Admin clicks the "publish button".
REQ-15: System test broadcasts.

3.2.3 Create Question

3.2.3.1 Description and Priority

In the question creation feature, the admin enters the properties of the question. It's not very important for security.

Image 20: Create Question Activity Diagram
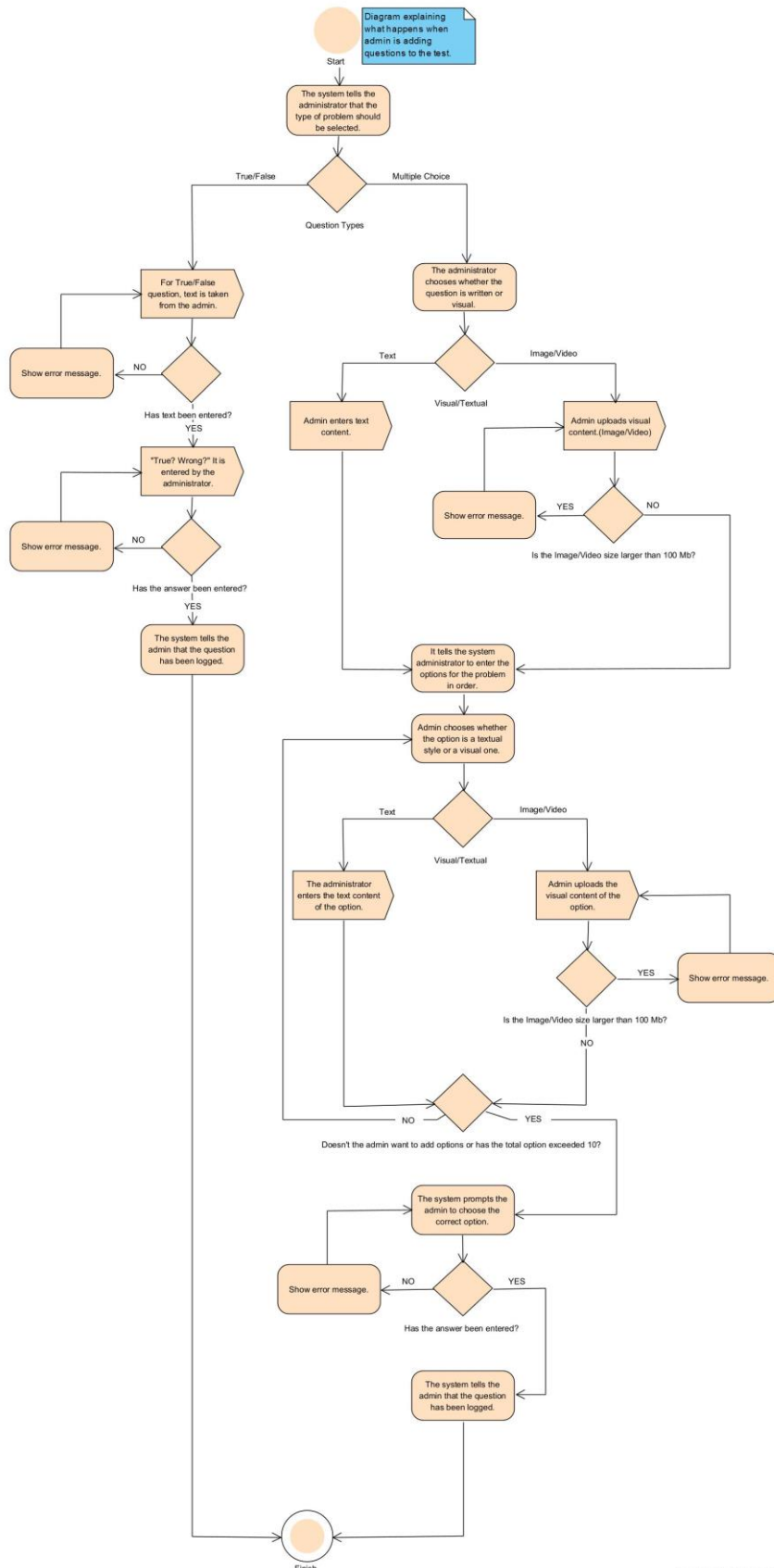
3.2.3.2 Stimulus/Response Sequences

Sequences of user actions and system responses is listed below:

1. Admin: Selects the question type.
2. Admin: Enters the text for the true-false question.
3. System: Checks whether the text has been entered. If no text is entered, it will give an error message. (The text part cannot be empty!)
4. Admin: Enters the answer for the T/F question.
5. System: The system checks whether the answer has been entered. Shows an error message if no answer is entered. (Please enter the answer to the T/F question!)
6. Admin: Enters text or visual content for the multiple-choice question.
7. System: If the image size is larger than 100mb, it will give an error message. (Image size cannot be larger than 100mb!)
8. Admin: Enters the options for the multiple-choice question.
9. System: If the image size is larger than 100mb, it will give an error message. (Image size cannot be larger than 100mb!)
10. System: It does not allow to enter more than 10 answers. (A multiple-question can have a maximum of 10 answers!)
11. Admin: Chooses the correct answer.
12. System: The system checks whether the answer has been entered. Shows an error message if no answer is entered. (Please enter the answer to the question!)
13. Admin: Saves questions.

3.2.4.3 Functional Requirements for Create Question

Functional requirements associated with the "Create Question" feature is listed below:

REQ-1: The system tells admin to select the problem type.

REQ-2: Admin selects question type.

REQ-3: After admin selects true-false question, admin enters the textual or visual part of the T/F question.

REQ-4: The system checks whether the text part of the question has been entered.

REQ-5: Admin enters the answer to the question.

REQ-6: The system checks whether the answer has been entered.

REQ-7: The system tells the admin that the problem has been registered.

REQ-8: After the admin chooses the multiple choice question, admin enters the textual or visual part of the multiple-choice question.

REQ-9: The system controls the image size.

REQ-10: The system tells the admin to enter a maximum of 10 questions.

REQ-11: Admin enters the answers to the question visually or textually.

REQ-12: The system controls the size of the image.

REQ-13: Admin enters the correct answer to the question.

REQ-14: The system will check if the answer has been entered.

REQ-15: Says the system problem has been registered.

4. Other Non-functional Requirements

4.1 Performance Requirements

- Maximum data size will be 100 MB.
- System should be able to process 1000 orders per hour.
- The maximum number of questions in any test should be 50.
- The maximum number of options in any multiple-choice question should be 10.

All the performance measurements should be set according to the maximum data size and max order frequency to make the product available under any circumstances.

4.2 Security Requirements

This product should only work in data transfer and security products made by doftdare software company. Any data transferred to or from the server should be encrypted. Decryption key should not be stored in the server.

4.3 Software Quality Attributes

Product should have following quality attributes:

- ability to achieve the purpose with the least effort and time,

- easy to use,

- easy to remember,

- satisfying design in the first use,

- allowing the users to take back their mistakes,

- preventing mistakes

- a pleasant user experience.