

# **Software Requirements Specification**

**for**

# **Learn&Joy**

**Version 1.0**

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**20.05.2022**

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## Revision History

Name	Date	Reason For Changes	Version
SRS	20.05.2022	First Version created	1.0

## ***1. Introduction***

### ***1.1 Purpose***

This document is an online test application that helps users measure their knowledge by solving tests in the areas they specify. It has been prepared to specify the requirements of the “Learn&Joy” software project. The tests were prepared by the administrators and users were allowed to solve them.

### ***1.2 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 web and mobile application created with tests made by administrators that allows users to measure their knowledge. User and administrator account required and is a free application.

## ***2.2 Product Functions***

This product will have the functions below:

1. The user encounters an interface where he can create an account or log in to his account.
2. The user can determine the category in which he wants to measure his knowledge and choose the test he wants under this category.
3. The user can solve the test he/she chooses without time constraint, he/she can stop and continue the test whenever he/she wants.
4. At the end of the test, the user can see his success in the test.
5. Admin can create tests for users.
6. The administrator can choose the most suitable category for the test or create it if there is no suitable category.
7. The administrator may create preliminary information at his discretion at the start of the test.
8. The administrator can add up to 50 questions to the test and up to 10 options for each question. You can also choose the question type.
9. The administrator can log in to the system by determining the correct answer to each question.

## ***2.3 Users and Characteristics***

It will be used by Doftdare Company employees and stakeholders by creating an account. The user has basic computer and telephone skills. It is intended for all users over the age of 18.

## ***2.4 General Constraints***

- a. This product is a new and independent product to be developed as a web and mobile application.
- b. Screenshots will be blocked while using the app to prevent cheating in shared tests.
- c. The maximum data size of content such as photos, videos, and audios in each question of each test will be 100 MB. In this case, the maximum data size in the question options will be updated to 50MB.
- d. Unity programming language will not be used.
- e. Users and administrators can create a password of up to 8 characters, and passwords can contain numbers, uppercase and lowercase letters.
- f. Questions can be text, image, video, audio, or file in any format.
- g. The product default language will be English and Turkish, but since other languages will be added in the future, the language infrastructure should be designed as extensible.
- h. The system is expected to be used by 1000 users per hour.
- i. The administrator can create up to 50 questions for each test.
- j. The theme color of the application is orange.
- k. Users cannot download tests to their devices.
- l. Administrators can access profile information of all users except passwords.
- m. Administrators can only learn about the success of users in their own tests.
- n. The product must support the SQL server infrastructure.
- o. Users can only see their own scores.

## ***2.5 Assumptions and Dependencies***

For password management, third party tools like KeePass can be used in the future. Further information and scenarios about this integration will be provided by Doftdare Company.

### 3. The Specific Requirements

#### 3.1 External Interface Requirements

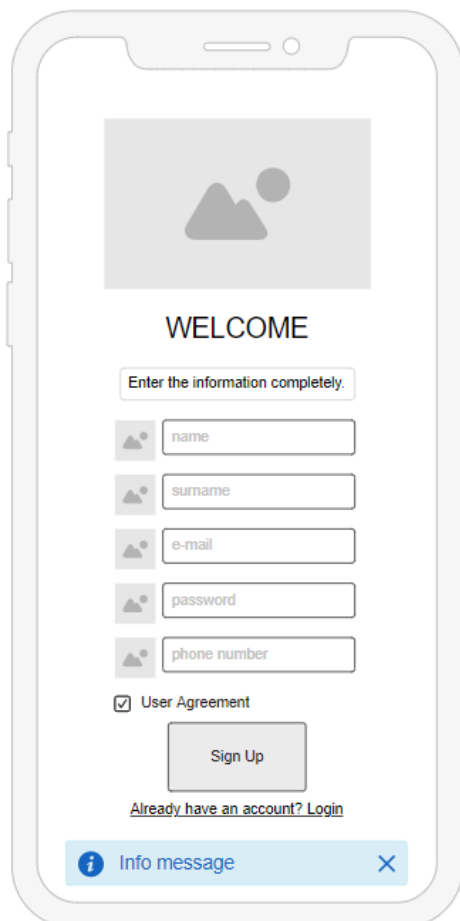
##### 3.1.1 User Interfaces

###### 3.1.1.1 Sign-Up Page and Login Page

The Sign-Up page is an interface where users and administrators can create their accounts. Mandatory fields on this page are the user's name, surname, e-mail address, phone number and password. Account creation is successful after user and administrator provide required and valid information and click "Sign Up" button. Image 1 is the wireframe design of the page.

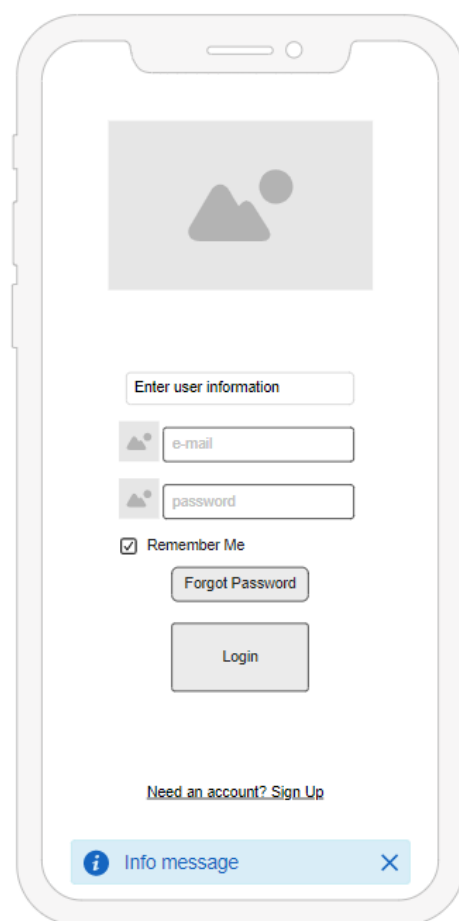
The Login page is an interface where the user and administrator can log into their accounts. Required fields for this page are User e-mail address and password. After the user and administrator provide valid information and click the "Login" button, the account is successfully opened. Image 2 is the wireframe design of the page.

Image 1: Sign Up Page Wireframe



The wireframe for the Sign Up page is displayed within a mobile phone frame. At the top is a placeholder for a profile picture. Below it is the heading "WELCOME". A text prompt "Enter the information completely." is followed by five input fields, each with a person icon: "name", "surname", "e-mail", "password", and "phone number". Below these fields is a checked checkbox labeled "User Agreement" and a "Sign Up" button. At the bottom, there is a link "Already have an account? Login" and a blue footer bar with an "Info message" and a close button.

Image 2: Login Page Wireframe



The wireframe for the Login page is displayed within a mobile phone frame. At the top is a placeholder for a profile picture. Below it is the heading "Enter user information". This is followed by two input fields with person icons: "e-mail" and "password". Below these is a checked checkbox labeled "Remember Me", a "Forgot Password" button, and a "Login" button. At the bottom, there is a link "Need an account? Sign Up" and a blue footer bar with an "Info message" and a close button.

### 3.1.1.2 Landing Page:

A landing page is an interface where popular tests are listed, tests in progress or completed are displayed, and users can enter any test that appears on the landing page. Required fields for this page are popular tests, ongoing tests, and completed tests. Image 3 is the wireframe design of the page.

The landing page is an interface for administrators where popular tests are listed, created tests are displayed and there is a test creation button. Required fields for this page are popular tests, created tests and the "Add test" button. Image 4 is the wireframe design of the page.

Image 3: Landing Page for User Wireframe

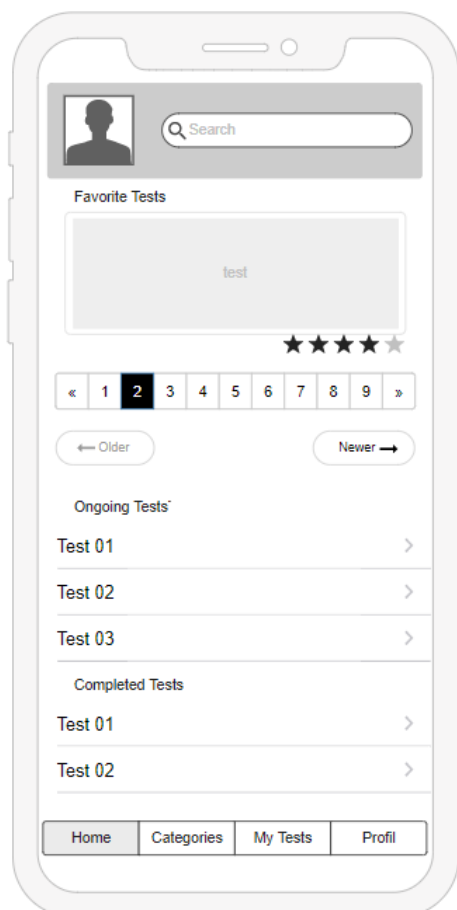
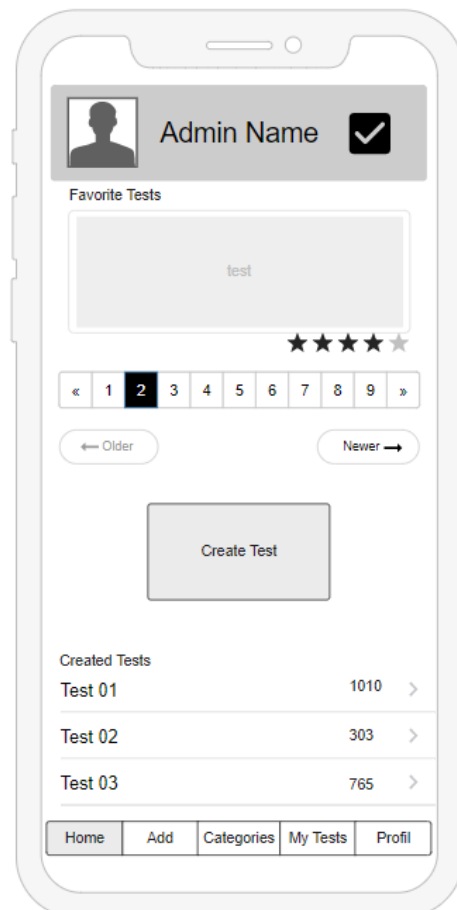


Image 4: Landing Page for Admin Wireframe



### 3.1.1.3 Category Page and Test Page:

The category page is an interface where users can see the categories, sort them, and choose what they want. Image 5 is the wireframe design of the page.

The test page is an interface where users can choose what they want from the tests listed under the category they choose. Image 6 is the wireframe design of the page.

Image 5: Category Page Wireframe

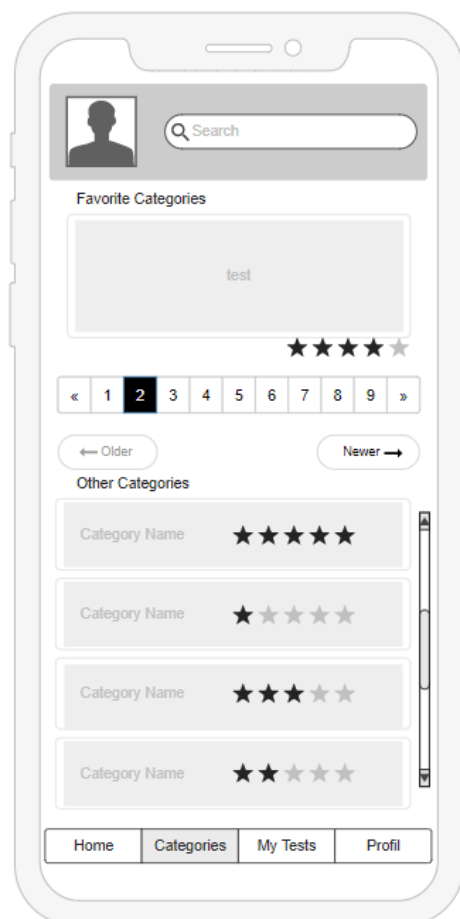
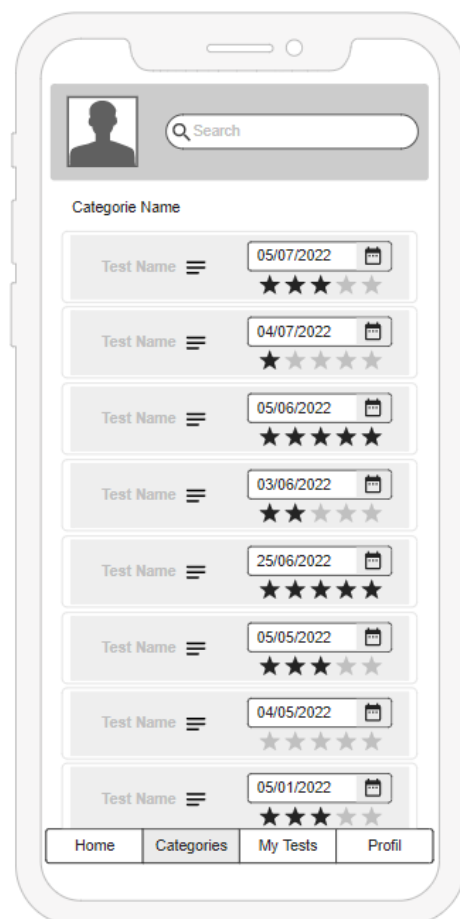


Image 6: Test Page Wireframe



### 3.1.1.4 Test Information Page and Test Result Page:

After the test is selected by the user, the page with the information about the test opens. Required fields for this page; the name of the exam, information about the exam, the overall evaluation score of the exam, and if added by the administrator, pictures, video, audio, etc. related to the exam content. are the contents. The test starts when the user clicks the "Start Test" button. Image 7 is the wireframe design of the page.

After the user finishes the test, the results page is shown to the user. The user sees his success in the test. If the user wants, he can look at the detailed test analysis. The user can retake the test. User can share the result. The required fields for this page are the table showing the test result, the "Detailed Test Analysis" button, the "Retest" button, the "Share" button, the system information message box. Image 8 is the wireframe design of the page.

Image 7: Test Information Page Wireframe

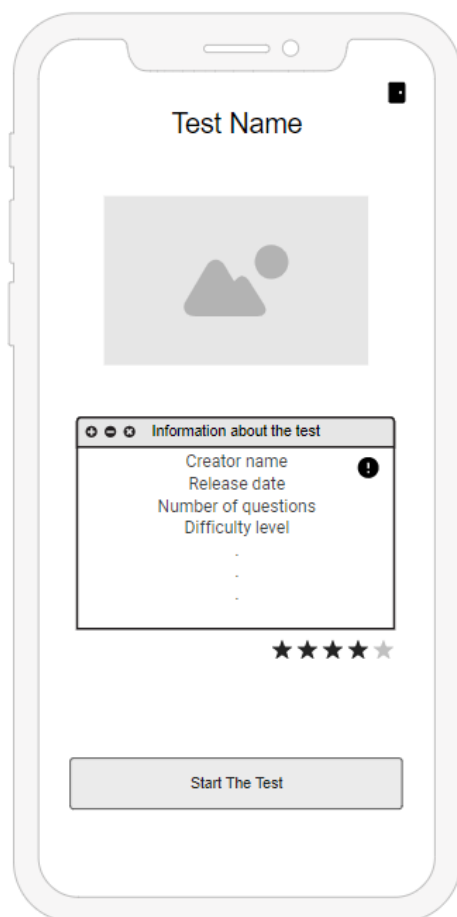
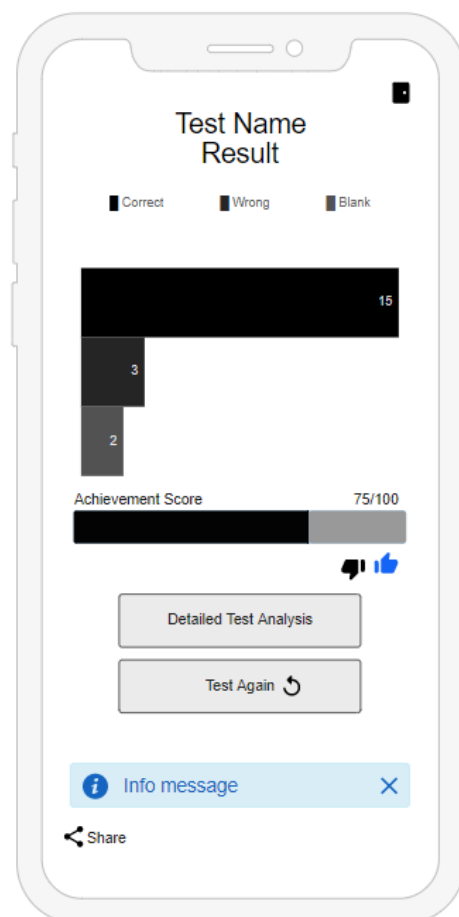


Image 8: Test Result Page Wireframe





### 3.1.1.5 True False Page and Multiple Choice Page:

After the user starts the test, the questions are shown to the user in the order created by the administrator. The user can switch between questions. He can take a break from the test at any time and return to the test at any time. If the user continues without making any selection, the system automatically accepts the question as blank.

The True/False question page displays the required content to the user if there is a question. Required fields for this page are the question section, the True/false option, the switch to the previous and next question button, and the pause test button. There is also a special score box for each question created by the administrator. Image 9 is the wireframe design of the page.

If there are any questions on the multiple-choice question page, the required content is displayed to the user. Then the options are listed. The required fields for this page are the question section, the question options, the switch to the previous and next question button, and the pause test button. There is also a special score box for each question created by the administrator. Image 10 is the wireframe design of the page.

Image 9: True False Page Wireframe

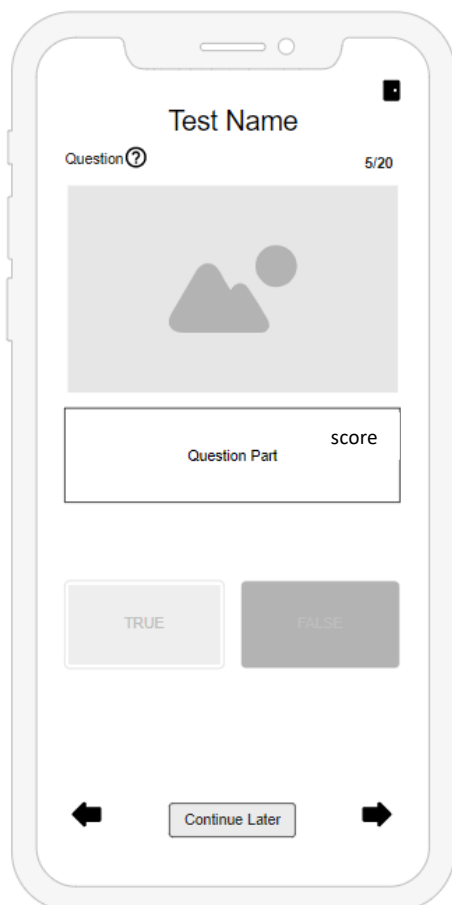
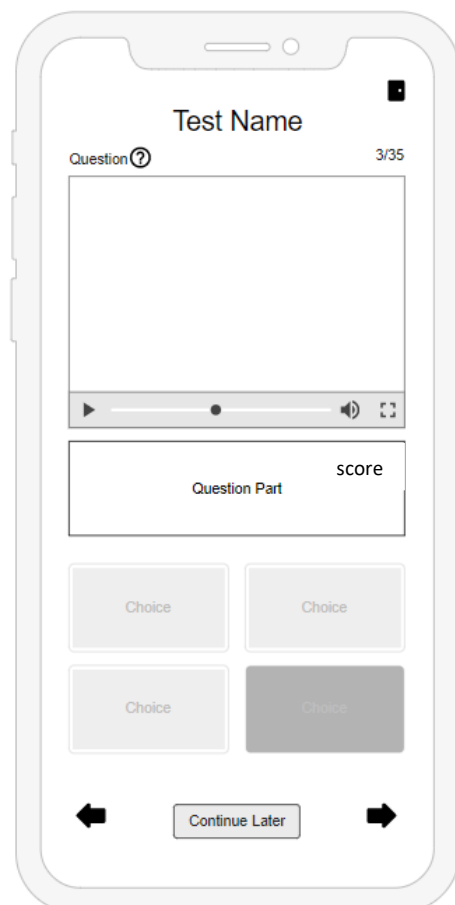


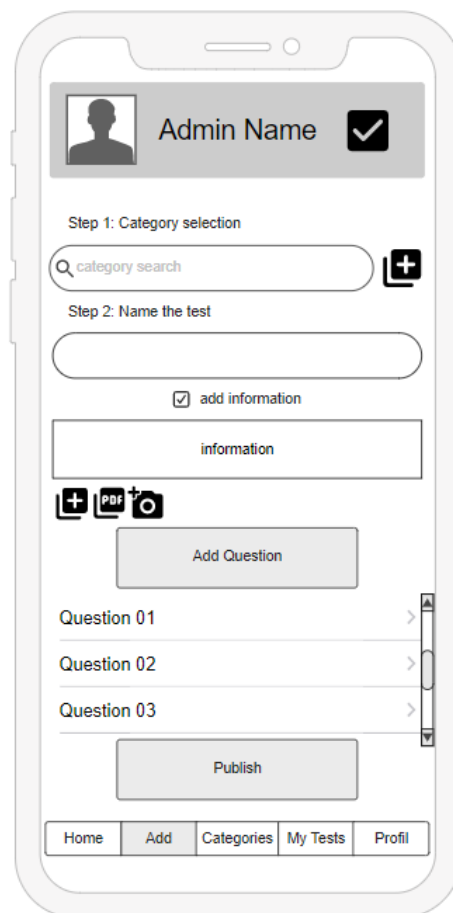
Image 10: Multiple Choice Page Wireframe



### 3.1.1.6 Create Test Page:

The administrator must first select a category on the test creation page. If the desired category name does not exist, it can generate a new category name. Name the test after the category selection. Admin can add test-related content if they want. After selecting the category and completing the relevant parts of the test, the administrator clicks on the add question button. Performs the process of adding a question on the add question page that opens. Added questions are listed at the bottom of the page. If the administrator wants, he publishes the test. Image 11 is the wireframe design of the page.

Image 11: Create Test Page Wireframe



### 3.1.1.7 Create Question Page:

In the adding question section, the administrator first selects the question type. The page opens for this question type. Admin can add a maximum of 50 questions.

In the Add Multiple Choice question section, the administrator creates the question section. Then, if he wishes, he can add pictures, video, audio, etc. to the question. Content can be added. The administrator must determine the score for each question. After the question section is created, you can add the options of the question with the "Add Option" button. Content can be added if your question asks for options. You can add as many options as you want. Added options are listed at the bottom of the question add page. He chooses the correct answer to the question and clicks the "Add Question" button to go to the new question creation page. Image 12 and Image 13 is the wireframe design of the page.

In the Add True/False question section, the administrator creates the question section. Then, if he wishes, he can add pictures, video, audio, etc. to the question. Content can be added. The administrator must determine the score for each question. He chooses the correct answer to the question and clicks the "Add Question" button to go to the new question creation page. Image 14 is the wireframe design of the page.

Image 13: Create Option Page For Multiple Choice Wireframe

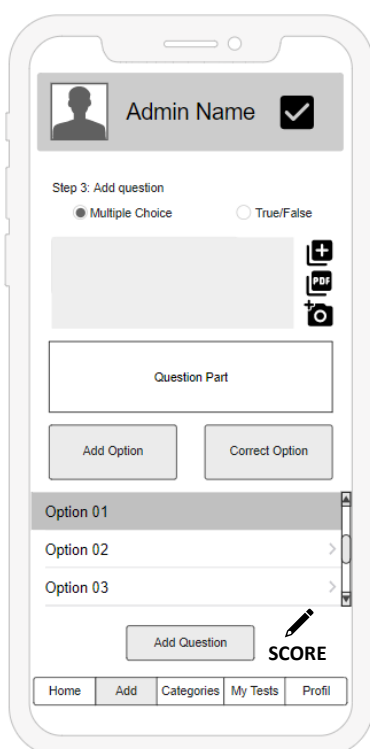


Image 12: Create Multiple Choice Page Wireframe

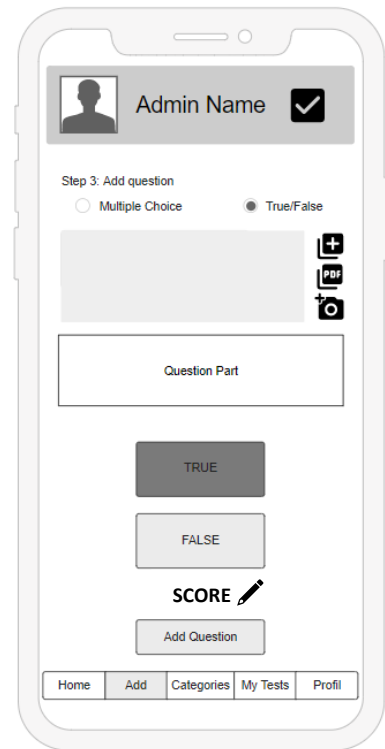
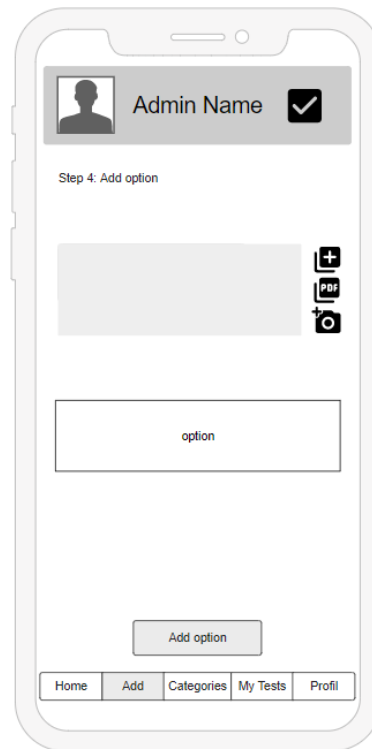


Image 14: Create True False Page Wireframe

### 3.1.2 Hardware interfaces

### 3.1.3 Software interfaces

### 3.1.4 Communications Interfaces

This product features account-based authorization and authentication. You cannot use this service without creating an account. Content can only be shared by administrators. Secure testing solution, storage and access should be considered as part of the software architecture at the design stage.

## 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

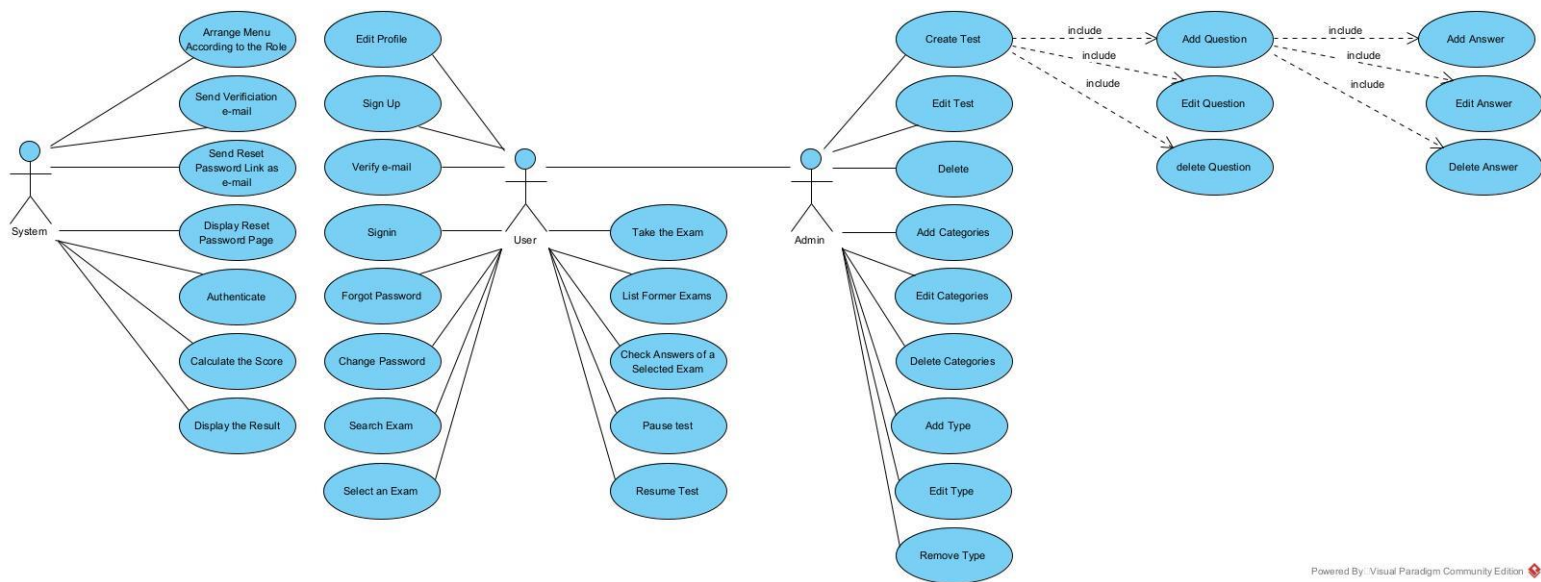
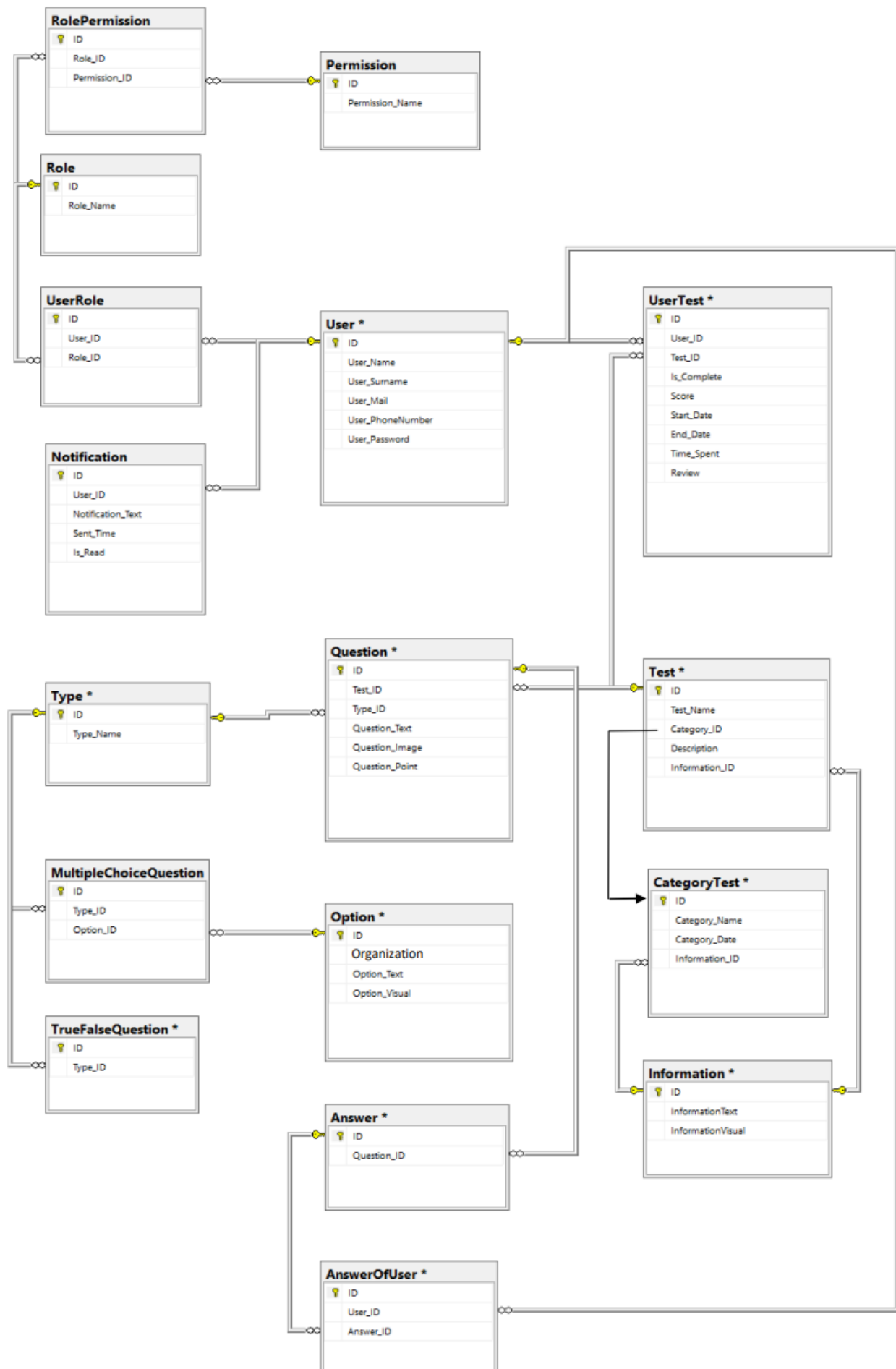


Image 16: Data Model



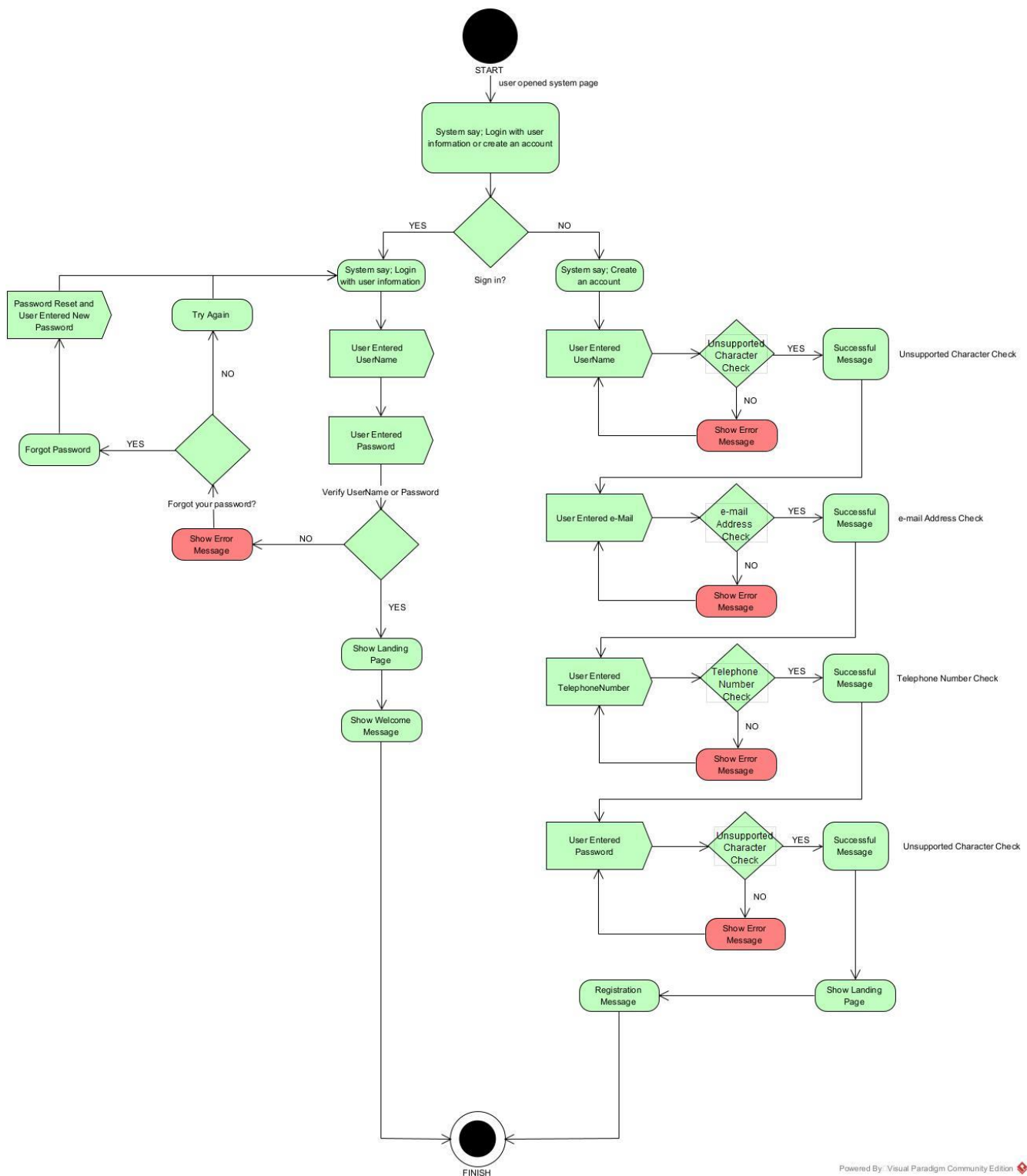
### 3.2.1 Login and Sign Up

#### 3.2.1.1 Description and Priority

Account creation feature, it is the system feature in which the user and the administrator create an account by entering their name, surname, e-mail address, telephone, and password. The inputs entered are controlled by this feature. Control criteria are determined by the system.

Account login is a system feature where users and administrators can access their accounts by entering their email addresses and passwords. Entered entries are controlled by this feature. If the password is forgotten, this feature can be used to reset the password.

Image 17: Login and Sign Up Activity Diagram



**3.2.1.2 Stimulus/Response Sequences**

Sequences of user actions and system responses is listed below:

1. User: Can choose to create an account or log in.
2. System: Opens the required page if the user chooses to create an account.
3. User: Enters name.
4. System: Checks whether the name has been entered using the specified criteria. If not, it gives a warning message. (Try again.)
5. User: Enter last name.
6. System: Checks whether the last name has been entered using the specified criteria. If not, it gives a warning message. (Try again.)
7. User: Enters mail.
8. System: Checks whether mail is entered according to the specified criteria. If not, it gives a warning message. (Try again.)
9. User: Enters the phone number.
10. System: Checks whether the phone number has been entered using the specified criteria. If not, it gives a warning message. (Try again.)
11. User: Enters the password.
12. System: Checks whether the password has been entered using the specified criteria. If not, it gives a warning message. (Maximum 8 letters and numbers.) (Try again.)
13. System: "Register" button becomes active when all conditions are met.
14. User: Creates the account by clicking the button.
15. System: Opens the required page if the user chooses to log in to the account.
16. User: Enters e-mail address and password.
17. System: Checks the password and email address. It gives an error message. (Email or password incorrect)
18. User: Can try again or update password.
19. System: If the user chooses to update the password, the system will update the password by going through the necessary steps. (Welcome message)

**3.2.1.3 Functional Requirements for Login and Sign Up**

Functional requirements associated with the "Login and Sign Up" feature is listed below:

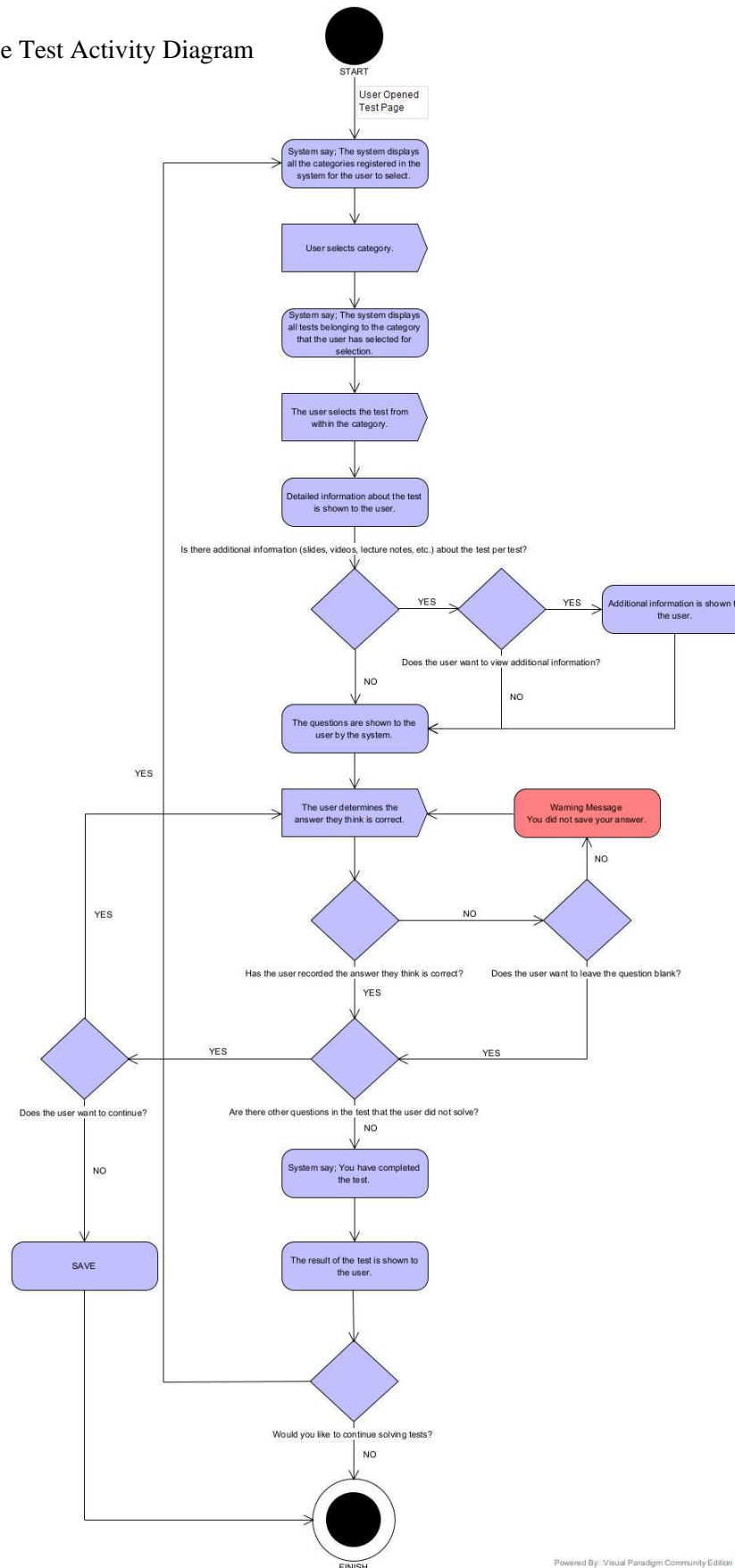
- ✚ REQ-1: User can create an account or login to user account.
- ✚ REQ-2: If the user chooses to create an account, the system opens the current page.
- ✚ REQ-3: Enters the username. The system checks whether the name has been entered using the specified criteria.
- ✚ REQ-4: User enters last name. The system checks whether the last name has been entered using the specified criteria.
- ✚ REQ-5: User enters mail. The system checks whether the mail has been entered using the specified criteria.
- ✚ REQ-6: User enters phone number. The system checks whether the phone number has been entered using the specified criteria.
- ✚ REQ-7: User enters password. The system checks whether you have entered the password using the specified criteria. (The password can be up to 8 characters. The password consists of letters and numbers.)
- ✚ REQ-8: If the user chooses to log into their own account, the system opens the current page.
- ✚ REQ-9: The user must enter their e-mail address and password to log in to their account.
- ✚ REQ-10: If the password is wrong, the system will give a warning.
- ✚ REQ-11: User can re-enter or update their password.
- ✚ REQ-12: If the user chooses to update his password, he can update his password by going through certain stages.
- ✚ REQ-13: An information message is given to the user when the system is logged in

### 3.2.2 Solve Test

#### 3.2.1.1 Description and Priority

The test-solving feature is a feature that allows the user to select a category, select the desired test under the selected category, and solve it. There are no security measures other than blocking screenshots.

Image 18: Solve Test Activity Diagram





**3.2.1.2 Stimulus/Response Sequences**

Sequences of user actions and system responses is listed below:

1. User: Selects a category from all the categories registered in the system.
2. System: The system checks if the category is selected. (You have not selected a category.)
3. User: Selects a test from all the tests registered in the category.
4. System: The system checks if the test is selected. (You have not selected a test.)
5. System: If the user wants to see the additional information, the system will show the additional information to the user.
6. User: Clicks the "Start Button"
7. User: Selects an option or leaves the question blank.
8. System: If the question is empty, it warns the user, but if the user wants to leave the question blank, the system allows it to continue. (Would you like to leave the question blank?)
9. User: Clicks stop button if user wants to stop the test.
10. System: If the user wants to pause the test, it saves the test in the ongoing tests category and exits the test (Test paused!)
11. System: Checks the number of questions remaining in the test. If the questions are finished, the test is over.
12. User: Has completed the test.
13. System: If the user wants to continue solving the test, the system restarts all the steps.

**3.2.1.3 Functional Requirements for Solve Test**

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

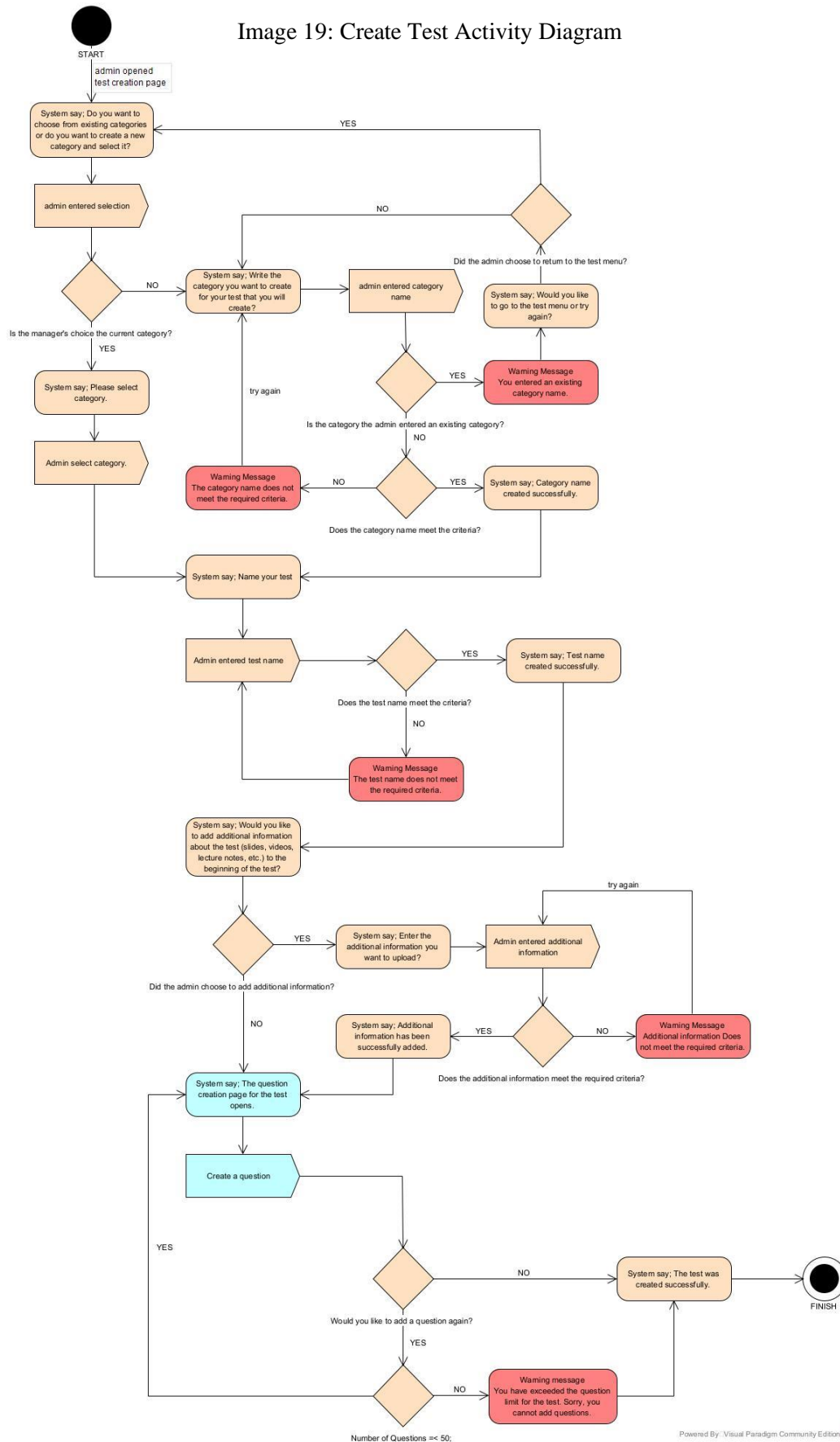
- ✚ REQ-1: All categories registered in the system are displayed to the user.
- ✚ REQ-2: User selects a category.
- ✚ REQ-3: All tests under the category are displayed to the user.
- ✚ REQ-4: User selects a test.
- ✚ REQ-5: The user is shown information about the test.
- ✚ REQ-6: Want to see more information?
- ✚ REQ-7: User makes selection.
- ✚ REQ-8: More information is shown if the selection is positive.
- ✚ REQ-9: Starts the test.
- ✚ REQ-10: Question and options are shown to the user.
- ✚ REQ-11: User selects the answer.
- ✚ REQ-12: Check if the answer is marked.
- ✚ REQ-13: If it is blank, you will be asked if you want to leave the question blank.
- ✚ REQ-14: User makes his selection.
- ✚ REQ-15: Warns the user if the selection is negative.
- ✚ REQ-16: The question reappears.
- ✚ REQ-17: Prompts the user whether to continue.
- ✚ REQ-18: Indicates user selection.
- ✚ REQ-19: If the selection is positive, the test continues.
- ✚ REQ-20: Question solving steps are repeated until all questions in the test are finished.
- ✚ REQ-21: Do you want to continue solving another test when the test is over?
- ✚ REQ-22: Shows the result according to the given answer and exits the system. or the results are displayed, allowing the user to solve another test.

### 3.2.2 Create Test

#### 3.2.1.1 Description and Priority

The test creation feature is a system feature that allows the administrator to select a category or, if the desired category does not exist, create it and name the test. No security measures.

Image 19: Create Test Activity Diagram



**3.2.1.2 Stimulus/Response Sequences**

Sequences of user actions and system responses is listed below:

1. Admin: Selects a category from all the categories registered in the system.
2. Admin: Creates a new category if there is no category in the system.
3. System: The system checks the category created by the administrator. If there is a category in the system, it gives an error message. (You have entered an existing category in the system.)
4. System: The system checks the category created by the administrator. If it is not suitable for system conditions, it gives an error message. (The category name is not appropriate.)
5. Admin: The test gives a name.
6. System: The system checks the test's name created by the administrator. If it is not suitable for system conditions, it gives an error message. (The test name is not appropriate.)
7. Admin: If admin wishes, admin can add the preliminary information to the test. (Image, video, voice etc.)
8. System: The system checks the added content by size and type. If not, it will give an error message. (Added content is not suitable in size and type.)
9. Admin: Creates a question.
10. System: If the number of questions exceeds 50, the system prevents the administrator from creating new questions. (The number of questions cannot exceed 50.)
11. Admin: Presses "Publish Button"
12. System: System test published successfully.

**3.2.1.3 Functional Requirements for Create Test**

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

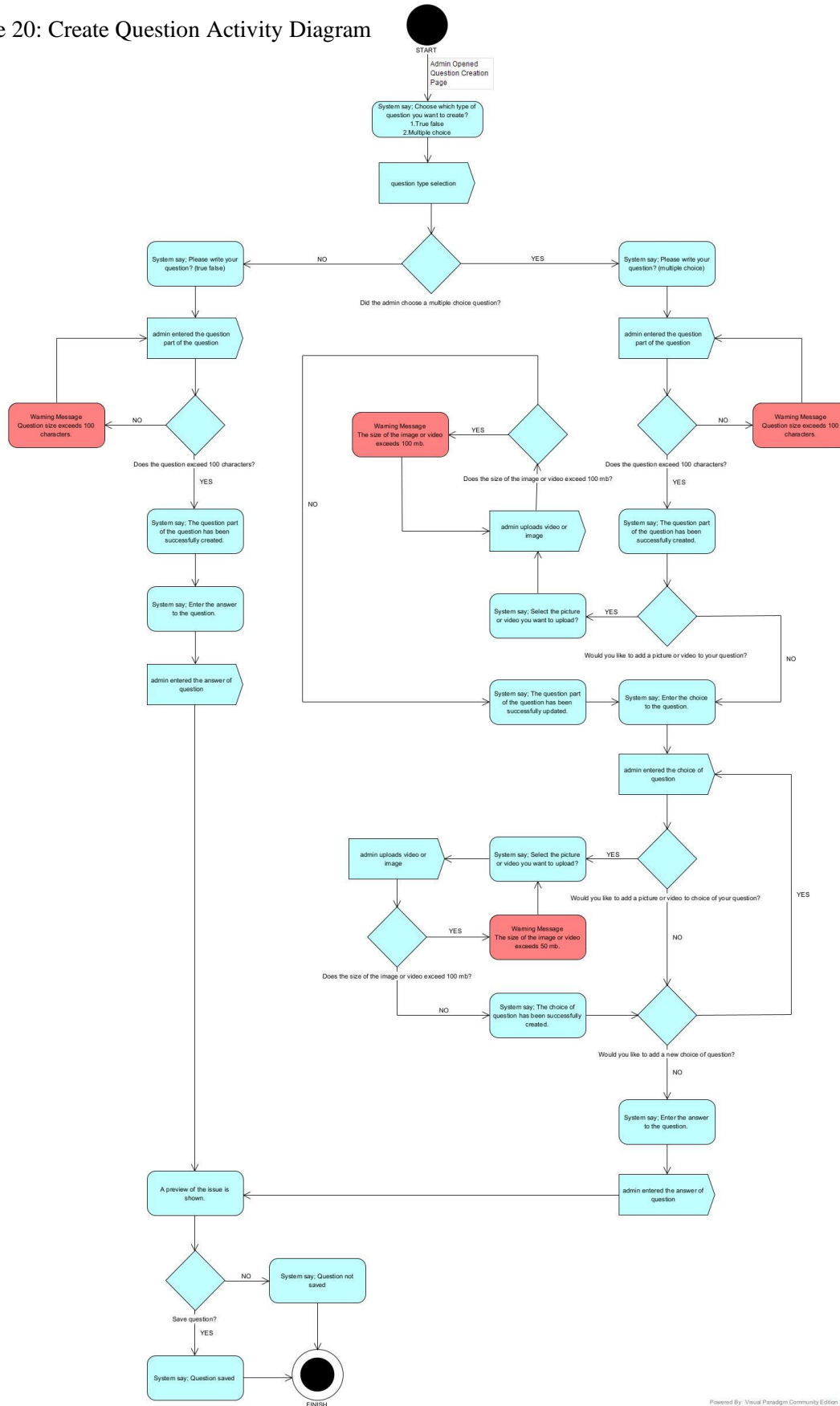
- ✚ REQ-1: Administrator selects or creates categories.
- ✚ REQ-2: The category created by the administrator is controlled by the system.
- ✚ REQ-3: If there is an existing category in the system, the system gives a warning.
- ✚ REQ-4: The administrator is prompted to try again or select an existing category.
- ✚ REQ-5: Category successfully created or selected.
- ✚ REQ-6: Administrator enters test name.
- ✚ REQ-7: The test name created by the administrator is controlled by the system.
- ✚ REQ-8: If it does not comply with the requirements of the system, the test name is entered again.
- ✚ REQ-9: Test name created successfully.
- ✚ REQ-10: If the administrator wants, preliminary information can be added to the test (image, video, sound, etc.).
- ✚ REQ-11: Added preliminary information is checked.
- ✚ REQ-12: If it is not suitable for the conditions of the system, preliminary information is created again.
- ✚ REQ-13: Preliminary information is created successfully.
- ✚ REQ-14: The questions are created by the administrator to have a maximum of 50 questions.
- ✚ REQ-15: The test would build successfully.

### 3.2.2 Create Question

#### 3.2.1.1 Description and Priority

The question creation feature is a system feature where the administrator can create questions for tests, choose the question type, add as many options as he wants to the multiple-choice questions, and save the answer to the question. No security measures.

Image 20: Create Question Activity Diagram



**3.2.1.2 Stimulus/Response Sequences**

Sequences of user actions and system responses is listed below:

1. Admin: Selects the question type.
2. Admin: If he chooses True-False Question type, he creates the question section.
3. System: Controls the question part. If the question part exceeds 1000 characters, it will give a warning. (You have exceeded the 1000-character size.)
4. Admin: Records the answer to the question.
5. System: Informs the user when there is no problem. (The operation is successful.)
6. Admin: If he/she chooses the multiple-choice question type, he/she creates the question section.
7. System: Controls the question part. If the question part exceeds 1000 characters, it will give a warning. (You have exceeded the 1000-character size.)
8. Admin: If the admin wants, you can add pictures, video, audio, etc. to the question section. can add.
9. System: If content is created, the system checks the size of the content. It gives a warning if the size exceeds 100 MB. (Content size cannot exceed 100mb)
10. Admin: Creates the options for the question.
11. Admin: If the admin wants, you can add pictures, video, audio, etc. to the answer to the question. can add.
12. System: If content is created, the system checks the size of the content. It gives a warning if the size exceeds 50 MB. (Content size cannot exceed 50mb)
13. System: If the question option created by the admin exceeds 10, it gives a warning. (You can add up to 10 options.)
14. System: Informs the user when there is no problem. (The operation is successful.)
15. Admin: Records the answer to the question.
16. System: Informs the user when there is no problem. (The operation is successful.)
17. Admin: Enters points for both question types.
18. System: Gives an error message if no points are entered for the question. (You did not enter a score for the question.)
19. Admin: If he wants, he can save the question after previewing it.

**3.2.1.3 Functional Requirements for Create Question**

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

- ✚ REQ-1: The administrator chooses one of the question types. (Multiple Choice / True-False)
- ✚ REQ-2: The system checks the administrator's selection and opens the appropriate page for selection.
- ✚ REQ-3: If the administrator chooses the "True-False" question type, it creates the question section.
- ✚ REQ-4: The system checks the question part according to the determined criteria.
- ✚ REQ-5: The administrator determines the correct answer to the question.
- ✚ REQ-6: Creates the question section if the administrator has selected the "Multiple Choice" question type.
- ✚ REQ-7: The system checks the question part according to the determined criteria.
- ✚ REQ-8: If the administrator wants, pictures, videos, music, etc. can be added to the created question part. can be added.
- ✚ REQ-9: If the administrator has added content to the question section, the system will control the size of the content. (Must not exceed 100 MB).
- ✚ REQ-10: The administrator can create the options to the question in order. (More than 10 options cannot be added.)
- ✚ REQ-11: If the administrator wants, admin can add pictures, videos etc. to the options.
- ✚ REQ-12: If the administrator has added content to the option, the system will check the size of the content. (Do not exceed 50 MB)
- ✚ REQ-13: The administrator determines the correct answer to the question.
- ✚ REQ-14: The administrator previews the problem he has created.
- ✚ REQ-15: The manager determines the score of the question admin creates.
- ✚ REQ-16: The administrator can save the question if he wants.

## ***4. Other Nonfunctional Requirements***

### ***4.1 Performance Requirements***

- Maximum data size will be 100 MB for questions.
- Maximum data size will be 50 MB for options.
- System should be able to process 1000 orders per hour.
- 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 run only in HTTPS. 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.