



CAPSTONE PROJECT REPORT

Report 3 – Software Requirement Specification

– Hanoi, September 2021 –

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1. Product Overview 製品の概要

Zappy is a new software system that supports FPT University students to learn Japanese. Targeted software helps users to learn Japanese by providing engaging lessons and simple learning methods. Aside from that, the system includes games to assist users with self-study. The context diagram below illustrates the external entities and system interfaces for release 1.0.

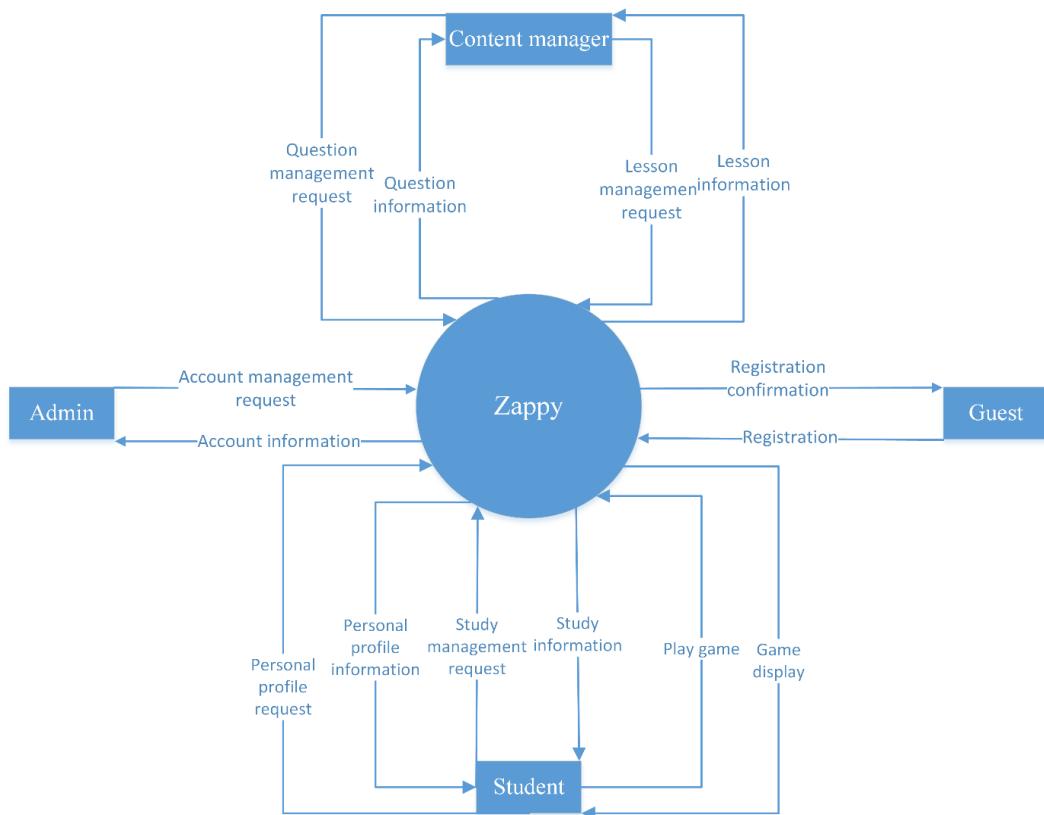


Figure 1: Context diagram

2. User Requirements ユーザー要求

2.1 Actors アクター

#	Actor	Description
1	Admin	The person who manages all accounts in the system.
2	Content Manager(s)	The registered user who manages question bank and lesson content.
3	Student(s)	The registered user who joins in courses, practices, takes the test and plays the game.
4	Guests	People who do not have an account and access the system.

Table 1: Actors

2.2 Use Cases ユースケース

2.2.1 Use Case Diagrams ユースケース図

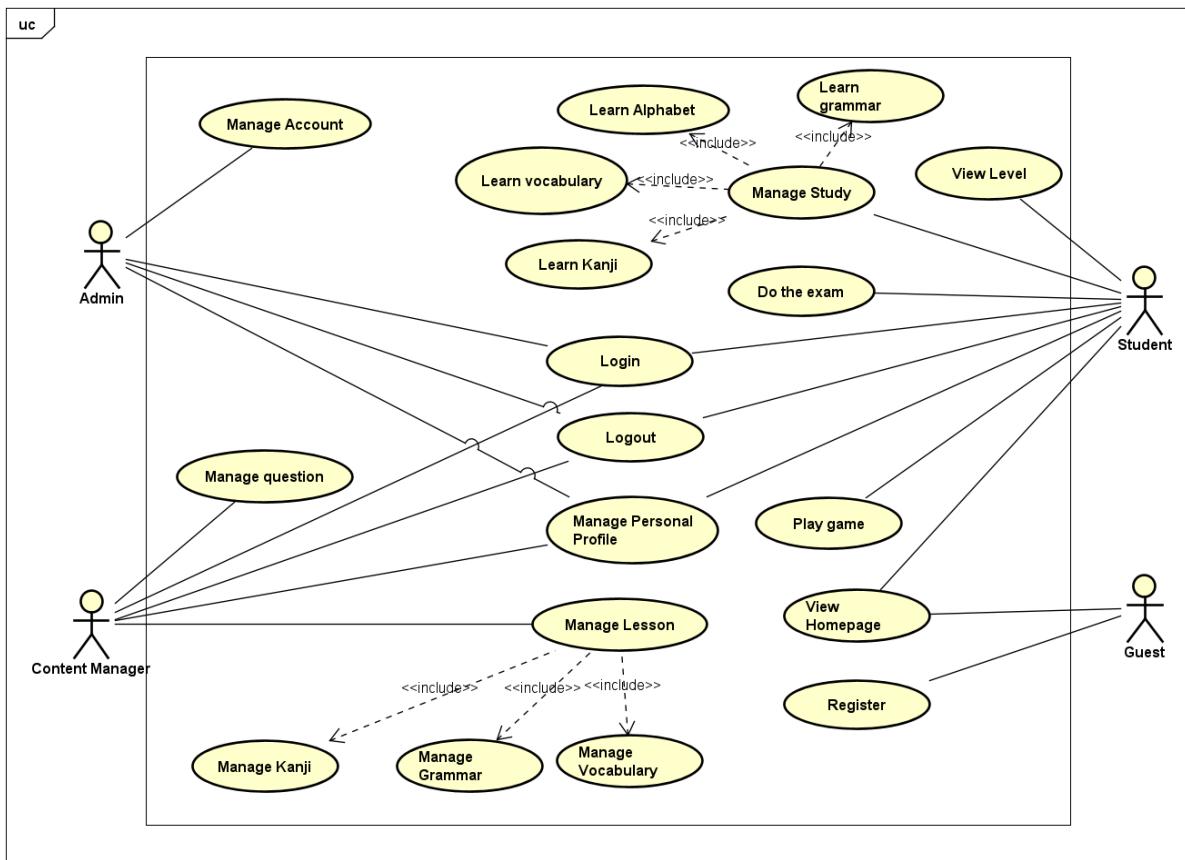


Figure 2: High level use case diagram

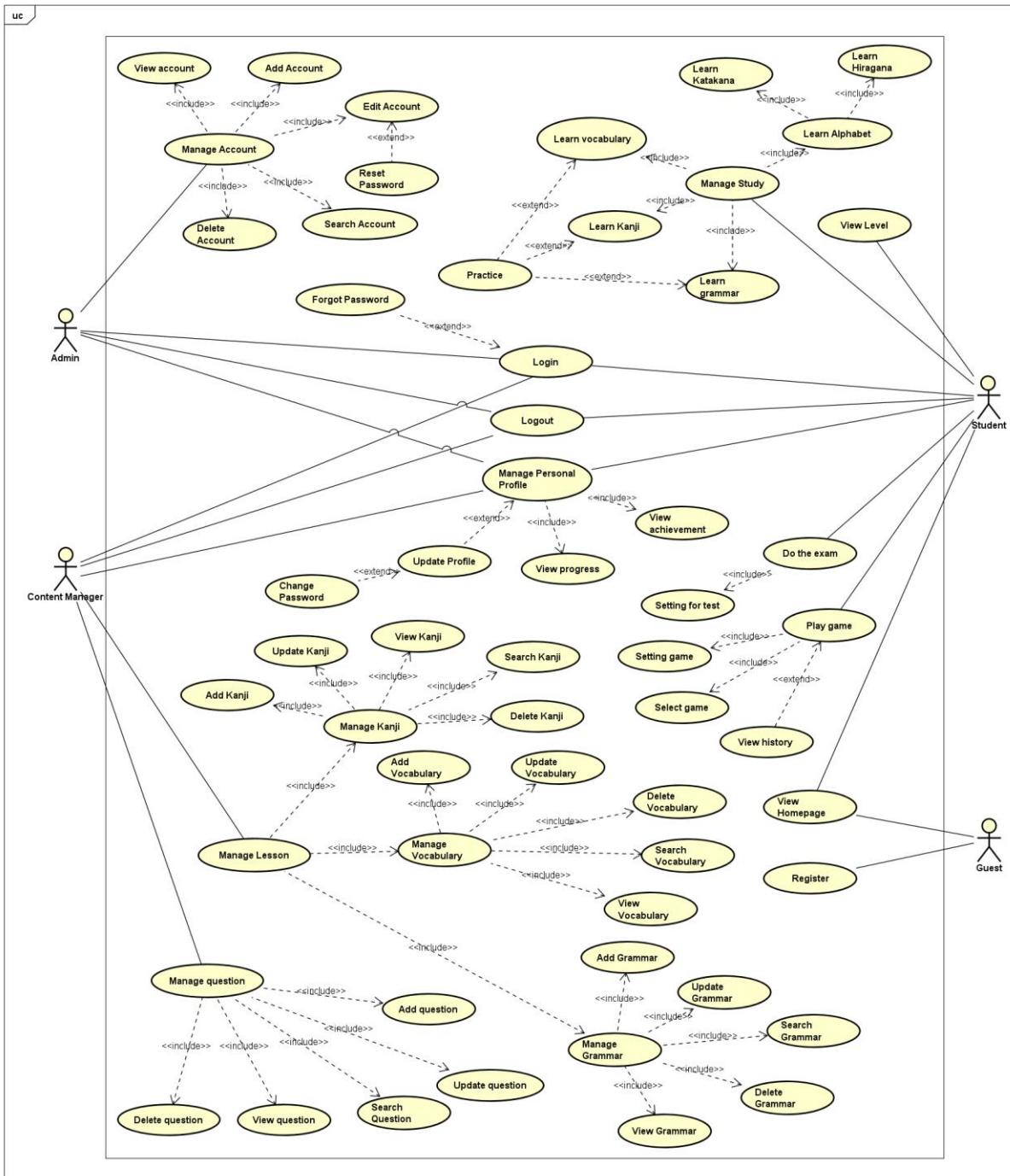


Figure 3: Detailed use case diagram

2.2.2 Use Case Descriptions ユースケース説明

ID	Use Case	Actors	Use Case Description
01	Manage account	Admin	This function allows admin to view all accounts in the system by clicking the account management button from the sidebar.

02	Add account	Admin	This function allows admin to add a new account into the system by clicking the “Thêm mới” button and filling out the form with account information.
03	Search account	Admin	This function allows admin to search account by entering keywords in the search box.
04	View account	Admin	This function allows admin to view account information in the system by clicking on the view icon in the “Thao tác” column on the account management page.
05	Edit account	Admin	This function allows admin to edit information of an account in the system by clicking on the edit icon in the “Thao tác” column on the account management page.
06	Reset password	Admin	This function allows admin to reset user's password when user send request.
07	Delete account	Admin	This function allows admin to delete an account in the system by clicking on the delete icon in the “Thao tác” column on the account management page.
08	Manage lesson	Content manager	This function allows content manager to choose one of three skills to manage.
09	Manage kanji	Content manager	This function allows the content manager to see all kanji in the system by clicking the “Quản lý bài học” hyperlink from the sidebar then selecting the “Quản lý chữ hán” hyperlink in the menu.
10	Add kanji	Content manager	This function allows the content manager to add a new kanji by clicking on the “Thêm mới” button on the kanji management page.

11	View kanji	Content manager	This function allows the content manager to view kanji information by clicking on the view icon in the “Thao tác” column on the kanji management page.
12	Update kanji	Content manager	This function allows the content manager to update kanji information by clicking on the edit icon in the “Thao tác” column on the kanji management page.
13	Delete kanji	Content manager	This function allows the content manager to delete a kanji by clicking on the delete icon in the “Thao tác” column on the kanji management page.
14	Search kanji	Content manager	This function allows the content manager to search kanji by entering keywords in the search box.
15	Manage vocabulary	Content manager	This function allows the content manager to see all vocabulary in the system by clicking the “Quản lý bài học” hyperlink from the sidebar and selecting the “Quản lý từ vựng” hyperlink in the menu.
16	Add vocabulary	Content manager	This function allows the content manager to add a new vocabulary by clicking on the “Thêm mới” button on the vocabulary management page.
17	View vocabulary	Content manager	This function allows the content manager to view vocabulary information by clicking on the view icon in the “Thao tác” column on the vocabulary management page.
18	Update vocabulary	Content manager	This function allows the content manager to update vocabulary information by clicking on the edit icon in the “Thao tác” column on the vocabulary management page.

19	Delete vocabulary	Content manager	This function allows the content manager to delete a vocabulary by clicking on the delete icon in the “Thao tác” column on the vocabulary management page.
20	Search vocabulary	Content manager	This function allows the content manager to search vocabulary by entering keywords in the search box.
21	Manage grammar	Content manager	This function allows the content manager to see all grammar in the system by clicking the “Quản lý bài học” hyperlink from the sidebar and selecting the “Quản lý ngữ pháp” hyperlink in the menu.
22	Add grammar	Content manager	This function allows the content manager to add a new grammar by clicking on the “Thêm mới” button on the grammar list page.
23	View grammar	Content manager	This function allows the content manager to view grammar information by clicking on the view icon in the “Thao tác” column on the grammar management page.
24	Update grammar	Content manager	This function allows the content manager to update grammar information by clicking on the edit icon in the “Thao tác” column on the grammar management page.
25	Delete grammar	Content manager	This function allows the content manager to delete grammar by clicking on the delete icon in the “Thao tác” column on the grammar management page.
26	Search grammar	Content manager	This function allows the content manager to search grammar, kanji, and vocabulary by entering keywords in the search box.

27	Manage question	Content manager	This function allows the content manager to view all questions in the system by clicking the “Quản lý câu hỏi” hyperlink from the sidebar.
28	Add question	Content manager	This function allows the content manager to add a new question by clicking on the “Thêm mới” button on the question list page.
29	Update question	Content manager	This function allows the content manager to update question information by clicking on the edit icon in the “Thao tác” column on the question list page.
30	View question	Content manager	This function allows the content manager to view question information by clicking on the view icon in the “Thao tác” column on the question list page.
31	Delete question	Content manager	This function allows the content manager to delete a question by clicking on the delete icon in the “Thao tác” column on the question list page.
32	Search question	Content manager	This function allows the content manager to search a question by entering keywords in the search box.
33	Manage study	Student	This function allows students to view study management navigation.
34	Learn alphabet	Student	This function allows the actor to learn the general of 2 alphabets
35	Learn hiragana	Student	This function allows students to learn the Hiragana alphabet by clicking on the “Học tập” button in the navigation bar, then clicking on the “Bảng chữ cái” button from the sidebar and selecting the “Hiragana” button.

36	Learn katakana	Student	This function allows student to learn the Katakana alphabet by clicking on the “Học tập” button in the navigation bar, clicking on the “Bảng chữ cái” button in the sidebar, and selecting the “Katakana” button.
37	Learn kanji	Student	This function allows student to learn kanji by clicking on the “Học tập” button in the navigation bar and selecting the “Chữ hán” button.
38	Learn grammar	Student	This function allows student to learn grammar by clicking on the “Học tập” button in the navigation bar and selecting the “Ngữ pháp” button.
39	Learn vocabulary	Student	This function allows student to learn vocabulary by clicking on the “Học tập” button in the navigation bar and selecting the “Từ vựng” button.
40	Practice	Student	This function allows students to practice what they have just learned by pressing the “Luyện tập” button on the screen and doing the exercises.
41	Setting for test	Student	This function allows students to customize the test by clicking on the “Kiểm tra” button in the navigation bar and selecting the parts they want to test.
42	Do the exam	Student	This function allows students to take a test by clicking on the “Tạo bài kiểm tra” button after setting for the test.
43	Select game	Student	This function allows students to choose a game they want to play by clicking on the “Choi game” button in the navigation bar and choosing a game.

44	Setting game	Student	This function allows students to customize the game by clicking on the “Chơi game” button in the navigation bar then choosing game, finally installing the game.
45	Play game	Student	This function allows students to play the game they previously selected by clicking on the “Bắt đầu” button after they have finished installing the game.
46	View history	Student	This function allows student to see the history of the game played by clicking on the “Lịch sử” button.
47	View progress	Student	This function allows students to view learning progress by accessing a personal profile page and clicking on the “Tiến độ học tập” hyperlink from the sidebar.
48	View achievement	Student	This function allows students to view achievement by accessing a personal profile page and clicking on the “Thành tích” hyperlink.
49	Manage personal profile	Admin, Content manager, Student	This function allows the actor to manage personal profile
50	Update profile	Admin, Content manager, Student	This function allows actors to change personal information in the system by clicking on the avatar in the navigation bar and selecting the “Thông tin cá nhân” hyperlink.
51	Change password	Admin, Content manager, Student	This function allows actors to change the password by clicking the “Cập nhật mật khẩu” hyperlink after accessing the personal profile page.
52	View level	Student	This function allows students to view their level score and list of level by hovering the cursor to “Level” label in navigation bar.

53	Register	Guest	This function allows guests to register a new account in the system.
54	Login	Admin, Content manager, Student	This function allows actors to log in to the system to access the functionality of the system.
55	Logout	Admin, Content manager, Student	This function allows actors to log out of the system.
56	Forgot Password	Admin, Content manager, Student	This function allows actors to change to new password when having forgotten password.
57	View homepage	Student, Guest	This function allows the actors to view homepage

Table 2: Use case list and description

3. Functional Requirements 機能要求

3.1 System Functional Overview システム機能の概要

3.1.1 Screens Flow スクリーンフロー

3.1.1.1 ‘Manage account’ screen flow アカウントの管理という画面シロー

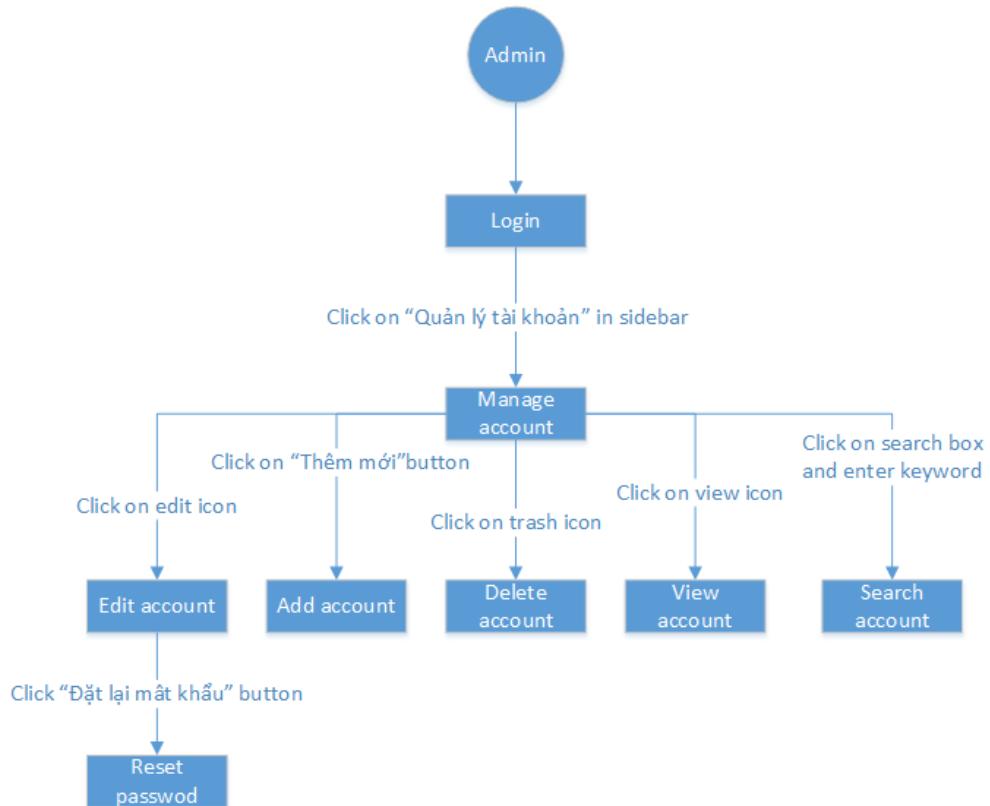


Figure 4: ‘Manage account’ screen flow

3.1.1.2 'Manage question' screen flow 質問の管理という画面フロー

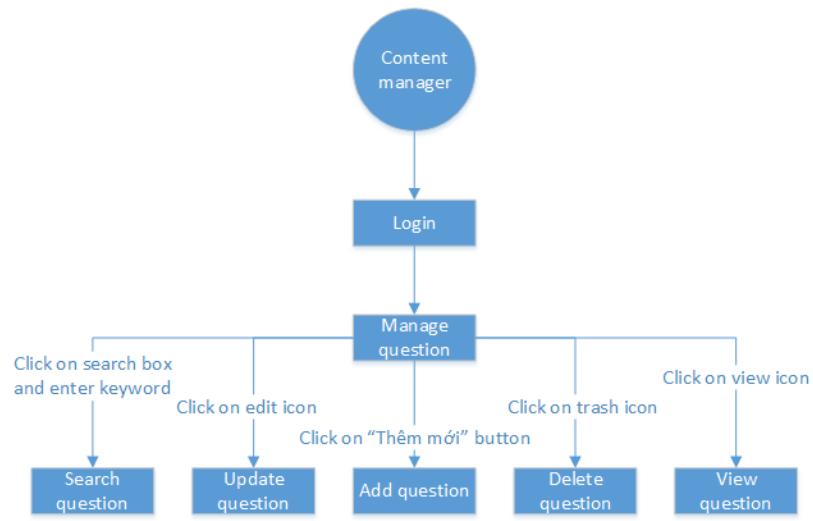


Figure 5: 'Manage question' screen flow

3.1.1.3 'Manage lesson' screen flow レッスンの管理という画面フロー

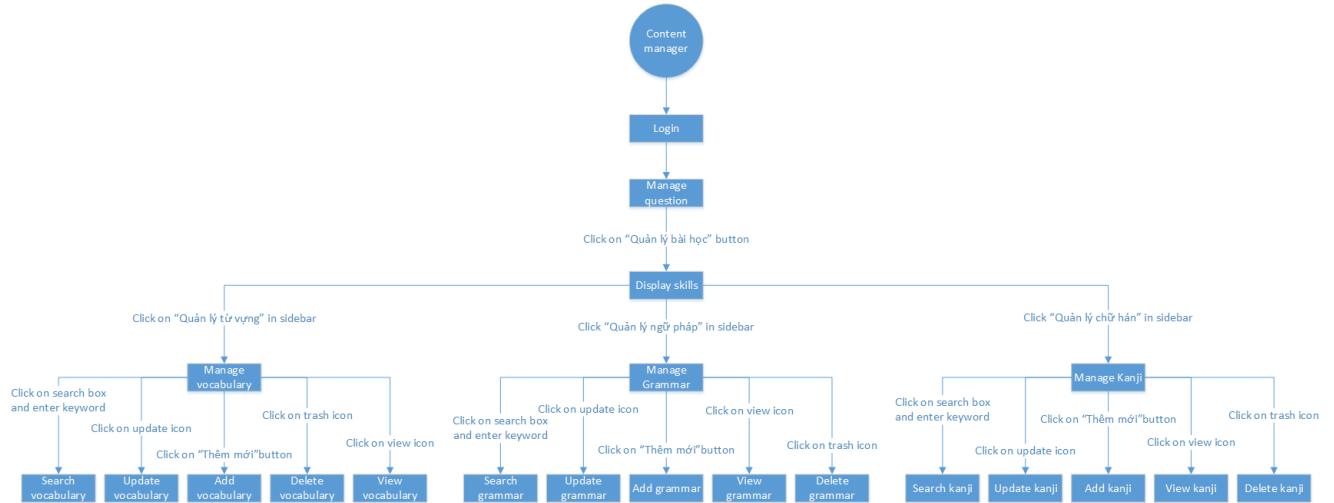


Figure 6: 'Manage lesson' screen flow

3.1.1.4 'Manage study' screen flow 学習の管理という画面フロー

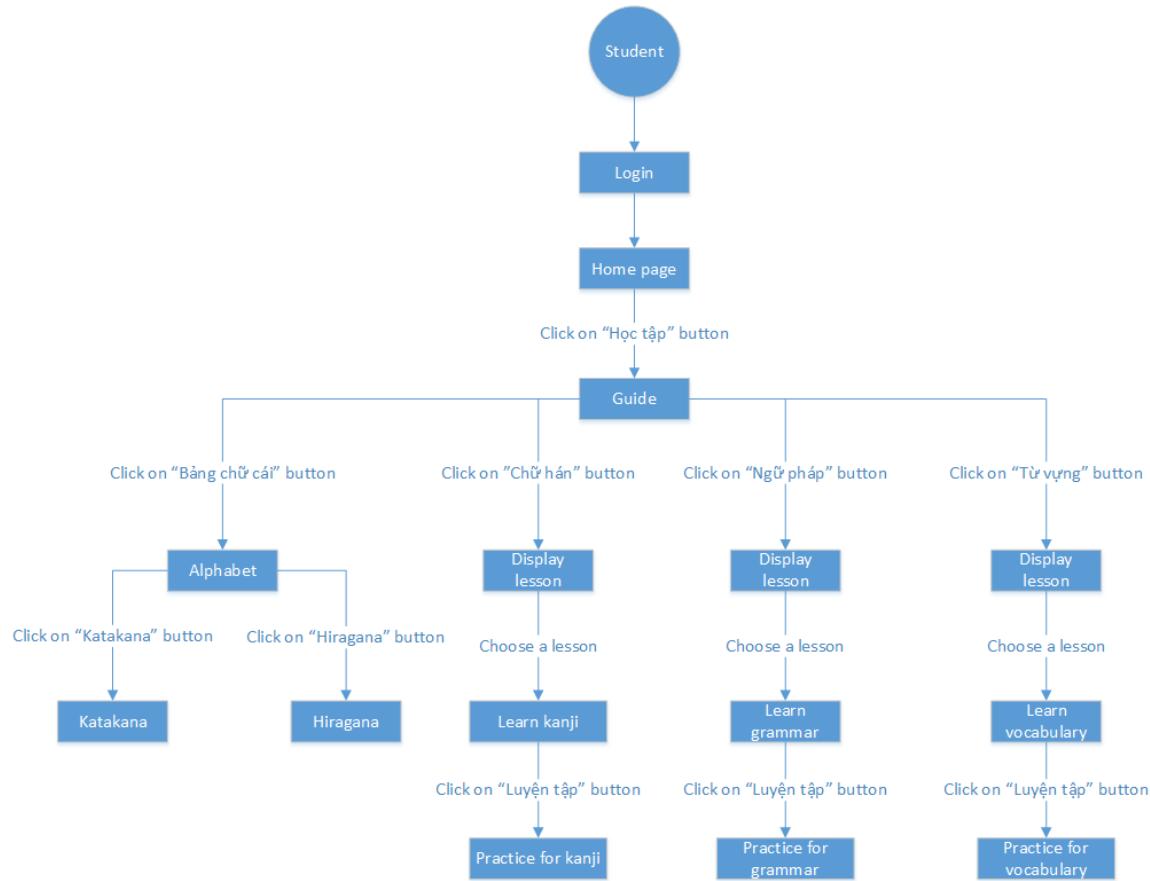


Figure 7: 'Manage study' screen flow

3.1.1.5 'Do the exam' screen flow テストするという画面フロー

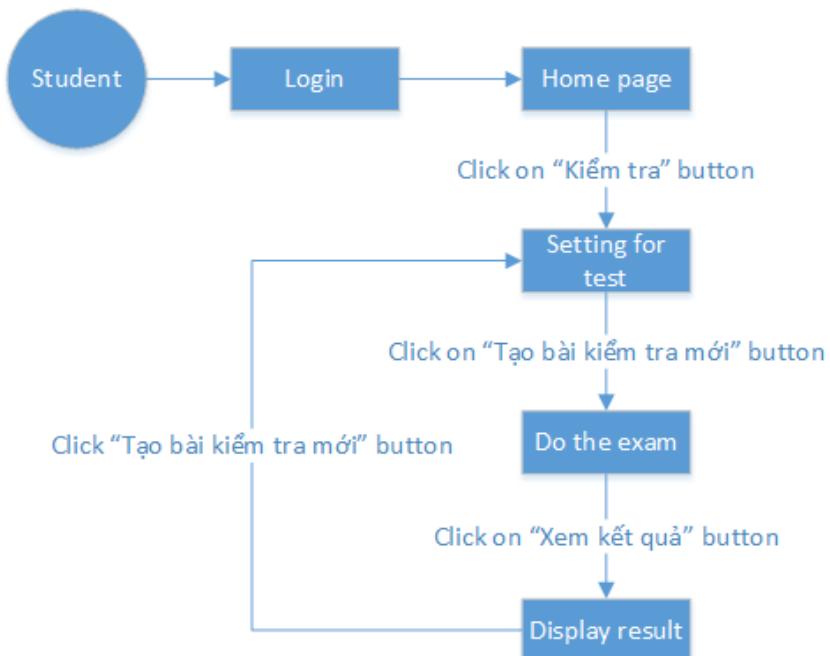


Figure 8: 'Do the exam' screen flow

3.1.1.6 'Play game' screen flow ゲームするという画面フロー

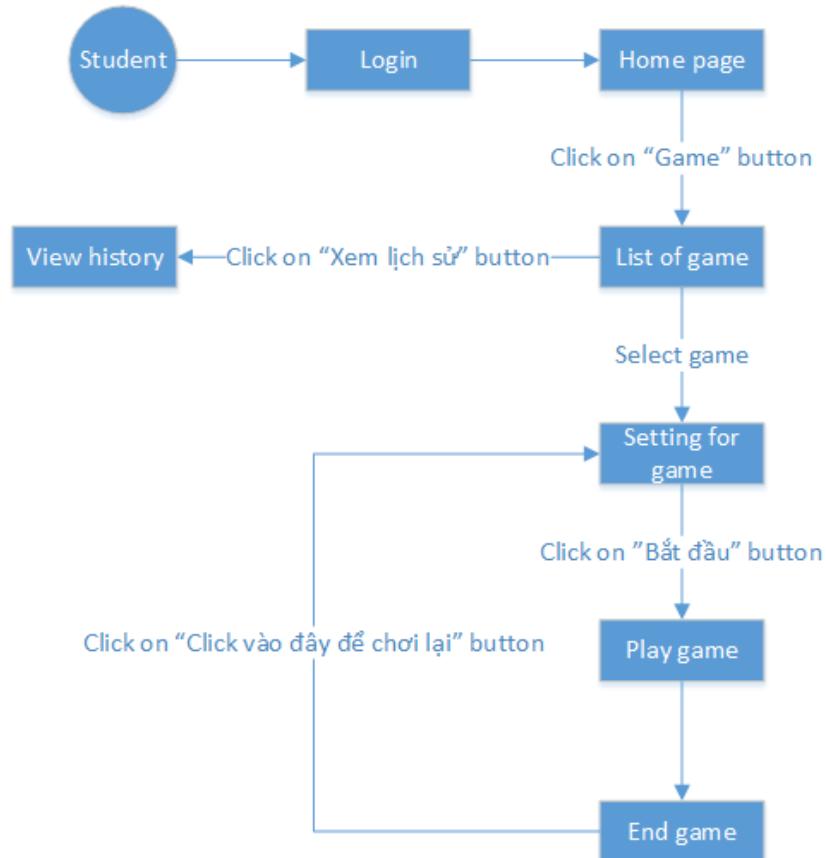


Figure 9: 'Play game' screen flow

3.1.1.7 'Manage personal profile' screen flow 個人プロフィールの管理という画面フロー

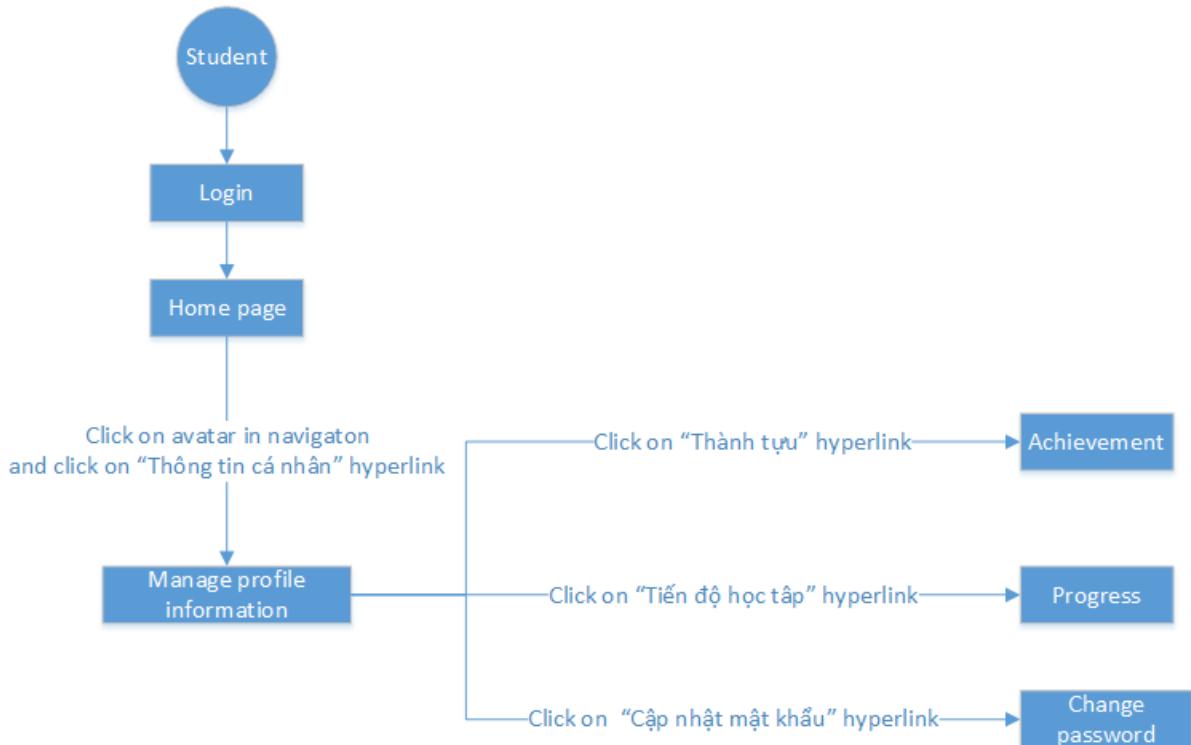


Figure 10: 'Manage personal profile' screen flow

3.1.1.8 'Common feature' screen flow 共通機能という画面フロー

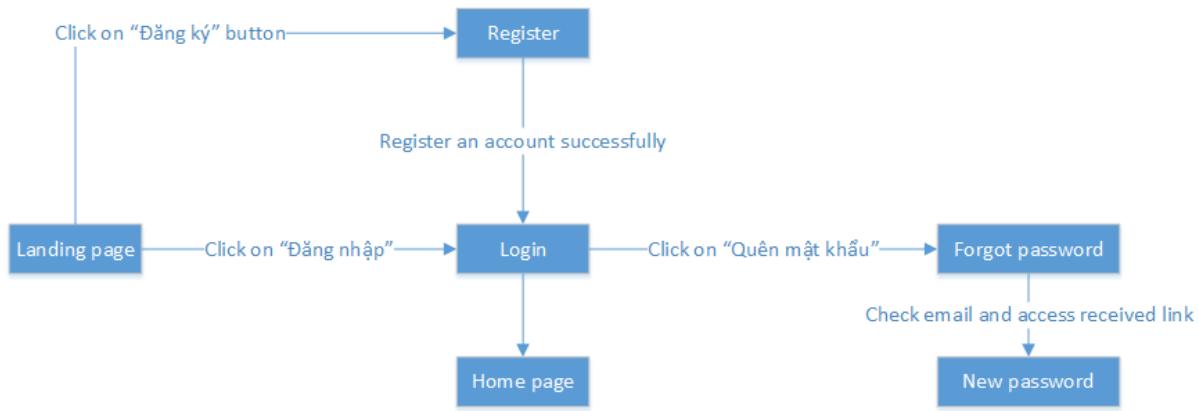


Figure 11: 'Common feature' screen flow

3.1.2 Screen Descriptions 画面説明

#	Feature	Screen	Description
1	Manage account	Manage account	Display all accounts in the system
2	Manage account	Edit account	Display pop-up form with account information to change user's role
3	Manage account	Add account	Display pop-up form to add a new account into the system
4	Manage account	Delete account	Display confirmation message to delete an account in the system
5	Manage account	View account	Display account information
6	Manage account	Search account	Display a list of accounts that contains keywords
7	Manage account	Reset password	Reset password when requested by user
8	Manage lesson	Display skills	Display list of skills to management
9	Manage lesson	Manage vocabulary	Display list of vocabulary in the system
10	Manage lesson	Edit vocabulary	Display pop-up form with vocabulary information to edit
11	Manage lesson	Add vocabulary	Display pop-up form to add new vocabulary into the list
12	Manage lesson	Delete vocabulary	Display confirmation message to delete a vocabulary in the list
13	Manage lesson	View vocabulary	Display vocabulary information

14	Manage lesson	Search vocabulary	Display a list of vocabulary that contains keywords
15	Manage lesson	Manage grammar	Display list of grammar in the system
16	Manage lesson	Edit grammar	Display pop-up form with grammar information to edit
17	Manage lesson	Add grammar	Display pop-up form to add new grammar into the list
18	Manage lesson	Delete grammar	Display confirmation message to delete a grammar in the list
19	Manage lesson	View grammar	Display grammar information
20	Manage lesson	Search grammar	Display a list of grammar that contains keywords
21	Manage lesson	Manage kanji	Display list of kanji in the system
22	Manage lesson	Edit kanji	Display pop-up form with kanji information to edit
23	Manage lesson	Add kanji	Display pop-up form to add new kanji into the list
24	Manage lesson	Delete kanji	Display confirmation message to delete a kanji in the list
25	Manage lesson	View kanji	Display kanji information
26	Manage lesson	Search kanji	Display a list kanji that contains keywords
27	Manage question	Manage question	Display list of questions in the system
28	Manage question	Edit question	Display pop-up form with question information to edit
29	Manage question	Add question	Display pop-up form to add a new question into the list
30	Manage question	Delete question	Display confirmation message to delete a question in the list
31	Manage question	View question	Display question information
32	Manage question	Search question	Display a list of question that contains keywords
33	Manage study	Guide	Instructions for use before learning

34	Manage study	Alphabet	Display hiragana and katakana alphabet image
35	Manage study	Hiragana	Display each letter of the hiragana alphabet as a card
36	Manage study	Katakana	Display each letter of the katakana alphabet as a card
37	Manage study	Display lesson	Display lessons for student to choose
38	Manage study	Learn kanji	Display each kanji as a card
39	Manage study	Practice for kanji	Do exercises about kanji
40	Manage study	Learn grammar	Display each grammar as a collapsible button
41	Manage study	Practice for grammar	Do exercises about grammar
42	Manage study	Learn vocabulary	Display each vocabulary as a card
43	Manage study	Practice for vocabulary	Do exercises about vocabulary
44	Manage study	Setting for test	Select skills student wants to test
45	Manage study	Do the exam	Display questions according to student settings
46	Manage study	Display result	Display score, number of questions students answered correctly
47	Play game	List of game	Display all games in the system
48	Play game	Setting for game	Customize lessons, skills, ... to practice through games
49	Play game	Play game	Play selected game
50	Play game	End game	Display score
51	Play game	History	Display score and time of played game
52	Manage personal profile	Manage profile information	Display user's information to update
53	Manage personal profile	Achievement	Display achievements during study
54	Manage personal profile	Progress	Display learning progress
55	Manage personal profile	Change password	Display form to change current password

56	Common	Register	Register an account for a new user
57	Common	Login	Allow users to log in to use services
58	Common	Homepage	Main functionally page for user
59	Common	Forgot Pasword	Allow users to input email to receive forgot password link
60	Common	New Password	Allow users to change to a new password

Table 3: Screen descriptions

3.1.3 Screen Authorization 画面認可

Screen	Admin	Content Manager	Student	Guest
Manage account	X			
Edit account	X			
Add account	X			
Delete account	X			
View account	X			
Search account	X			
Reset password	X			
Display skills		X		
Manage vocabulary		X		
Edit vocabulary		X		
Add vocabulary		X		
Delete vocabulary		X		
View vocabulary		X		
Search vocabulary		X		
Manage grammar		X		
Edit grammar		X		
Add grammar		X		
Delete grammar		X		
View grammar		X		
Search grammar		X		

Manage kanji		X		
Edit kanji		X		
Add kanji		X		
Delete kanji		X		
View kanji		X		
Search kanji		X		
Manage question		X		
Edit question		X		
Add question		X		
Delete question		X		
View question		X		
Search question		X		
Guide			X	
Alphabet			X	
Hiragana			X	
Katakana			X	
Display lesson			X	
Learn kanji			X	
Practice for kanji			X	
Learn grammar			X	
Practice for grammar			X	
Learn vocabulary			X	
Practice for vocabulary			X	
Setting for test			X	
Do the exam			X	
Display result			X	
List of game			X	
Setting for game			X	
Play game			X	

End game			X	
History			X	
Manage profile information	X	X	X	
Achievement			X	
Progress			X	
Change password	X	X	X	
Register				X
Login	X	X	X	
Forgot Password	X	X	X	
New Password	X	X	X	
Homepage			X	X

Table 4: Screen Authorization

3.1.4 Entity Relationship Diagram 実体関連図

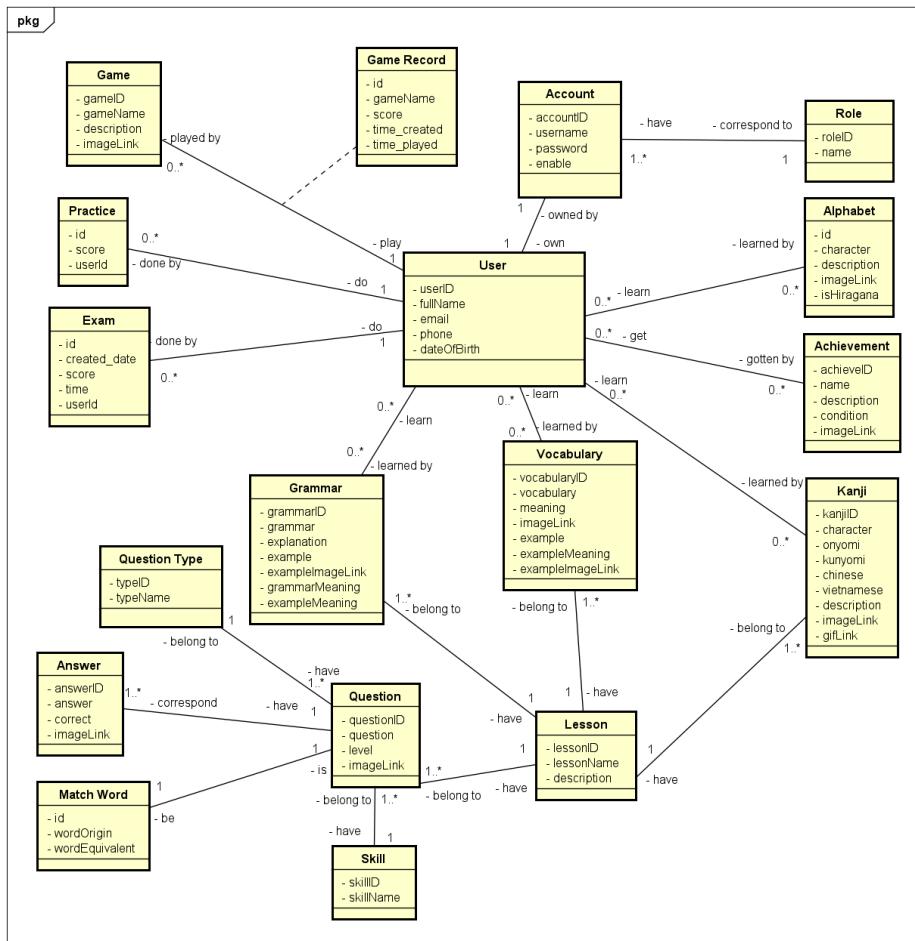


Figure 12: Entity relationship diagram

Entities Description 實体說明

#	Entity	Description
1	Account	The registered user of the system
2	User	Personal profile of a registered account
3	Role	The role of users on the system
4	Achievement	Achievements of the student during learning progress
5	Lesson	Contains information on lessons
6	Alphabet	Contains information on the alphabet
7	Kanji	Contains information on kanji
8	Vocabulary	Contains information on vocabulary
9	Grammar	Contains information on grammar
10	Question type	The type of question used in the test or practice or game
11	Question	The question used in the test or practice or game
12	Answer	The answers to the question
13	Game	Games
14	Game Record	History of games played by the user including time, scores,....
15	Skill	Skills such as vocabulary, grammar, kanji, and the alphabet.
16	Exam	Information of exam
17	Practice	Information of practice

Table 5: Entities description

3.2 Manage account アカウントを管理する

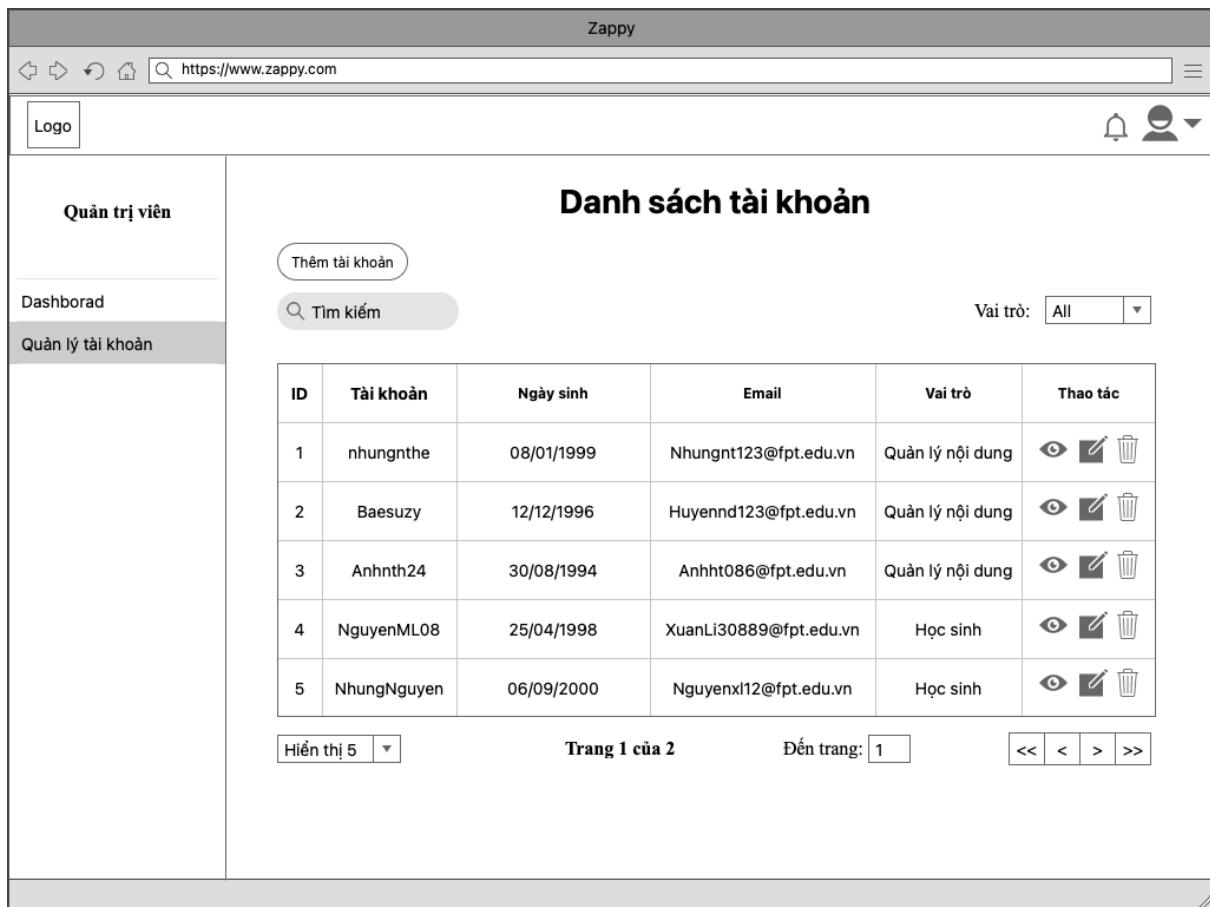


Figure 13: Manage account screen

ID and Name:	01 - Manage account	Actor:	Admin
Description:	This function allows actor to view all accounts in the system.		
Trigger:	When actor logged in.		
Preconditions:	PRE-1. Actor has logged in the system with an admin account.		
Post-conditions:	POST-1. The system displays the account list.		
Normal Flows:	Actor actions	System responses	
		1. Display screen management with a list of accounts.	
Alternative Flows:	N/A		
Exception Flows:	N/A		
Business Rules:	BR-02, BR-18		

3.2.1 Add account アカウントを追加する

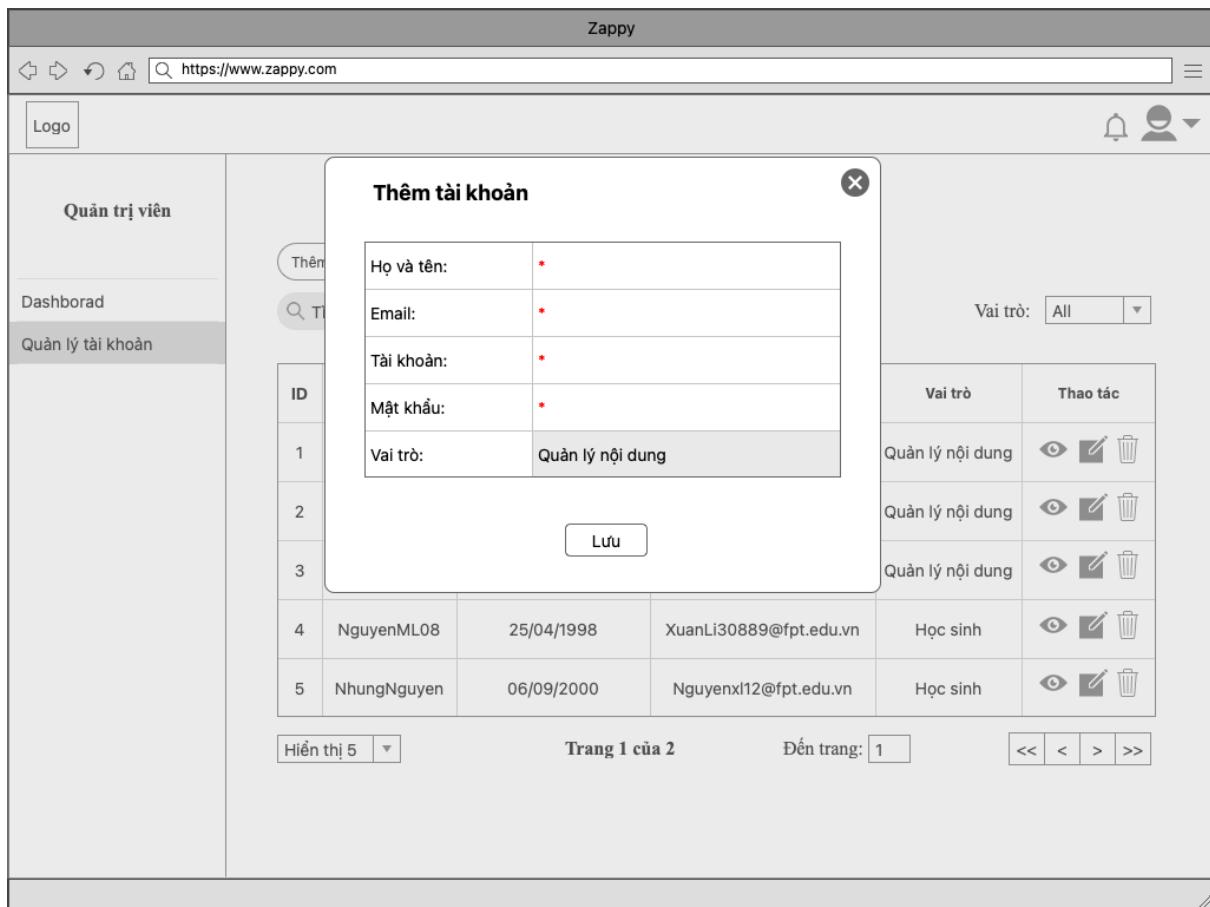


Figure 14: Add account screen

ID and Name:	02 - Add account	Actor:	Admin
Description:	This function allows actor to add a new account.		
Trigger:	Actor clicks on the button “Thêm mới”.		
Preconditions:	PRE-1. Actor has logged in the system with an admin account. PRE-2. Actor accesses the account management page.		
Post-conditions:	POST-1. The system displays a list of accounts with a new account added. POST-2. A new account has been added to the database.		
Normal Flows:	Actor actions 1. Click on the add button. 3. Input information of a new account. 4. Click on the “Lưu” button.	System responses 2. Display a pop-up form to fill in the new account information. 5. Display a pop-up message: “Thêm tài khoản thành công.”	
Alternative Flows:	A1. The actor clicks on the “X” button (After step 2) The system closes pop-up and doesn't change anything.		

Exception Flows:	<p>E1. The username is blank (After step 4) Notify an error message: “Không được để trống”</p> <p>E2. The username contains special characters (After step 4) Notify an error message: “Không bao gồm dấu cách hoặc ký tự đặc biệt”</p> <p>E3. Length of the username is not between 4 and 20 characters (After step 4) Notify an error message: “Độ dài từ 4-20 ký tự”</p> <p>E4. The email is blank (After step 4) Notify an error message: “Không được để trống”</p> <p>E5. The email is in the wrong format (After step 4) Notify an error message: “Cần bao gồm ‘@’ và không được chứa dấu cách”</p> <p>E6. The full name is blank (After step 4) Notify an error message: “Không được để trống.”</p> <p>E7. The full name contains special characters and number (After step 4) Notify an error message: “Không được bao gồm số và ký tự đặc biệt”</p> <p>E8. The full name is not between 1 and 50 characters (After step 4) Notify an error message: “Độ dài từ 1-50 ký tự”</p> <p>E9. The username has already existed (After step 4) Notify an error message: “Tên tài khoản đã tồn tại”</p> <p>E10. The email is already in use (After step 4) Notify an error message: “Email đã được sử dụng”</p> <p>E11. The phone number does not start with 0 and does not contain 10 digits (After step 4) Notify an error message: “Độ dài 10 số, không bao gồm ký tự đặc biệt và dấu cách”</p> <p>E12. The date of birth is not before the current time (After step 4) Notify an error message: “Cần chọn ngày sinh nhỏ hơn hiện tại”</p> <p>E13. The role has not been selected (After step 4) Notify an error message: “Vui lòng chọn vai trò”</p>
Business Rules:	<u>BR-04, BR-05, BR-06, BR-07, BR-08, BR-09, BR-13, BR-16, BR-17, BR-19</u>

3.2.2 Search account アカウントを検索する

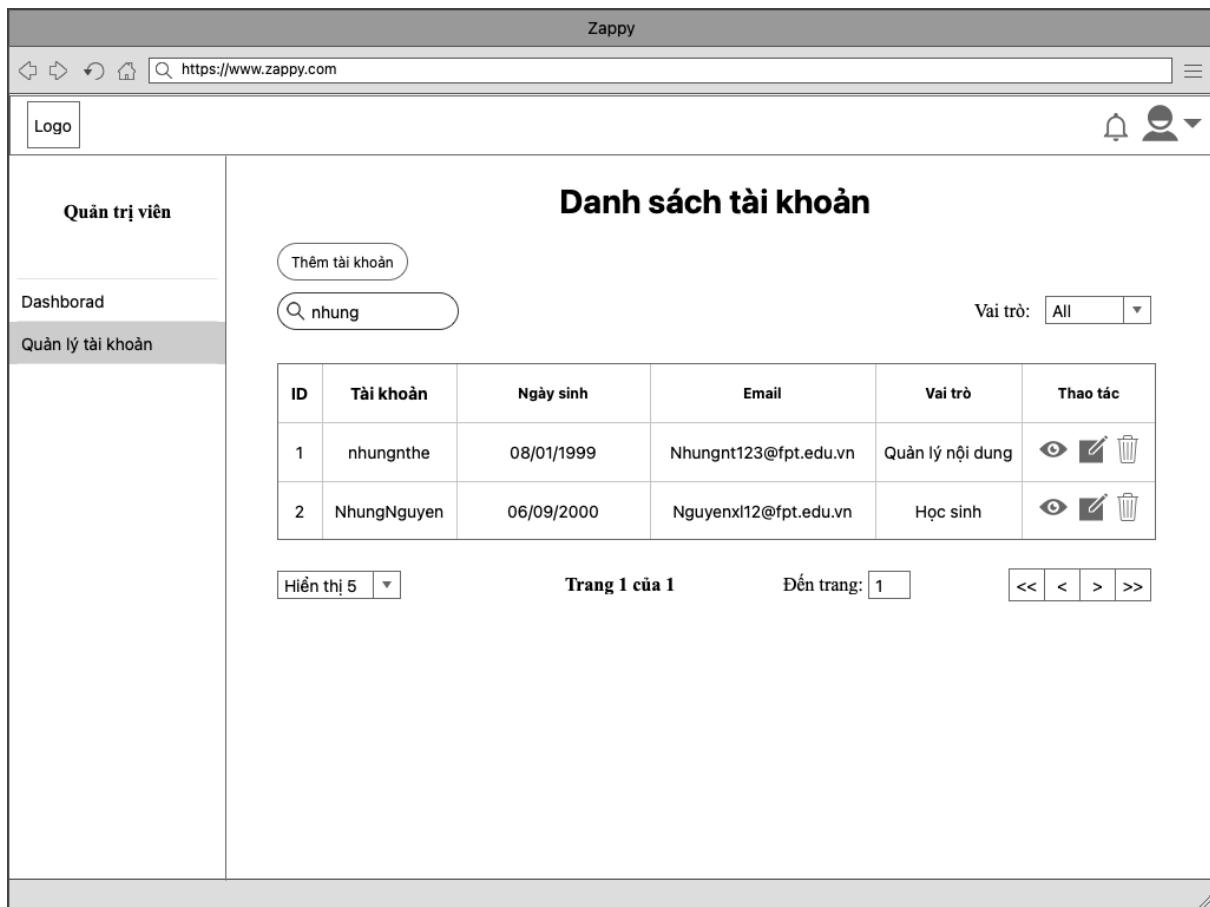


Figure 15: Search account screen

ID and Name:	03 – Search account	Actor:	Admin		
Description:	This function allows actor to search the accounts with the information related to the word filled in search box.				
Trigger:	Actor inputs the keywords into the search box.				
Preconditions:	PRE-1. Actor has logged in the system with an admin account. PRE-2. Actor accesses the account management page.				
Post-conditions:	POST-1. The system displays a list of accounts with field information that contains entered keywords.				
Normal Flows:	Actor actions	System responses			
	1. Input keywords in the search box.	2. Display the search results.			
Alternative Flows:	N/A				
Exception Flows:	N/A				
Business Rules:	BR-02, BR-18				

3.2.3 View account アカウントの情報を見る

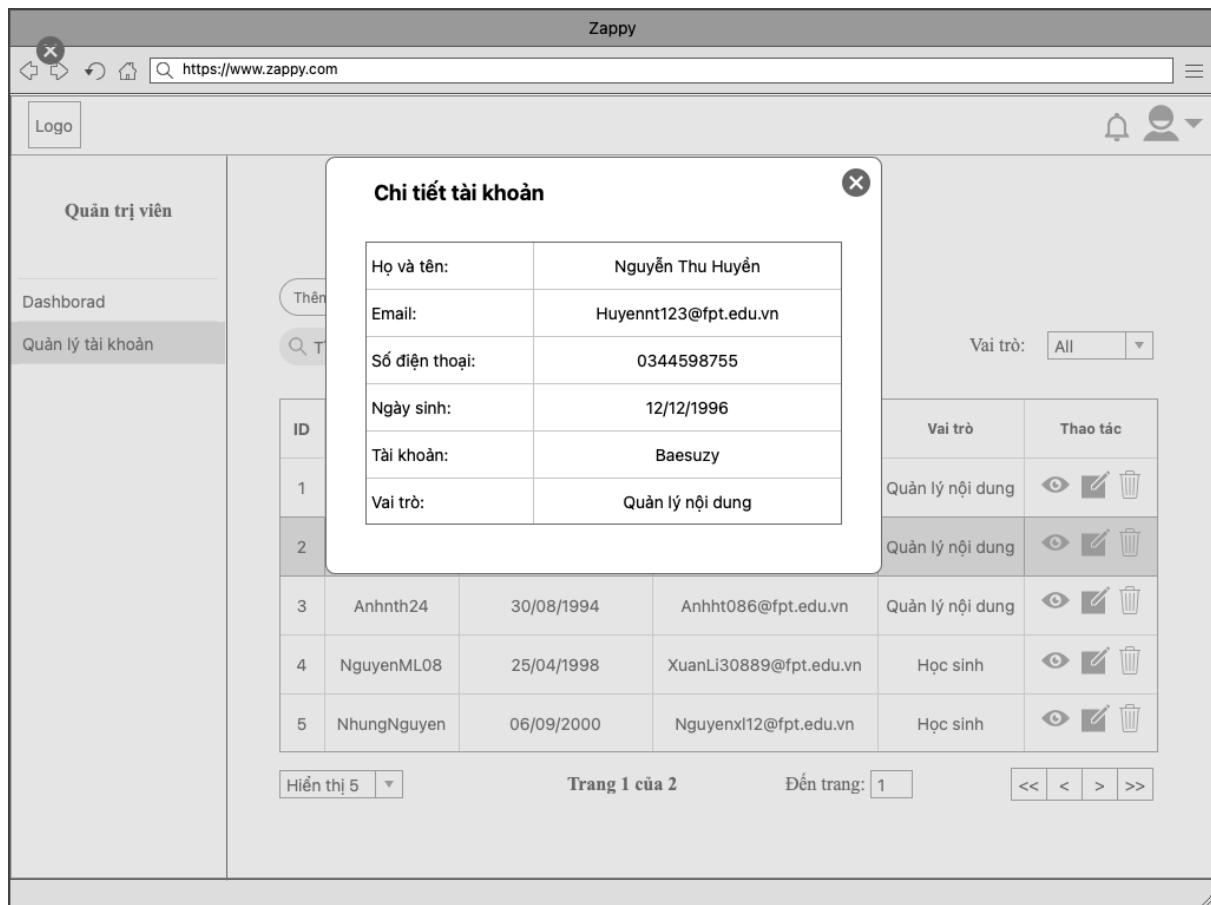


Figure 16: View account screen

ID and Name:	04 - View account	Actor:	Admin		
Description:	This function allows the actor to view an account's information.				
Trigger:	Actor clicks on the view icon in the "Thao tác" column.				
Preconditions:	PRE-1. Actor has logged in the system with an admin account. PRE-2. Actor accesses the account management page. PRE-3. Account list must have at least 1 account.				
Post-conditions:	POST-1. The system displays information about an account.				
Normal Flows:	Actor actions	System responses			
	1. Click on the view icon at the row which has the account to view detail.	2. Display a pop-up form with the account information.			
Alternative Flows:	N/A				
Exception Flows:	N/A				

Business Rules:	BR-02
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3.2.4 Edit account アカウントを編集する

Figure 17: Edit account screen

ID and Name:	05 - Edit account	Actor:	Admin
Description:	This function allows the actor to edit the information of an account.		
Trigger:	Actor clicks on the edit icon in the “Thao tác” column.		
Preconditions:	PRE-1. Actor has logged in the system with an admin account. PRE-2. Actor accesses the account management page. PRE-3. Account list must have at least 1 account.		
Post-conditions:	POST-1. The system displays a list of accounts with the edited account. POST-2. The account information in the database has been updated with new information.		
	Actor action	System responses	

Normal Flows:	1. Click on the edit icon at the row which has the account to edit. 3. Edit account information. 4. Click the “Lưu” button.	2. Display a pop-up form to edit account information. 5. Display message: “Đã lưu”
Alternative Flows:	N/A	
Exception Flows:	<p>E0. The actor clicks on the “X” button (After step 2) The system closes pop-up and doesn't change anything.</p> <p>E1. The username is blank (After step 4) Notify an error message: “Không được để trống”</p> <p>E2. The username contains special characters (After step 4) Notify an error message: “Không bao gồm dấu cách hoặc ký tự đặc biệt”</p> <p>E3. Length of the username is not between 4 and 20 characters (After step 4) Notify an error message: “Độ dài từ 4-20 ký tự”</p> <p>E4. The email is blank (After step 4) Notify an error message: “Không được để trống”</p> <p>E5. The email is in the wrong format (After step 4) Notify an error message: “Cần bao gồm ‘@ .’ và không được chứa dấu cách”</p> <p>E6. The full name is blank (After step 4) Notify an error message: “Không được để trống.”</p> <p>E7. The full name contains special characters and number (After step 4) Notify an error message: “Không được bao gồm số và ký tự đặc biệt”</p> <p>E8. The full name is not between 1 and 50 characters (After step 4) Notify an error message: “Độ dài từ 1-50 ký tự”</p> <p>E9. The username has already existed (After step 4) Notify an error message: “Tên tài khoản đã tồn tại”</p> <p>E10. The email is already in use (After step 4) Notify an error message: “Email đã được sử dụng”</p> <p>E11. The phone number does not start with 0 and does not contain 10 digits (After step 4) Notify an error message: “Độ dài 10 số, không bao gồm ký tự đặc biệt và dấu cách”</p> <p>E12. The date of birth is not before the current time (After step 4) Notify an error message: “Cần chọn ngày sinh nhỏ hơn hiện tại”</p>	
Business Rules:	BR-02 , BR-04 , BR-05 , BR-06 , BR-07 , BR-08 , BR-09 , BR-13 , BR-16 , BR-17 , BR-19 , BR-20	

3.2.5 Reset password パスワードを再設定する

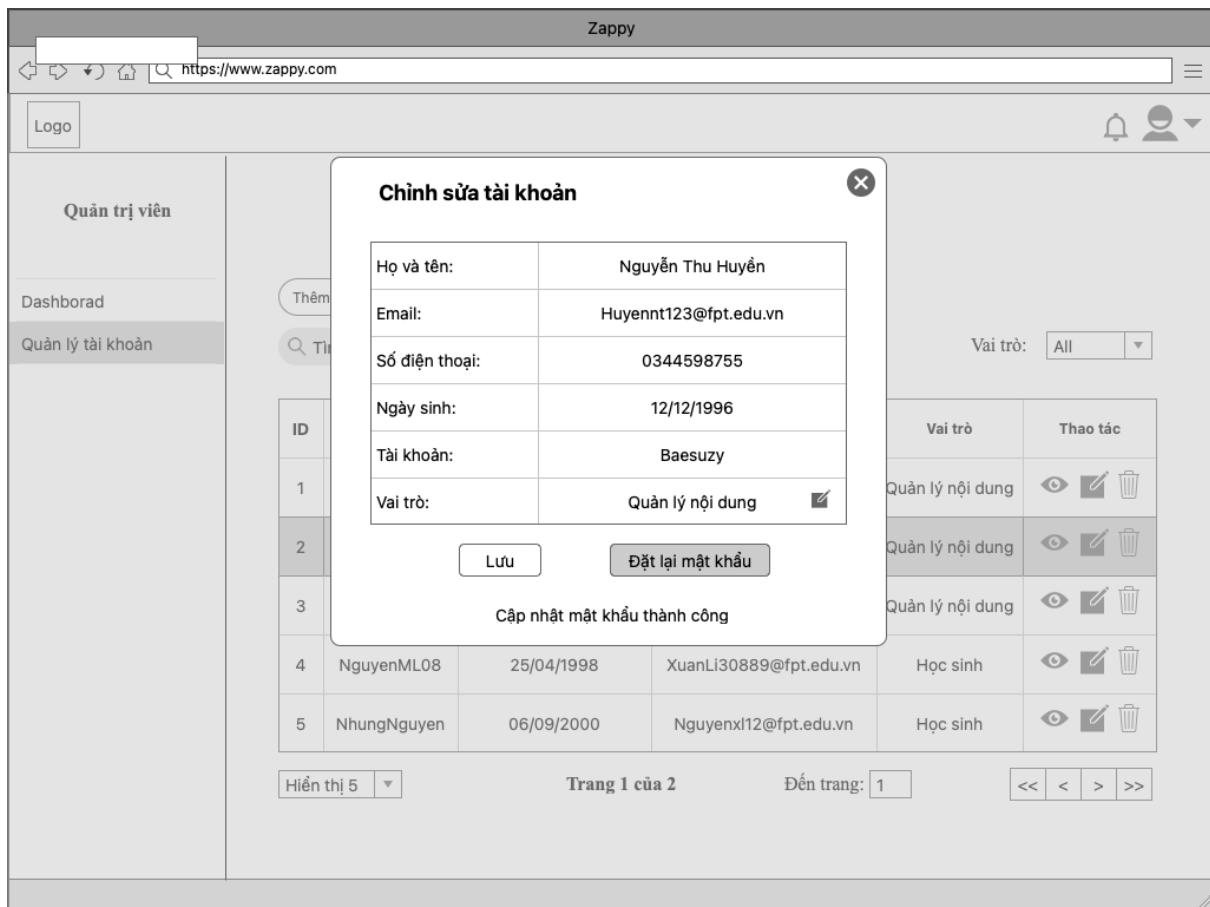


Figure 18: Reset password screen

ID and Name:	06 – Reset password	Actor:	Admin
Description:	Actor uses this function to reset password of an account.		
Trigger:	Actor clicks on the reset button.		
Preconditions:	PRE-1. Actor has logged in the system with an admin account. PRE-2. Actor accesses the account management page. PRE-3. Admin received a request to reset password from user.		
Post-conditions:	POST-1. The system displays message reset password successful. POST-2. The user's password is reset to the default password. POST-3. The system send notification to user via email.		
Normal Flows:	Actor actions 1. Click on the edit icon at the row which has the account to reset password. 3. Click on the “Đặt lại mật khẩu” button. 5. Click on the “Có” button.	System responses 2. Display pop-up form with account information. 4. Display message: “Bạn muốn đặt lại mật khẩu của tài khoản này?” 6. Display message: “Đặt lại mật khẩu thành công”	

Alternative Flows:	N/A
Exception Flows:	E1. The actor clicks on the “Không” button (Step 5) The system closes pop-up and doesn't change anything.
Business Rules:	BR-02, BR-21

3.2.6 Delete account アカウントを削除する

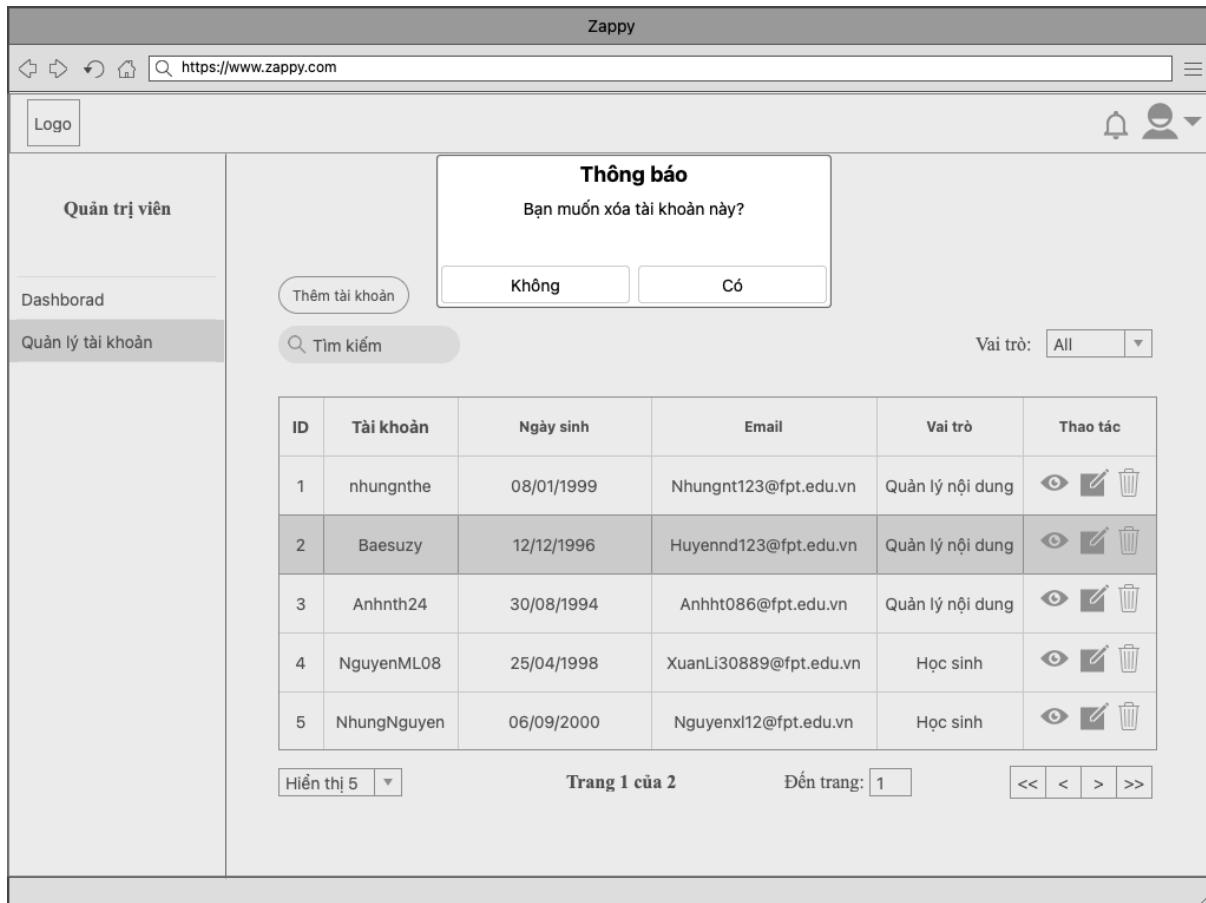


Figure 19: Delete account screen

ID and Name:	07 - Delete account	Actor:	Admin
Description:	This function allows the actor to delete an account.		
Trigger:	Actor clicks on the delete icon in the “Thao tác” column.		
Preconditions:	PRE-1. Actor has logged in the system with an admin account. PRE-2. Actor accesses the account management page. PRE-3. Account list must have at least 1 account.		
Post-conditions:	POST-1. The system displays a list of accounts without a deleted account.		

	POST-2. The account information in the database has been updated with the disabled status.	
Normal Flows:	Actor actions	System responses
	1. Click on the delete icon at the row which has the account to delete. 3. Click the “Có” button.	2. Display a pop-up message: “Bạn muốn xóa tài khoản này?” 4. Display message: “Xóa tài khoản thành công”
Alternative Flows:	N/A	
Exception Flows:	E1. The actor clicks on the “Không” button (At step 3) The system closes pop-up and doesn't change anything.	
Business Rules:	BR-02	

3.3 Manage lesson レッスンを管理する

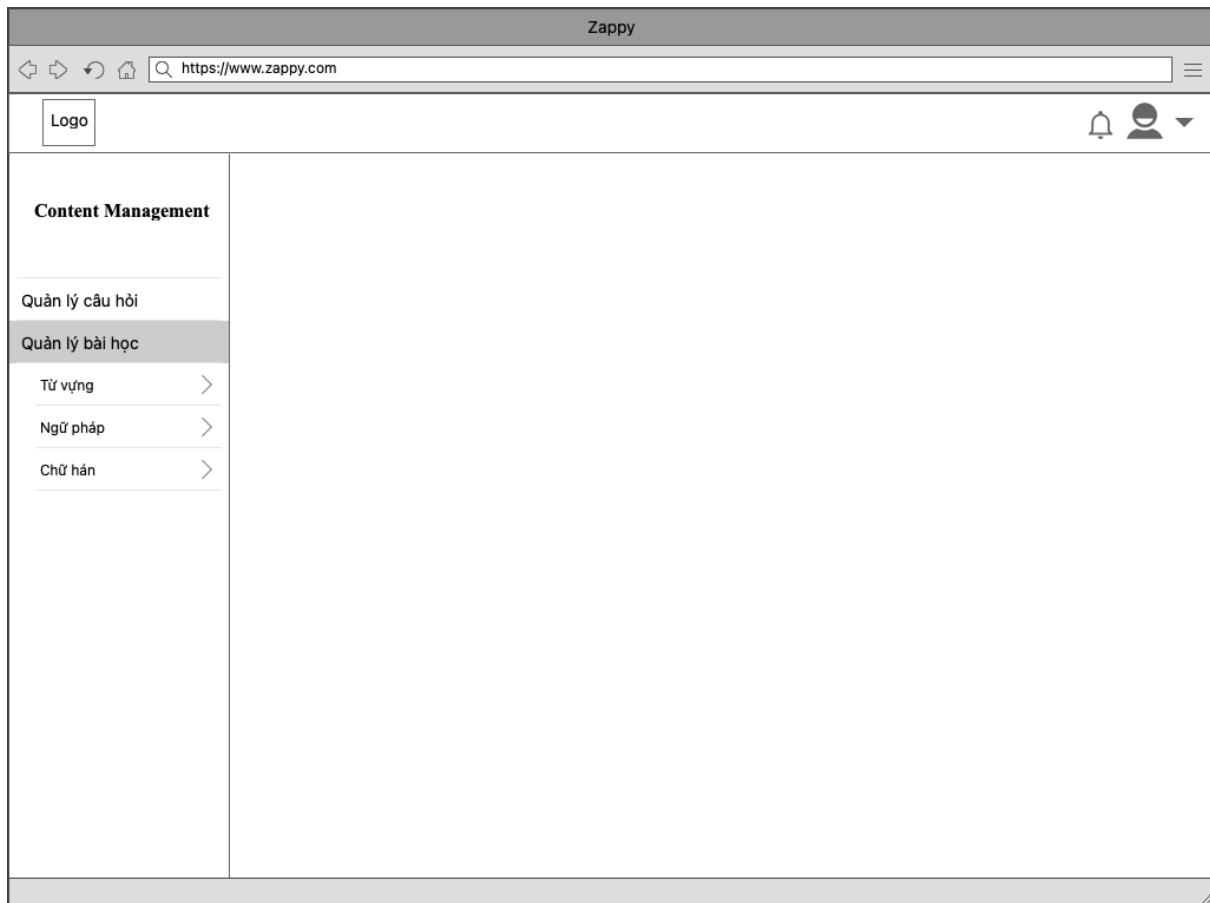


Figure 20: Manage lesson

ID and Name:	08 – Manage lesson	Actor:	Content Manager
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Description:	This function allows content manager to choose one of three skills to manage.	
Trigger:	Actor clicks on the “Quản lý bài học” hyperlink in the sidebar.	
Preconditions:	PRE-1. Actor has logged in the system with a content manager account.	
Post-conditions:	POST-1. The system displays menu to manage lesson.	
Normal Flows:	Actor actions	System responses
	1. Click on the “Quản lý bài học” hyperlink in the sidebar.	2. Display a drop-down menu.
Alternative Flows:	N/A	
Exception Flows:	N/A	
Business Rules:	BR-03	

3.3.1 Manage kanji 漢字を管理する

ID	Bài	Hán tự	Âm Hán	Nghĩa	Thao tác
1	Bài 1	私	Tư	Tôi	
2	Bài 1	人	NHÂN	Người	
3	Bài 1	才	TÀI	Tuổi	
4	Bài 1	学	HỌC	Học	
5	Bài 1	生	SINH	Sống	

Figure 21: Manage kanji screen

ID and Name:	09 – Manage kanji	Actor:	Content Manager
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Description:	This function allows the actor to view kanji list and manage kanji.	
Trigger:	Actor clicks on the “Quản lý bài học” hyperlink in the sidebar, then click on the “Quản lý chữ hán” hyperlink.	
Preconditions:	PRE-1. Actor has logged in the system with a content manager account.	
Post-conditions:	POST-1. The system displays kanji list of the system.	
Normal Flows:	Actor actions	System responses
	1. Click on the “Quản lý bài học” hyperlink in the sidebar. 3. Click on the “Quản lý chữ hán” hyperlink.	2. Display a drop-down menu. 4. Display kanji management screen.
Alternative Flows:	N/A	
Exception Flows:	N/A	
Business Rules:	BR-03, BR-18	

3.3.1.1 Add kanji 漢字を追加する

The screenshot shows the 'Thêm chữ hán' (Add Kanji) form in the Zappy application. The form contains the following fields:

- Bài* (Lesson): A dropdown menu currently set to 'Bài học'.
- Hán tự* (Kanji): An input field.
- Âm Hán* (Pinyin): An input field.
- Nghĩa* (Meaning): An input field.
- Âm Ôn* (Repetition sound): An input field.
- Âm Kun* (Kun reading): An input field.
- Mô tả* (Description): An input field.
- Hình ảnh* (Image): An input field with a 'Tải ảnh lên' (Upload image) button.
- Cách viết* (Handwriting): An input field with a 'Tải gif lên' (Upload gif) button.
- Image: A thumbnail preview for uploaded images.
- Gif: A thumbnail preview for uploaded gifs.
- Làm mới (Reset): A button.
- Lưu (Save): A button.

The sidebar on the left lists 'Content Management' categories: Quản lý câu hỏi, Quản lý bài học, Từ vựng, Ngữ pháp, and Chữ hán (which is currently selected).

Figure 22: Add kanji screen

ID and Name:	10 - Add kanji	Actor:	Content Manager		
Description:	This function allows actor to add a new kanji.				
Trigger:	Actor clicks on the “Thêm mới” button.				
Preconditions:	PRE-1. Actor has logged in the system with a content manager account. PRE-2. Actor accesses the kanji management page.				
Post-conditions:	POST-1. The system displays a list of kanji with a new kanji added. POST-2. A new kanji has been added to the database.				
Normal Flows:	Actor actions	System responses			
	1. Click on the “Thêm mới” button. 3. Input new kanji information. 4. Click on the “Lưu” button.	2. Display a pop-up form to fill in the information of the new kanji. 5. Display a message: “Thêm chữ hán thành công”.			
Alternative Flows:	N/A				
Exception Flows:	<p>E0. The actor clicks on the “X” button (After step 2) The system closes pop-up and doesn't change anything.</p> <p>E1. Lesson is not selected (After step 4) Notify an error message: “Vui lòng chọn bài”</p> <p>E2. Kanji is blank (After step 4) Notify an error message: “Không được để trống”</p> <p>E3. Kanji is duplicated (After step 4) Notify an error message: “Chữ hán này đã tồn tại”</p> <p>E4. Kanji contains more than 2 characters (After step 4) Notify an error message: “Chỉ chứa 1 ký tự”</p> <p>E5. Kanji contains special characters (After step 4) Notify an error message: “Chỉ nhập Hán tự”</p> <p>E6. Onyomi is not written in hiragana and contains special characters (After step 4) Notify an error message: “Chỉ nhập hiragana và các ký tự: , 、 ・ / ／”</p> <p>E7. Kunyomi is blank (After step 4) Notify an error message: “Không được để trống”</p> <p>E8. Kunyomi is not written in katakana and contains special characters (After step 4) Notify an error message: “Chỉ nhập katakana và các ký tự: , 、 ・ / ／”</p> <p>E9. Chinese is blank (After step 4) Notify an error message: “Không được để trống”</p> <p>E10. Chinese contains special characters and space (After step 4) Notify an error message: “Không bao gồm ký tự đặc biệt và dấu cách”</p> <p>E11. Meaning is blank (After step 4) Notify an error message: “Không được để trống”</p>				

	<p>E12. Description is blank (After step 4) Notify an error message: “Không được để trống”</p> <p>E13. Image is blank (After step 4) Notify an error message: “Vui lòng chọn 1 ảnh”</p> <p>E14. Gif is blank (After step 4) Notify an error message: “Vui lòng chọn 1 gif”</p>
Business Rules:	BR-03 , BR-14 , BR-15 , BR-19 , BR-22 , BR-23 , BR-24 , BR-25 , BR-26 , BR-27

3.3.1.2 View kanji 漢字の情報を見る

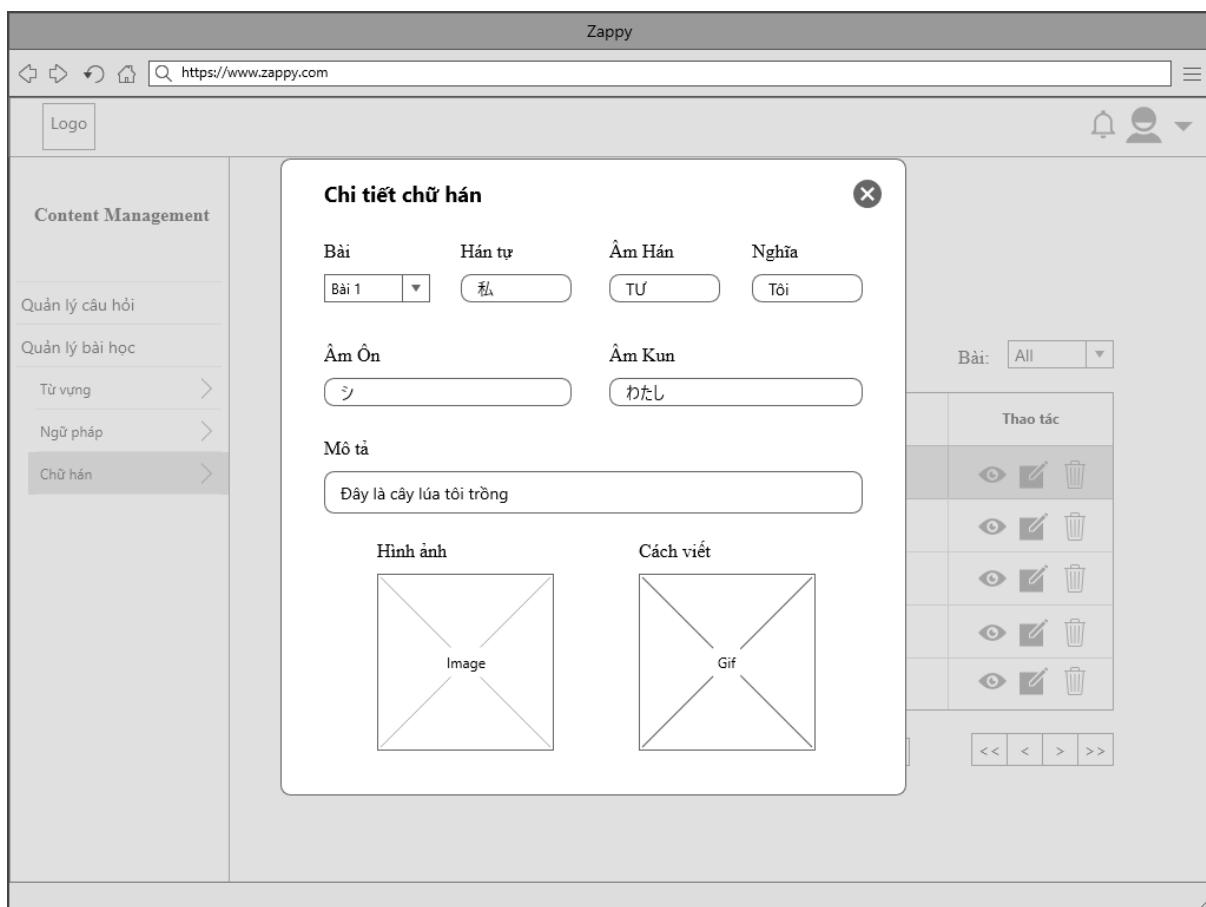


Figure 23: View kanji screen

ID and Name:	11 – View kanji	Actor:	Content Manager
Description:	This function allows actor to view kanji.		
Trigger:	Actor clicks on the view icon in the “Thao tác” column.		
Preconditions:	PRE-1. Actor has logged in the system with a content manager account. PRE-2. Actor accesses the kanji management page. PRE-3. Kanji list must have at least 1 kanji.		

Post-conditions:	POST-1. The system displays information about kanji.	
Normal Flows:	Actor actions	System responses
	1. Click on the view icon at the row which has the kanji to view information.	2. Display a pop-up form with kanji information.
Alternative Flows:	N/A	
Exception Flows:	N/A	
Business Rules:	BR-03	

3.3.1.3 Update kanji 漢字を更新する

Figure 24: Update kanji screen

ID and Name:	12 – Update kanji	Actor:	Content Manager
Description:	This function allows actor to update information of a kanji.		
Trigger:	Actor clicks on the update icon in the “Thao tác” column.		

Preconditions:	PRE-1. Actor has logged in the system with a content manager account. PRE-2. Actor accesses the kanji management page. PRE-3. Kanji list must have at least 1 kanji.	
Post-conditions:	POST-1. The system displays a list of kanji with an updated kanji. POST-2. The kanji information in the database has been updated with new information.	
Normal Flows:	Actor actions	System responses
	1. Click on the update icon at the row which has the kanji to update. 3. Update the information that the actor wants to change. 4. Click the “Lưu” button.	2. Display a pop-up form to update kanji information. 5. Display message: “Đã lưu”.
Alternative Flows:	<p>A1. The actor clicks on the “X” button (After step 2) The system closes pop-up and doesn't change anything.</p>	
Exception Flows:	<p>E1. Kanji is blank (After step 4) Notify an error message: “Không được để trống”</p> <p>E2. Kanji is duplicated (After step 4) Notify an error message: “Chữ hán này đã tồn tại”</p> <p>E3. Kanji contains more than 2 characters (After step 4) Notify an error message: “Chỉ chứa 1 ký tự”</p> <p>E4. Kanji contains special characters (After step 4) Notify an error message: “Chỉ nhập Hán tự”</p> <p>E5. Onyomi is not written in hiragana and contains special characters (After step 4) Notify an error message: “Chỉ nhập hiragana và các ký tự: , 、 ・ / ／”</p> <p>E6. Kunyomi is blank (After step 4) Notify an error message: “Không được để trống”</p> <p>E7. Kunyomi is not written in katakana and contains special characters (After step 4) Notify an error message: “Chỉ nhập katakana và các ký tự: , 、 ・ / ／”</p> <p>E8. Chinese is blank (After step 4) Notify an error message: “Không được để trống”</p> <p>E9. Chinese contains special characters and space (After step 4) Notify an error message: “Không bao gồm ký tự đặc biệt và dấu cách”</p> <p>E10. Meaning is blank (After step 4) Notify an error message: “Không được để trống”</p> <p>E11. Description is blank (After step 4) Notify an error message: “Không được để trống”</p> <p>E12. Image is blank (After step 4) Notify an error message: “Vui lòng chọn 1 ảnh”</p> <p>E13. Gif is blank (After step 4) Notify an error message: “Vui lòng chọn 1 gif”</p>	

Business Rules:

[BR-03, BR-14, BR-15, BR-22, BR-23, BR-24, BR-25, BR-26, BR-27](#)

3.3.1.4 Delete kanji 漢字を削除する

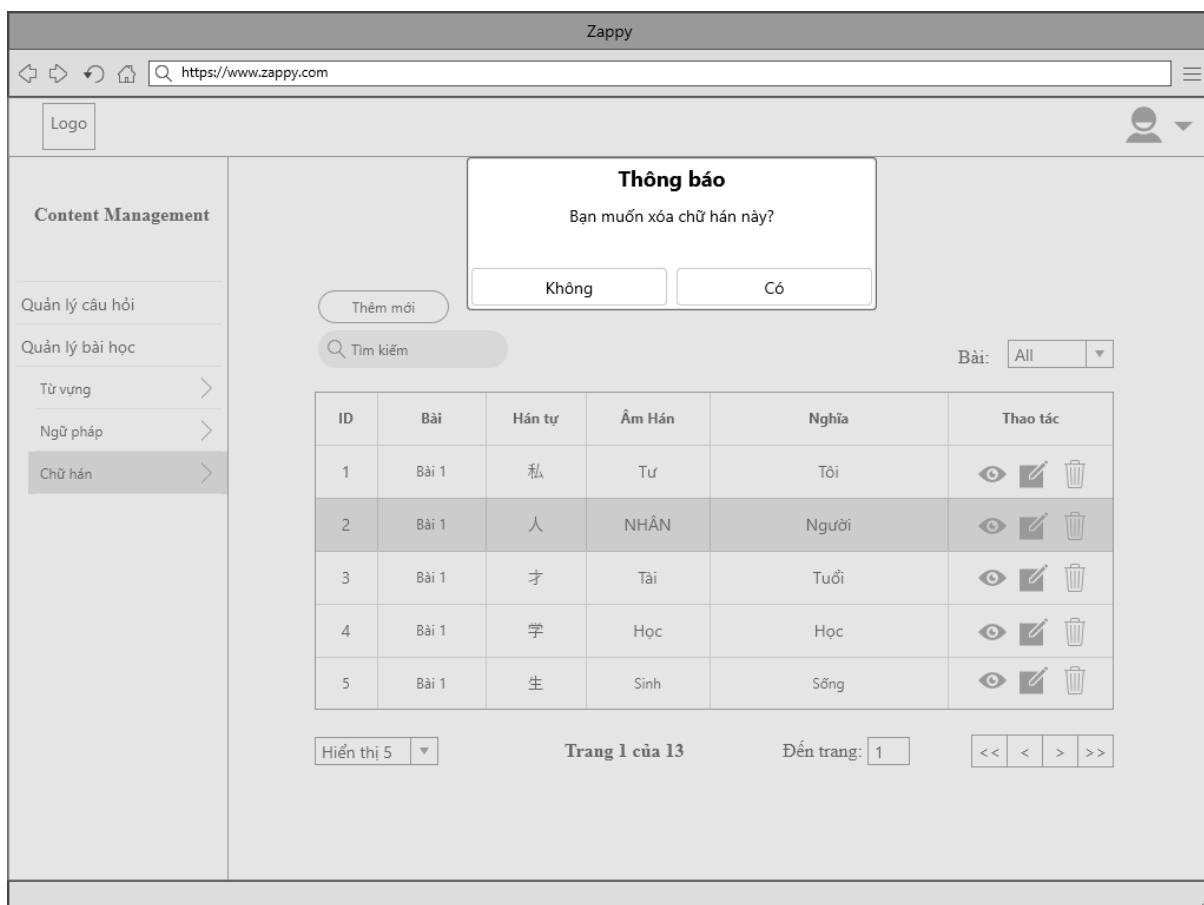


Figure 25: Delete kanji screen

ID and Name:	13 - Delete kanji	Actor:	Content Manager
Description:	This function allows actor to delete a kanji.		
Trigger:	Actor clicks on the delete icon in the “Thao tác” column.		
Preconditions:	PRE-1. Actor has logged in the system with a content manager account. PRE-2. Actor accesses the kanji management page. PRE-3. Kanji list must have at least 1 kanji.		
Post-conditions:	POST-1. The system displays a list of kanji without a deleted kanji. POST-2. The kanji information in the database has been removed.		
Normal Flows:	Actor actions	System responses	
	1. Click on the delete icon at the row which has the kanji to delete. 3. Click the “Có” button.	2. Display a pop-up message: “Bạn muốn xóa chữ hán này?”	

		4. Display message: “Xóa thành công”
Alternative Flows:	N/A	
Exception Flows:	E1. The actor clicks on the “Không” button (Step 3) The system closes pop-up and doesn't change anything.	
Business Rules:	BR-03	

3.3.1.5 Search kanji 漢字を検索する

Figure 26: Search kanji screen

ID and Name:	14 – Search kanji	Actor:	Content Manager
Description:	This function allows the actor to search kanji by inputting keywords into the search box.		
Trigger:	Actor inputs the keyword into the search box.		
Preconditions:	PRE-1. Actor has logged in the system with a content manager account. PRE-2. Actor accesses the kanji management page.		

Post-conditions:	POST-1. The system displays results with field information that contains entered keywords.	
Normal Flows:	Actor actions	System responses
	1. Input keyword in the search box.	2. Display the searched results.
Alternative Flows:	N/A	
Exception Flows:	N/A	
Business Rules:	BR-03, BR-18	

3.3.2 Manage vocabulary 言葉を管理する

ID	Bài học	Từ vựng	Nghĩa	Ví dụ	Chức năng
1	Bài 1	わたし	Tôi	わたしはベトナムじんです。	
2	Bài 1	(お)なまえ	Tên (bạn)	おなまえは？	
3	Bài 1	(お)くに	Đất nước (bạn)	おくには？	
4	Bài 1	にほん	Nhật Bản	わたしはにほんじんです。	
5	Bài 1	アメリカ	Mỹ	Aさんはアメリカじんです。	

Figure 27: Manage vocabulary screen

ID and Name:	15 – Manage vocabulary	Actor:	Content Manager
Description:	This function allows the actor to manage kanji and view kanji list.		
Trigger:	Actor clicks on the “Quản lý bài học” hyperlink in the sidebar, then clicks on the “Quản lý từ vựng” hyperlink.		

Preconditions:	PRE-1. Actor has logged in the system with a content manager account.	
Post-conditions:	POST-1. The system displays a list of vocabulary.	
Normal Flows:	Actor actions	System responses
	1. Click on the “Quản lý bài học” hyperlink in the sidebar. 3. Click on the “Quản lý từ vựng” hyperlink.	2. Display a drop-down menu. 4. Display vocabulary management screen.
Alternative Flows:	N/A	
Exception Flows:	N/A	
Business Rules:	BR-03, BR-18	

3.3.2.1 Add vocabulary 言葉を追加する

The screenshot shows the Zappy application's 'Content Management' section. On the left, there's a sidebar with 'Content Management' and several sub-options: 'Quản lý câu hỏi', 'Quản lý bài học', 'Từ vựng' (which is highlighted in grey), 'Ngữ pháp', and 'Chữ hán'. The main area is titled 'Thêm từ vựng' (Add vocabulary). It contains input fields for 'Bài*' (Lesson), 'Từ vựng*' (Vocabulary), 'Nghĩa*' (Meaning), 'Ví dụ*' (Example), 'Giải thích ví dụ*' (Explanation of example), and 'Hình ảnh*' (Image). There's also a dropdown for 'Bài:' set to 'All'. To the right, there's a list of existing vocabulary entries with columns for 'Ví dụ' (Example) and 'Chức năng' (Function). Each entry has icons for edit and delete. At the bottom, there are buttons for 'Làm mới' (New) and 'Lưu' (Save).

Figure 28: Add vocabulary screen

ID and Name:	16 - Add vocabulary	Actor:	Content manager
Description:	This function allows the actor to add a new vocabulary.		

Trigger:	Actor clicks on the “Thêm mới” button.	
Preconditions:	PRE-1. Actor has logged in the system with a content manager account. PRE-2. Actor accesses the vocabulary management page.	
Post-conditions:	POST-1. The system displays a list of vocabulary with a new vocabulary added. POST-2. A new vocabulary has been added to the database.	
Normal Flows:	Actor actions 1. Click on the “Thêm mới” button. 3. Input new vocabulary information. 4. Click on the “Lưu” button	System responses 2. Display a pop-up form to fill in the information of the new vocabulary. 5. Display a message: “Thêm từ vựng thành công”
Alternative Flows:	N/A	
Exception Flows:	E1. The actor clicks on the “X” button (After step 2) The system closes pop-up and doesn't change anything. E2. Lesson is not selected (After step 4) Notify an error message: “Vui lòng chọn bài” E3. Vocabulary is blank (After step 4) Notify an error message: “Không được để trống” E4. Meaning is blank (After step 4) Notify an error message: “Không được để trống”	
Business Rules:	BR-03 , BR-19 , BR-22	

3.3.2.2 View vocabulary 言葉の情報を見る

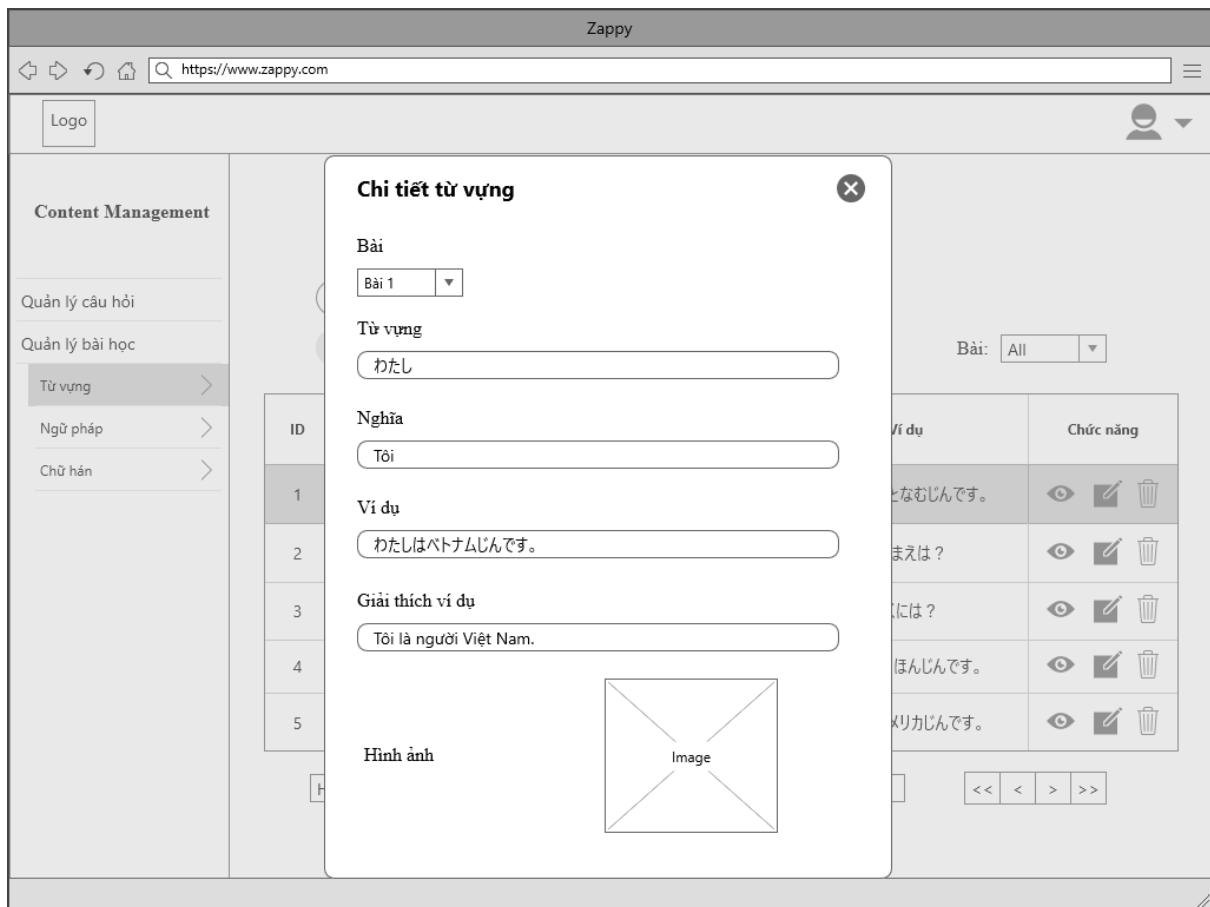


Figure 29: View vocabulary screen

ID and Name:	17 – View vocabulary	Actor:	Content Manager		
Description:	This function allows the actor to view the detail of a vocabulary.				
Trigger:	Actor clicks on the view icon in the “Thao tác” column.				
Preconditions:	PRE-1. Actor has logged in the system with a content manager account. PRE-2. Actor accesses the vocabulary management page. PRE-3. Vocabulary list must have at least 1 vocabulary.				
Post-conditions:	POST-1. The system displays information about vocabulary.				
Normal Flows:	Actor actions	System responses			
	1. Click on the view icon at the row which has the vocabulary to view information.	2. Display a pop-up form with vocabulary information.			
Alternative Flows:	N/A				
Exception Flows:	N/A				
Business Rules:	BR-03				

3.3.2.3 Update vocabulary 言葉を更新する

Figure 30: Update vocabulary screen

ID and Name:	18 – Update vocabulary	Actor:	Content Manager
Description:	This function allows the actor to update a vocabulary.		
Trigger:	Actor clicks on the update icon in the “Thao tác” column.		
Preconditions:	PRE-1. Actor has logged in the system with a content manager account. PRE-2. Actor accesses the vocabulary management page. PRE-3. Vocabulary list must have at least 1 vocabulary.		
Post-conditions:	POST-1. The system displays a list of vocabulary with an updated vocabulary. POST-2. The vocabulary information in the database has been updated with new information.		
	Actor actions	System responses	

Normal Flows:	<ol style="list-style-type: none"> 1. Click on the update icon at the row which has the vocabulary to update. 3. Update the information the actor wants to change. 4. Click the “Lưu” button 	<ol style="list-style-type: none"> 2. Display a pop-up form to update vocabulary information. 5. Display message: “Đã lưu”.
Alternative Flows:	N/A	
Exception Flows:	<p>E1. The actor clicks on the “X” button (After step 2) The system closes pop-up and doesn't change anything.</p> <p>E2. Vocabulary is blank (After step 4) Notify an error message: “Không được để trống”</p> <p>E3. Meaning is blank (After step 4) Notify an error message: “Không được để trống”</p>	
Business Rules:	BR-03, BR-19, BR-22	

3.3.2.4 Delete vocabulary 言葉を削除する

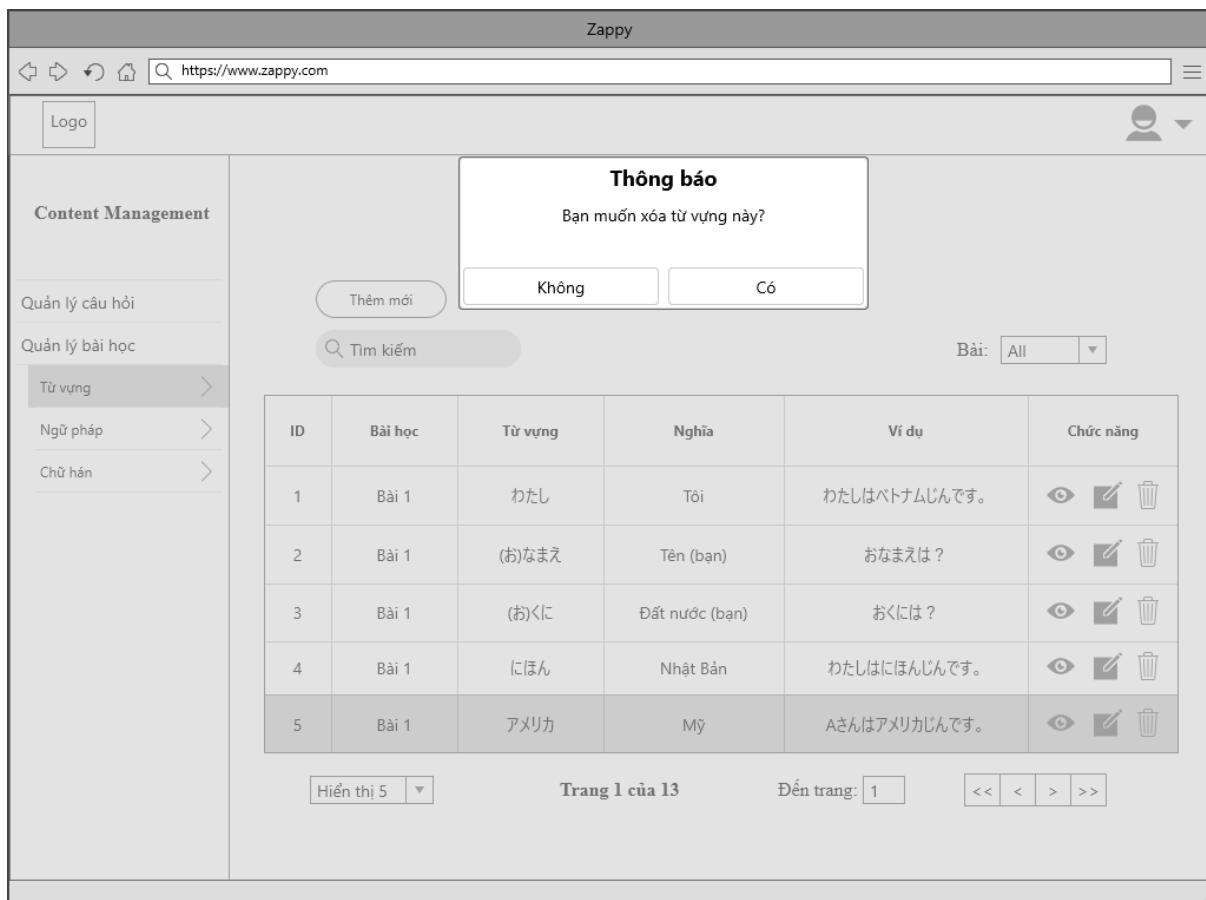


Figure 31: Delete vocabulary screen

ID and Name:	19 - Delete vocabulary	Actor:	Content Manager
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Description:	This function allows the actor to update a vocabulary.	
Trigger:	Actor clicks on the delete icon in the “Thao tác” column.	
Preconditions:	PRE-1. Actor has logged in the system with a content manager account. PRE-2. Actor accesses the vocabulary management page. PRE-3. Vocabulary list must have at least 1 vocabulary.	
Post-conditions:	POST-1. The system displays a list of vocabulary without a deleted vocabulary. POST-2. The vocabulary information in the database has been removed.	
Normal Flows:	Actor actions 1. Click on the delete icon at the row which has the vocabulary to delete. 3. Click the “Có” button	System responses 2. Display a pop-up message: “Bạn muốn xóa từ vựng này?” 4. Display message: “Xóa thành công”
Alternative Flows:	N/A	
Exception Flows:	E1. The actor clicks on the “Không” button (Step 3) The system closes pop-up and doesn't change anything.	
Business Rules:	BR-03	

3.3.2.5 Search vocabulary 言葉を検索する

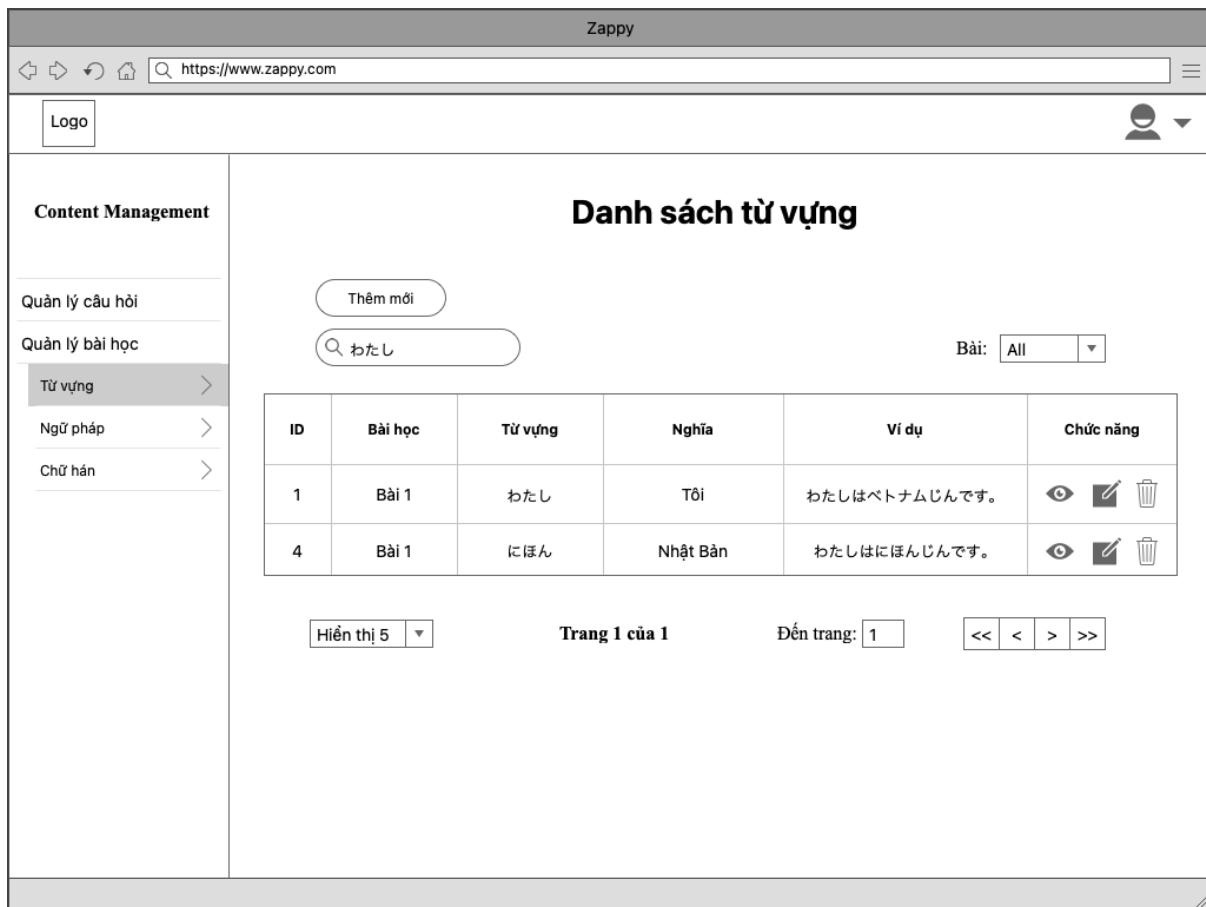


Figure 32: Search vocabulary screen

ID and Name:	20 – Search vocabulary	Actor:	Content Manager		
Description:	Actor searches vocabulary by inputting keywords into the search box. The results are displayed in a table.				
Trigger:	Actor inputs the keyword into the search box.				
Preconditions:	PRE-1. Actor has logged in the system with a content manager account. PRE-2. Actor accesses the vocabulary management page.				
Post-conditions:	POST-1. The system displays results with field information that contains entered keywords.				
Normal Flows:	Actor actions	System responses			
	1. Input keyword in the search box.	2. Display the search results.			
Alternative Flows:	N/a				
Exception Flows:	N/a				
Business Rules:	BR-03, BR-18				

3.3.3 Manage grammar 文法を管理する

Figure 33: Manage grammar screen

ID and Name:	21 – Manage grammar	Actor:	Content Manager
Description:	Actor accesses the question management page, actor clicks on the “Ngữ pháp” hyperlink in the sidebar to view all grammar in the system.		
Trigger:	Actor clicks on the “Quản lý bài học” hyperlink in the sidebar, then click on the “Quản lý ngữ pháp” hyperlink.		
Preconditions:	PRE-1. Actor has logged in the system with a content manager account.		
Post-conditions:	POST-1. The system displays a list of grammar.		
Normal Flows:	Actor actions	System responses	
	1. Click on the “Quản lý bài học” hyperlink in the sidebar. 3. Click on the “Quản lý ngữ pháp” hyperlink.	2. Display a drop-down menu. 4. Display grammar management screen.	
Alternative Flows:	N/a		

Exception Flows:	N/a
Business Rules:	BR-03, BR-18

3.3.3.1 Add grammar 文法を追加する

The screenshot shows the 'Thêm ngữ pháp' (Add grammar) screen in the Zappy application. The main form has fields for 'Bài*' (Lesson), 'Ngữ pháp*' (Grammar), 'Giải thích ngữ pháp*' (Explanation), 'Ý nghĩa*' (Meaning), 'Ví dụ*' (Example), and 'Nghĩa của ví dụ*' (Meaning of example). It includes a file input field 'Tải ảnh lên' (Upload image) and an 'Image' placeholder. Below the form are 'Làm mới' (New) and 'Lưu' (Save) buttons. To the right is a sidebar with a list of grammars and navigation buttons.

Figure 34: Add grammar screen

ID and Name:	22 - Add grammar	Actor:	Content Manager
Description:	After accessing grammar management page, the actor adds a new grammar by filling in the form with the new grammar information.		
Trigger:	Actor clicks on the “Thêm mới” button.		
Preconditions:	PRE-1. Actor has logged in the system with a content manager account. PRE-2. Actor accesses the grammar management page.		
Post-conditions:	POST-1. The system displays a list of grammar with a new grammar added. POST-2. A new grammar has been added to the database.		
	Actor actions	System responses	

Normal Flows:	1. Click on the “Thêm mới” button. 3. Input information on new grammar. 4. Click on the “Lưu” button.	2. Display a pop-up form to fill in the information of new grammar. 5. Display a message: “Thêm ngữ pháp thành công.”
Alternative Flows:	A1. The actor clicks on the “X” button (After step 2) The system closes pop-up and doesn't change anything.	
Exception Flows:	E1. Lesson is not selected (After step 4) Notify an error message: “Bài học chưa được chọn.” E2. Grammar is blank (After step 4) Notify an error message: “Không được để trống” E3. Meaning is blank (After step 4) Notify an error message: “Không được để trống” E4. The grammar explanation is blank (After step 4) Notify an error message: “Không được để trống”	
Business Rules:	BR-03, BR-15, BR-22	

3.3.3.2 View grammar 文法の情報を見る

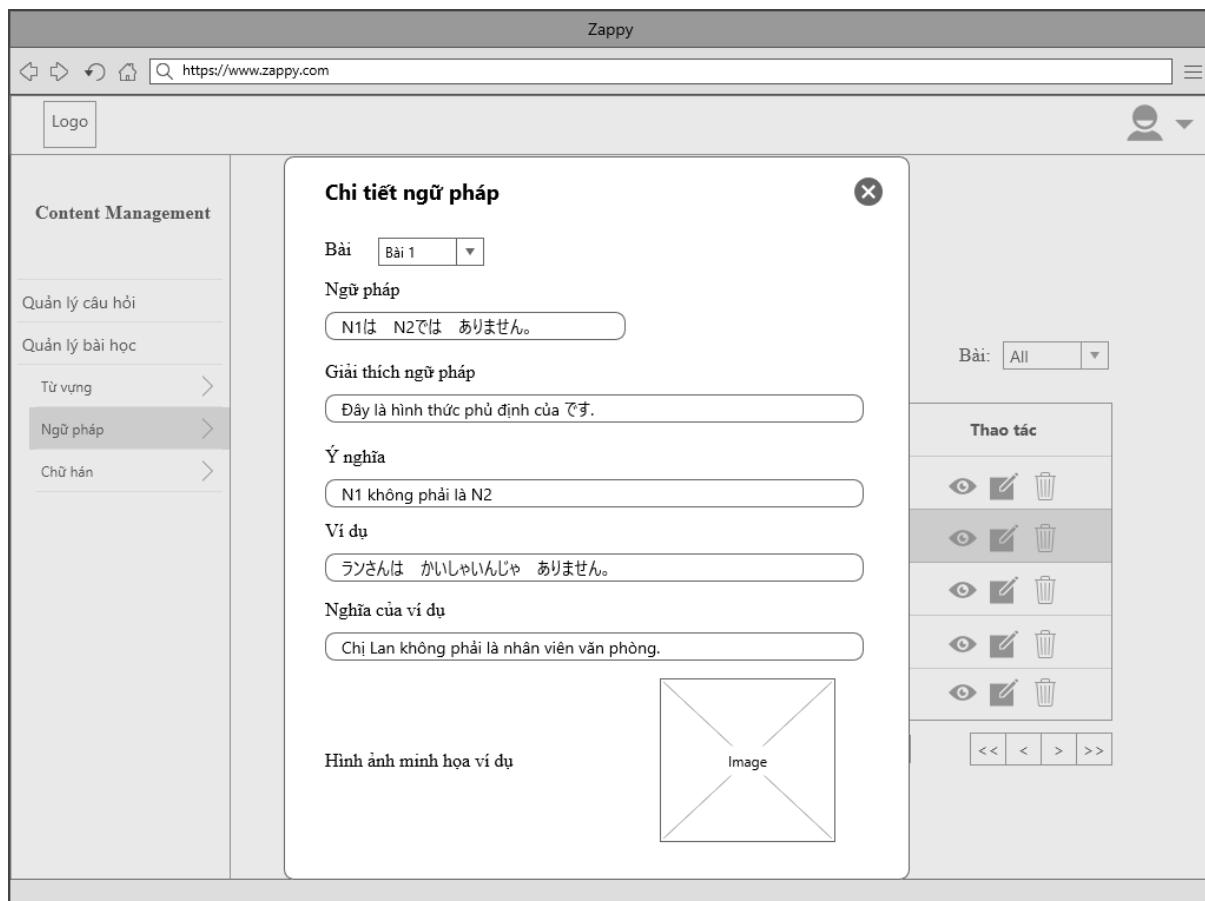


Figure 35: View grammar screen

ID and Name:	23 – View grammar	Actor:	Content Manager		
Description:	Actor clicks on the view icon at the row which has the grammar to view information.				
Trigger:	Actor clicks on the view icon in the “Thao tác” column.				
Preconditions:	PRE-1. Actor has logged in the system with a content manager account. PRE-2. Actor accesses the grammar management page. PRE-3. The grammar list must have at least 1 grammar.				
Post-conditions:	POST-1. The system displays information about grammar.				
Normal Flows:	Actor actions	System responses			
	1. Click on the view icon at the row which has the grammar to view information.	2. Display a pop-up form with grammar information.			
Alternative Flows:	N/a				
Exception Flows:	N/a				
Business Rules:	BR-03				

3.3.3.3 Update grammar 文法を更新する

The screenshot shows the Zappy application's 'Content Management' section. A modal window titled 'Chỉnh sửa ngữ pháp' (Edit Grammar) is open. Inside the modal, there are several input fields and dropdown menus. The 'Bài' dropdown is set to 'Bài 1'. The 'Ngữ pháp' field contains the Japanese sentence 'N1は N2では ありません。'. The 'Giải thích ngữ pháp' field contains the explanatory text 'Được sử dụng khi muốn trình bày một chủ đề'. The 'Ý nghĩa' field contains 'N1 là N2'. The 'Ví dụ' field contains the Japanese sentence 'ランさんは かいしゃいん じゃ ありません'. The 'Nghĩa của ví dụ' field contains the explanatory text 'Chi Lan không phải là nhân viên văn phòng.'. Below these fields is a file input for 'Hình ảnh minh họa ví dụ' with the file name '2.png' selected. To the right of the input is a preview area labeled 'Image' with a small thumbnail of the uploaded image. At the bottom of the modal are two buttons: 'Làm mới' (Reset) and 'Lưu' (Save). To the right of the modal, there is a vertical sidebar with a 'Thao tác' (Action) column containing icons for edit, delete, and view, followed by a navigation bar with arrows for navigating through the list of grammars.

Figure 36: Update grammar screen

ID and Name:	24 – Update grammar	Actor:	Content Manager				
Description:	Actor clicks on the update icon at the row which has the grammar to update, then the actor update information and clicks on the “Lưu” button.						
Trigger:	Actor clicks on the update icon in the “Thao tác” column.						
Preconditions:	PRE-1. Actor has logged in the system with a content manager account. PRE-2. Actor accesses the grammar management page. PRE-3. The grammar list must have at least 1 grammar.						
Post-conditions:	POST-1. The system displays a list of grammar with updated grammar. POST-2. The grammar information in the database has been updated with new information.						
Normal Flows:	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center; padding: 5px;">Actor actions</th> <th style="text-align: center; padding: 5px;">System responses</th> </tr> </thead> <tbody> <tr> <td style="padding: 5px;"> 1. Click on the update icon at the row which has the grammar to update. 3. Update the information the actor wants to change. 4. Click the “Lưu” button. </td> <td style="padding: 5px;"> 2. Display a pop-up form to edit grammar information. 5. Display message: “Đã lưu”. </td> </tr> </tbody> </table>			Actor actions	System responses	1. Click on the update icon at the row which has the grammar to update. 3. Update the information the actor wants to change. 4. Click the “Lưu” button.	2. Display a pop-up form to edit grammar information. 5. Display message: “Đã lưu”.
Actor actions	System responses						
1. Click on the update icon at the row which has the grammar to update. 3. Update the information the actor wants to change. 4. Click the “Lưu” button.	2. Display a pop-up form to edit grammar information. 5. Display message: “Đã lưu”.						
Alternative Flows:	A1. The actor clicks on the “X” button (After step 2) The system closes pop-up and doesn't change anything.						
Exception Flows:	E1. Grammar is blank (After step 4) Notify an error message: “Không được để trống” E2. Meaning is blank (After step 4) Notify an error message: “Không được để trống” E3. The grammar explanation is blank (After step 4) Notify an error message: “Không được để trống”						
Business Rules:	BR-03 , BR-15 , BR-22						

3.3.3.4 Delete grammar 文法を削除する

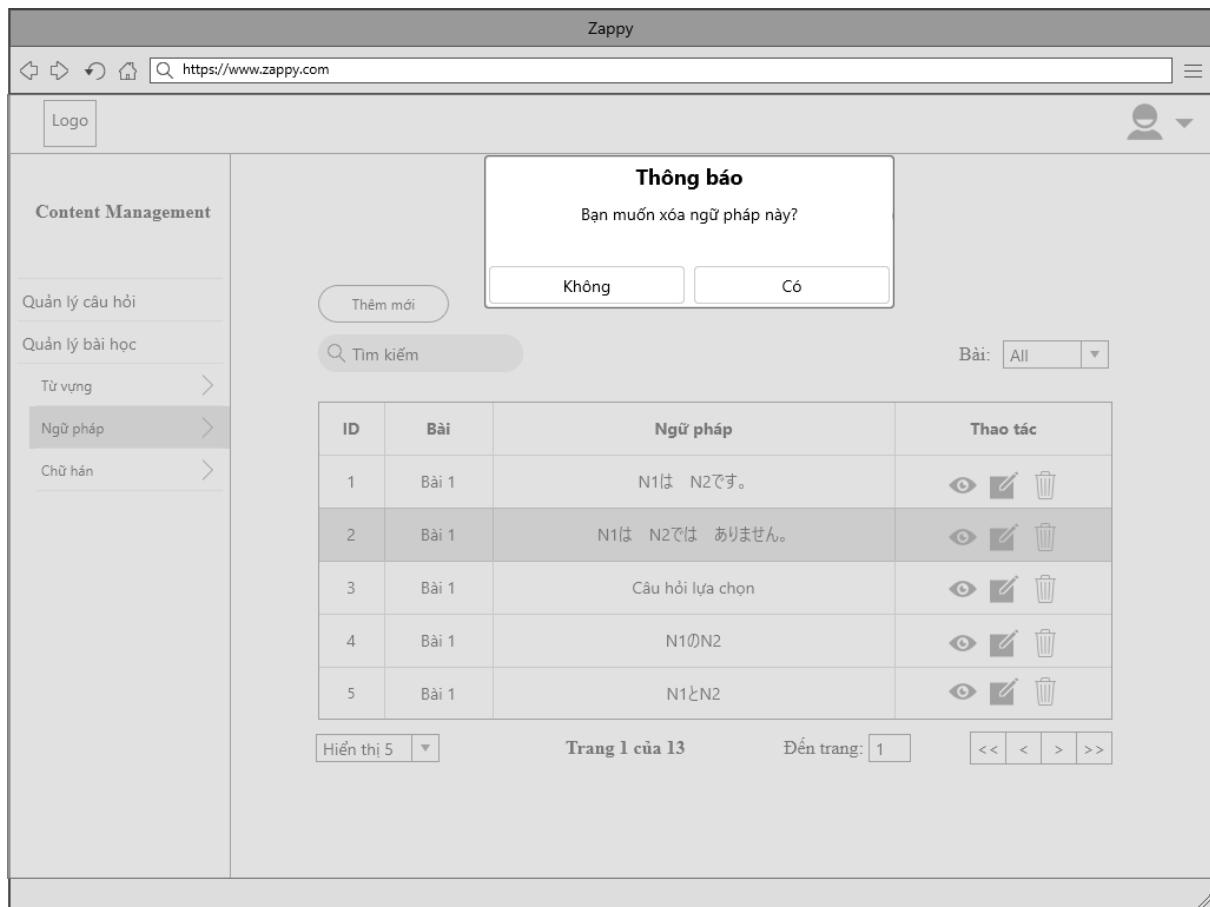


Figure 37: Delete grammar screen

ID and Name:	25 - Delete grammar	Actor:	Content Manager
Description:	Actor clicks on the delete icon at the row which has the grammar to delete, the system displays a confirmation message, then the actor clicks on the “Có” button.		
Trigger:	Actor clicks on the delete icon in the “Thao tác” column.		
Preconditions:	PRE-1. Actor has logged in the system with a content manager account. PRE-2. Actor accesses the grammar management page. PRE-3. Grammar list must have at least 1 grammar.		
Post-conditions:	POST-1. The system displays a list of grammar without a deleted grammar. POST-2. The grammar information in the database has been removed.		
Normal Flows:	Actor actions	System responses	
	1. Click on the delete icon at the row which has the grammar to delete. 3. Click the “Có” button.	2. Display a pop-up message: “Bạn có chắc chắn muốn xóa ngữ pháp này không?” 4. Display message: “Xóa thành công.”	

Alternative Flows:	A1. The actor clicks on the “Không” button (Step 3) The system closes pop-up and doesn't change anything.
Exception Flows:	N/a
Business Rules:	BR-03

3.3.3.5 Search grammar 文法を検索する

ID	Bài	Ngữ pháp	Thao tác
1	Bài 1	N1は N2です。	
2	Bài 1	N1は N2では ありません。	
3	Bài 1	N1のN2	
4	Bài 1	N1とN2	

Figure 38: Search grammar screen

ID and Name:	26 – Search grammar	Actor:	Content Manager
Description:	The actor searches grammar by inputting keywords into the search box. The results are displayed in a table.		
Trigger:	Actor inputs the keyword into the search box.		
Preconditions:	PRE-1. Actor has logged in the system with a content manager account. PRE-2. Actor accesses the grammar management page.		
Post-conditions:	POST-1. The system displays results with field information that contains entered keywords.		

Normal Flows:	Actor actions	System responses
	1. Input keyword in the search box.	2. Display the search results.
Alternative Flows:	N/a	
Exception Flows:	N/a	
Business Rules:	BR-03	

3.4 Manage question 質問を管理する

ID	Loại câu hỏi	Kỹ năng	Bài	Câu hỏi	Đáp án đúng	Thao tác
1	True/False	Từ vựng	Bài 1	たんじょうび -> ngày sinh, sinh nhật	TRUE	
2	True/False	Từ vựng	Bài 1	Học sinh -> がくせい	FALSE	
3	True/False	Từ vựng	Bài 1	私のなまえはパクです。	TRUE	
4	True/False	Từ vựng	Bài 1	私のきょうしははまだせんせいです。	FALSE	
5	True/False	Từ vựng	Bài 1	私のしゅみはりょうりです。	TRUE	

Figure 39: Manage question screen

ID and Name:	27 - Manage question	Actor:	Content Manager
Description:	Actor indicates that he wants to see all questions in the system.		
Trigger:	Actor clicks on the “Quản lý câu hỏi” button in the sidebar.		
Preconditions:	PRE-1. Actor has logged in the system with a content manager account.		
Post-conditions:	POST-1. The system displays a question list.		

Normal Flows:	Actor actions	System responses
		1. Display screen management with a list of questions.
Alternative Flows:	N/a	
Exception Flows:	N/a	
Business Rules:		BR-03, BR-18

3.4.1 Add question 質問を追加する

The screenshot shows the Zappy application's 'Content Management' section. On the left, there's a sidebar with 'Quản lý câu hỏi' and 'Quản lý bài học'. The main area displays a list of questions with columns for 'ID' (1, 2, 3, 4, 5) and 'Bài' (All). A modal window titled 'Thêm câu hỏi' is open, containing fields for 'Loại câu hỏi*', 'Kỹ năng*', 'Bài*', 'Câu hỏi*', 'Đáp án đúng*', 'Đáp án sai', 'Hình ảnh', and 'Image'. There are also 'Làm mới' and 'Lưu' buttons. To the right of the modal, there's a sidebar with 'Đáp án đúng' and 'Thao tác' sections for each question, each with edit and delete icons. Navigation buttons (<<, <, >, >>) are at the bottom of the sidebar.

Figure 40: Add question screen

ID and Name:	28 - Add question	Actor:	Content Manager
Description:	Actor adds a new question by filling in the form with the new question information.		
Trigger:	Actor clicks on the “Thêm mới” button.		
Preconditions:	PRE-1. Actor has logged in the system with a content manager account. PRE-2. Actor accesses the question management page.		

Post-conditions:	POST-1. The system displays a list of questions with a new question added. POST-2. A new question has been added to the database.	
Normal Flows:	Actor actions	System responses
	1. Click on the “Thêm mới” button. 3. Input information of new question. 4. Click on the “Lưu” button	2. Display a pop-up form to fill in the information of the new question. 5. Display a message: “Thêm câu hỏi thành công”
Alternative Flows:	A1. The actor clicks on the “X” button (After step 2) The system closes pop-up and doesn't change anything.	
Exception Flows:	E1. The question type is not selected (After step 4) Notify an error message: “Vui lòng chọn loại câu hỏi” E2. Skill is not selected (After step 4) Notify an error message: “Vui lòng chọn kỹ năng” E3. Lesson is not selected (After step 4) Notify an error message: “Vui lòng chọn bài” E4. Question is blank (After step 4) Notify an error message: “Không được để trống” E5. Answer is blank (After step 4) Notify an error message: “Cần điền đầy đủ các đáp án”	
Business Rules:	BR-03 , BR-15 , BR-19 , BR-28 , BR-29	

3.4.2 Update question 質問を更新する

The screenshot shows the 'Chỉnh sửa câu hỏi' (Edit Question) screen in the Zappy application. On the left, there's a sidebar with 'Content Management' and 'Quản lý câu hỏi' selected. The main area has a table with columns 'ID' and rows numbered 1 to 5. To the right of the table is a form with the following fields:

- Loại câu hỏi***: Đúng/Sai
- Kỹ năng***: Từ vựng
- Bài***: Bài 1
- Câu hỏi***: たんじょうび -> ngày sinh, sinh nhật
- Đáp án đúng***: TRUE
- Đáp án sai ***: FALSE
- Hình ảnh**: 1.png
- Image**: A small preview of the uploaded image.
- Thay đổi**: A button to change the image.
- Làm mới**: A button to reset the form.
- Lưu**: A button to save the changes.

On the far right, there's a sidebar with a list of answers (Đáp án) and their corresponding edit (pencil icon) and delete (trash bin icon) icons. The sidebar also includes navigation buttons (<<, <, >, >>).

Figure 41: Update question screen

ID and Name:	29 - Update question	Actor:	Content Manager		
Description:	This function allows the actor to update information of a question.				
Trigger:	Actor clicks on the update icon in the “Thao tác” column.				
Preconditions:	PRE-1. Actor has logged in the system with a content manager account. PRE-2. Actor accesses the question management page. PRE-3. The question list must have at least 1 question.				
Post-conditions:	POST-1. The system displays a list of questions with the updated question. POST-2. The question information in the database has been updated with new information.				
Normal Flows:	Actor actions	System responses			
	1. Click on the update icon at the row which has questions to update. 3. Update the information that the actor wants to change. 4. Click on the “Lưu” button	2. Display a pop-up form to edit question information. 5. Display a message: “Đã lưu”			
Alternative Flows:	N/A				
Exception Flows:	E1. The actor clicks on the “X” button (After step 2) The system closes pop-up and doesn't change anything. E2. Question is blank (After step 4) Notify an error message: “Không được để trống” E3. Answer is blank (After step 4) Notify an error message: “Không được để trống”				
Business Rules:	BR-03 , BR-15 , BR-19 , BR-28 , BR-29 , BR-30				

3.4.3 View question 質問の情報を見る

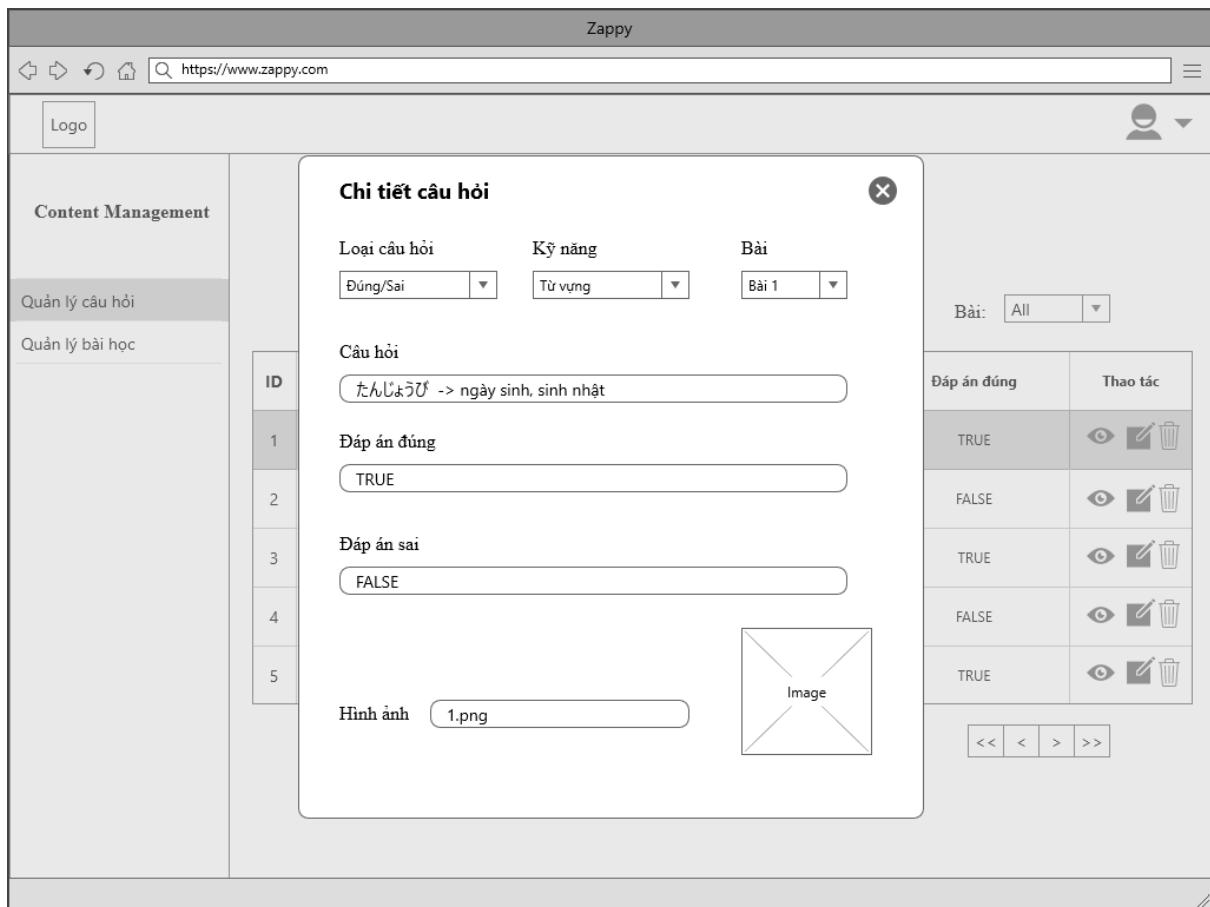


Figure 42: View question screen

ID and Name:	30 – View question	Actor:	Content Manager		
Description:	Actor clicks on the view icon at the row which has the question to view information.				
Trigger:	Actor clicks on the view icon in the “Thao tác” column.				
Preconditions:	PRE-1. Actor has logged in the system with a content manager account. PRE-2. Actor accesses the question management page. PRE-3. The question list must have at least 1 question.				
Post-conditions:	POST-1. The system displays information about vocabulary.				
Normal Flows:	Actor actions	System responses			
	1. Click on the view icon at the row which has the question to view information.	2. Display a pop-up form with question information.			
Alternative Flows:	N/a				
Exception Flows:	N/a				
Business Rules:	BR-03				

3.4.4 Delete question 質問を削除する

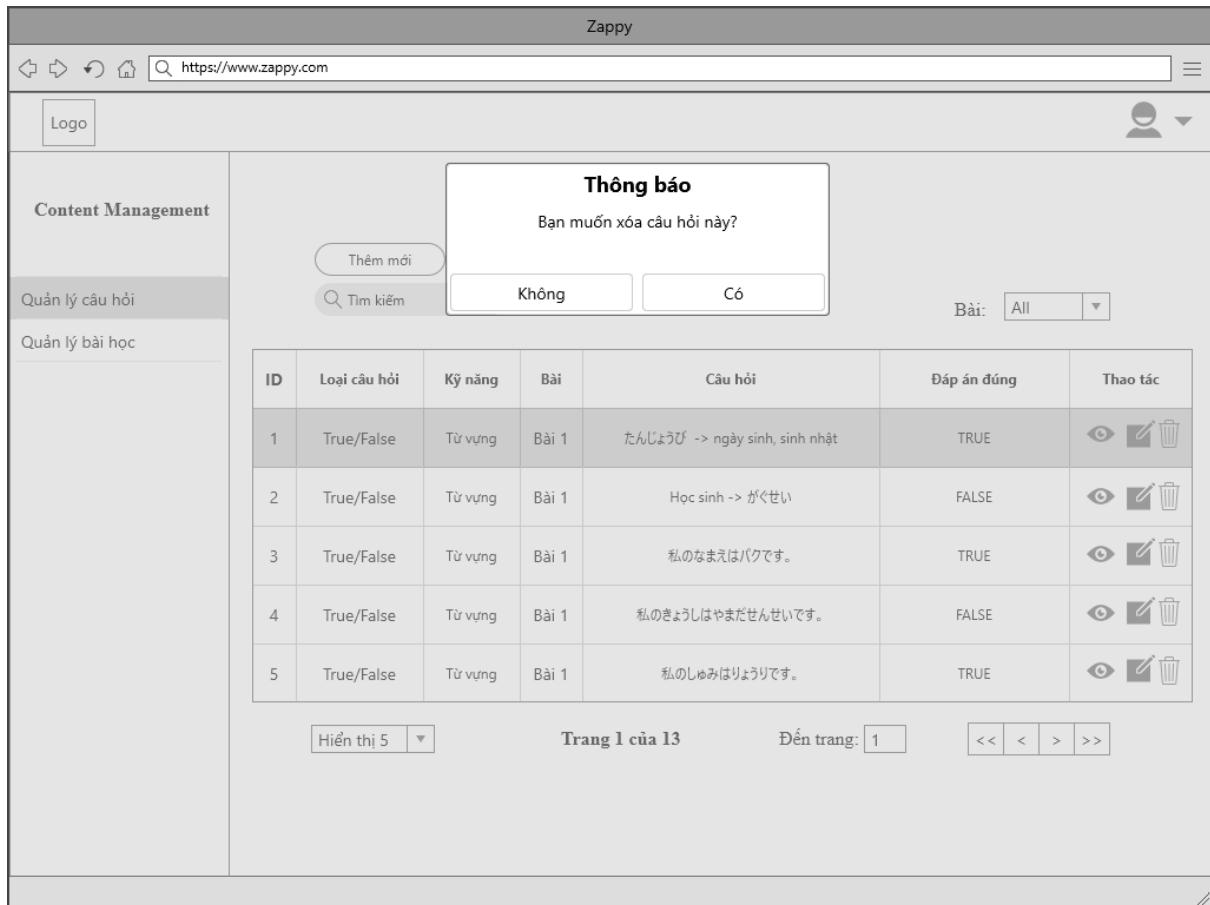


Figure 43: Delete question screen

ID and Name:	31 - Delete question	Actor:	Content Manager
Description:	This function allows the actor to delete a question.		
Trigger:	Actor clicks on the delete icon in the “Thao tác” column.		
Preconditions:	PRE-1. Actor has logged in the system with a content manager account. PRE-2. Actor accesses the question management page. PRE-3. The question list must have at least 1 question.		
Post-conditions:	POST-1. The system displays a list of questions without the deleted question. POST-2. The question information in the database has been removed.		
Normal Flows:	Actor actions	System responses	
	1. Click on the delete icon at the row which has the kanji to delete. 3. Click the “Có” button	2. Display a pop-up message: “Bạn muốn xóa câu hỏi này?” 4. Display message: “Xóa thành công”	

Alternative Flows:	N/A
Exception Flows:	E1. The actor clicks on the “Không” button (Step 3) The system closes pop-up and doesn't change anything.
Business Rules:	BR-03

3.3.5 Search question 質問を検索する

ID	Loại câu hỏi	Kỹ năng	Bài	Câu hỏi	Đáp án đúng	Thao tác
1	True/False	Từ vựng	Bài 1	たんじょうび -> ngày sinh, sinh nhật	TRUE	
2	True/False	Từ vựng	Bài 1	Học sinh -> がくせい	FALSE	

Figure 44: Search question screen

ID and Name:	32 – Search question	Actor:	Content Manager
Description:	Actor searches questions by inputting keywords into the search box.		
Trigger:	Actor inputs the keyword into the search box.		
Preconditions:	PRE-1. Actor has logged in the system with a content manager account. PRE-2. Actor accesses the question management page.		
Post-conditions:	POST-1. The system displays results with field information that contains entered keywords.		
Normal Flows:	Actor actions	System responses	

	1. Input keyword in the search box. 2. Display the search results.	
Alternative Flows:	N/a	
Exception Flows:	N/a	
Business Rules:	BR-03	

3.5 Manage study 学習を管理する



Figure 45: Manage study screen

ID and Name:	33 – Manage study	Actor:	Student
Description:	This function allows the actor to study and practice.		
Trigger:	Actor clicks on the “Học tập” button in the sidebar.		
Preconditions:	PRE-1. Actor has logged into the system with a student account.		
Post-conditions:	POST-1. The system displays study management navigation.		
	Actor actions	System responses	

Normal Flows:	1. Click on the “Học tập” button in the navigation bar.	2. Display study guideline on the right content and the study sidebar on the left content.
Alternative Flows:	N/a	
Exception Flows:	N/a	
Business Rules:	BR-01	

3.5.1 Learn alphabet アルファベットを勉強する

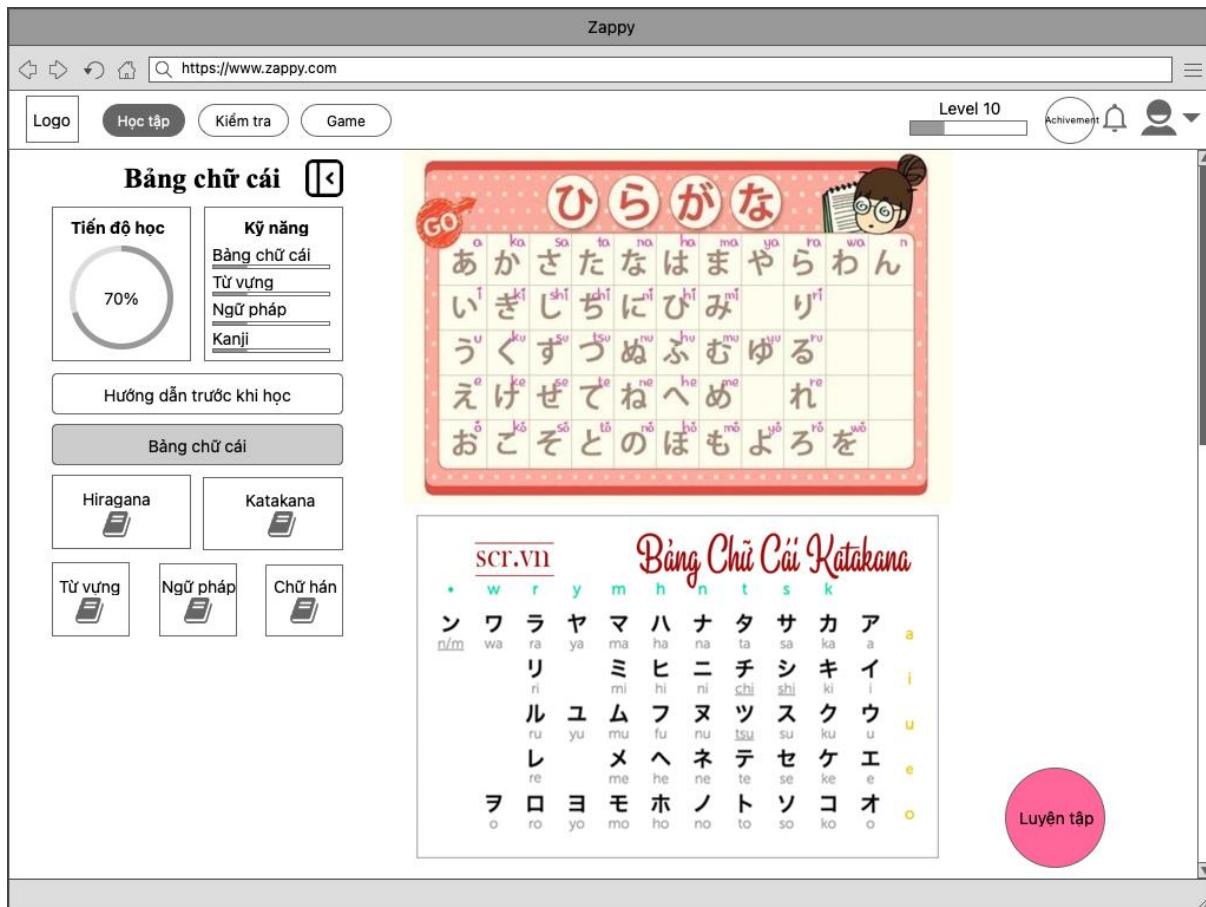


Figure 46: Learn alphabet

ID and Name:	34 – Learn alphabet	Actor:	Student
Description:	This function allows the actor to view two alphabets: hiragana and katakana.		
Trigger:	Actor clicks on the “Bảng chữ cái” button in the sidebar.		
Preconditions:	PRE-1. Actor has logged into the system with a student account. PRE-2. Actor is on Study page.		

Post-conditions:	POST-1. The system displays 2 alphabets.	
Normal Flows:	Actor actions	System responses
	1. Click on the the “Bảng chữ cái” button in the sidebar.	2. Display two alphabets: hiragana and katakana. 3. Two buttons hiragana and katakana are displayed
Alternative Flows:	N/a	
Exception Flows:	N/a	
Business Rules:	BR-01	

3.5.2 Learn hiragana ひらがなを勉強する



Figure 47: Learn hiragana screen

ID and Name:	35 – Learn hiragana	Actor:	Student
Description:	This function allows the actor to learn Hiragana alphabet.		
Trigger:	Actor clicks on the “Hiragana” button in the sidebar.		

Preconditions:	PRE-1. Actor has logged into the system with a student account. PRE-2. Actor is on Study page and has clicked on Alphabet button	
Post-conditions:	POST-1. The system displays each letter of Hiragana alphabet as a card.	
Normal Flows:	Actor actions	System responses
	1. Click on the “Hiragana” button in the sidebar. 3. Use the scroll bar to view other cards.	2. Display the Hiragana list that each letter of Hiragana alphabet as a card.
Alternative Flows:	N/a	
Exception Flows:	N/a	
Business Rules:	BR-01	

3.5.3 Learn katakana カタカナを勉強する



Figure 48: Learn katakana screen

ID and Name:	36 – Learn katakana	Actor:	Student
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Description:	This function allows the actor to learn Katakana alphabet.	
Trigger:	Actor clicks on the “Katakana” button in the sidebar.	
Preconditions:	PRE-1. Actor has logged into the system with a student account. PRE-2. Actor is on Study page and has clicked on Alphabet button	
Post-conditions:	POST-1. The system displays each letter of Katakana alphabet as a card.	
Normal Flows:	Actor actions	System responses
	1. Click on the “Katakana” button in the sidebar. 3. Use the scroll bar to view other cards.	2. Display each letter of Katakana alphabet as a card.
Alternative Flows:	N/a	
Exception Flows:	N/a	
Business Rules:	BR-01	

3.5.4 Learn kanji 漢字を勉強する



Figure 49: Learn kanji screen

ID and Name:	37 – Learn kanji	Actor:	Student		
Description:	This function allows the actor to learn Kanji.				
Trigger:	Actor clicks on the “Chữ hán” hyperlink in the sidebar.				
Preconditions:	PRE-1. Actor has logged into the system with a student account. PRE-2. Actor is on Study page				
Post-conditions:	POST-1. The system displays the kanji flashcards.				
Normal Flows:	Actor actions	System responses			
	1. Click on the “Chữ hán” button in the sidebar. 3. Choose a lesson to learn the kanji of that lesson. 5. Click on the “Tiếp theo” or “Quay lại” button to study other kanji.	2. Display a list of lessons in the sidebar. 4. Display kanji flashcards of selected lessons.			
Alternative Flows:	N/a				
Exception Flows:	N/a				
Business Rules:	BR-01				

3.5.5 Learn grammar 文法を勉強する



Figure 50: Learn grammar screen

ID and Name:	38 – Learn grammar	Actor:	Student		
Description:	This function allows the actor to learn grammar.				
Trigger:	Actor clicks on the “Ngữ pháp” button in the sidebar.				
Preconditions:	PRE-1. Actor has logged in the system with a student account. PRE-2. Actor is on Study page				
Post-conditions:	POST-1. The system displays the grammar information.				
Normal Flows:	Actor actions	System responses			
	1. Click on the “Ngữ pháp” hyperlink in the sidebar. 3. Choose a lesson to learn the grammar of that lesson. 5. Click on grammar to learn.	2. Display a list of lessons in the sidebar. 4. Display the grammar list of the selected lesson. 6. Display grammar details.			
Alternative Flows:	N/a				
Exception Flows:	N/a				
Business Rules:	BR-01				

3.5.6 Learn vocabulary 言葉を勉強する



Figure 51: Learn vocabulary screen

ID and Name:	39 – Learn vocabulary	Actor:	Student		
Description:	This function allows the actor to learn vocabulary.				
Trigger:	Actor clicks on the “Từ vựng” button in the sidebar.				
Preconditions:	PRE-1. Actor has logged in the system with a student account. PRE-2. Actor is on Study page				
Post-conditions:	POST-1. The system displays the vocabulary cards.				
Normal Flows:	Actor actions	System responses			
	1. Click on the “Từ vựng” button in the sidebar. 3. Choose a lesson to learn the vocabulary of that lesson. 5. Click on the “Tiếp theo” button to study another vocabulary.	2. Display a list of lessons in the sidebar. 4. Display vocabulary cards of the selected lesson.			
Alternative Flows:	N/a				
Exception Flows:	N/a				
Business Rules:	BR-01				

3.5.7 Practice 練習

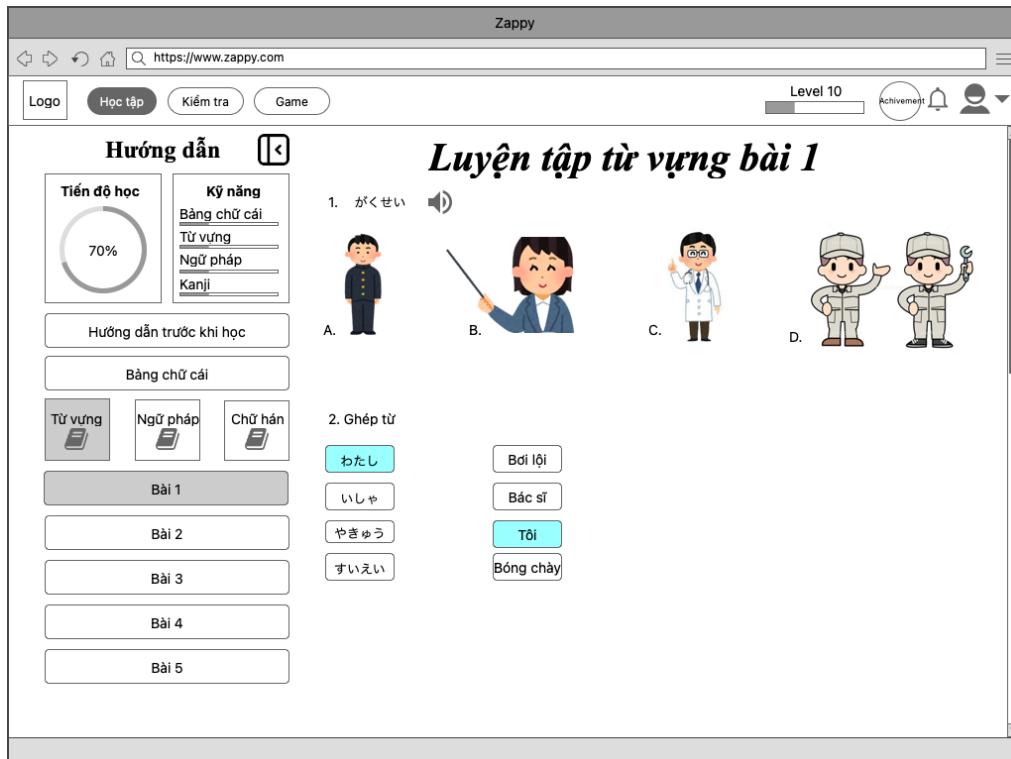


Figure 52: Practice screen

ID and Name:	40 – Practice	Actor:	Student		
Description:	This function allows the actor to do the practice of each part of the lesson.				
Trigger:	Actor clicks on the “Luyện tập” button on the bottom right of screen.				
Preconditions:	PRE-1. Actor has logged into the system with a student account. PRE-2. Actor accesses the Study page. PRE-2. Actor accesses the a lesson of Study page.				
Post-conditions:	POST-1. The system displays correct answers and scores.				
Normal Flows:	Actor actions	System responses			
	1. Click on the “Luyện tập” button on the bottom right of screen. 3. Answer questions. 4. Click on the “Xem kết quả” button.	2. Display a list of questions. 5. Display correct answers and score.			
Alternative Flows:	N/a				
Exception Flows:	N/a				
Business Rules:	BR-31 , BR-32 , BR-33 , BR-34 , BR-35 , BR-46 , BR-47 , BR-49				

3.6 Do the exam テストをする

3.6.1 Setting for test テストの設定

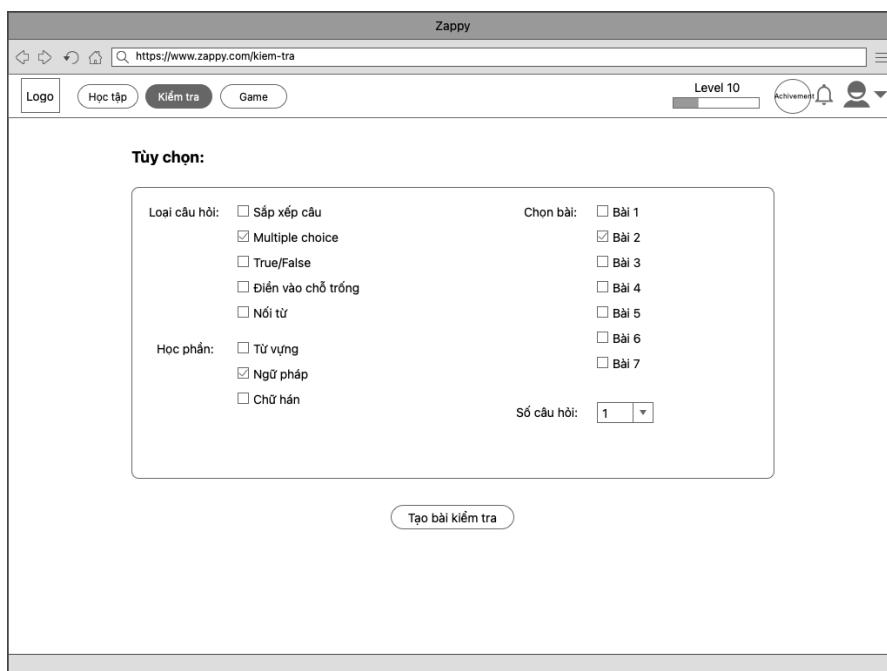


Figure 53: Setting for test screen

ID and Name:	41 – Setting for test	Actor:	Student		
Description:	This function allows the actor to select the skills, question types, lessons, and number of question the actor want to test				
Trigger:	Actor clicks on the “Kiểm tra” button in the navigation bar				
Preconditions:	PRE-1. Actor has logged in the system with a student account				
Post-conditions:	POST-1. The system creates a test according to actor selections.				
Normal Flows:	Actor actions	System responses			
	1. Click on the “Kiểm tra” button in the navigation bar 3. Select the skills, question types, lessons, and number of question actor want to test 4. Click “Tạo bài kiểm tra” button	2. Display settings page 5. Create a test according to actor selections.			
Alternative Flows:	N/a				
Exception Flows:	E1. Question type is not selected Notify an error message: “Không được để trống” E2. Lesson is not selected Notify an error message: “Không được để trống” E3. Skill is not selected Notify an error message: “Không được để trống” E4. Number of questions is not selected Notify an error message: “Không được để trống”				
Business Rules:	BR-19 , BR-42 , BR-43				

3.6.2 Do the exam テストをする



Figure 54: Do the exam screen

ID and Name:	42 – Do the exam	Actor:	Student		
Description:	This function allows the actor to do the exam.				
Trigger:	Actor clicks on the “Tạo bài kiểm tra” button.				
Preconditions:	PRE-1. Actor has logged into the system with a student account. PRE-2. Actor has just finished selecting the options to take the test.				
Post-conditions:	POST-1. The system displays the score of the test.				
Normal Flows:	Actor actions	System responses			
	1. Click on the “Tạo bài kiểm tra” button 3. Do the test, then click “Xem đáp án” button	2. Display a test according to actor selections. 4. Display the score of the test.			
Alternative Flows:	N/a				
Exception Flows:	E1. If no question is generated Display message: “There is no question in this part”				

3.7 Play game ゲームをする

3.7.1 Select game ゲームを選択する

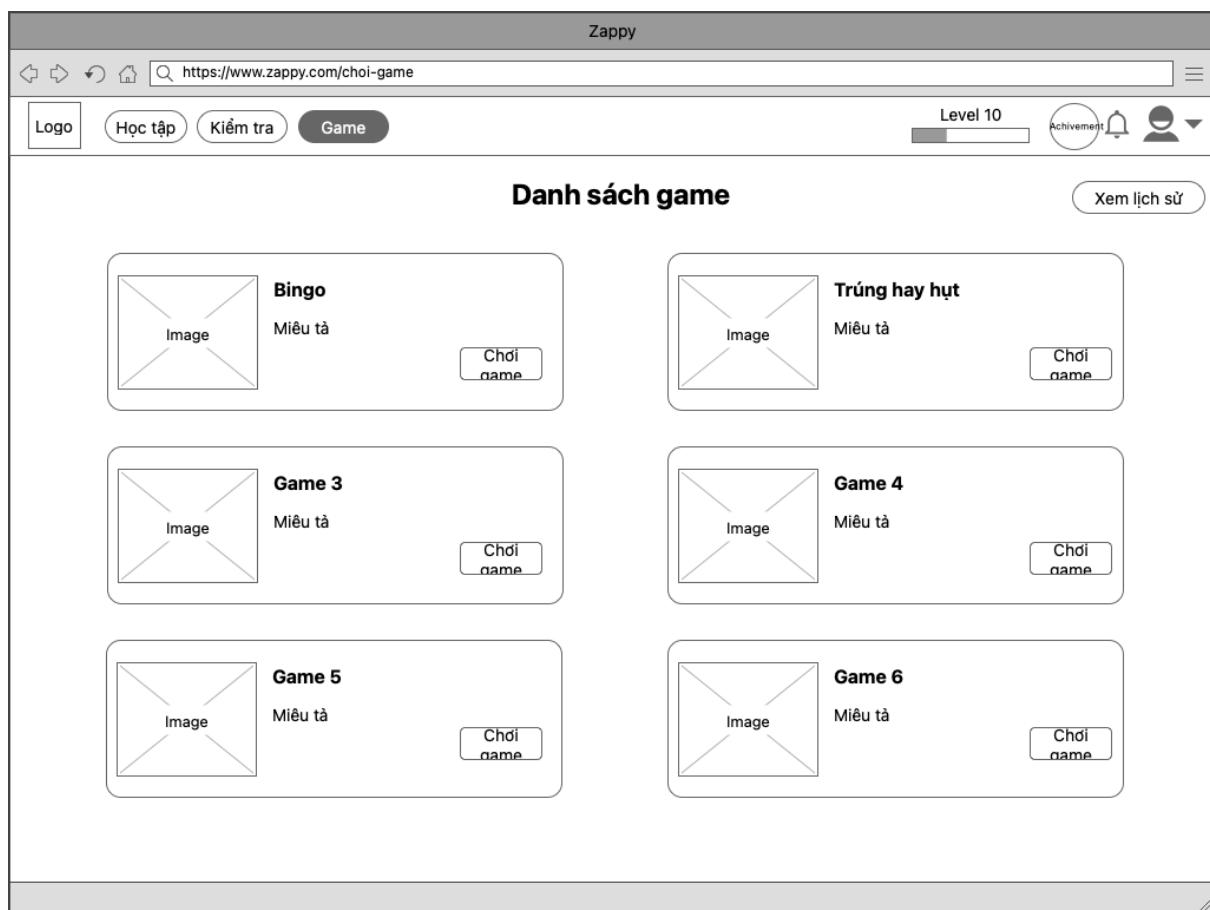


Figure 55: Select game screen

ID and Name:	43 – Select game	Actor:	Student
Description:	Actor selects a game to play.		
Trigger:	Actor clicks on the “Chơi game” button in the navigation bar.		
Preconditions:	PRE-1. Actor has logged in the system with a student account.		
Post-conditions:	POST-1. The system display setting game screen.		
Normal Flows:	Actor actions	System responses	
	1. Click on the “Game” button in the navigation bar.	2. Display list of games. 4. Display setting game screen.	

	3. Click on the “Chơi game” button next to the game actor want to play.	
Alternative Flows:	N/a	
Exception Flows:	N/a	
Business Rules:	N/a	

3.7.2 Setting game ゲームの設定

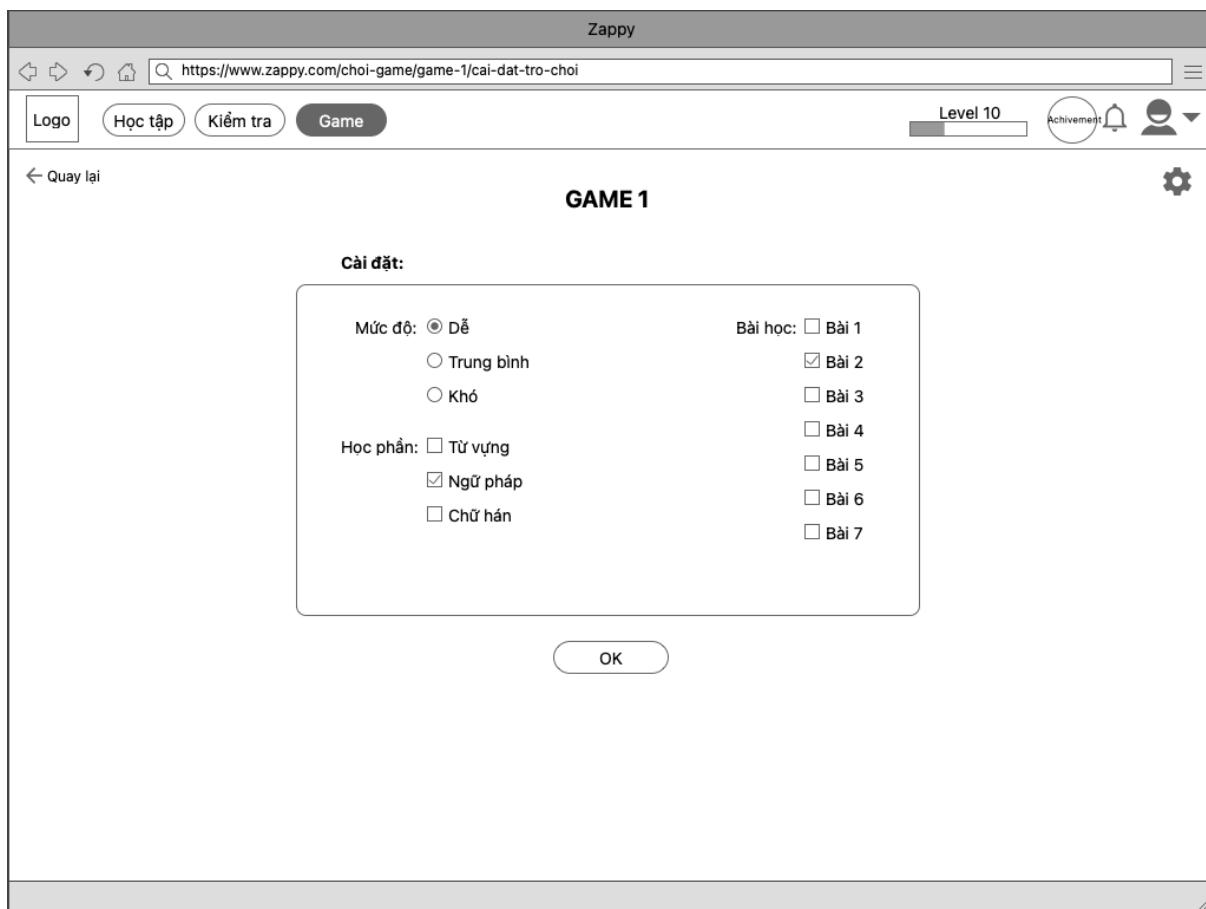


Figure 56: Setting game screen

ID and Name:	44 – Setting game	Actor:	Student
Description:	Actor customizes lesson and level for game.		
Trigger:	Actor selects a game on the screen.		
Preconditions:	PRE-1. Actor has logged in the system with a student account. PRE-2. Actor has just finished choosing a game.		
Post-conditions:	POST-1. The system displays a game according to actor selections.		

	Actor actions	System responses
Normal Flows:	1. Choose lesson and level. 2. Click on the “Bắt đầu” button	3. Display a game according to actor selections.
Alternative Flows:	N/a	
Exception Flows:	E1: If no level is chosen (After step 2) Notify an error message: “Bạn cần chọn mức độ” E2: If no lesson is chosen (After step 2) Notify an error message: “Bạn cần chọn ít nhất một bài học”	
Business Rules:	BR-19	

3.7.3 Play game ゲームをする

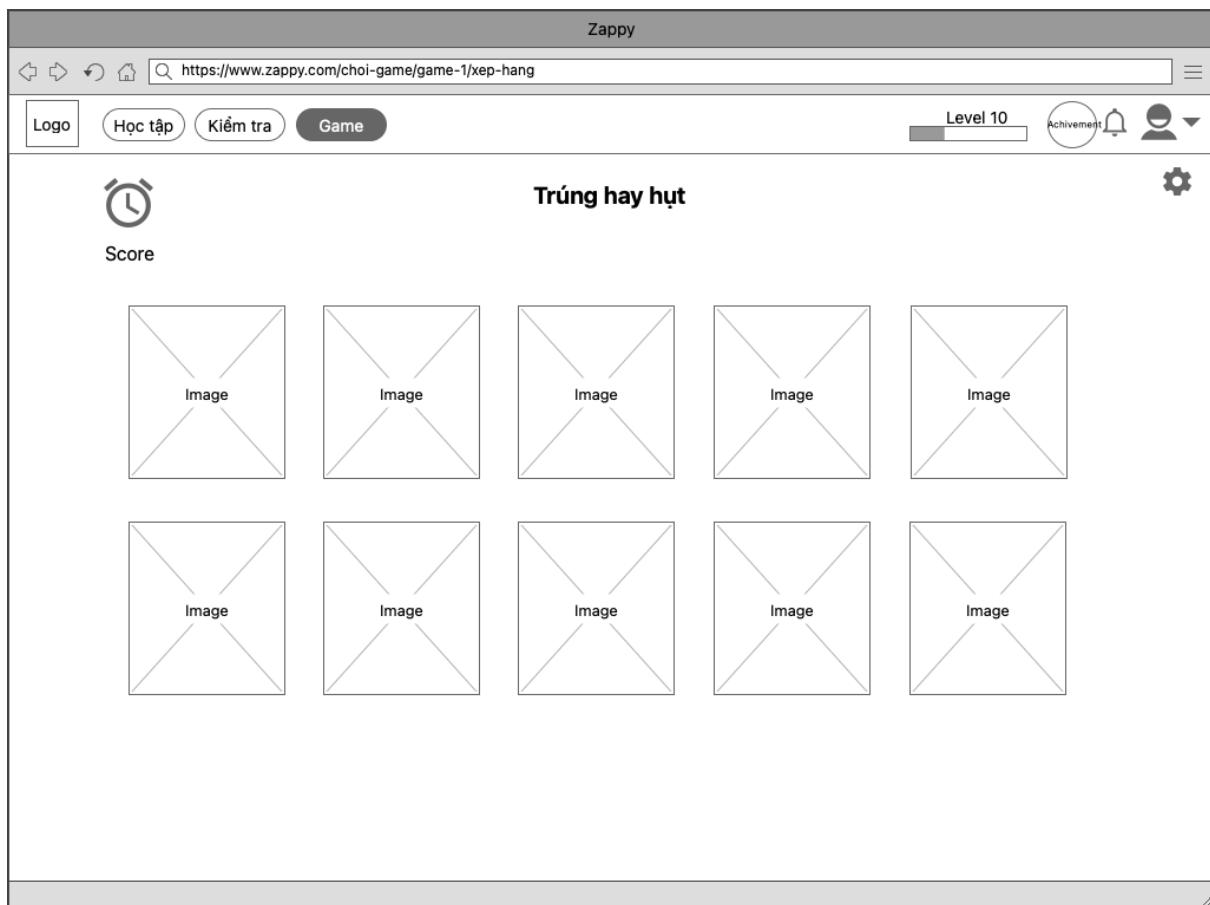


Figure 57: Play game screen

ID and Name:	45 – Play game	Actor:	Student
Description:	Actor play the game they have chosen.		
Trigger:	Actor clicks on the “Bắt đầu” button on the setting game screen.		

Preconditions:	PRE-1. Actor has logged in the system with a student account. PRE-2. Actor accesses setting game page.	
Post-conditions:	POST-1. The system display questions for	
Normal Flows:	Actor actions	System responses
	1. Click on the “Bắt đầu” button on the setting page. 4. Answer questions.	2. Time is counted down 3. Display questions of game. 5. Display score.
Alternative Flows:	N/a	
Exception Flows:	N/a	
Business Rules:	BR-45	

3.7.4 View history 歴史を見る

The screenshot shows the Zappy application interface. At the top, there is a navigation bar with links for Home, Test, Exam, and Game. On the right side of the header, there is a progress bar labeled "Level 10" and icons for Achievement, Bell, and User profile. Below the header, the main content area is titled "LỊCH SỬ GAME". A table displays the following data:

ID	Tên trò chơi	Điểm	thời gian	Thời lượng
1	Game 1	980	21/09/2021	00:05:20
2	Game 2	970	23/09/2021	00:04:20
3	Game 3	860	23/09/2021	00:07:15
4	Game 4	830	24/09/2021	00:09:01
5	Game 5	820	25/09/2021	00:10:01
6	Game 6	600	26/09/2021	00:12:08

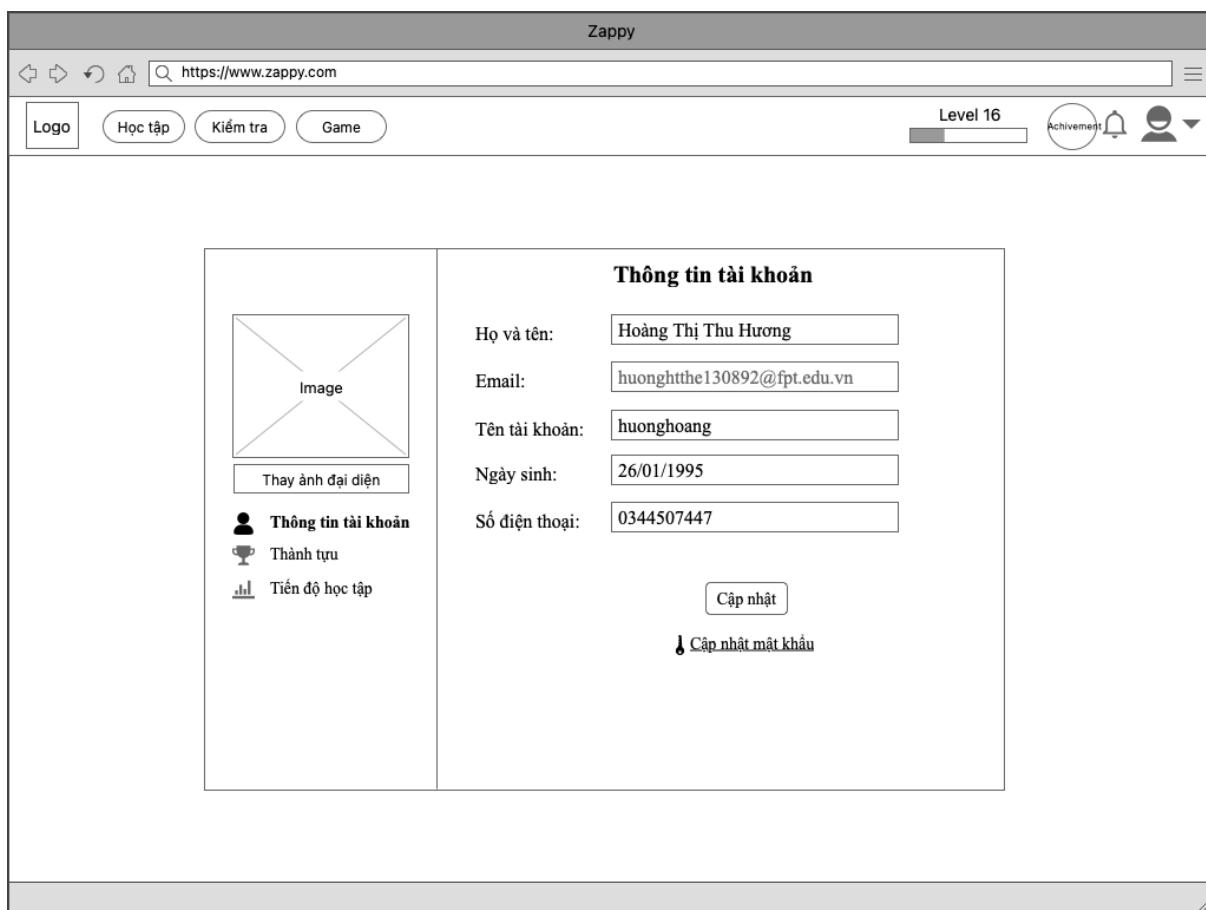
At the bottom center of the screen is an "OK" button.

Figure 58: View history screen

ID and Name:	46 – View history	Actor:	Student
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Description:	Actor want to see all game history.	
Trigger:	Actor clicks on the “Lịch sử” button on the screen.	
Preconditions:	PRE-1. Actor has logged in the system with a student account. PRE-1. Actor is on select game screen.	
Post-conditions:	POST-1. The system displays history about played game.	
Normal Flows:	Actor actions	System responses
	1. Click on the “Xem lịch sử” button on the screen	2. Display game history.
Alternative Flows:	N/a	
Exception Flows:	N/a	
Business Rules:	BR-02	

3.8 Manage Personal Profile 個人プロフィールを管理する



The screenshot shows the Zappy application interface with the following details:

- Header:** The title bar says "Zappy". The address bar shows the URL <https://www.zappy.com>. The top right corner includes a progress bar labeled "Level 16", an "Achievement" badge, a bell icon, and a user profile icon.
- Navigation:** Below the header are navigation buttons for "Logo", "Học tập", "Kiểm tra", and "Game".
- Content Area:**
 - User Profile Section:** On the left, there is a placeholder for an "Image" with a "Thay ảnh đại diện" (Change profile picture) button below it. To the right of this are three icons: a person icon labeled "Thông tin tài khoản", a trophy icon labeled "Thành tựu", and a chart icon labeled "Tiến độ học tập".
 - Account Information Form:** A large form titled "Thông tin tài khoản" contains the following fields:

Họ và tên:	Hoàng Thị Thu Hương
Email:	huonghtthe130892@fpt.edu.vn
Tên tài khoản:	huonghoang
Ngày sinh:	26/01/1995
Số điện thoại:	0344507447

 Below the form are two buttons: "Cập nhật" (Update) and "Cập nhật mật khẩu" (Change password).

Figure 59: Manage personal profile screen

ID and Name:	47 – Manage personal profile	Actor:	Admin, Student, Content manager		
Description:	Actor accesses personal profile page.				
Trigger:	Actor clicks on the “Thông tin cá nhân” hyperlink.				
Preconditions:	PRE-1. Actor has logged into the system.				
Post-conditions:	POST-1. The system displays account information.				
Normal Flows:	Actor actions	System responses			
	1. Click on the avatar icon in the navigation bar. 3. Click on the “Thông tin cá nhân” hyperlink in the menu.	2. Display a drop-down menu. 4. Display a pop-up form with account information.			
Alternative Flows:	N/a				
Exception Flows:	N/a				
Business Rules:	BR-02				

3.8.1 View progress 進捗を見る

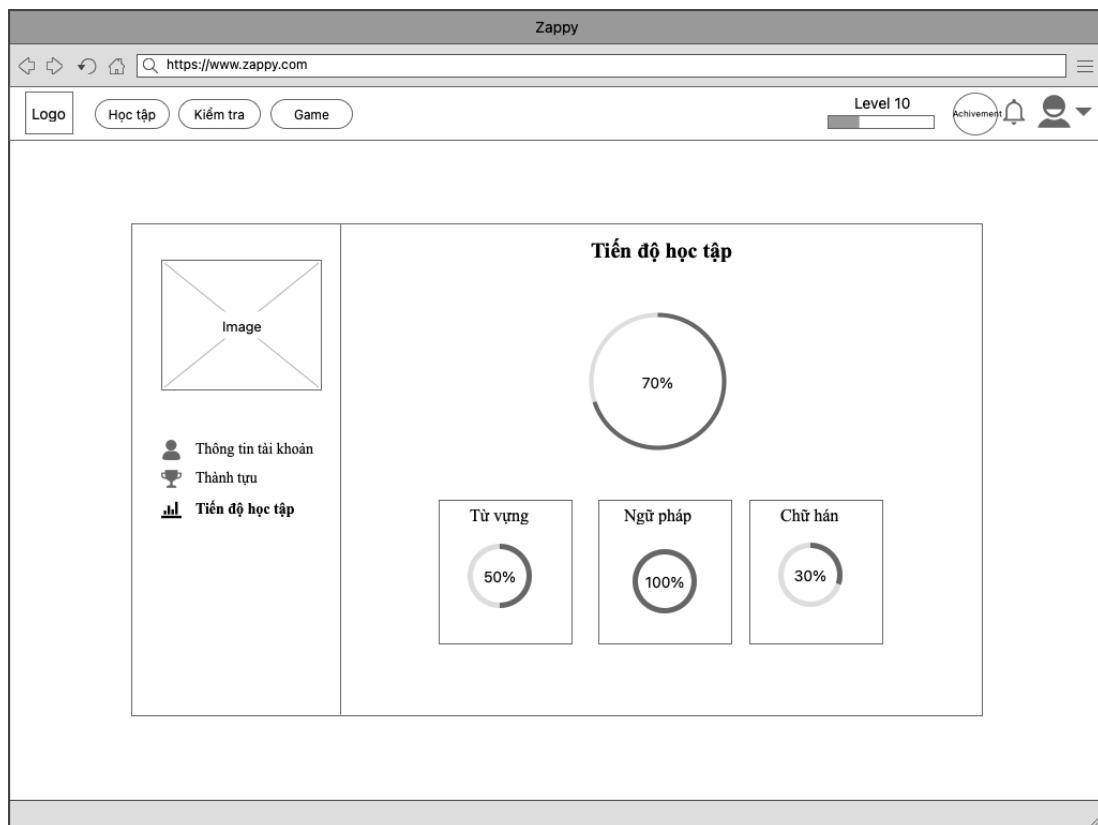


Figure 60: View progress screen

ID and Name:	48 – View progress	Actor:	Student		
Description:	This function allows the actor to view study progress				
Trigger:	Actor clicks on the “Tiến độ học tập” hyperlink.				
Preconditions:	PRE-1. Actor has logged into the system with a student account. PRE-2. Actor accesses personal profile screen.				
Post-conditions:	POST-1. The system displays information on learning progress.				
Normal Flows:	Actor actions	System responses			
	1. Click on the “Tiến độ học tập” hyperlink in the sidebar.	2. Display information about learning progress.			
Alternative Flows:	A1. On homepage, the actor clicks on the Study button in navigation bar (Step 1). The Progress will be displayed at the study sidebar.				
Exception Flows:	N/a				
Business Rules:	BR-02				
Other information:	Progress for each skill is divided into 7 sections for 7 lessons. In the system, it is defined that if the actor got 80% of total mark or more of a practice for a lesson for each skill, it also means you pass the lesson in that skill. For example: If you do practice for Lesson 1 in Kanji, you got mark 81/100, that means you passed the Kanji lesson 1, the progress is increased for you. If the system includes 7 lessons, it means you got 1/7 progress of Kanji skill.				

3.8.2 View achievement 成績事績を見る

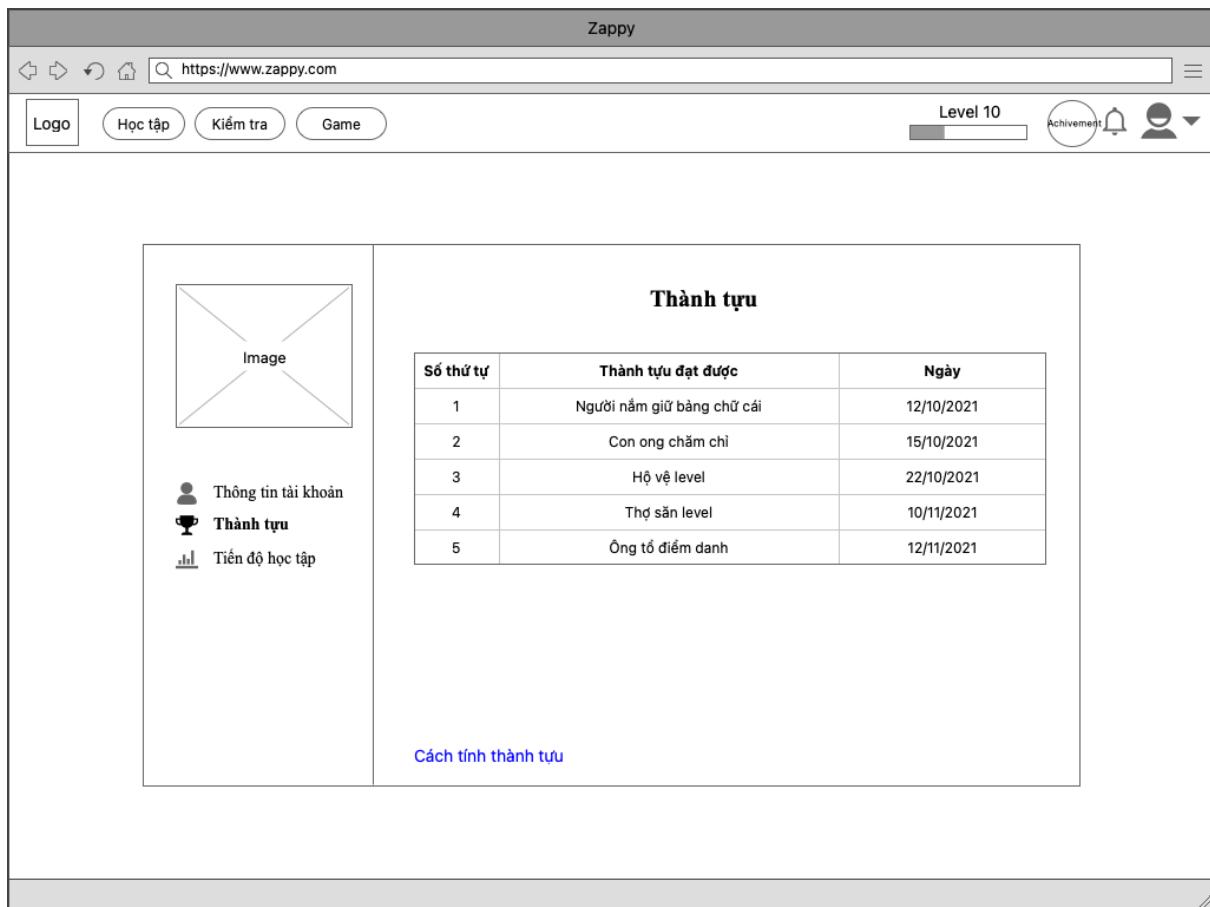


Figure 61: View achievement screen

ID and Name:	49 – View achievement	Actor:	Student		
Description:	This function allows the actor to view achievement.				
Trigger:	Actor clicks on the “Thành tựu” hyperlink.				
Preconditions:	PRE-1. Actor has logged into the system with a student account. PRE-2. Actor accesses personal profile screen.				
Post-conditions:	POST-1. The system displays information on achievement.				
Normal Flows:	Actor actions	System responses			
	1. Click on the “Thành tựu” hyperlink in the sidebar.	2. Display information about achievement.			
Alternative Flows:	N/a				
Exception Flows:	N/a				
Business Rules:	BR-02				

Achievement list 成績事績リスト

Achievement name	Condition
Quái vật kiểm tra	10 consecutive tests get 100 points.
Bậc thầy chữ Hán	All kanji have been learned.
Vị thần ngữ pháp	All grammar has been learned.
Chúa tể ngôn từ	All vocabulary has been learned.
Thần đồng ngôn ngữ	All kanji, grammar and vocabulary have been learned.
Hộ vệ level	Students reach 1000 experience points.
Thợ săn level	Students reach 5000 experience points.
Quái thú level	Students reach 10000 experience points.
Kẻ hủy diệt level	Students reach 20000 experience points.
Thần thoại level	Students reach 30000 experience points.

Table 6: Achievement list

3.8.3 Update profile プロフィールを更新する

The screenshot shows the Zappy application interface for updating a user's profile. At the top, there is a navigation bar with links for 'Học tập' (Study), 'Kiểm tra' (Test), and 'Game'. On the right side of the header, there is a progress bar labeled 'Level 16' and a bell icon. Below the header, there is a large form for updating account information. The form includes fields for 'Họ và tên' (Name) containing 'Hoàng Thị Thu Hương', 'Email' containing 'huonghtthe130892@fpt.edu.vn', 'Tên tài khoản' (Account name) containing 'huonghoang', 'Ngày sinh' (Birthdate) containing '26/01/1995', and 'Số điện thoại' (Phone number) containing '0344507447'. There are also buttons for 'Cập nhật' (Update) and 'Cập nhật mật khẩu' (Change password). On the left side of the form, there is a placeholder for a profile picture with the text 'Image' and a button 'Thay ảnh đại diện' (Change profile picture). Below this, there are three categories: 'Thông tin tài khoản' (Account information), 'Thành tựu' (Achievements), and 'Tiến độ học tập' (Learning progress).

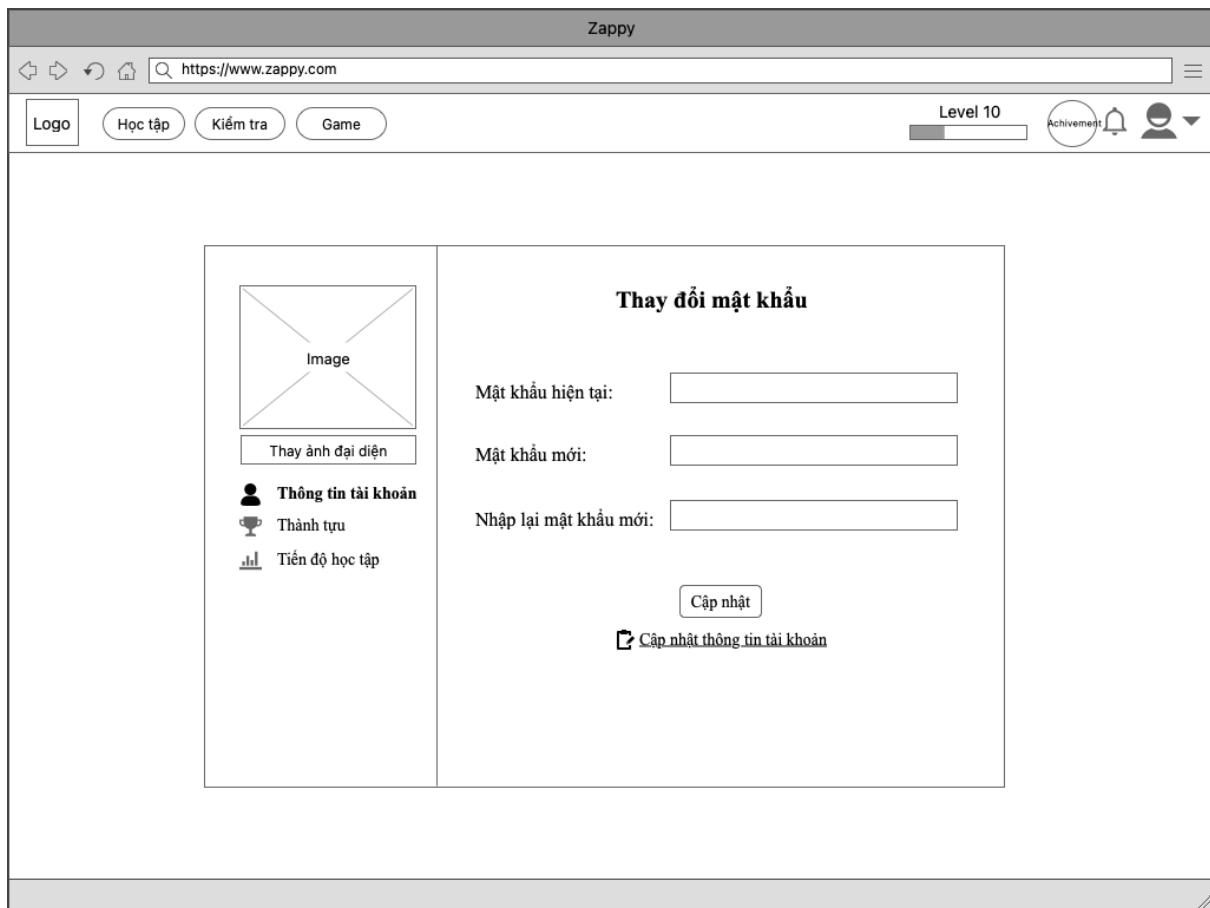
Figure 62: Update profile screen

ID and Name:	50 – Update profile	Actor:	Student, Content manager, Admin				
Description:	This function allows the actor to update personal profile.						
Trigger:	Actors click on the “Thông tin cá nhân” hyperlink.						
Preconditions:	PRE-1. Actors have been logged into the system. PRE-2. Actors access personal profile screen.						
Post-conditions:	POST-1. The system displays the user's personal information.						
Normal Flows:	<table border="1"> <thead> <tr> <th>Actor actions</th> <th>System responses</th> </tr> </thead> <tbody> <tr> <td> 1. Edit the information that the actor wants to change. 2. Click on the “Cập nhật” button. </td> <td> 3. Display message: “Cập nhật thành công” </td> </tr> </tbody> </table>	Actor actions	System responses	1. Edit the information that the actor wants to change. 2. Click on the “Cập nhật” button.	3. Display message: “Cập nhật thành công”		
Actor actions	System responses						
1. Edit the information that the actor wants to change. 2. Click on the “Cập nhật” button.	3. Display message: “Cập nhật thành công”						
Alternative Flows:	N/A						
Exception Flows:	<p>E0. The actor clicks on the “X” button The system closes pop-up and doesn't change anything.</p> <p>E1. The full name is blank (After step 2) Notify an error message: “Không được để trống.”</p> <p>E3. The full name contains special characters (After step 2) Notify an error message: “Không đúng định dạng”</p> <p>E4. The full name is not between 1 and 50 characters (After step 2) Notify an error message: “Độ dài từ 1-50 ký tự”</p> <p>E5. The email is blank (After step 2) Notify an error message: “Không được để trống.”</p> <p>E6. The email is in the wrong format (After step 2) Notify an error message: “Không đúng định dạng”</p> <p>E7. The email is already in use (After step 2) Notify an error message: “Email đã được sử dụng.”</p> <p>E8. The username is blank (After step 2) Notify an error message: “Không được để trống”</p> <p>E9. The username contains special characters (After step 2) Notify an error message: “Không đúng định dạng”</p> <p>E10. The length of the username is not between 4 and 20 characters (After step 2) Notify an error message: “Độ dài chưa đủ”</p> <p>E11. The username has already existed (After step 2) Notify an error message: “Tên tài khoản đã tồn tại.”</p> <p>E12. The date of birth is not before the current time (After step 2) Notify an error message: “Không đúng định dạng”</p> <p>E13. The phone number does not start with 0 and does not contain 10 digits (After step 2) Notify an error message: “Không đúng định dạng”</p>						

Business Rules:

[BR-01, BR-02, BR-05, BR-06, BR-07, BR-08, BR-09, BR-13, BR-16,](#)
[BR-17, BR-19](#)

3.8.4 Change password パスワードを変更する



The screenshot shows the Zappy application interface. At the top, there's a header bar with the title 'Zappy', a search bar containing 'https://www.zappy.com', and various navigation icons. Below the header is a navigation bar with buttons for 'Logo', 'Học tập', 'Kiểm tra', 'Game', 'Level 10', 'Achievement', and a user profile icon. The main content area is divided into two sections. On the left, there's a sidebar with a placeholder 'Image' for a profile picture, a 'Thay ảnh đại diện' (Change profile picture) button, and three menu items: 'Thông tin tài khoản' (Account information), 'Thành tựu' (Achievements), and 'Tiến độ học tập' (Learning progress). On the right, the main form is titled 'Thay đổi mật khẩu' (Change password). It contains three input fields: 'Mật khẩu hiện tại' (Current password), 'Mật khẩu mới' (New password), and 'Nhập lại mật khẩu mới' (Re-enter new password). Below these fields is a 'Cập nhật' (Update) button. Underneath the button is a link labeled 'Cập nhật thông tin tài khoản' (Update account information).

Figure 63: Chang password screen

ID and Name:	51 – Change password	Actor:	Student, Content Manager, Admin
Description:	This function allows the actor to change password.		
Trigger:	Actor clicks on the “Cập nhật mật khẩu” hyperlink.		
Preconditions:	PRE-1. Actor has logged into the system. PRE-2. Actor is accessing personal profile screen.		
Post-conditions:	POST-1. The system displays message: “Cập nhật mật khẩu thành công” and update password in the database.		
Normal Flows:	Actor actions	System responses	
	1. Click on the “Cập nhật mật khẩu” hyperlink.	2. Display pop-up form to change password.	

	3. Enter the old password and new password. 4. Click “Cập nhật” button	5. Display message: “Đã lưu”
Alternative Flows:	N/A	
Exception Flows:	<p>E0. The actor clicks on the “Quay lại” hyperlink (After step 2) The system goes back to the previous screen and doesn't change anything</p> <p>E1. The old password is blank (After step 4) Notify an error message: “Không được để trống”</p> <p>E2. The old password is incorrect (After step 4) Notify an error message: “Không đúng mật khẩu”</p> <p>E3. The new password is blank (After step 4) Notify an error message: “Không được để trống”</p> <p>E4. The new password is not between 8 and 20 characters (After step 4) Notify an error message: “Độ dài từ 8-20 ký tự”</p> <p>E5. The new password contains space (After step 4) Notify an error message: “Không đúng định dạng”</p>	
Business Rules:	BR-02 , BR-11 , BR-12	

3.9 Common feature 共通機能

3.9.1 View level レベルを見る

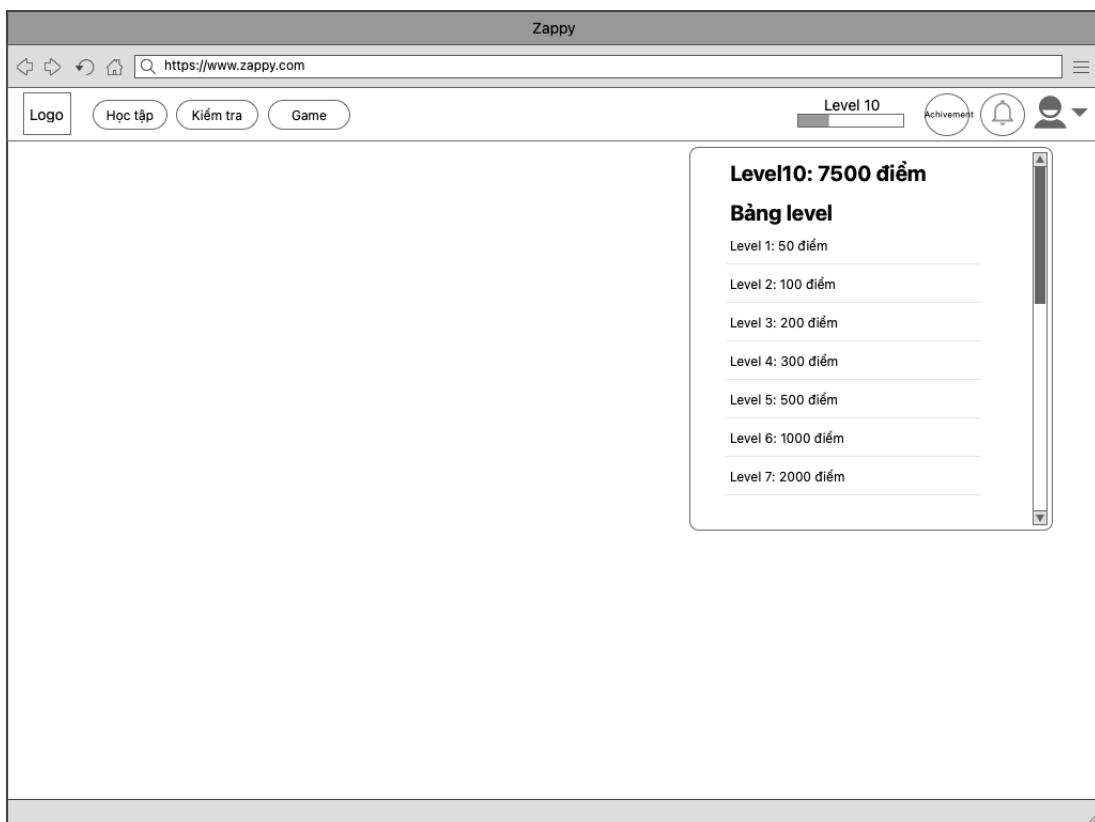


Figure 64: View level screen

ID and Name:	52 – View level	Actor:	Student		
Description:	Actor wants to view actor's level score.				
Trigger:	N/A				
Preconditions:	PRE-1. Actor has logged into the system with a student account.				
Post-conditions:	POST-1. The system displays actor's level.				
Normal Flows:	Actor actions	System responses			
		1. Display actor's level score on navigation bar.			
Alternative Flows:	N/a				
Exception Flows:	N/a				
Business Rules:	BR-02 , BR-48				
Other information:	<p>Level starts from 0 and no level limit. The level is calculated by exp score using the formula: New level = Current level + distance, where distance is a number in ascending order starting at 100, 200, 300, and so on. For example: Level 1: 100 exp Level 2: 300 exp Level 3: 600 exp And so on.</p> <p>User level score is calculated by: Number of correct answers in the test * 5 + number of correct answers in the practice * 2 + bingo game score * 1/31 + memory game score * 1/23</p>				

3.9.2 Register 登録する

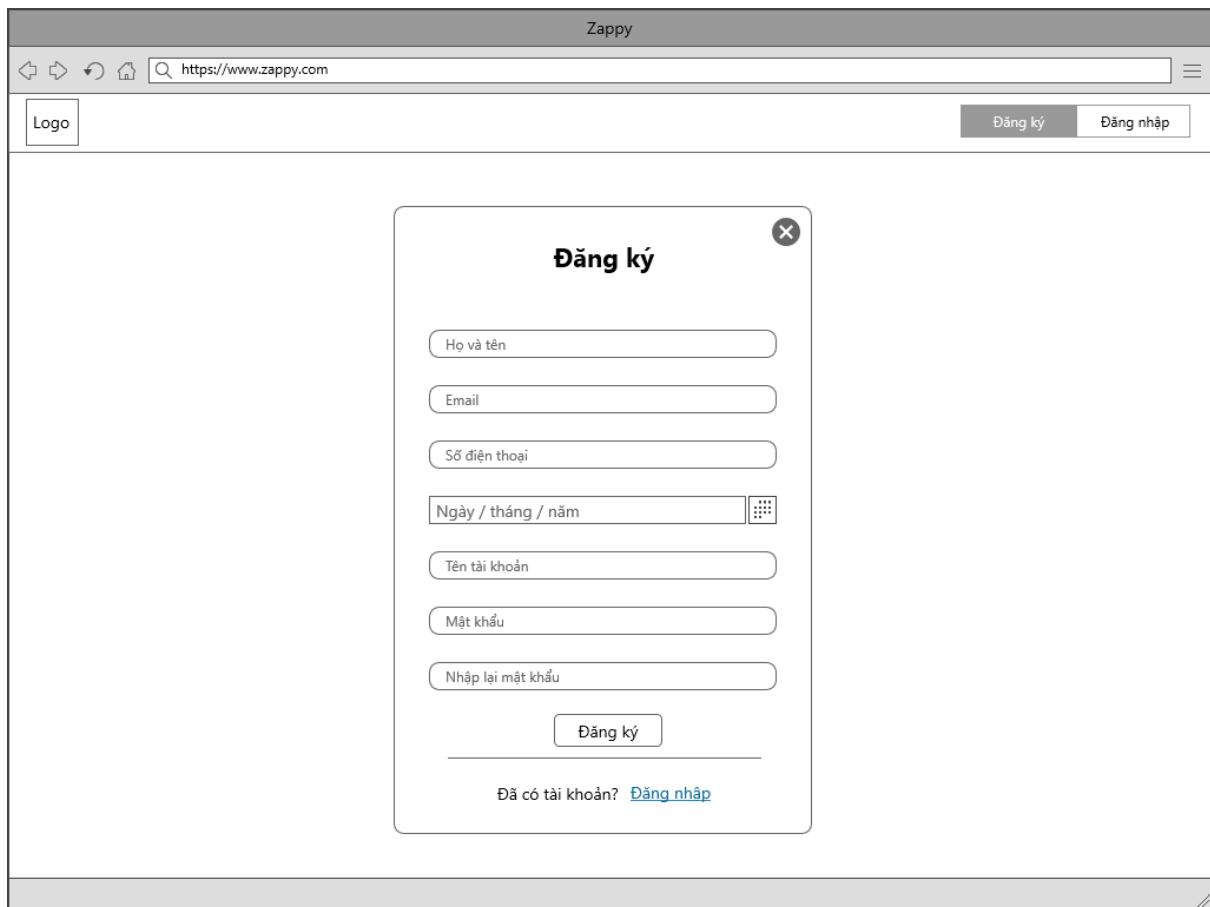


Figure 65: Register screen

ID and Name:	53 – Register	Actor:	Guest
Description:	This function allows the actor to register new account.		
Trigger:	Actor clicks on the “Đăng ký” button in the navigation bar.		
Preconditions:	PRE-1. The actor does not have an account PRE-2. The actor accesses the homepage without login status.		
Post-conditions:	POST-1. The system displays message: “Tạo tài khoản thành công”. POST-2. The system saves user information to the database.		
Normal Flows:	Actor actions 1. Click on the “Đăng ký” button in the navigation bar. 3. Fill in personal information. 4. Click on the “Đăng ký” button in the pop-up form.	System responses 2. Display pop-up form to fill in user information. 5. Display message: “Đăng ký thành công”	
Alternative Flows:	N/A		
Exception Flows:	E0. The actor clicks on the “X” button (After step 2)		

	<p>The system goes back to the previous screen and doesn't change anything.</p> <p>E1. The full name is blank (After step 4) Notify an error message: "Không được để trống."</p> <p>E2. The full name contains special characters (After step 4) Notify an error message: "Không đúng định dạng"</p> <p>E3. The full name is not between 1 and 50 characters (After step 4) Notify an error message: "Độ dài từ 1-50 ký tự"</p> <p>E4. The email is blank (After step 4) Notify an error message: "Không được để trống."</p> <p>E5. The email is in the wrong format (After step 4) Notify an error message: "Không đúng định dạng"</p> <p>E6. The email is already in use (After step 4) Notify an error message: "Email đã được sử dụng."</p> <p>E7. The phone is blank (After step 4) Notify an error message: "Không được để trống."</p> <p>E8. The phone does not contain 10 digits and does not start with 0 (After step 4) Notify an error message: "Không đúng định dạng"</p> <p>E9. The date of birth is not before the current time (After step 4) Notify an error message: "Không đúng định dạng"</p> <p>E10. The username is blank (After step 4) Notify an error message: "Không được để trống"</p> <p>E11. The username contains special characters (After step 4) Notify an error message: "Không đúng định dạng"</p> <p>E12. The length of the username is not between 4 and 20 characters (After step 4) Notify an error message: "Độ dài từ 4-20 ký tự"</p> <p>E13. The password is blank (After step 4) Notify an error message: "Không được để trống"</p> <p>E14. The password contains space (After step 4) Notify an error message: "Không đúng định dạng"</p> <p>E15. The password is not between 8 and 20 characters (After step 4) Notify an error message: "Độ dài từ 8-20 ký tự"</p> <p>E16. The username has already existed (After step 4) Notify an error message: "Tên tài khoản đã tồn tại."</p>
Business Rules:	BR-03 , BR-05 , BR-06 , BR-07 , BR-08 , BR-09 , BR-11 , BR-12 , BR-13 , BR-16 , BR-17 , BR-19

3.9.3 Login ログインする

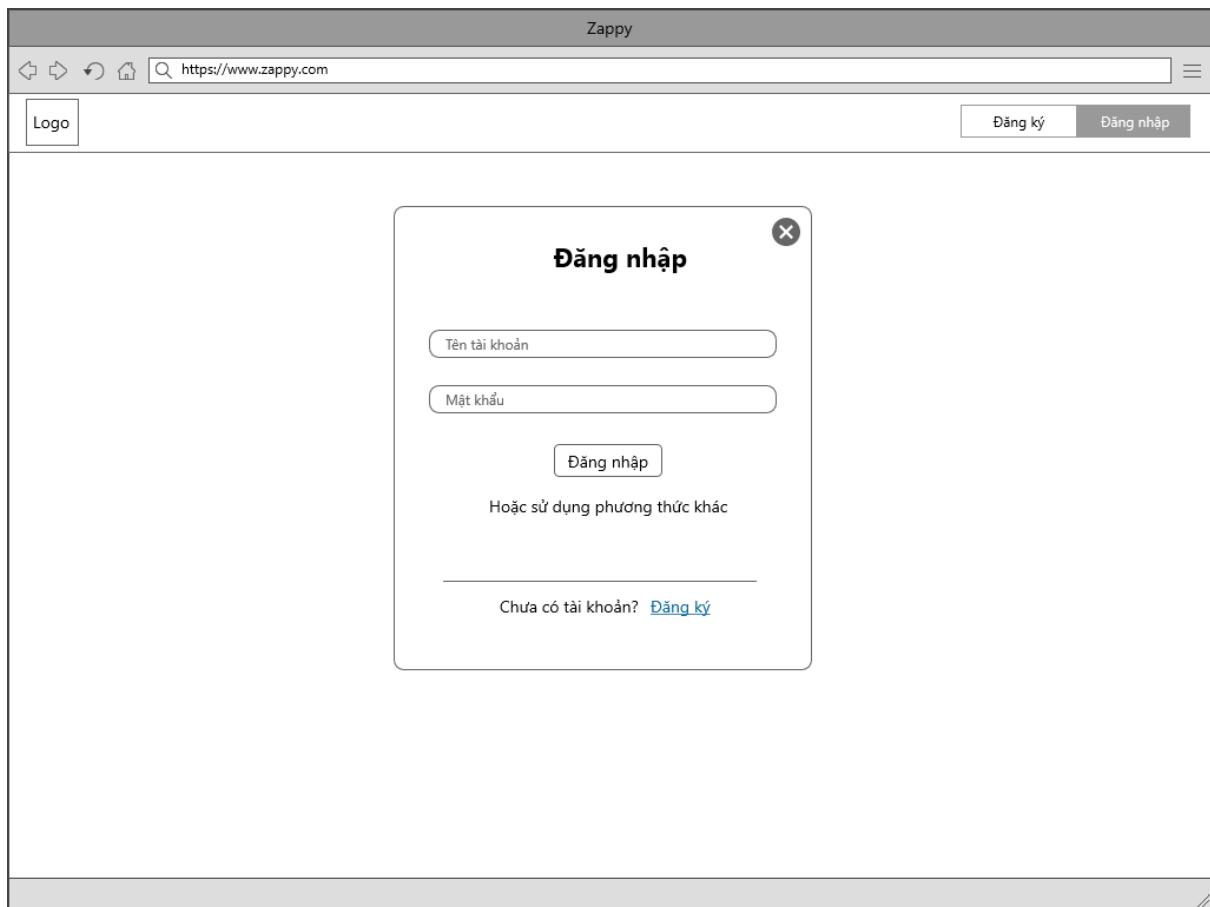


Figure 66: Login screen

ID and Name:	54 – Login	Actor:	Student, Content manager, Admin
Description:	Actors use this function to log in with the account.		
Trigger:	Actors click on the “Đăng nhập” button in the navigation bar.		
Preconditions:	PRE-1. Actors are not signed in the system PRE-2. Actors have owned an account.		
Post-conditions:	POST-1. Actor logged in to the system. POST-2. The system saved the actor's successful login status.		
Normal Flows:	Actor actions 1. Access website without login status. 2. Click on the “Đăng nhập” button in the navigation bar. 4. Enter username, password. 5. Click on the “Đăng nhập” button in the pop-up form.	System responses 3. Display pop-up form to fill in account information. 6. Display homepage if authentication is successful.	
Alternative Flows:	N/A		

Exception Flows:	<p>E0. The actor clicks on the “X” button (After step 3) The system goes back to the previous screen and doesn't change anything.</p> <p>E1. The username is blank or incorrect (After step 5) Notify an error message: “Không được để trống”</p> <p>E2. The username is incorrect (After step 5) Notify an error message: “Sai tài khoản”</p> <p>E3. The password is blank (After step 5) Notify an error message: “Không được để trống”</p> <p>E4. The password is incorrect (After step 5) Notify an error message: “Sai mật khẩu”</p>
Business Rules:	BR-01

3.9.4 Logout ログアウトする

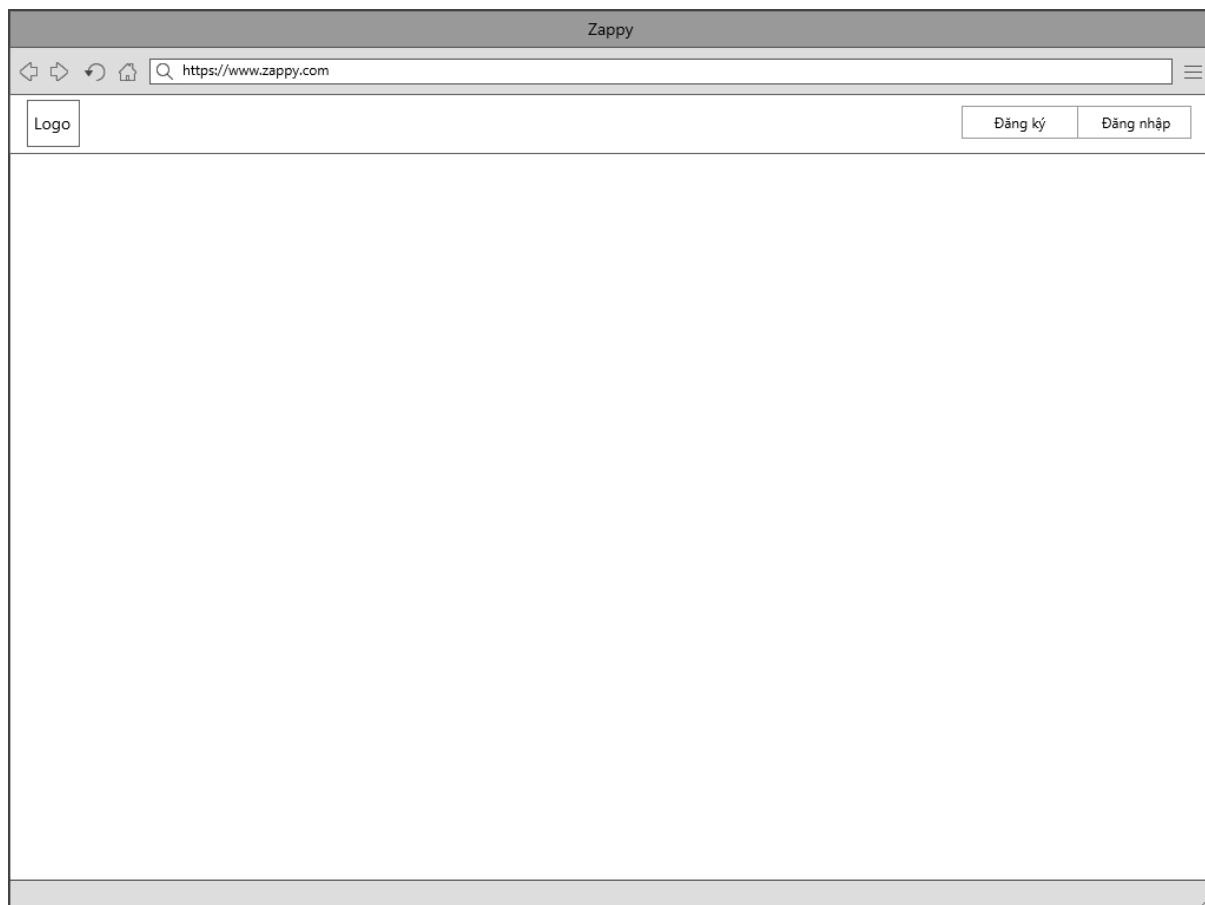


Figure 67: Log out screen

ID and Name:	55 – Logout	Actor:	Student, Content manager, Admin
Description:	Actors use this function to log out systems.		
Trigger:	Actors click on the “Đăng xuất” button.		

Preconditions:	PRE-1. Actors have logged into the system.		
Post-conditions:	POST-1 Actors logged out of the system. POST-2 The system saved the actor's successful logout status and ended the session		
Normal Flows:	Actor actions 1. Click on the avatar icon in the navigation bar. 3. Click on the “Đăng xuất” button.		System responses 2. Display a drop-down menu. 4. Display homepage without login status.
Alternative Flows:	N/a		
Exception Flows:	N/a		
Business Rules:	N/a		

3.9.5 Forgot Password パスワードを忘れる

ID and Name:	56 – Forgot Password	Actor:	Student, Content manager, Admin
Description:	Actors use this function to change the password because they have forgotten it.		
Trigger:	Actors click on the “Quên mật khẩu?” button.		
Preconditions:	PRE-1. Actors have been on Login Screen.		
Post-conditions:	POST-1. Successfully changed to a new password.		
Normal Flows:	Actor actions 1. Click on the the “Quên mật khẩu?” button on Login Screen. 3. Input valid email existing on the system. 6. Click on the link in the mail 8. Input the new password		System responses 2. Display forgot password pop-up with textbox for inputting email. 4. A successful message is displayed to announce the user to check the mail. 5. Send a mail to user 7. Redirect to the change new password page 9. Display a successful message.
Alternative Flows:	N/a		

Exception Flows:	E1. Input mail does not exist on the system (After step 2) Display message: “Không tìm thấy email” E2. Input invalid mail (After step 2) Display message: “Cần viết đúng format của mail” E3. Input invalid password (After step 8) Display message: “The password must be from 8-20 characters”
Business Rules:	BR-11 , BR-06

4. Non-Functional Requirements 非機能要件

4.1 External Interfaces 外部インターフェース

4.1.1 User Interfaces ユーザーインターフェース

- UI-1: The user can log in the system as Admin, Content manager or Student role.
- UI-2: The GUI is suitable for display on the computer.
- UI-3: The layout of the screen is streamlined, easy to operate, and implemented for the user.
- UI-4: Use icons to provide visual insights to users.
- UI-5: The text colour should be black except for some special texts.
- UI-6: Tables appearing on the system must have filter and sort functions.
- UI-7: Buttons, links, checkboxes, radio buttons are easy to click to use.

4.1.2 Hardware Interfaces ハードウェアインターフェース

No hardware interfaces have been identified.

4.1.3 Communications Interfaces 通信インターフェース

- CI-1: The system shall send an email to the user's email to get new password when user forgot her/his account password.
- CI-2: User use mouse to communicate with application to handle functions that user need.
- CI-3: The system shall display a text message to notify about the result of the function that the user performed.

4.2 Quality Attributes 品等属性

4.2.1 Usability 使用性

- The language is Vietnamese.
- The Front-end web application should support Chrome browsers.
- The function is divided into menu items for easier access.

4.2.2 Availability稼働率

- Zappy shall be available at least 98% of the time between 5:00 A.M and midnight local time, and at least 90% of the time between midnight and 5:00 A.M local time, excluding scheduled maintenance servers.

4.2.3 Performance パフォーマンス

- All pages have loading speed less than 3 seconds on average
- The system can support up to 500 requests at the same time; The system allows up to 1200 students to register in system per semester.
- The system shall display confirmation messages to users within an average of 1.5 seconds and a maximum of 3 seconds after the user submits information to the system.

4.2.4 Security セキュリティ

- HTTPs between client and server.
- Token-based authentication using JWT.
- Encrypt password with BCrypt algorithm.

4.2.5 Safety 無難

- The system shall not spread virus into the devices of users.
- The system shall not include any harm information for users.
- The system shall notify the user to confirm when performing any function that affects the database.

4.2.6 Support Documents 書類

- Class libraries, framework, etc shall be described in System Design document (part VI)
- Zappy system shall develop the User Guides document for user (part VI)

5. Requirement Appendix 要件付録

5.1 Business Rules ビジネスルール

ID	Rule Definition
BR-01	Only verified users can log in successfully and access the system.
BR-02	Users only can access information that belongs to their own, except admin.
BR-03	Content manager only login with an account that is provided by admin.
BR-04	Each user has exactly one role.
BR-05	Each email is only registered for one user.
BR-06	Email must be right format: “abc123@example.com”.
BR-07	The username must be unique.

BR-08	The username does not contain space and special characters.
BR-09	The length of the username must be 4-20 characters.
BR-10	Passwords must be encrypted.
BR-11	The length of the password must be 8-20 characters and does not contain space.
BR-12	When registering or changing a password, the user must enter the password twice.
BR-13	Full name must be 1-50 characters and does not contain special characters.
BR-14	Gif must be in the right format (extension name: .gif).
BR-15	Image must be in the right format (extension name: .png.jpeg.jpg).
BR-16	The phone must contain only 10 digits and start with 0.
BR-17	The date of birth must be before the current time.
BR-18	All management lists must be displayed with the pagination.
BR-19	Fields marked with an asterisk (*) cannot be blank.
BR-20	When admin update account, do not edit admin account role.
BR-21	The admin is only allowed to reset password when admin receives a request by the user.
BR-22	Kanji, grammar, and vocabulary must belong to a lesson.
BR-23	Each kanji must be unique.
BR-24	Each kanji contains 1 character and does not contain special characters.
BR-25	Onyomi must be written in Hiragana and contains only some special characters such as: , 、 • / /
BR-26	Kunyomi must be written in Katakana and contains only some special characters such as: , 、 • / /
BR-27	Chinese does not contain special characters and space.
BR-28	Question is not blank.
BR-29	When content manager inserts a question, the number of answers must correspond to the question type.
BR-30	When content manager updates a question, do not allow update question type.
BR-31	Practice according to the skills and lessons the student is accessing.
BR-32	The number of questions for kanji practice is 15 questions.
BR-33	The number of questions for grammar practice is 20 questions.
BR-34	The number of questions for vocabulary practice is 30 questions.
BR-35	Display correct answer for practice.
BR-36	Do not display correct answer for test.
BR-37	Time for 1 multiple choice question is 1 minute.

BR-38	Time for 1 true/false question is 30 seconds.
BR-39	Time for 1 fill in blank question is 50 seconds.
BR-40	Time for 1 arrangement sentence question is 1 minute 30 seconds.
BR-41	Time for 1 match word question is 30 seconds.
BR-42	The maximum number of questions in the test is 50 questions.
BR-43	The minimum number of questions in the test is 10 questions.
BR-44	If student exits while taking a test, no history will be saved.
BR-45	If student exits the game while playing, no history will be saved.
BR-46	If student exits while practicing, no history will be saved.
BR-47	Practice scores equal to or greater than 80 will be marked as completing a lesson.
BR-48	Level (experience points) is calculated based on the number of correct answers.
BR-49	The percentage of correct answers is used to calculate practice and test scores.

Table 7:Business Rule

5.2 Common Requirement 共通要件

- The pop-up form is used for functions such as viewing, adding, editing, and deleting.
- Account in the database is not deleted when using the delete function; instead, it is changed from enabled to disabled.
- The system must display the result of performing a data-related function at the end of the function.

5.3 Application Messages List アプリケーションメッセージのリスト

#	Message code	Message Type	Context	Content
1	MSG01	In red, under the text box	The user does not select or enter required field (denoted by *)	<i>Không được để trống</i>
2	MSG02	In red, on alert	The user entered an email which is existed in the database	<i>Email đã tồn tại trong hệ thống</i>
3	MSG03	In red, under the text box	The user entered an email invalid	<i>Cần bao gồm '@.' và không được chứa dấu cách</i>
4	MSG04	In red, under the text box	The user do not select role of account	<i>Vui lòng chọn chức năng</i>
5	MSG05	In red, on alert	The user entered a username which is existed in the database	<i>Tên tài khoản đã tồn tại trong hệ thống</i>

6	MSG06	In red, under the text box	The user entered a username invalid	<i>Không bao gồm dấu cách hoặc kí tự đặc biệt</i>
7	MSG07	In red, under the text box	The user entered a username has length less than 4 characters or greater than 20 characters	<i>Độ dài từ 4-20 kí tự</i>
8	MSG08	In red, under the text box	The user entered fullname invalid	<i>Không được bao gồm số và kí tự đặc biệt</i>
9	MSG09	In red, under the text box	The user entered a fullname has length less than 1 character or greater than 50 characters	<i>Độ dài từ 1-50 kí tự</i>
10	MSG10	In red, under the text box	The user entered date of birth which is in the future	<i>Cần chọn ngày sinh nhỏ hơn hiện tại</i>
11	MSG11	In red, under the text box	The user entered password invalid	<i>Không được chứa dấu cách</i>
12	MSG12	In red, under the text box	The user entered a password has length less than 8 characters or greater than 20 characters	<i>Độ dài từ 8-20 kí tự</i>
13	MSG13	In red, under the text box	The user entered a re-password does not match with password	<i>Mật khẩu không khớp</i>
14	MSG14	In red, under the text box	The user entered phone invalid	<i>Độ dài 10 số, không bao gồm kí tự đặc biệt và dấu cách</i>
15	MSG15	In red, under the text box	The user entered kanji character invalid	<i>Chỉ nhập Hán tự</i>
16	MSG16	In red, under the text box	The user entered more than 1 kanji character	<i>Chỉ chứa 1 ký tự</i>
17	MSG17	In red, on alert	The user entered kanji character which is existed in database	<i>Chữ Hán ... đã tồn tại trong hệ thống</i>
18	MSG18	In red, under the text box	The user entered chinese of kanji invalid	<i>Không bao gồm ký tự đặc biệt và dấu cách.</i>

19	MSG19	In red, under the text box	The user entered onyomi invalid	<i>Chỉ nhập katakana và các ký tự ,、・／＼</i>
20	MSG20	In red, under the text box	The user entered kunyomi invalid	<i>Chỉ nhập hiragana và các ký tự ,、・／＼</i>
21	MSG21	In red, under the text box	The user doesn't entered choose image	<i>Vui lòng chọn 1 ảnh (Định dạng: .png.jpeg.jpg)</i>
22	MSG22	In red, under the text box	The user doesn't entered choose gif	<i>Vui lòng chọn 1 ảnh (Định dạng: .gif)</i>
23	MSG23	In red, under the text box	The user doesn't select question type	<i>Vui lòng chọn loại câu hỏi</i>
24	MSG24	In red, under the text box	The user doesn't select lesson	<i>Vui lòng chọn bài</i>
25	MSG25	In red, under the text box	The user doesn't select skill	<i>Vui lòng chọn kỹ năng</i>
26	MSG26	In red, under the text box	The user doesn't enter fully answer field	<i>Cần điền đầy đủ các đáp án</i>
27	MSG27	In green, on alert	User added account successfully	<i>Thêm tài khoản ... thành công</i>
28	MSG28	In red, on alert	User added account failed	<i>Đã có lỗi xảy ra, vui lòng thử lại</i>
29	MSG29	In green, on alert	User edited account successfully	<i>Cập nhật tài khoản ... thành công</i>
30	MSG30	In red, on alert	User edited account failed	<i>Đã có lỗi xảy ra, vui lòng thử lại</i>
31	MSG31	In black, on confirm alert	User want to reset password of account	<i>Bạn có chắc muốn đặt lại mật khẩu của tài khoản ... chứ ?</i>
32	MSG32	In green, on alert	User reset password of account successfully	<i>Đặt lại mật khẩu tài khoản thành công!</i>
33	MSG33	In red, on alert	User reset password of account failed	<i>Đặt lại mật khẩu tài khoản thất bại!</i>
34	MSG34	In black, on confirm alert	User want to delete account	<i>Bạn có chắc muốn xóa tài khoản ... chứ?</i>
35	MSG35	In green, on alert	User deleted account successfully	<i>Xóa tài khoản ... thành công</i>
36	MSG36	In red, on alert	User deleted account failed	<i>Đã có lỗi xảy ra, vui lòng thử lại</i>

37	MSG37	In green, on alert	User added question successfully	<i>Thêm câu hỏi ... thành công</i>
38	MSG38	In red, on alert	User added question failed	<i>Đã có lỗi xảy ra, vui lòng thử lại</i>
39	MSG39	In green, on alert	User edited question successfully	<i>Cập nhật câu hỏi ... thành công</i>
40	MSG40	In red, on alert	User edited question failed	<i>Đã có lỗi xảy ra, vui lòng thử lại</i>
41	MSG41	In green, on alert	User deleted question successfully	<i>Xóa câu hỏi ... thành công</i>
42	MSG42	In red, on alert	User deleted question failed	<i>Đã có lỗi xảy ra, vui lòng thử lại</i>
43	MSG43	In green, on alert	User added account successfully	<i>Thêm tài khoản ... thành công</i>
44	MSG44	In red, on alert	User added account failed	<i>Đã có lỗi xảy ra, vui lòng thử lại</i>
45	MSG45	In green, on alert	User edited account successfully	<i>Cập nhật tài khoản ... thành công</i>
46	MSG46	In red, on alert	User edited account failed	<i>Đã có lỗi xảy ra, vui lòng thử lại</i>
47	MSG47	In green, on alert	User deleted account successfully	<i>Xóa tài khoản ... thành công</i>
48	MSG48	In red, on alert	User deleted account failed	<i>Đã có lỗi xảy ra, vui lòng thử lại</i>
49	MSG49	In green, on alert	User added kanji successfully	<i>Thêm chữ Hán ... thành công</i>
50	MSG50	In red, on alert	User added kanji failed	<i>Đã có lỗi xảy ra, vui lòng thử lại</i>
51	MSG51	In green, on alert	User edited kanji successfully	<i>Cập nhật chữ Hán ... thành công</i>
52	MSG52	In red, on alert	User edited kanji failed	<i>Đã có lỗi xảy ra, vui lòng thử lại</i>
53	MSG53	In green, on alert	User deleted kanji successfully	<i>Xóa chữ Hán ... thành công</i>
54	MSG54	In red, on alert	User deleted kanji failed	<i>Đã có lỗi xảy ra, vui lòng thử lại</i>
55	MSG55	In green, on alert	User added grammar successfully	<i>Thêm ngữ pháp ... thành công</i>
56	MSG56	In red, on alert	User added grammar failed	<i>Đã có lỗi xảy ra, vui lòng thử lại</i>

57	MSG57	In green, on alert	User edited grammar successfully	<i>Cập nhật ngữ pháp ... thành công</i>
58	MSG58	In red, on alert	User edited grammar failed	<i>Đã có lỗi xảy ra, vui lòng thử lại</i>
59	MSG59	In green, on alert	User deleted grammar successfully	<i>Xóa ngữ pháp ... thành công</i>
60	MSG60	In red, on alert	User deleted grammar failed	<i>Đã có lỗi xảy ra, vui lòng thử lại</i>
61	MSG61	In green, on alert	User added vocabulary successfully	<i>Thêm từ vựng... thành công</i>
62	MSG62	In red, on alert	User added vocabulary failed	<i>Đã có lỗi xảy ra, vui lòng thử lại</i>
63	MSG63	In green, on alert	User edited vocabulary successfully	<i>Cập nhật từ vựng ... thành công</i>
64	MSG64	In red, on alert	User edited vocabulary failed	<i>Đã có lỗi xảy ra, vui lòng thử lại</i>
65	MSG65	In green, on alert	User deleted vocabulary successfully	<i>Xóa từ vựng ... thành công</i>
66	MSG66	In red, on alert	User deleted vocabulary failed	<i>Đã có lỗi xảy ra, vui lòng thử lại</i>
67	MSG67	In red, under the title "Cập nhật tài khoản"	User updated profile successfully	<i>Cập nhật thành công !</i>
68	MSG68	In red, under the title "Cập nhật tài khoản"	User updated profile failed	<i>Đã có lỗi xảy ra, vui lòng thử lại</i>
69	MSG69	In red, under the title "Đổi mật khẩu"	User updated password successfully	<i>Cập nhật mật khẩu thành công !</i>
70	MSG70	In red, under the title "Đổi mật khẩu"	User updated password failed	<i>Đã có lỗi xảy ra, vui lòng thử lại</i>
71	MSG71	On Exam screen, in red, under the text "Loại câu hỏi"	User does not select question type	<i>Vui lòng chọn ít nhất một loại câu hỏi</i>
72	MSG72	On Exam, Memory Game screen, in red, under the text "Bài học"	User does not select lesson	<i>Vui lòng chọn ít nhất một bài học</i>
73	MSG73	On Exam, Memory Game screen, in red, under the text "Kĩ năng"	User does not select skill	<i>Vui lòng chọn ít nhất một học phần</i>

74	MSG74	On Exam screen, in red, under the text “Số lượng câu hỏi”	User does not select number of question	<i>Vui lòng chọn số lượng câu hỏi</i>
75	MSG75	On Memory Game, Bingo Game screen, under the text “Chọn độ khó”	User does not select level	<i>Bạn cần chọn mức độ</i>
76	MSG76	On View Achievement screen, on table	User got no any achievement	<i>Bạn chưa đạt được thành tựu nào :)</i>
77	MSG77	On alert, in green	User caught new achievement	<i>Chúc mừng bạn đã được thành tựu ... !</i>

Table 8: Application messages list

5.4 Game Rules ゲームルール

5.4.1 Game rules

#	Attribute	Bingo game	Memory game
1	Level	<p>The game's level is divided into three levels based on the time in playing:</p> <ul style="list-style-type: none"> - Easy: 11 minutes - Normal: 9 minutes - Hard: 7 minutes 	<p>The game's level is divided into three levels based on number of cards:</p> <ul style="list-style-type: none"> - Easy: 12 cards - Normal: 18 cards - Hard: 24 cards
2	Rule	<ul style="list-style-type: none"> - Players must choose a level and lesson before playing the game. - There are 25 questions in this game, which are arranged in a 5x5 square. - To win the game, the player must correctly answer 5 questions in a vertical, horizontal, or diagonal row. 	<ul style="list-style-type: none"> - Players must choose a level, skill and lesson before playing the game. - The player must find the two matching cards by flipping the pairs of cards. If there is a match, the cards are flipped face-up; if there isn't a match, the cards are turned face down. - The player must find all matching pairs of cards to win the game.
3	Score	<ul style="list-style-type: none"> - The player will receive 100 points for each correct answer, incorrect answers will receive no points. - When the player wins the game, the remaining time will be converted into bonus points, specifically: <ul style="list-style-type: none"> + With easy level: 1 second is equivalent to 2 bonus points + With normal level: 1 second is equivalent to 4 bonus points 	<ul style="list-style-type: none"> - When the player flips 2 matching cards, the player will get 100 points, with 2 cards that do not match, 5 points will be deducted. - When the player wins the game, the remaining time will be converted into bonus points, specifically:

	+ With hard level: 1 second is equivalent to 10 bonus points	+ With easy level: 1 second is equivalent to 2 bonus points + With normal level: 1 second is equivalent to 5 bonus points + With hard level: 1 second is equivalent to 10 bonus points
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Table 9: Game rules

5.4.2 Flowchart

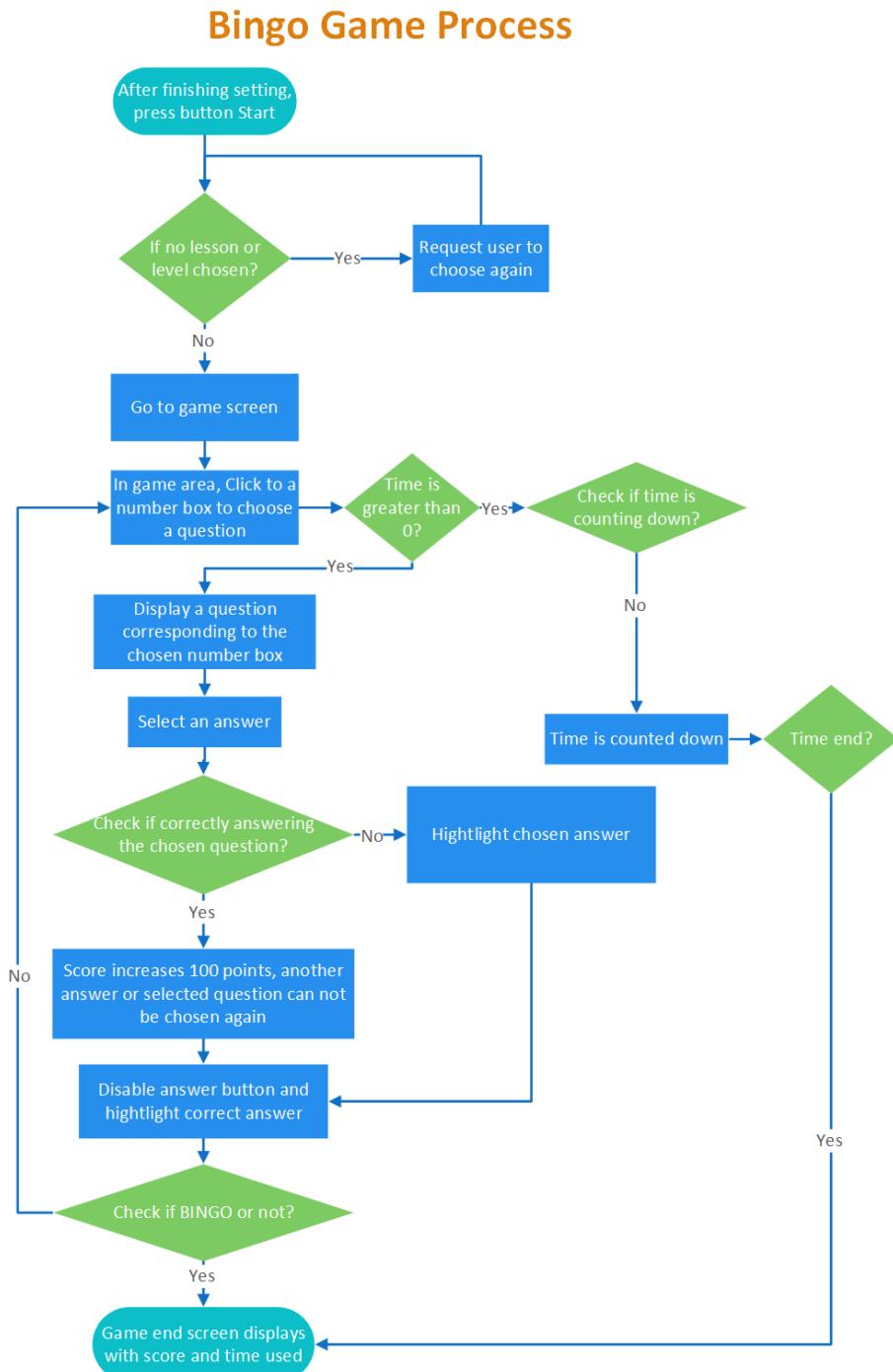


Figure 68: Flowchart for Bingo game

Memory Game Process

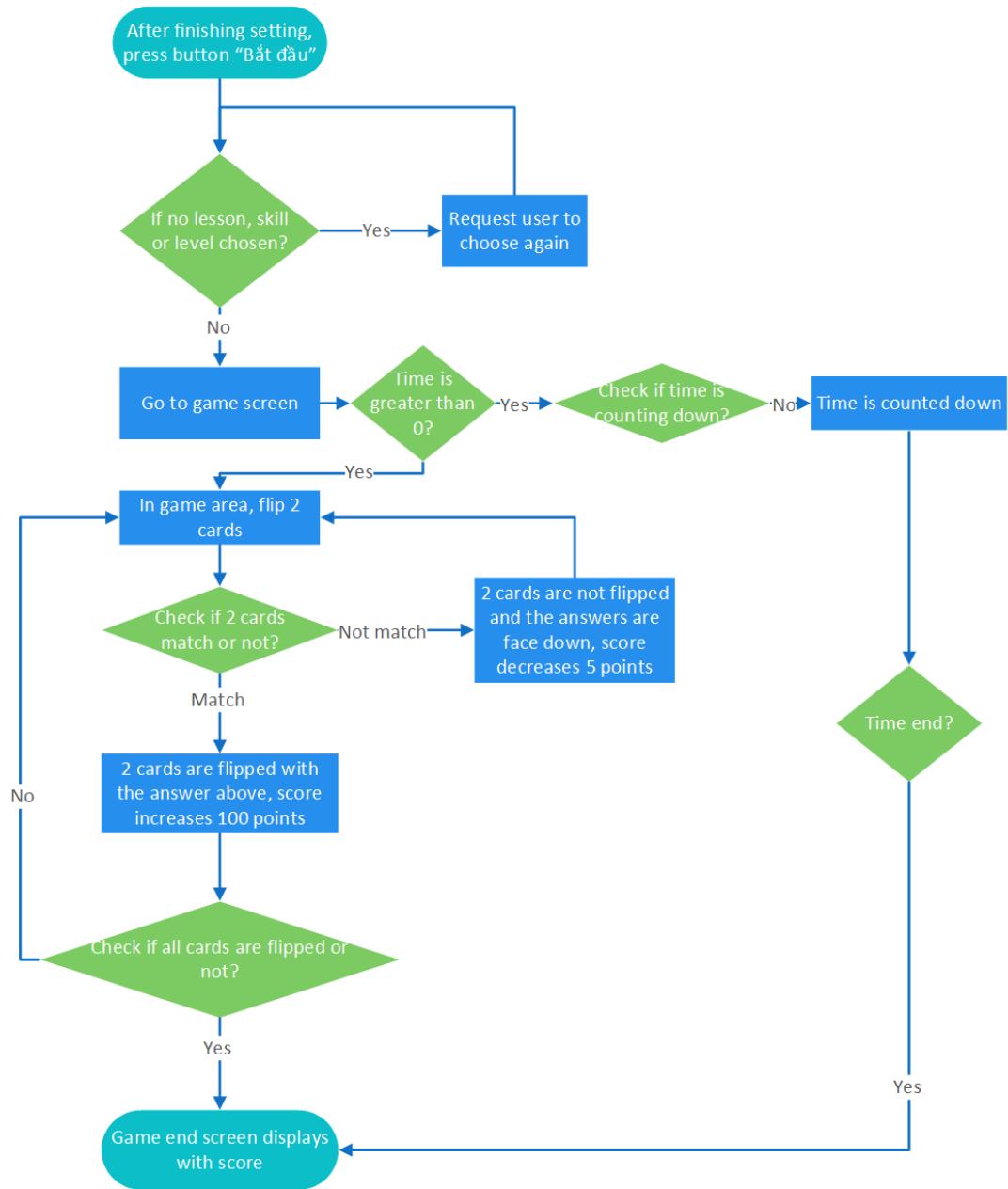


Figure 69: Flowchart for Memory game