CAN THO UNIVERSITY
FACULTY OF INFORMATION TECHNOLOGY AND COMMUNICATIONS

REPORT

INFORMATION TECHNOLOGY INDUSTRY ANNUAL

Topic

SOCIAL NETWORK FOR STUDENTS

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CHAPTER 1: INTRODUCE

1.1 Problem

In the digital era, social networks have evolved beyond simple tools for personal connection; they are now integral to educational and professional development, especially for university students. As a student at Can Tho University, I am keenly aware of the unique challenges and needs that arise in our academic community. While existing social media platforms offer general connectivity, they often lack the specific resources, functionalities, and focused environment necessary for students to thrive academically and socially. This research aims to investigate the critical features and appropriate technologies for developing a student-focused social network tailored to enhance the university experience.

A dedicated social network for students could provide a centralized platform where academic resources, peer collaboration, and extracurricular activities are seamlessly integrated. By creating an interactive and supportive online environment, students would gain access to academic materials, exchange knowledge, participate in study groups, and receive academic support in a space designed explicitly for their needs. Additionally, such a network could foster stronger connections between students and faculty, enhancing communication and collaboration on academic projects and research.

Through this study, we aim to address the growing demand for a student-oriented digital space that not only promotes academic success but also supports personal growth, professional networking, and community building.

1.2 Objectives

- **User Interface (UI):**

Design an intuitive and user-friendly interface that allows students to easily navigate, access academic resources, connect with peers, and participate in discussions, fostering an engaging and supportive online community.

- **Server:**

Develop a secure, scalable server architecture to manage user data, support real-time interactions, and ensure reliable access to platform resources, with a focus on data privacy, performance, and efficient management of academic content and communications.

1.3 Scope and results to be achieved

- **Scope:**

This research focuses on designing and developing an internal social network platform tailored for university students, covering two main components: user interface (UI) and server architecture. The scope includes creating a user-friendly interface and designing a server system that ensures security, scalability, and supports real-time interactions.

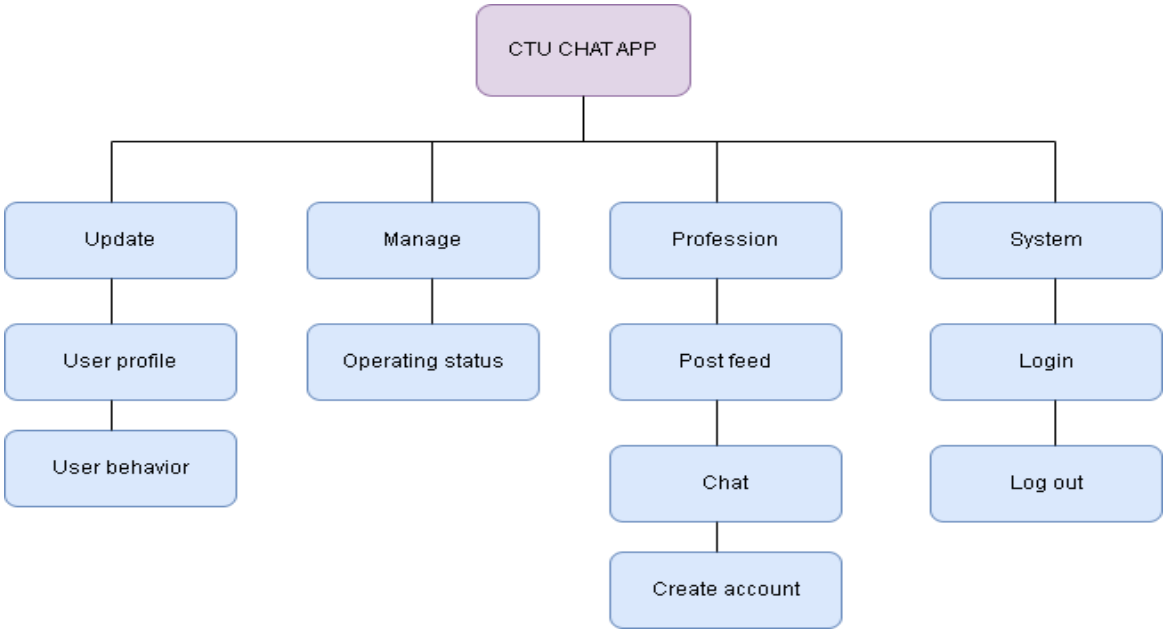
- **Expected Outcomes:**

The project aims to deliver a basic, stable social networking platform with an intuitive interface, offering features for sharing study materials, exchanging information, and facilitating interaction between students and faculty. The system will ensure secure data

storage and processing, provide a smooth user experience, and support a dynamic learning community.

1.4 Program functions

- The main functions of the system are described in the diagram below:



Hình 1.1 Function diagram CTU Chat App

- Characteristics of each user group:

Bảng 1.1 User characteristics

User group	Feature	Functions	Role	Power	Level of importance
Owner ,admin	As a person with full system rights, can create and manage other user groups.	- Login - Manage account - Manage Post feed	Admin	Admin	Very importance

		- Ban account - Manage comment			
User	Application users	- Login - Log out - Post feed - Like - Comment - Chat	user	user	importance

CHAPTER 2: THEORETICAL BASIS

2.1 Requirements

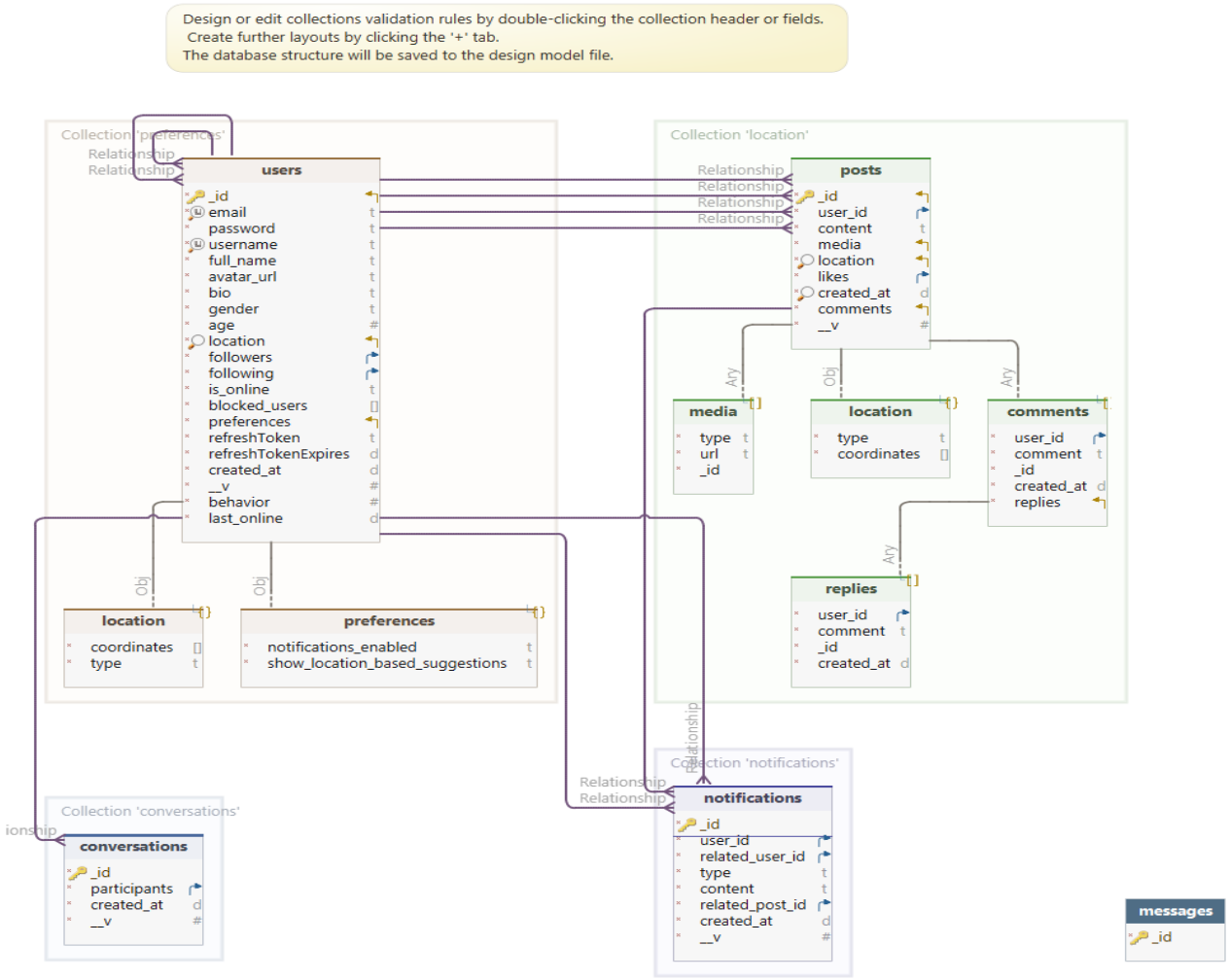
The application aims to create a dedicated social networking platform for university students, providing features that support academic collaboration, knowledge sharing, and social interaction within a secure, accessible, and user-friendly environment.

- User Registration and Authentication**:** Support registration with student email verification to ensure only university members have access. Include secure login, logout, and password recovery functionalities.
- User profile: Allow students to create profiles with information such as name, program, courses, and interests. Provide options for profile customization and privacy settings.
- Resource upload and download: Enable students to upload, download, and share academic resources such as lecture notes, assignments, and study guides.
- File management Support various file formats (e.g., PDF, DOCX, PPT) with file size limits and categorized storage.
- Message system: Implement a direct messaging system for one-on-one or group conversations. Ensure messages are encrypted to protect privacy.

This specification provides a structured foundation for developing the application, addressing essential functionalities, and setting the technical requirements for secure and efficient operation.

2.2 Database design

2.2.1 Database model



Hình 2.1. Mô hình CDM

2.2.1 Description of classes

List of tables:

Bảng 2.1. List of tables in the CDM model

No	Table name	Interpretation
1	Users	User
2	Posts	Feed
3	Notifications	Notification
4	Conversations	Conversation
5	Replies	Replie
6	Location	Location
7	Media	Media
8	Comment	Comment

2.2.2.1. Users: User

Bảng 2.2. Description user

No	Properties	Key	Data type	Describe
1	_id	PK	string	Id user
2	email		string	Email of user
3	password		string	Password of user
4	username		string	Name of user
5	full_name		string	Full name of user
6	Avt_url		string	Avatar of user
7	bio		string	Bio of user
8	gender		string	Gender of user
9	age		int	Age of user
10	Location		array	Location of user
11	Followers		array	Follower
12	Following		array	Following
13	Is_online		Boolean	Online
14	RefreshToken		string	Token
15	refreshTokenExpire		string	Date of token
16	Created_at		Date	Date
17	Behavior		int	Behavior
18	Last_online		Date	Last online

2.2.2.2. Posts: Post

Bảng 2.3. Description Video

No	Properties	Key	Data type	Describe
1	_id	PK	string	ID post
2	User_id	FK	string	ID user
3	content		string	Content post
4	media	FK	array	Image of post
5	location		Array	Location of user

6	Likes		array	Like post

2.2.2.3. Conversations: Conversation

Bảng 2.4. Description conversations

No	Properties	Key	Data type	Describe
1	_id	PK	string	Id of conversation
2	participants		array	List of user
3	Created_at		Date	Date of conversation

2.2.2.4. Notifications: Notification

Bảng 2.5. Description notification

No	Properties	Key	Data type	Describe
1	_id	PK	String	Id of notification
2	User_id		String	Id user
3	Related_user_id		String	Id of related user
4	Type		Array	Type of notification
5	Content		String	Content of notification
6	Related_post_id		String	Id of post related
7	Created_at		Date	Date of notification

2.3 Chapter summary

After determining the main functions of the system, proceed to build the database based on the specification requirements set out after analysis.

CHAPTER 3: SETUP AND RESULT

3.1 Programming language

3.1.1. React Native

React Native is a JavaScript framework created by Facebook in 2015.

It provides comprehensive and clear documentation, with simple and readable code, and is known for its fast performance. The latest version of React Native introduces features that streamline the development process, making it easier to reuse similar code blocks, resulting in smaller project sizes and reduced workloadCác tính năng của Laravel framework.

Key features of the React Native framework:

- Host reloading
- Flexbox Layout
- Components
- Cross-platform Compatibility
- Native modules
- Expo Integration
- Third-Party Libraries
- Javascript and TypeScript support

3.1.2. Mongodb

MongoDB is a NoSQL database management system developed in 2007 by MongoDB, Inc. Known for its flexible, schema-less structure, MongoDB stores data in a JSON-like format called BSON, which allows for scalable and high-performance operations.

The latest version of MongoDB introduces powerful aggregation capabilities, improved indexing, and enhanced support for distributed architectures, making it ideal for handling large volumes of data with ease..

3.1.3. Setup

Install Android studio first for simulator or can use real device for both IOS and Android (just expo). (for detail Download Android Studio & App Tools - Android Developers)

Then install NodeJs.

Install Nodejs v22.11.0 (for detail Node.js — Run JavaScript Everywhere)

3.2 System requirements

3.2.1. Hardware

Hardware devices must satisfy the requirements:

- Processor: Pentium III 1.8 Ghz up to
- RAM: 8 GB up to
- SDD: 80 GB trở lên
- Internet : Having Internet
- Screen resolution: 960 x 640

It is necessary to ensure that the hardware devices are capable of serving the system to operate efficiently and quickly.

3.2.2. Operating system

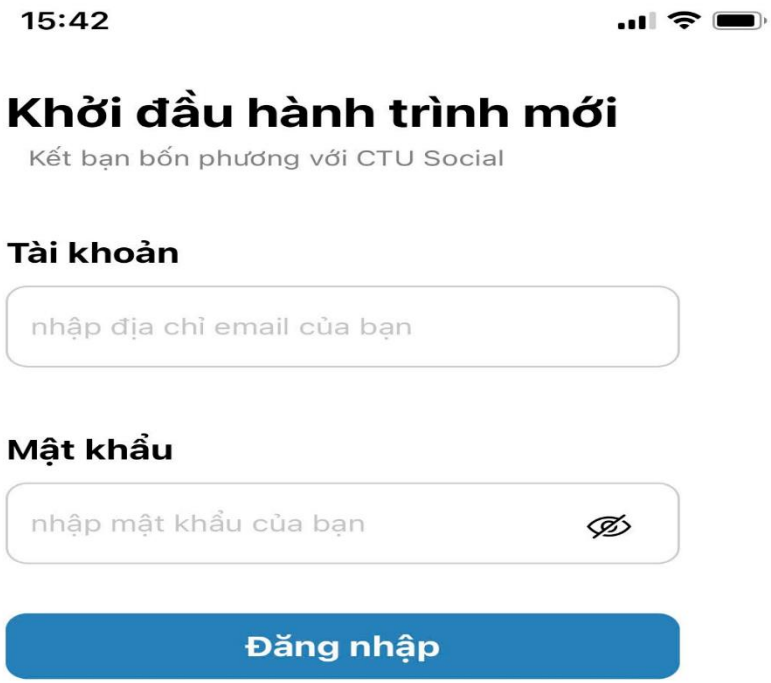
The system must interact well with the following software.:

- OS: All of OS.
- Webserver: Apache.
- Mongodb.
- Programming language: Javascript,Typescript

3.3 Results

3.3.1. Login

3.3.1.1. User interface log in



Hình 3.1. UI Log in

Bảng 3.1. Components in the Login function

No	Control type	Default value	Describe
1	TextInput		Input email
2	TextInput		Input password
3	Hide icon		unhide password
4	Button		log in

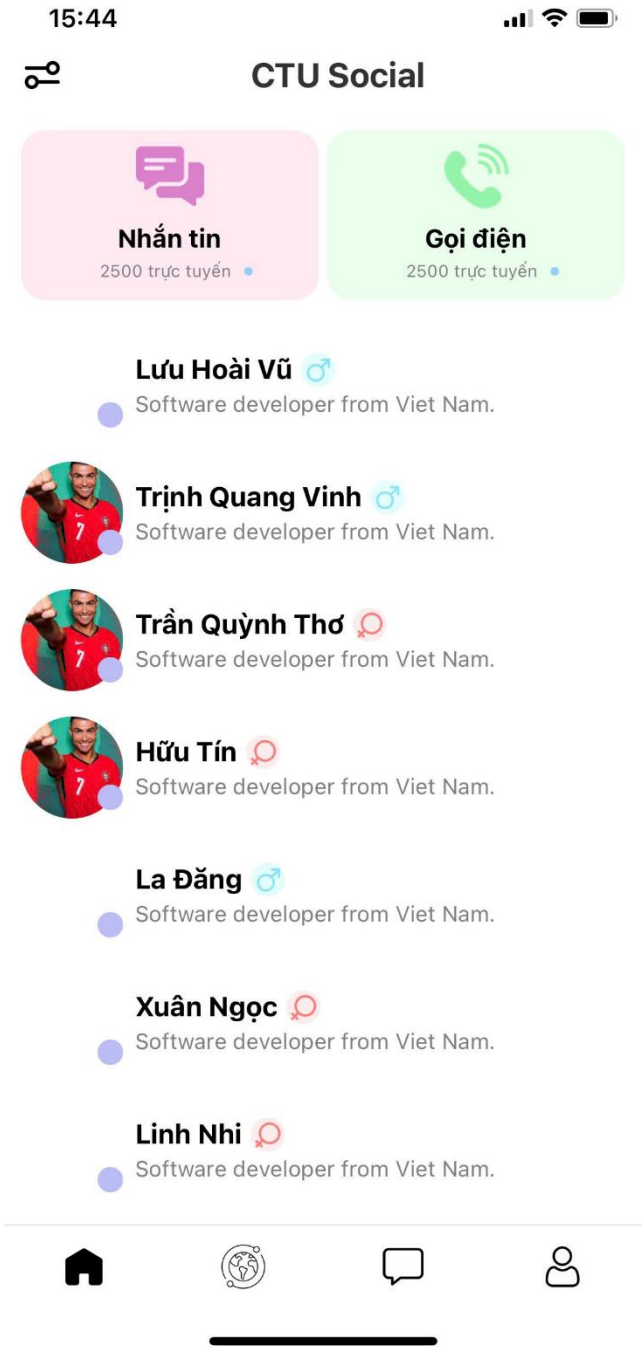
3.3.1.2. Data used in the log in function

Bảng 3.2. Data used in the login function

No	Control type	Phương thức			
		Add	**Update**	**Delete**	**Query**
1	User				✓
2	Admin				✓

3.3.2. User interface home page

3.3.2.1. User interface homepage



Hình 3.3. User interface homepage

3.3.2.2. Component in homepage

Bảng 3.4. Component in homepage

No	Control type	Default value	Describe
1	Button		Select gender to view

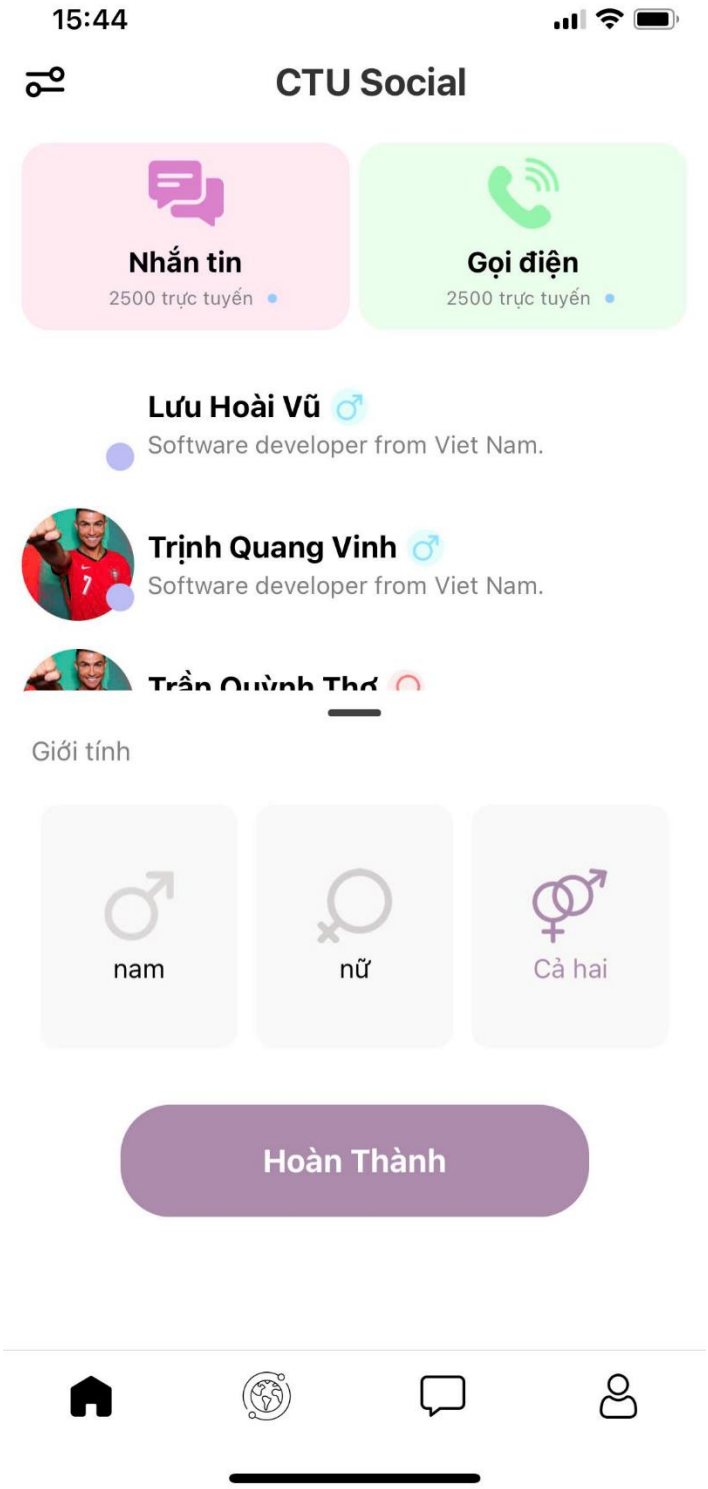
3.3.2.3. Data used in homepgae

Bảng 3.5. Date used in home page

No	Control type	Function			
		Add	Update	Delete	Query
1	user				✓

3.3.3. Select gender

3.3.3.1. User interface select gender



Hình 3.4. Giao diện Thêm sinh viên

3.3.3.2. Component in select gender

Bảng 3.6. Component in select gender

No	Control type	Default value	Descibe
1	Button		Select male
2	Button		Select female
3	Button		Select both
4	Button		confirm

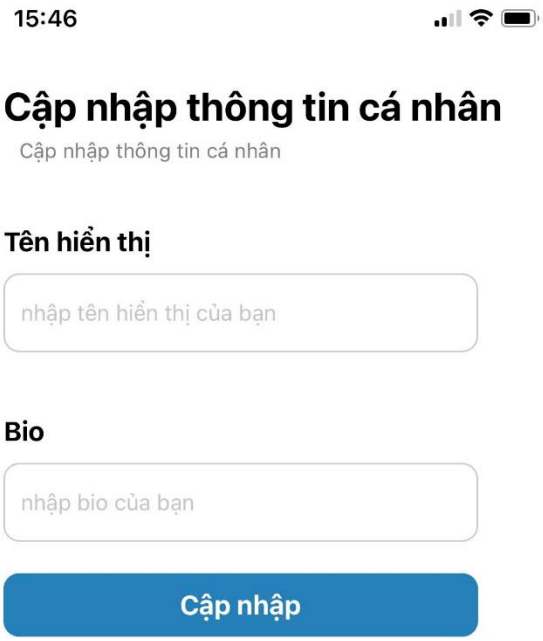
3.3.3.3. Data used in select gender

Bảng 3.7. Data used in select gender

No	Control type	Function			
		Add	Update	Delete	Query
1	User				✓

3.3.4. Update user

3.3.4.1. UI update user



Hình 3.5. UI update user

3.3.4.2. Component in update

Bảng 3.8. Component in update user

No	Control type	Default Value	Describe
1	TextInput		Input username
2	TextInput		Input Bio
3	Button		Confirm

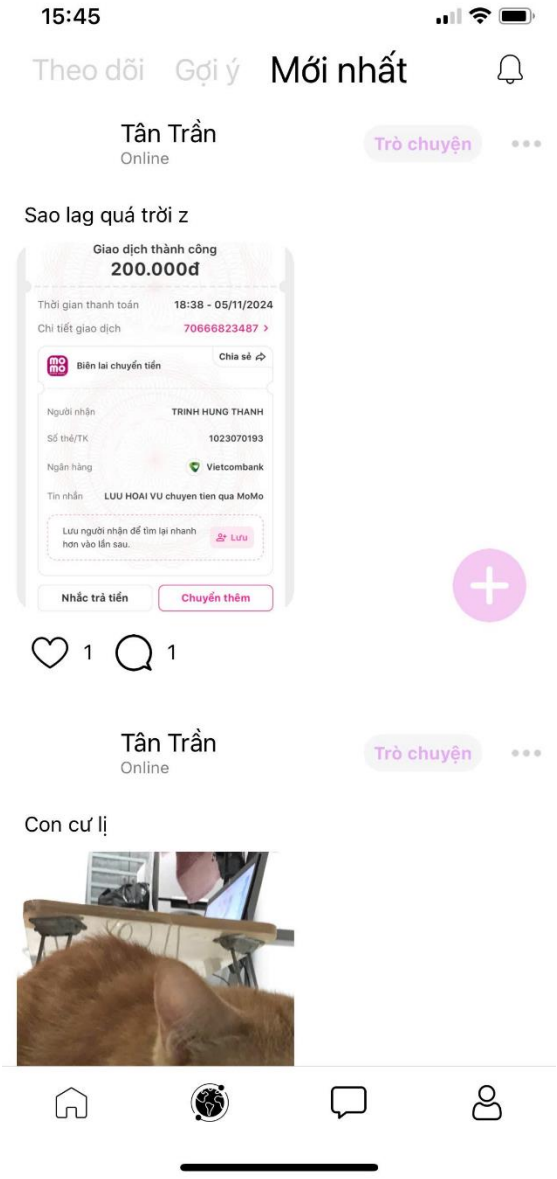
3.3.4.3. Data used in update component

Bảng 3.9. Date used in update component

No	Control type	Function			
		Add	Update	Delete	Query
1	User		✓		✓

3.3.5. New feed

3.3.5.1. New feed



Hình 3.6. UI New feed

3.3.5.2. Component used in new feed

Bảng 3.10. Component used in new feed

STT	Loại điều khiển	Giá trị mặc định	Mô tả
1	Button		Chat
2	Button		Notification
3	Button		More
4	Button		Post
5	Icon		Like
6	Icon		Comment

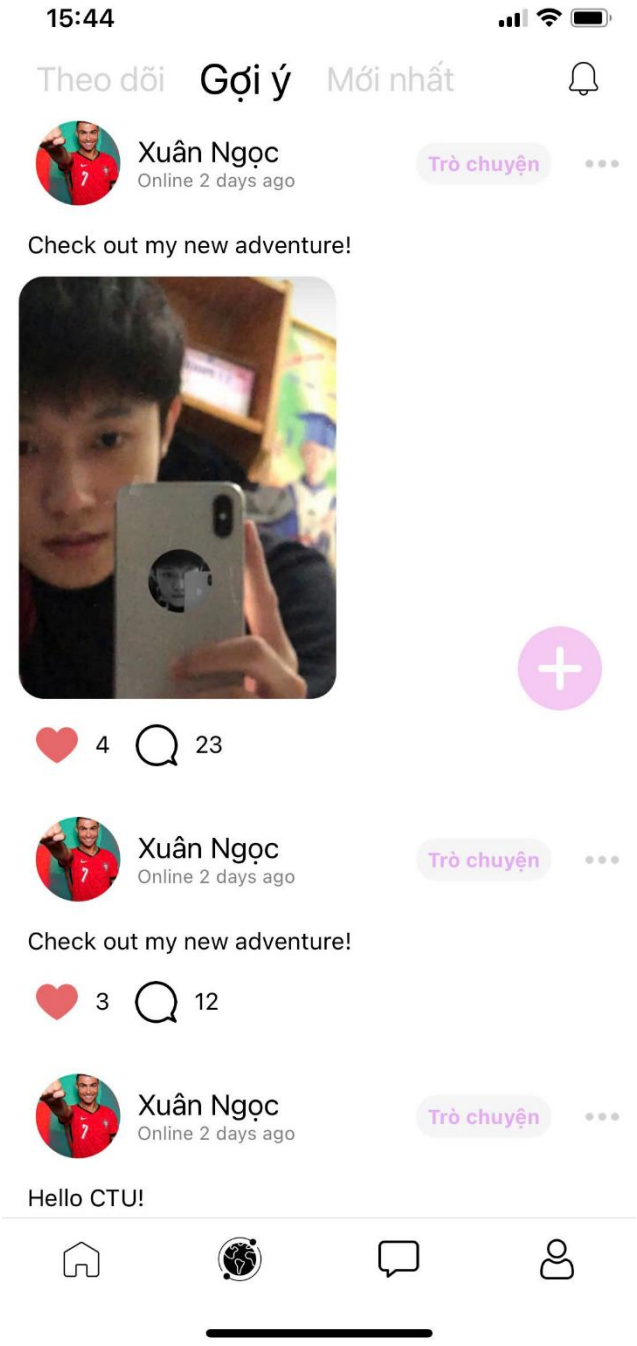
3.3.5.3. Date used in new feed

Bảng 3.11. Data used in new feed

No	Control type	Function			
		Add	Update	Delete	Query
1	User	✓			✓

3.3.6. Suggested feed

3.3.6.1. UI suggested feed



Hình 3.7. Giao diện Thêm khóa

3.3.6.2. Component used in suggested feed

Bảng 3.12. Component used in suggested feed

No	Control type	Default Value	Describe
1	Button		Chat
2	Button		More
3	Button		Notification
4	Button		Like
5	Button		Comment

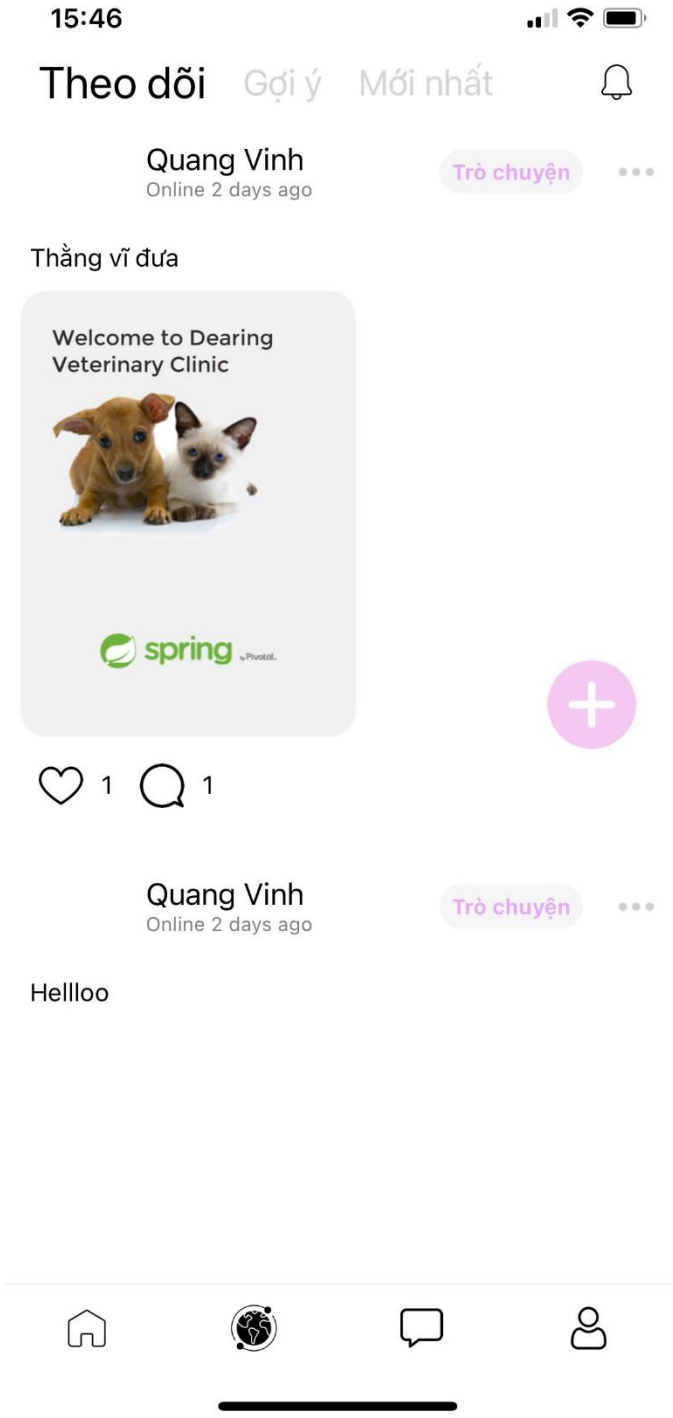
3.3.6.3. Data used in suggested feed

Bảng 3.13. Data used in suggested feed

No	Control type	Function			
		Add	Update	Delete	Query
1	User	✓			✓

3.3.7. Follow feed

3.3.7.1. UI follow feed



Hình 3.8. UI follow feed

3.3.7.2. Component used in follow feed

Bảng 3.14. Component used in follow feed

No	Control type	Default Value	Describe
1	Button		Chat
2	Button		More
3	Button		Notification
4	Button		Like
5	Button		Comment

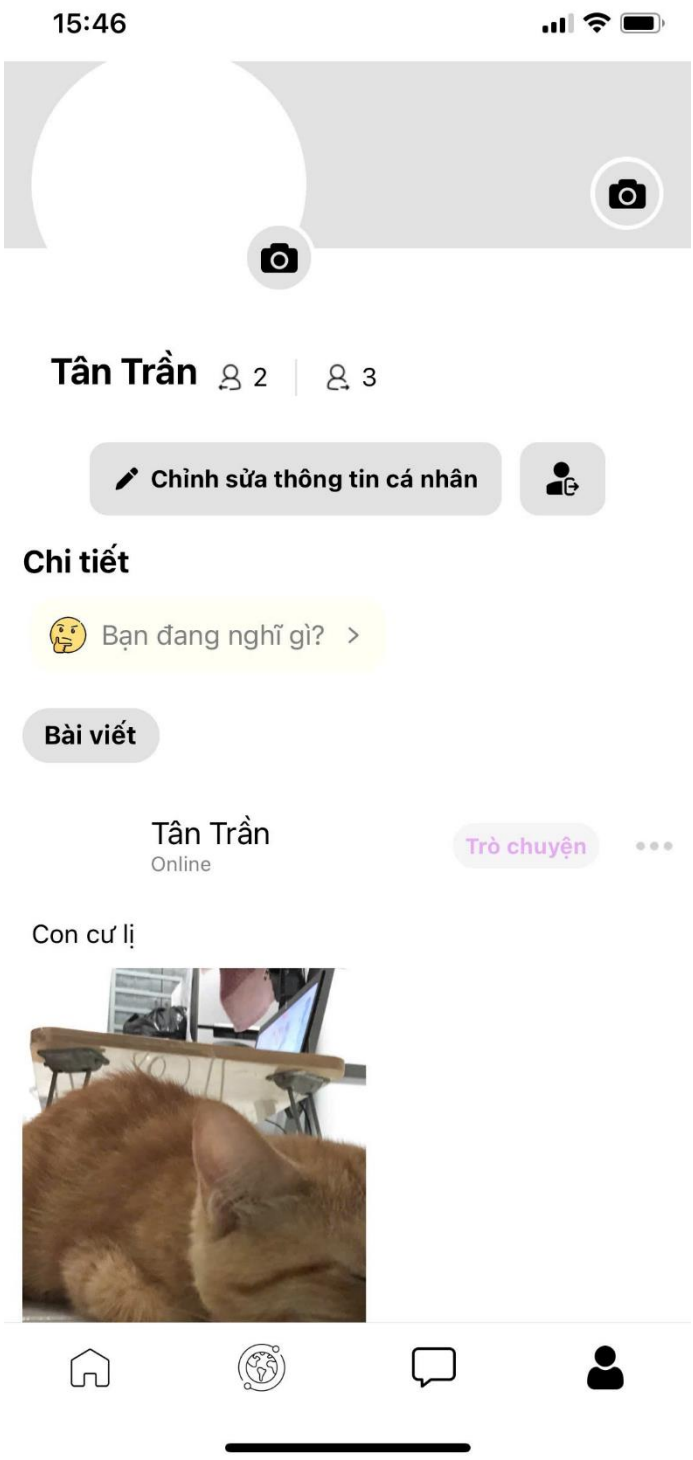
3.3.7.3. Data used in follow feed

Bảng 3.15. Data used in follow feed

No	Control type	Function			
		Add	Update	Delete	Query
1	User	✓			✓

3.3.8. Profile

3.3.8.1. UI profile



Hình 3.9. UI profile

3.3.8.2. Component used in profile

Bảng 3.16. Component used in profile

No	Control type	Default Value	Describe
1	Button		Update avatar
2	Button		Behavior
3	Button		Log out

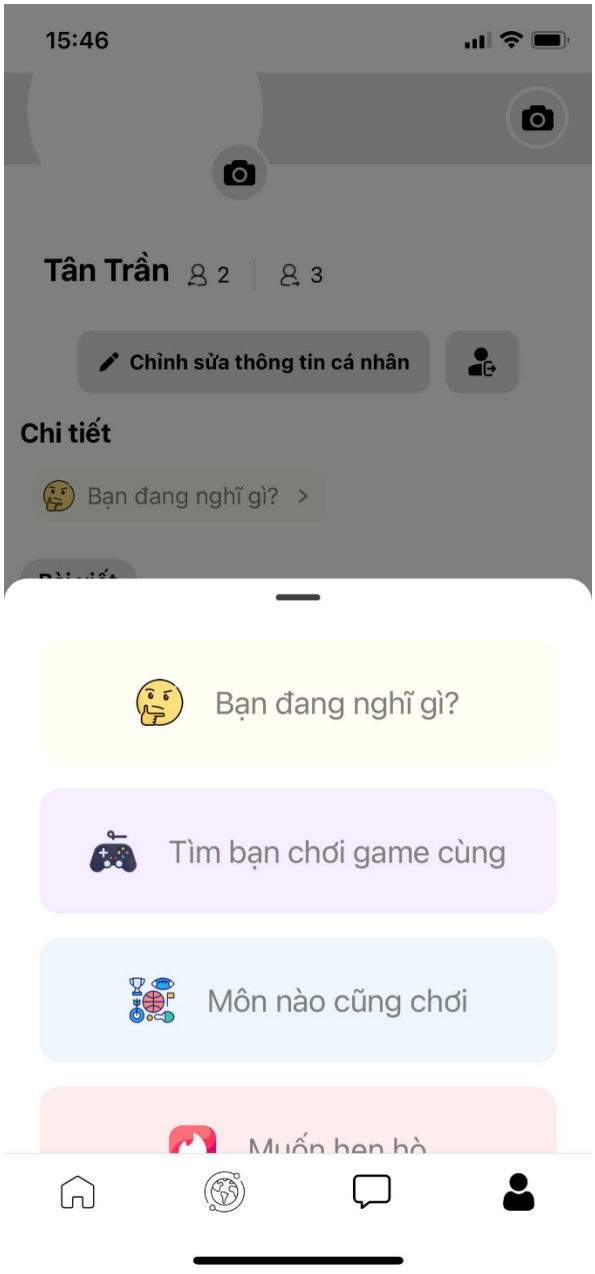
3.3.8.3. Data used in profile

Bảng 3.17. Data used in profile

No	Control type	Function			
		Add	Update	Delete	Query
1	User		✓		✓

3.3.9. Behavior

3.3.9.1. UI behavior



Hình 3.10. Giao diện Thêm lớp

3.3.9.2. Component used in behavior

Bảng 3.18. Component used in behavoir

No	Control type	Default value	Describe
1	Button		Behavior status

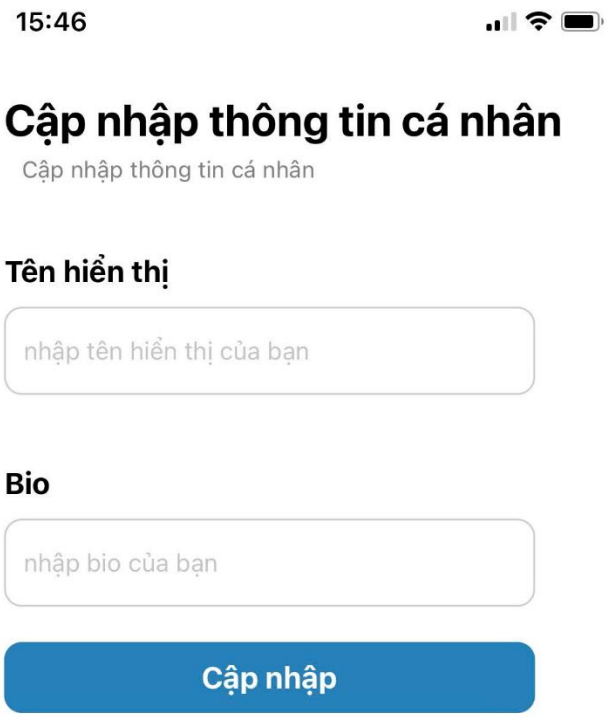
3.3.9.3. Data used in behavior

Bảng 3.19. Data used in behavior

No	Control type	Function			
		Add	Update	Delete	Query
1	Behavior		✓		

3.3.10. Update profile

3.3.10.1. UI update profile



Hình 3.11. UI update profile

3.3.10.2. Component used in update profile

Bảng 3.20. Component used in update profile

No	Control type	Default Value	Describe
1	Text Input		Username
2	Text Input		Bio
3	Button		Update

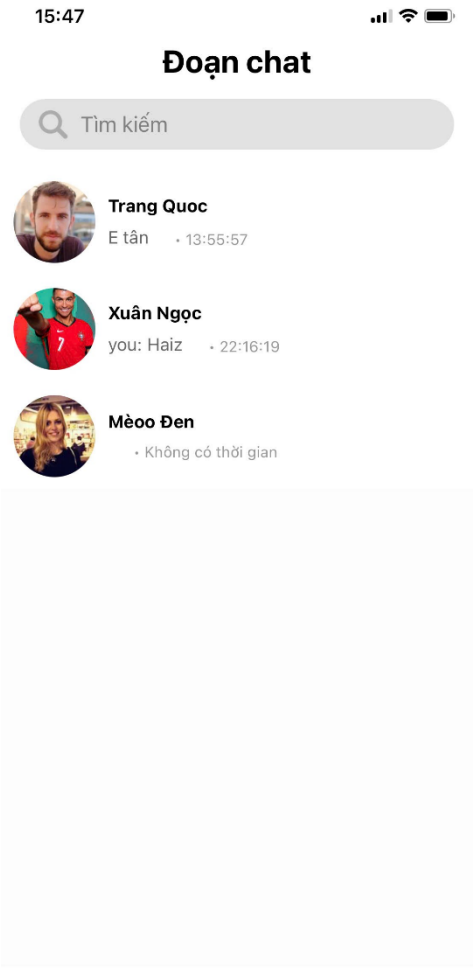
3.3.10.3. Data used in update profile

Bảng 3.21. Data used in profile

No	Control type	Function			
		Add	Update	Delete	Query
1	User		✓		✓

3.3.11. User interface chat out

3.3.11.1. UI chat out



Hình 3.12. UI chat out

3.3.11.2. Component used in chat out

Bảng 3.22. Component used in chat out

No	Control type	Default Value	Describe
1	Text Input		Search

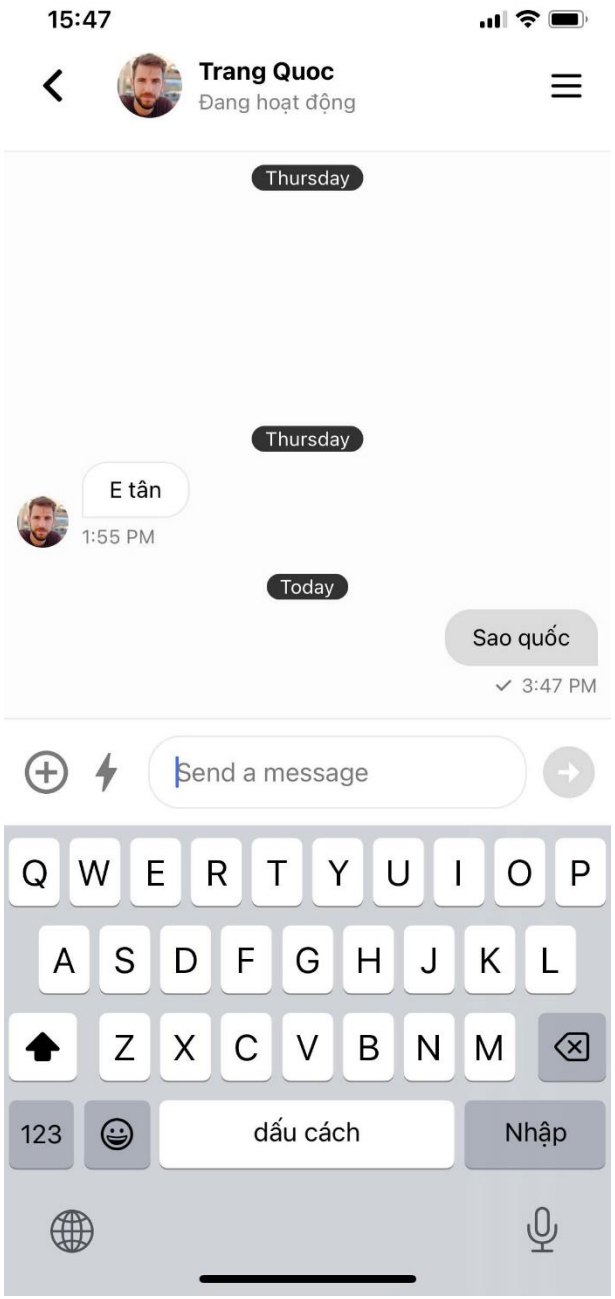
3.3.11.3. Data used in chat out

Bảng 3.23. Data used in chat out

No	Control type	Function			
		Add	**Update**	**Delete**	**Query**
1	Conversations				✓

3.3.12. UI chat in

3.3.12.1. UI chat in



Hình 3.13. UI chat in

3.3.12.2. Component in chat in

Bảng 3.24. Component in chat in

No	Control type	Default Value	Describe
1	Text Input		Message
2	Button		Send
3	Button		Image
4	Button		File
5	Button		Back

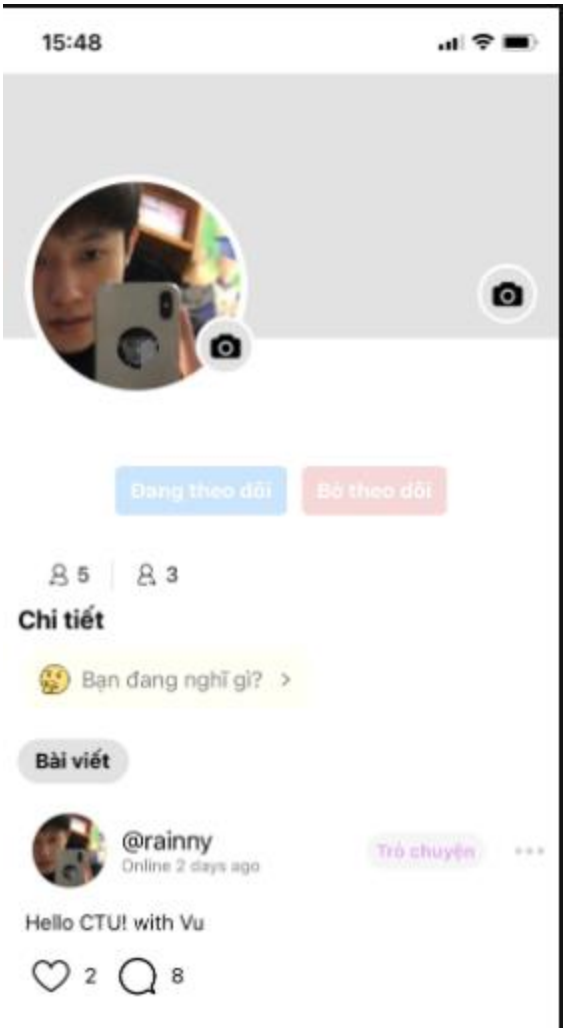
3.3.12.3. Data used in chat in

Bảng 3.25. Data used in chat in

No	Control type	Function			
		Add	**Update**	**Delete**	**Query**
1	User	✓			✓

3.3.13. UI profile other user

3.3.13.1. UI profile other user



Hình 3.14. UI profile others user

3.3.13.2. Component used in profile others user

Bảng 3.26. Component used in profile others user

No	Control type	Default value	Describe
1	Button		Follow
2	Button		Unfollow

3.3.13.3. Data used in profile others user

Bảng 3.27. Data used in profile others user

No	Control type	Function			
		Add	**Update**	**Delete**	**Query**
1	User		✓		✓

3.3.14. Notification

3.3.14.1. UI notification

Hình 3.15. UI notification

3.3.14.2. Component used in notification

Bảng 3.28. Component used in notification

No	Control type	Default Value	Describe
1	Selection		Read he notification

3.4 Chapter summary

Using Framework Ex makes programming convenient and fast with the utilities it brings combined with the MySQL database management system.

After installation and application, it brings the above results. Helps to basically meet the features that the system has set out..

CHAPTER 4: CONCLUSION AND DEVELOPMENT DIRECTION

4.1 Results achieved

The program ensures the basic requirements and functions set out in the specification and design documents..

Relatively user-friendly interface.

4.2 Limitations

Due to time and knowledge limitations, the app functions and interface are only completed at a basic level..

Not yet supported sending email notifications to users about registration information.

4.3 Development direction

Develop user-friendly interface.

Send email notification to users about registration information.

REFERENCES

1. 1. Documentation about Expressjs Framework: Express - Node.js web application framework