Content

1. Preface

Education is changing rapidly. Technology is now playing an important role in teaching methods. Traditional methods reveal many disadvantages comparing to modern methods. Due to new tools, teachers organize their lecture more effective and students interact more. However, applying technology into school faces many challenges. Project's expense is more over financial ability of each school. Both students and teachers can be limited to computer knowledge.

Internet has given a great chance so that the advanced technology can apply easily in education. School will not worry about budget. Every school can use facilities without any fee. Teacher will use graphical tools to make lecture as easy as possible. Students will now feel boring and study more effectively and interactively.

2. Introduction

2.1 What is a flashcard?

A **flashcard** is not a new concept but it is very popular in classroom rill or private study. It is a **set of cards**, each card have two sides, one contains a **question** and the other contains **answer** for this question. Flashcard is widely applied to learn vocabulary, historical date, formulas etc.

2.2 Why flashcard is effective?

According to many researches, memory decreases quickly over time. As we can see in the graph, after a month almost memory go off in our brain. Therefore, study highly requires revision. It helps us to remember more. There are many methods were proposed including flashcard. At least since 19th century, people have started using flash card. It now becomes very popular, especially in study vocabularies, because of its performance. Student use it to revise their knowledge in a convenient habit. Teachers use flashcard to make quizzes and lecture materials.

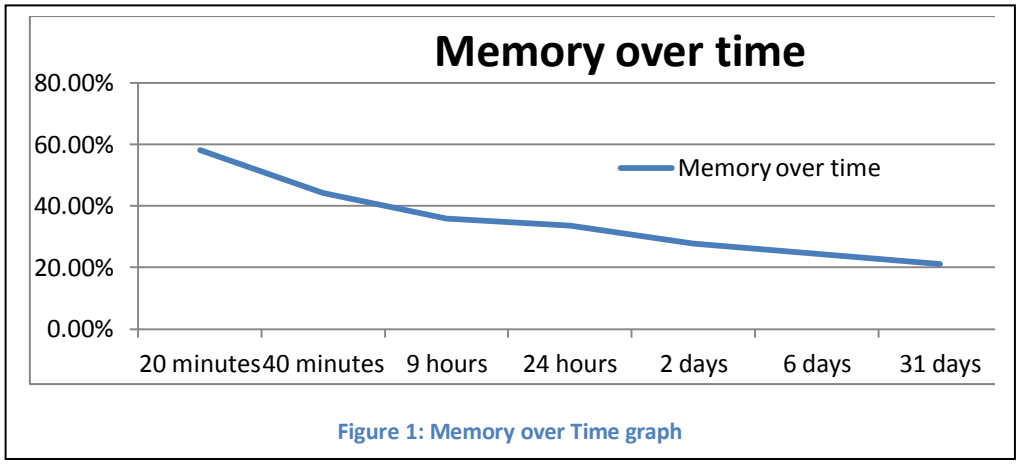


Figure 1: Memory over Time graph

2.3 Flashcard project

In order to provide a convenient technology tool for teachers and students, flashcard project have deployed. There are many cards on the Internet so that everyone can access and use it. They can also create their own card for their purposes.

Group 8 of K55CA Computer Science class developed this project under suggestion of Dr. Hoang Truong Anh.

3. Glossary

Guest: People visit the flashcard website, but they have not registered yet.

User: Guests have already registered the flashcard website, and then they become members. They can use all service flashcard system provide.

Account: Attached with user, including personal information, avatar, flashcard created, and everything concerned.

User name: Nickname users choose to register flashcard website. They use this name when log in flashcard system.

Password: Secret word of users, they use it to log in and protect their account.

Email: Email, system will use user email to communicate with users in case of losing password and necessary situation.

Profile: A part of account, it contains all personal information of users.

Service: Everything flashcard system provides to users and users can use it.

Multiple choices: A kind of test in flashcard system, that contains many choices but just only one is correct. Users must select the correct one to pass the test.

Community: All user of flashcard website belong to a community. And users can share and use shared material from community.

Like: It is actually a function of flashcard system when users vote for a flashcard that make you feel interested. Flashcard system uses it to rank the flashcards.

4. User requirements definition

4.1 Functional requirements

Flashcard provides these main services:

ID	Version	Features	Description
1	1.0	Register	When guests first visit the website, then it will suggest them to sign up a new account. The users must provide real name, user name, password and email. They must also accept the "Flashcard's Terms of Service". After register successfully, users can immediately log in and use flashcard service.
2	1.0	Log in	If users have already had an account then they can login from the main page of the website. After log in, it moves them to their own profile pages then they can easily select other features.
3	1.0	Log out	When users stop to use flashcard service, they will log out by click on log out notation and strangers cannot access their data. After log out, the website will move to log in page.
4	1.0	Manage profile	User can manage their profile such as upload an avatar or add some more detailed information. Before important changes, they must confirm their password.
5	1.0	Create flash cards	Users can start to create a flash card by click on create flashcard button. User must enter the flash card title, description, grade level, subject then questions and answers. After submits it will move to flash card lists.
6	1.0	View flash cards	Users can view their own flash cards and shared flash cards from community. View flash card classify into three features: 1. **Flashcards**: Users see the questions and click on show answer button to view the answers. 2. **Matching**: User move up and down the answers to appropriate questions. 3. **Multiple choices**: User will answer the questions by click on correct solution.

7	1.0	Edit	Users can edit their own cards and shared-permission cards to them.
8	1.0	Delete	Users can delete their own cards
9	1.0	Like	Users can like the interesting cards. The website will use this to order the cards.
10	1.0	Search	Users can find cards in two way: 1. Use cards category 2. Use search tool to search appropriate cards. The card is search by its title

4.2 Non-functional requirements:

4.2.1 Product requirement

Flashcard must have friendly interfaces. Flashcard must be easy to control for non-technical users. Flashcard must be stable, dependable. Development team must upload the project to Heroku server and ready to use.

4.2.2 Organizational requirement

Flashcards is a student's project so that all development team are students. They will not work full time on project. Dr. Truong Anh Hoang will verify and validate work of projects.

4.2.3 External requirement

Project develops on Python & Django framework, which is a open source code project. Therefore, it should not meet any problem about rights.

5. System architecture

5.1 MTV architecture pattern of Django

MTV architecture is a developed pattern from famous MCV pattern when applied in Django. MCV is abbreviation of Model-Control-View.

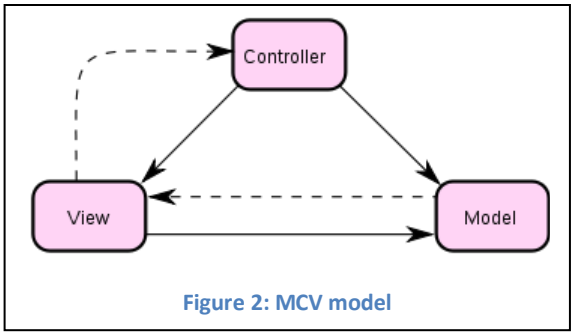


Figure 2: MCV model

Model is the data access portion, handled by Django database layer. **View** selects data to display, handled by **View** and **Template**. **Control** delegates the view depending on user input, handled by Django framework itself by following URLconf or python function for the given URL. However in Django **Control** is handled by framework itself, but most things happens in **View**, **Template** and **Model**. So it omits **Control**, MCV becomes MTV pattern. Here **Model** still contains everything about data: how to access it, how to validate it, which behaviors it has, and the relationships between the data. **Template** is the presentation layer. This layer contains presentation-related decisions: how to display a Web page or other type of document. **View** is the business logic layer. This layer contains the logic that accesses the model and defers to the appropriate template(s). You can think of it as the bridge between models and templates.

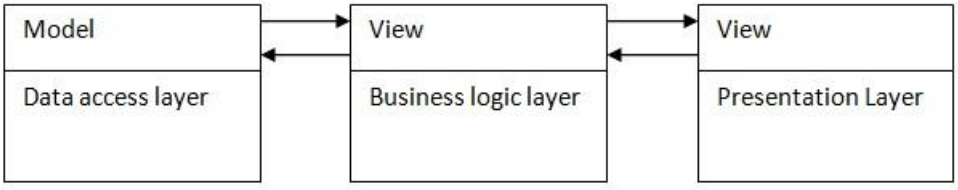


Figure 3: MTV Model

5.2 Flash card architecture model

Flashcard architecture model bases on MTV Model of Django. It is also a Web-based application then it contains client side and server side. JavaScript controller will solve some execution directly inside web browser. Django framework controller receives execution in form of HTTP request then use URL to map to the suitable View. The View will collect necessary data in Model and Template then responses to Web browser over Django.

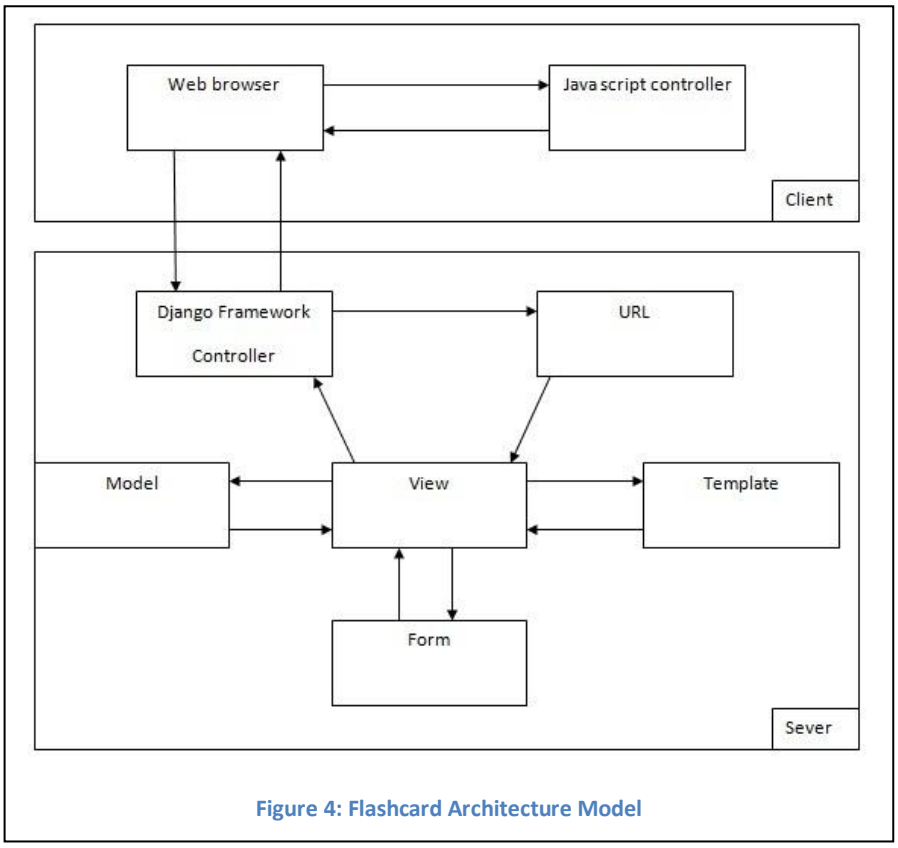


Figure 4: Flashcard Architecture Model

6 System requirement specification

1. Use case:

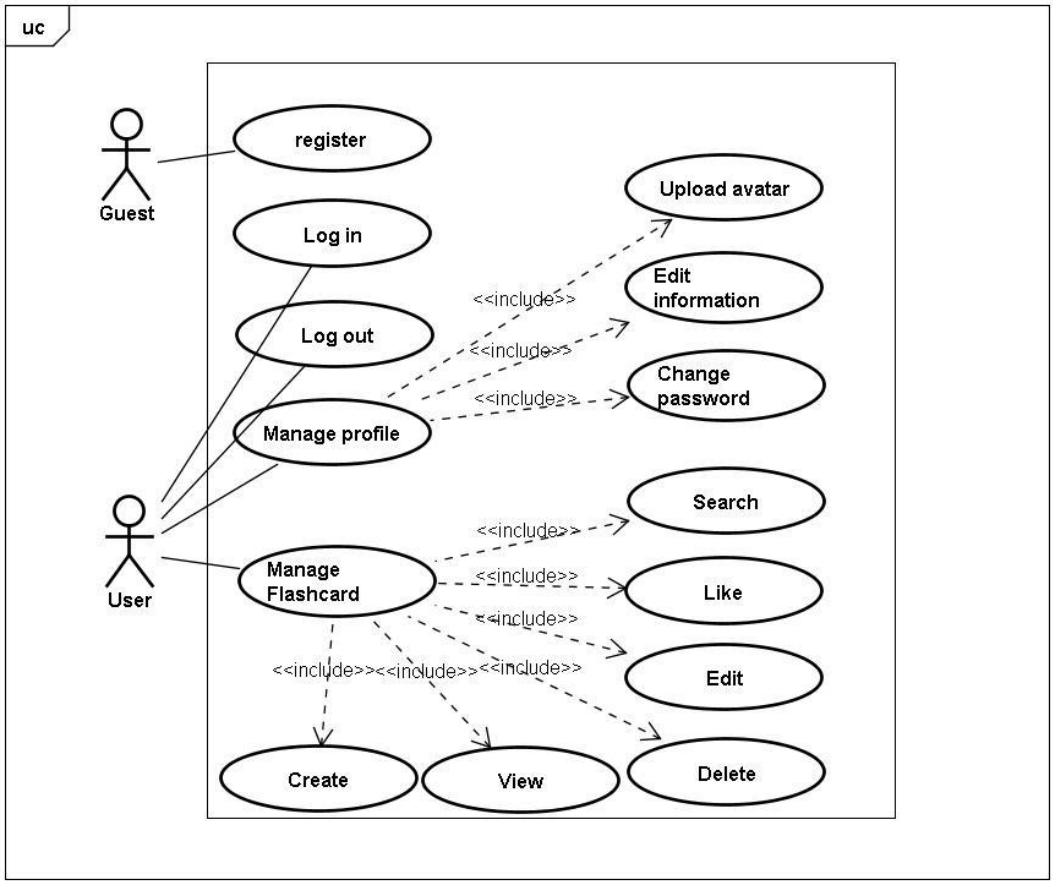


Figure 5: Flashcard use case diagram

2. Register

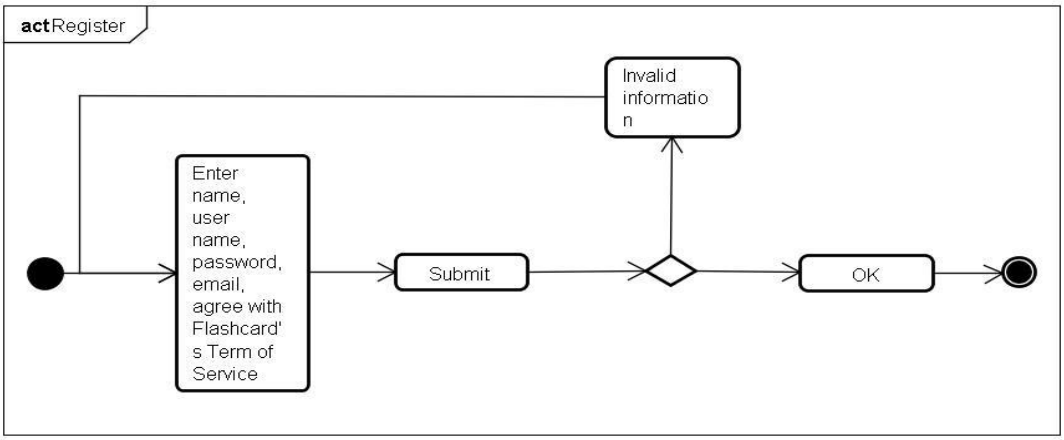


Figure 6: Register Activity Diagram

3. Log in:

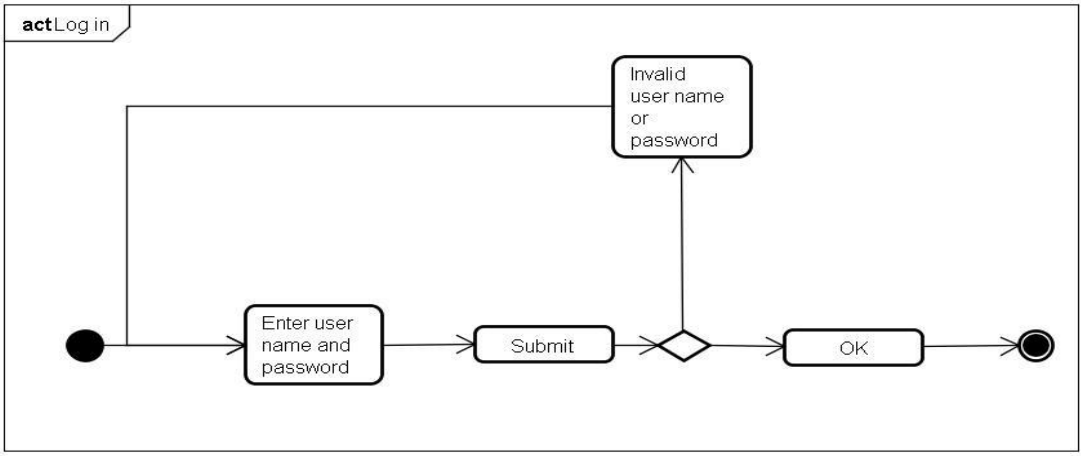


Figure 7: Log in activity diagram

4. Log out

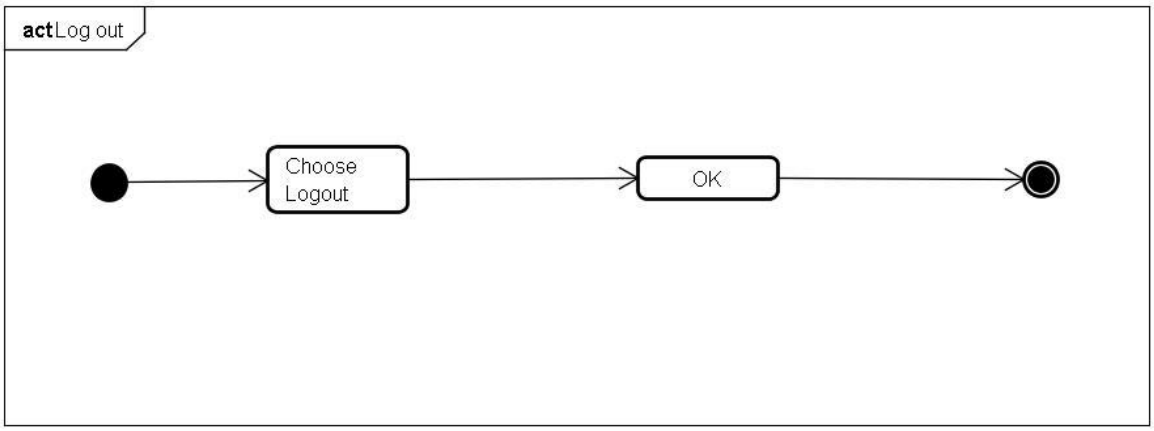


Figure 8: Log out Activity Diagram

5. Manage profile
   a. Upload avatar:

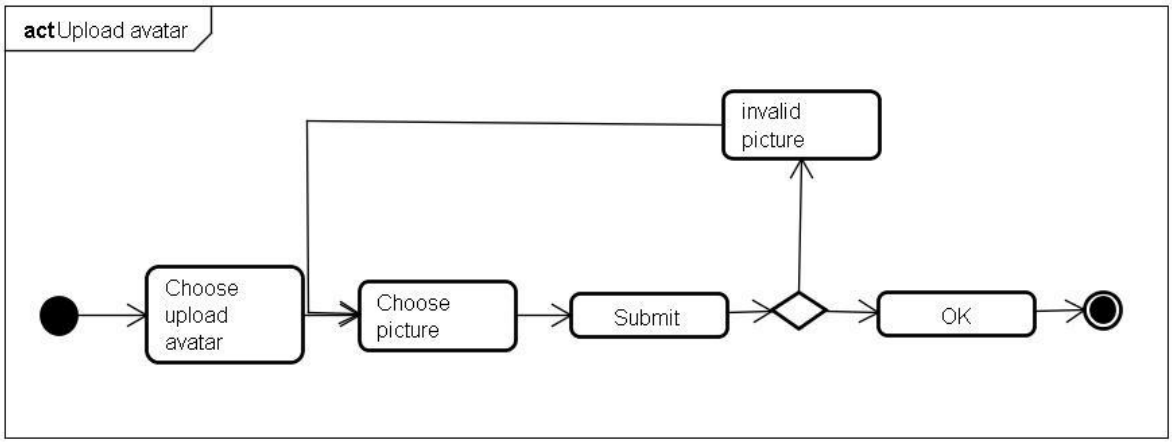
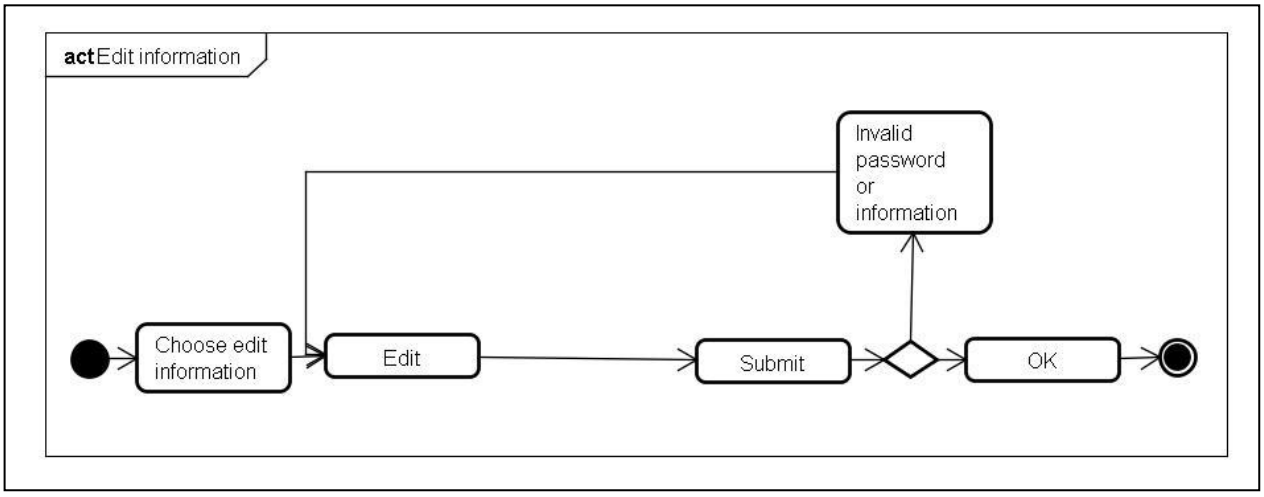


Figure 9: Upload Avatar Activity Diagram

b. Edit information



6. Manage Flashcard

a. Create flashcard

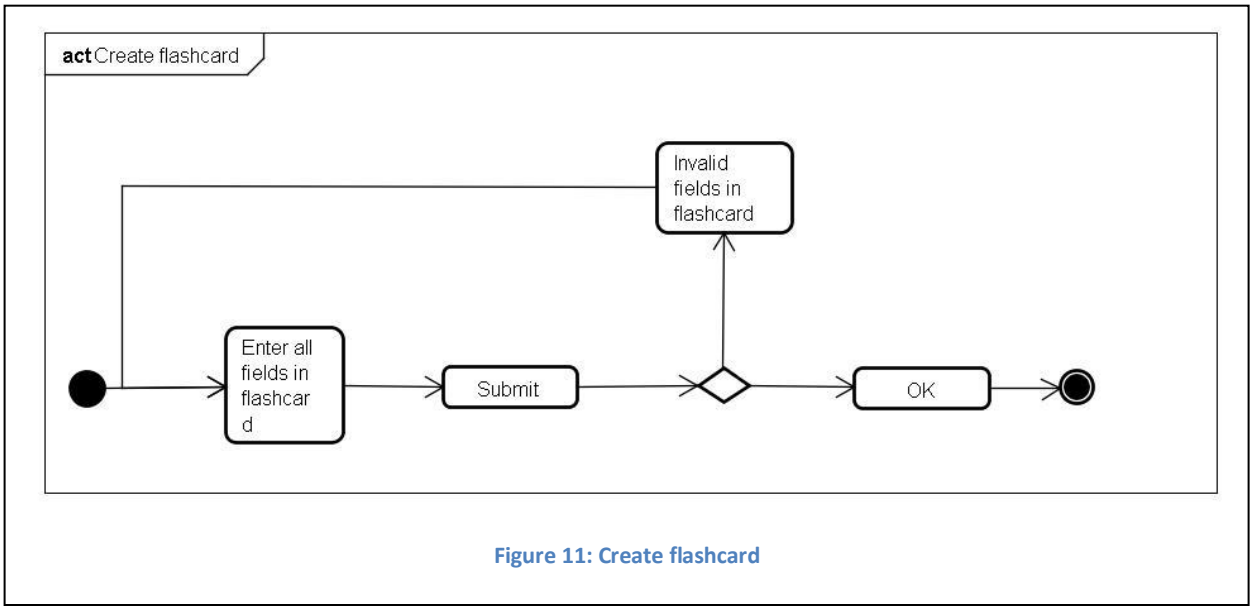


Figure 11: Create flashcard

b. View flashcard

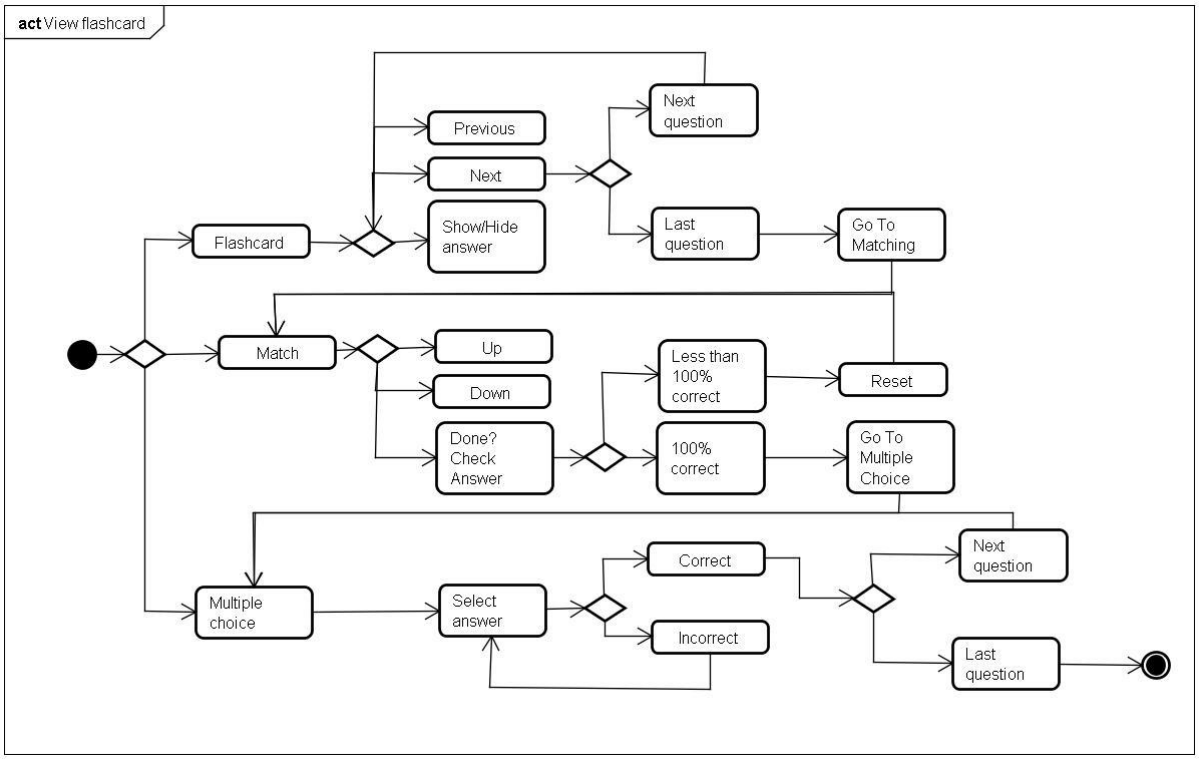


Figure 12: View Flashcard Activity Diagram

c. Edit flashcard

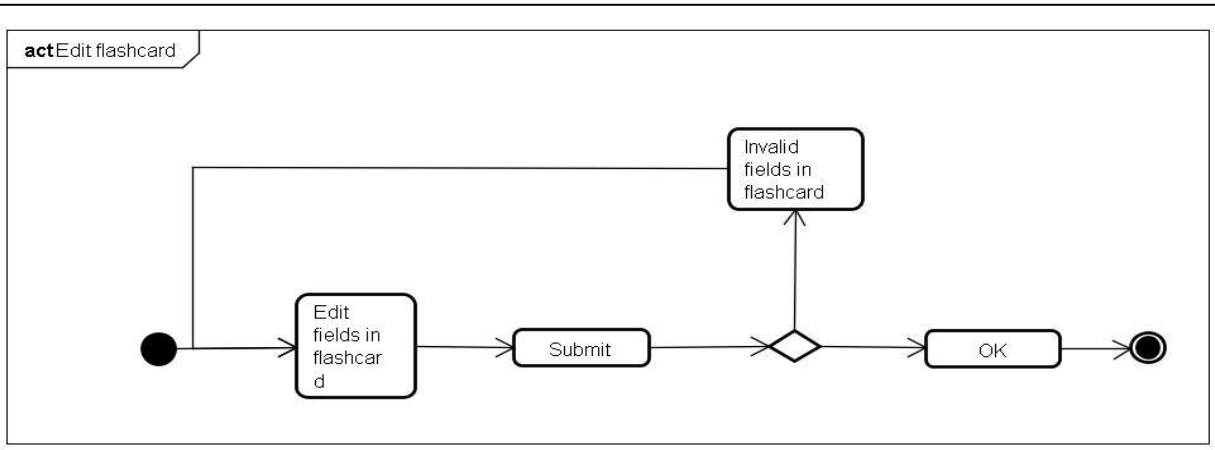


Figure 13: Edit Flashcard Activity Diagram

Delete flashcard

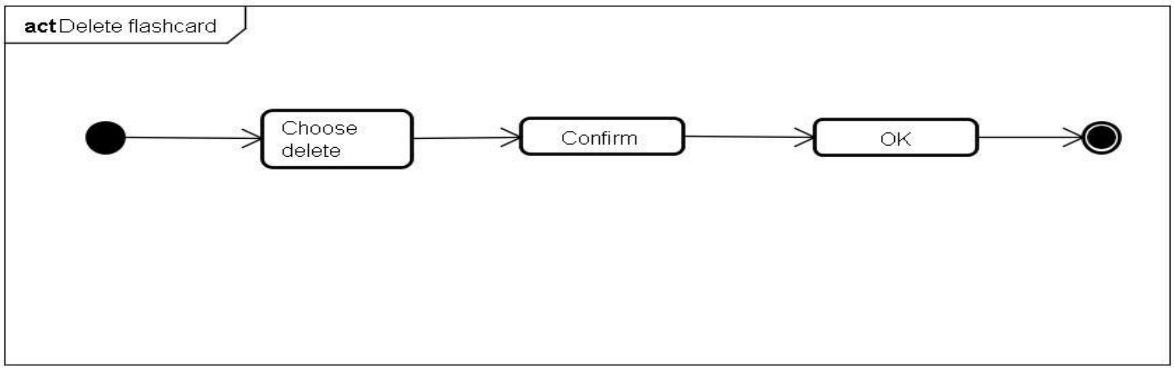


Figure 14: Delete Flashcard Activity Diagram

d. Like flashcard

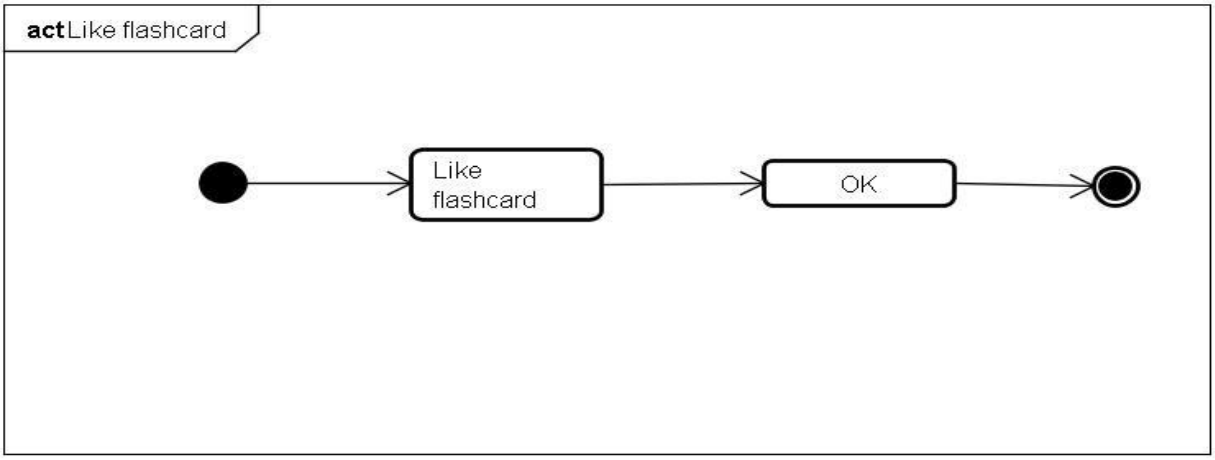


Figure 15: Like Flashcard Activity Diagram

e. Search flashcard

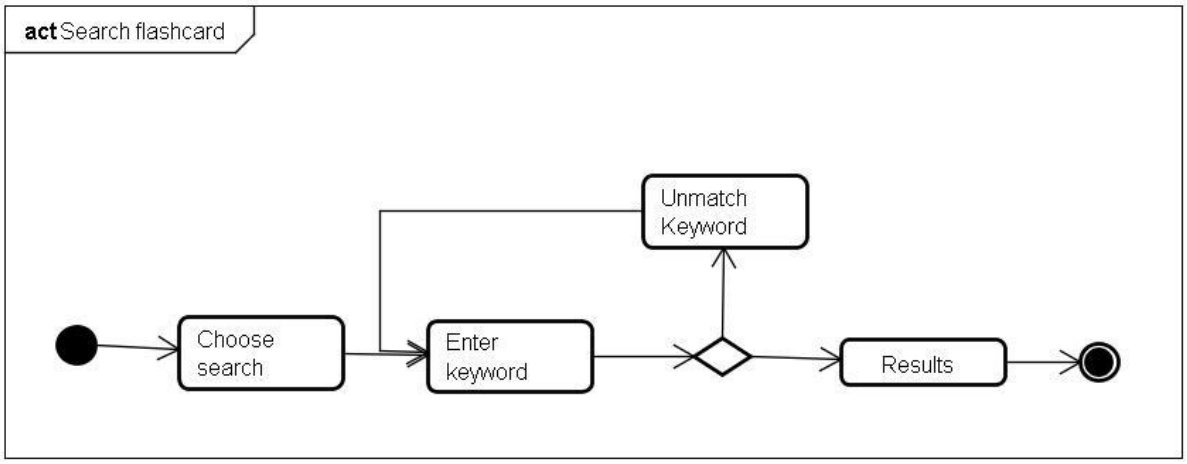


Figure 16: Search Flashcard Activity Diagram

7 System models

1. Register

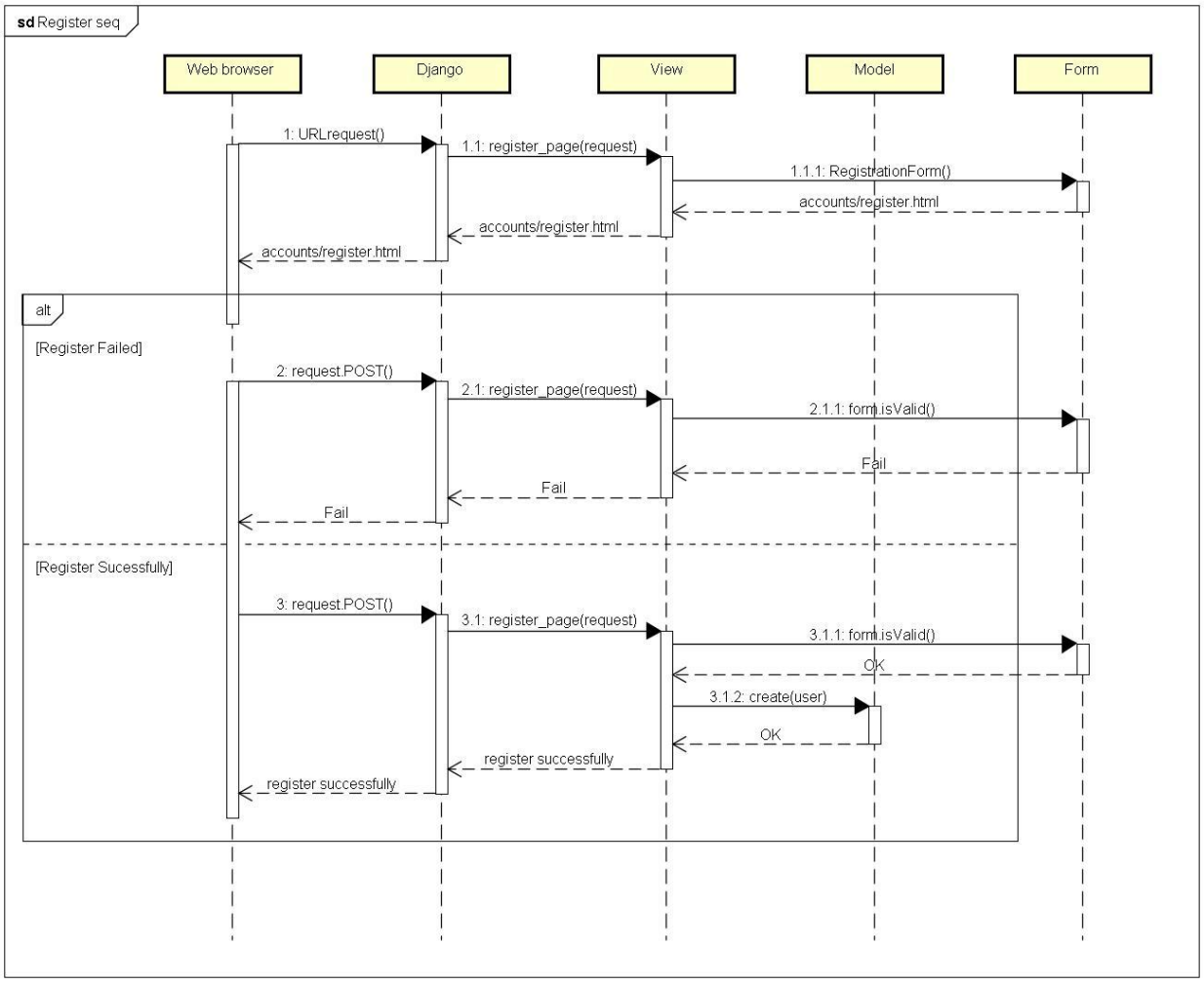


Figure 17: Register Sequence Diagram

2. Log in

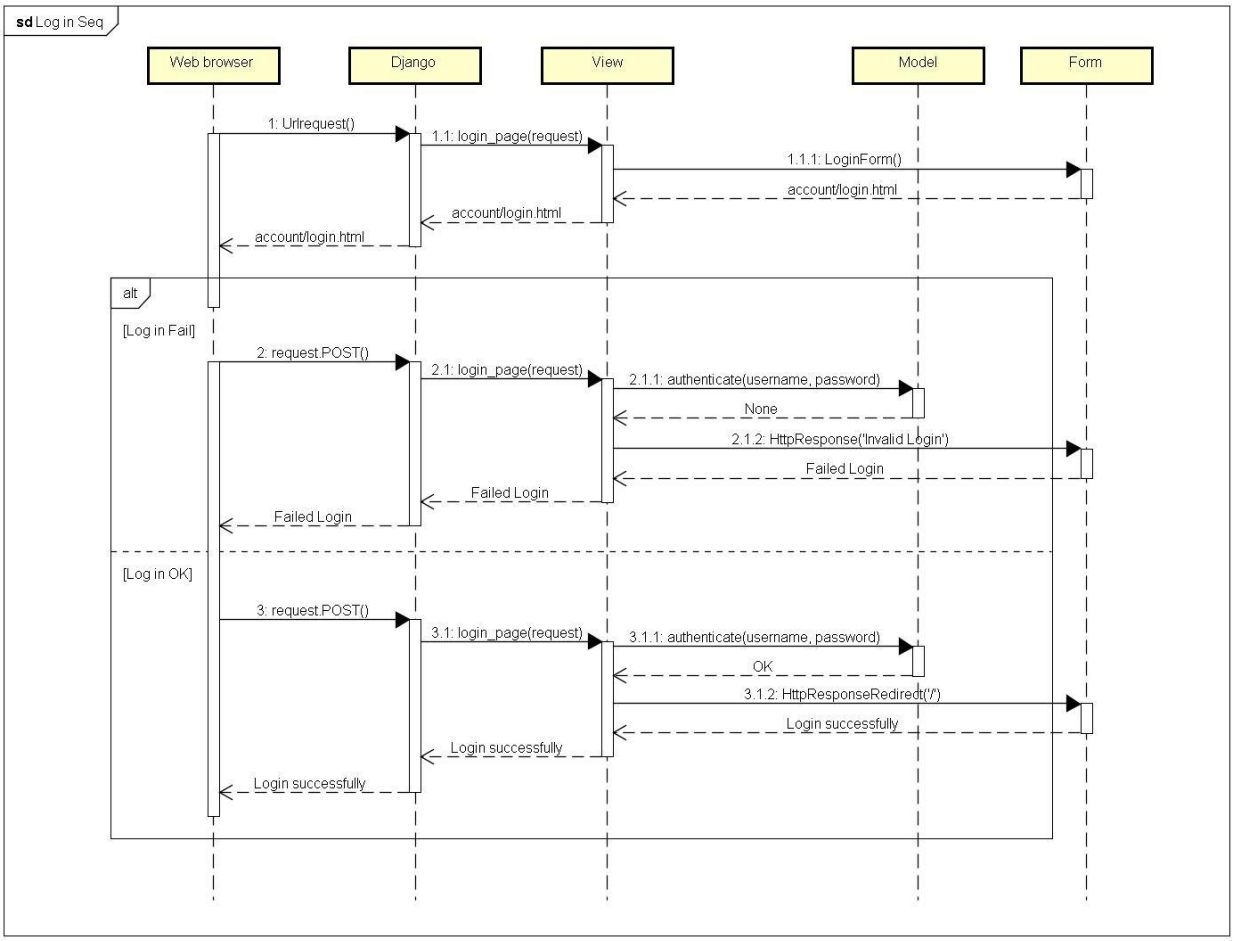


Figure 18: Log in Sequence Diagram

3. Log out

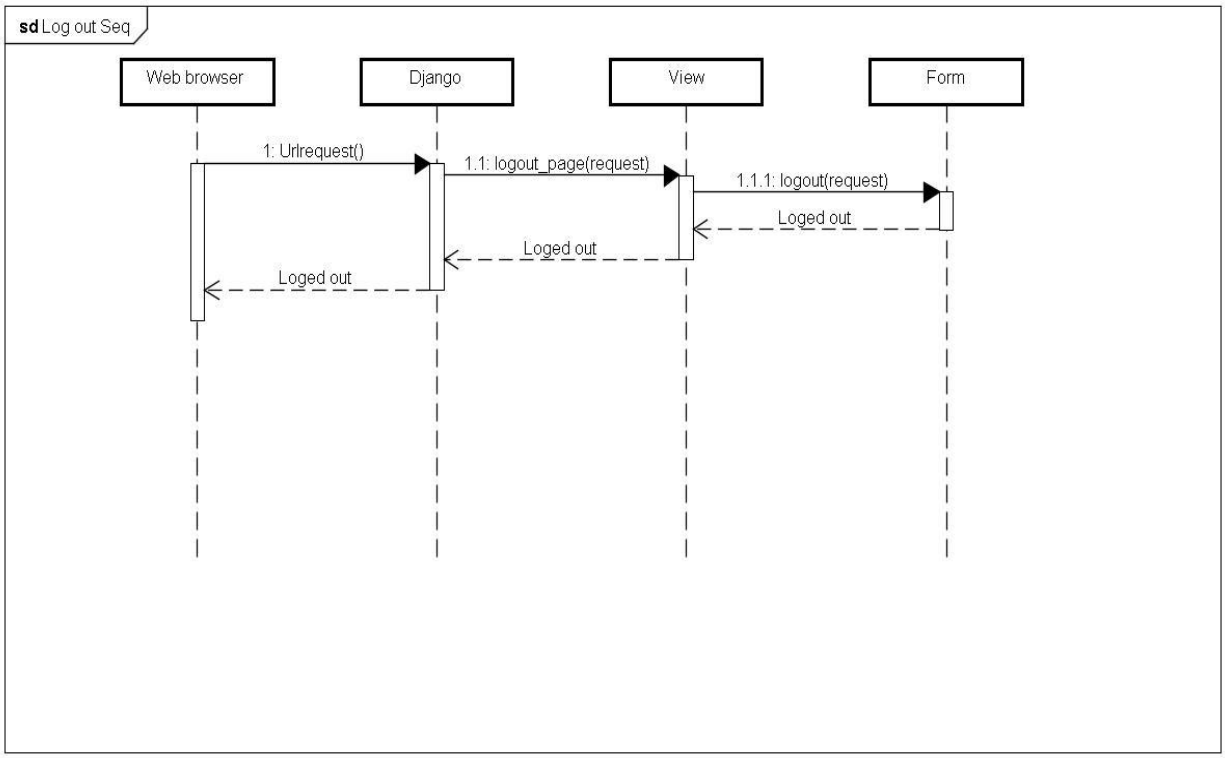


Figure 19: Log out sequence Diagram

4. Manage profile
    a. Upload avatar

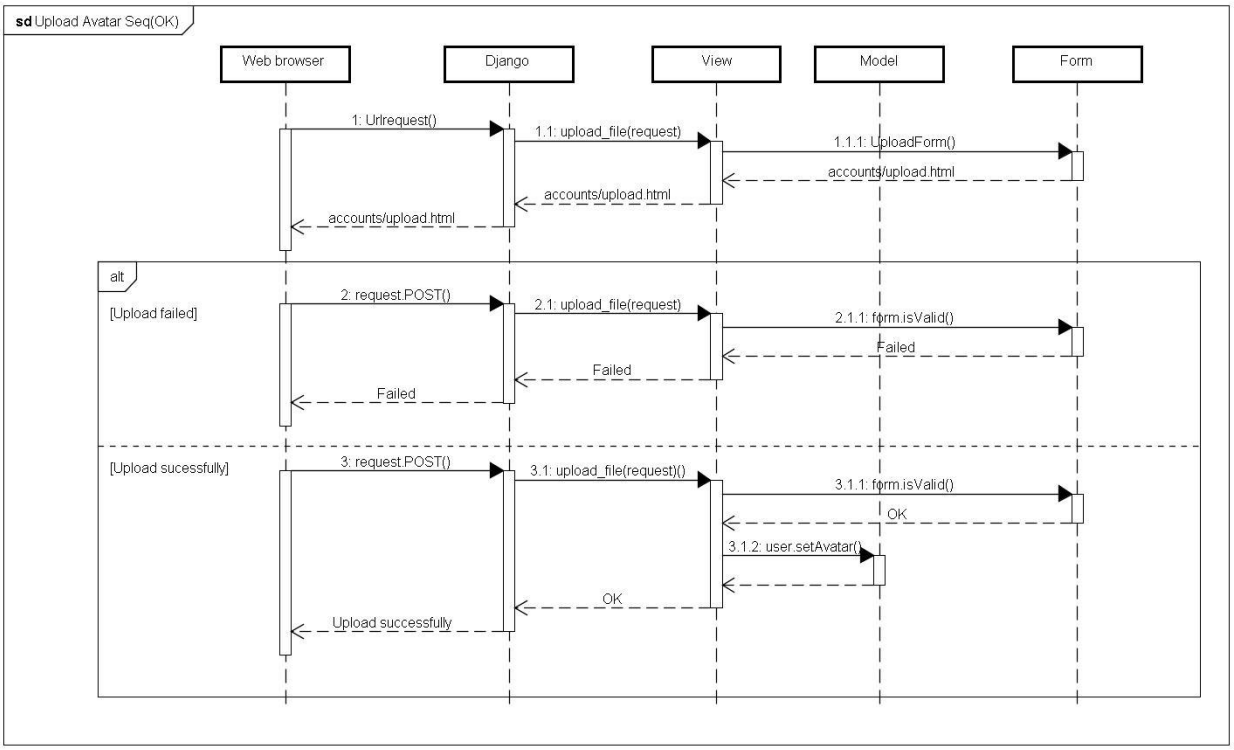


Figure 20: Upload Avatar sequence Diagram

b. Edit information

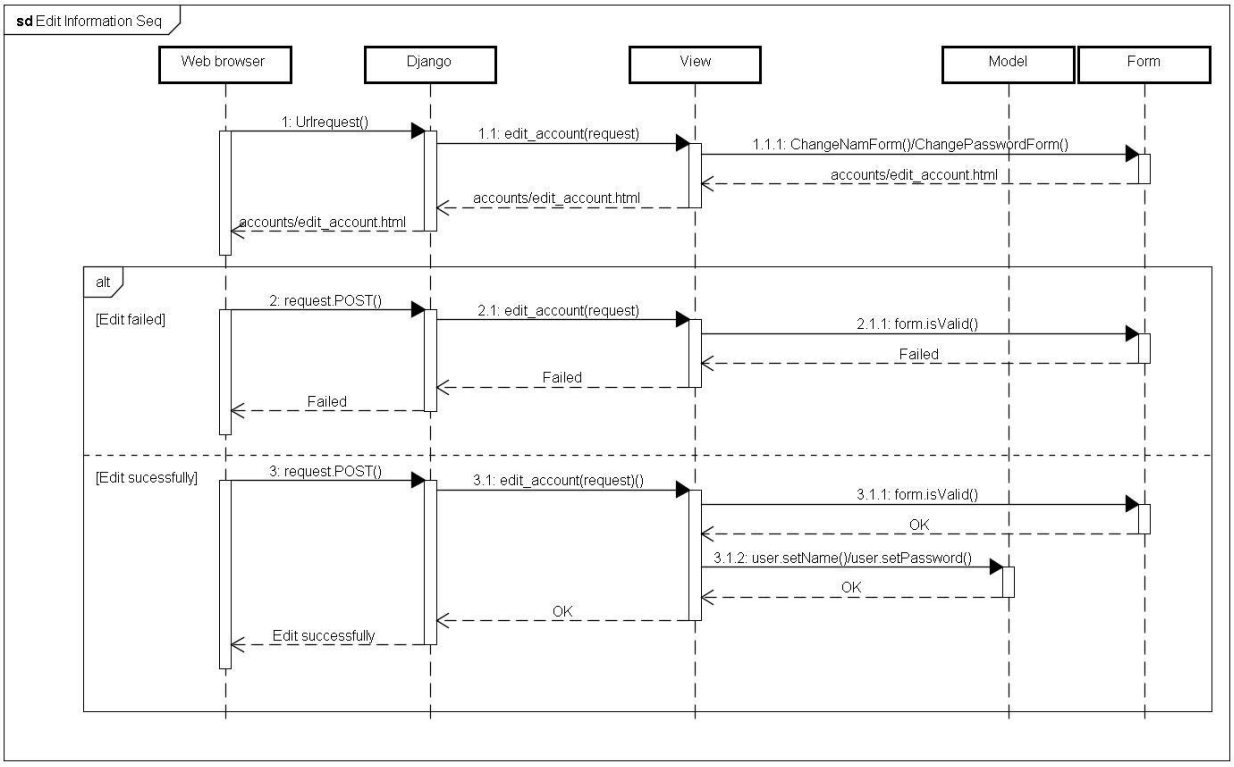


Figure 21: Edit Information Sequence Diagram

5. Manage Flashcards
    a. Create flashcards

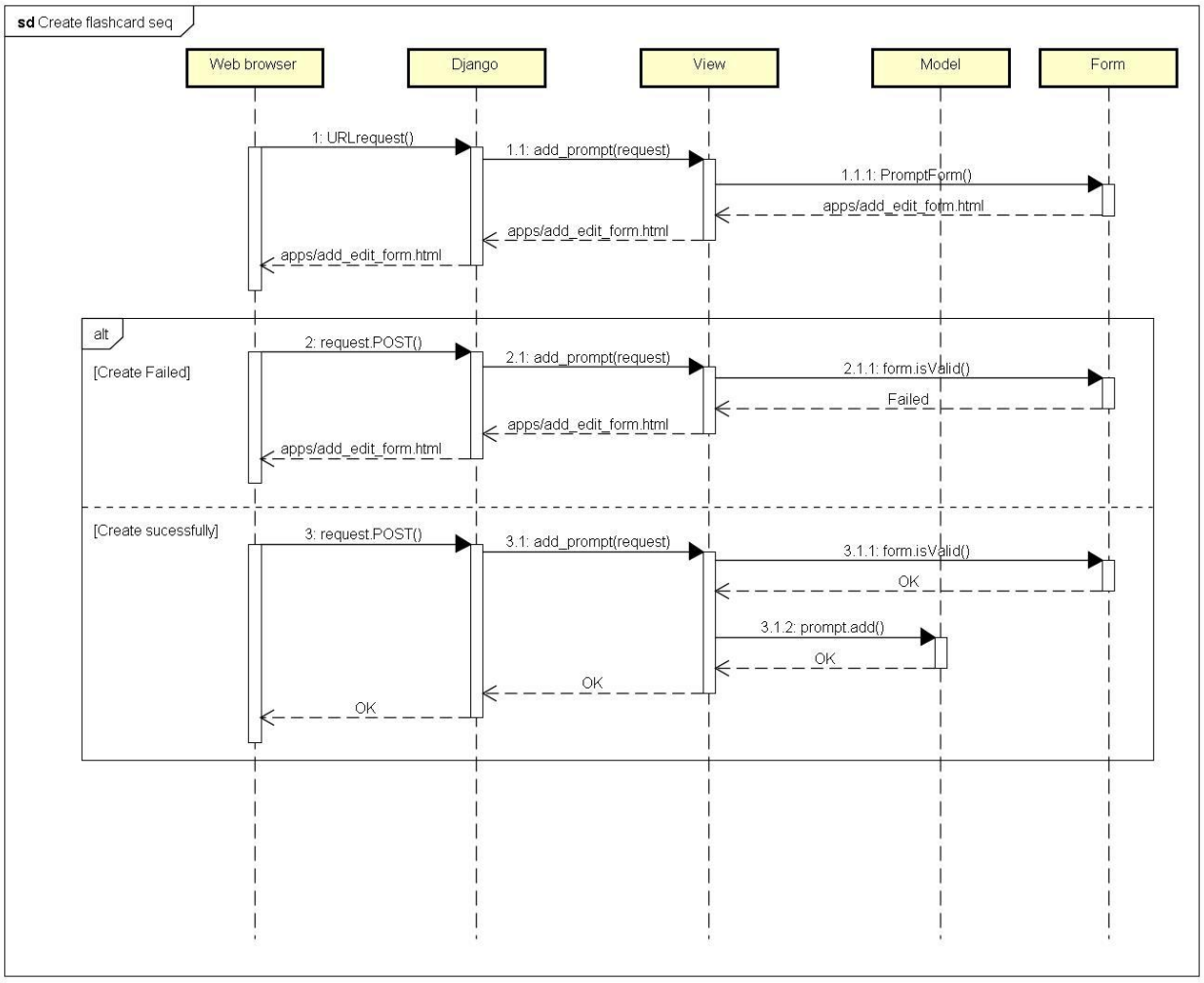


Figure 22: Create Flashcard Sequence Diagram

b. Edit flashcards

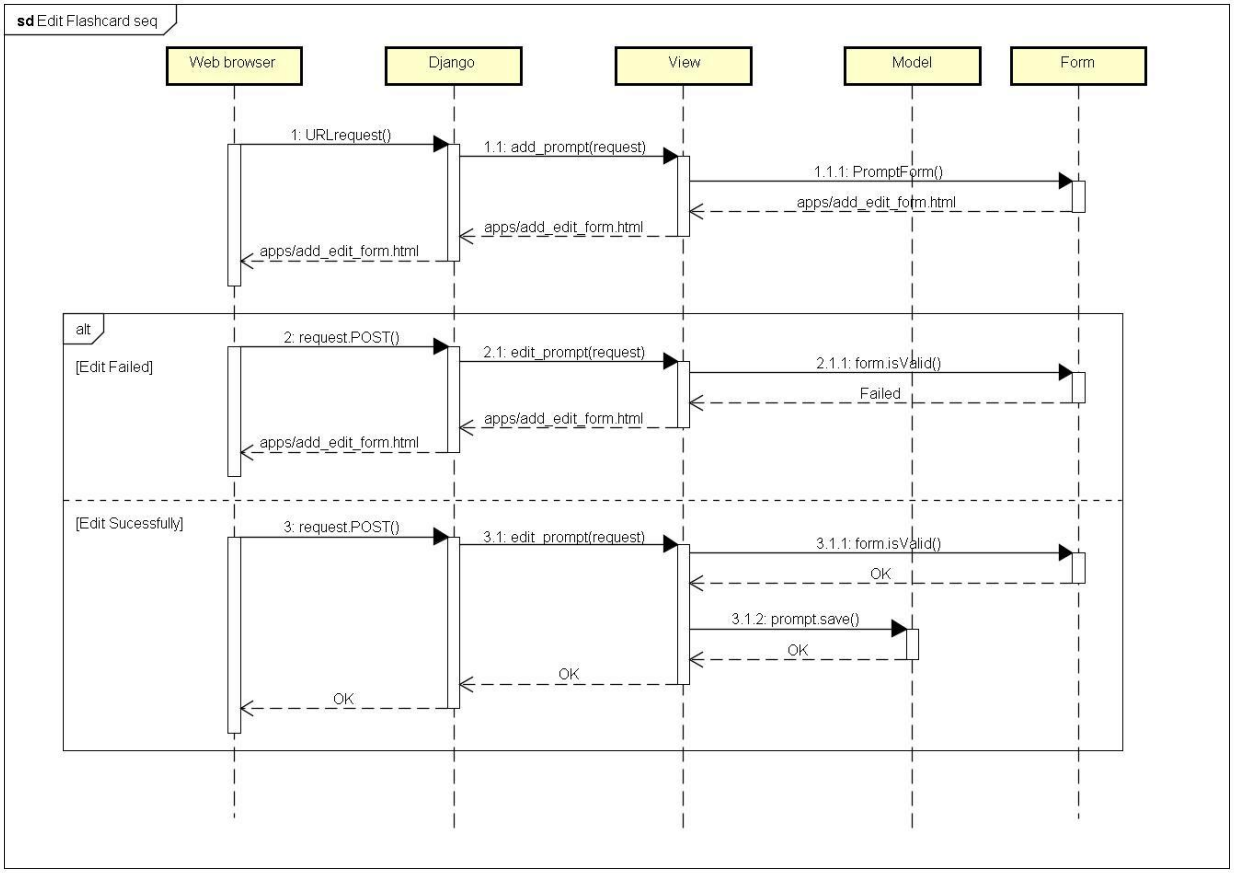


Figure 23: Edit Flashcard Sequence Diagram

c. Delete flashcards

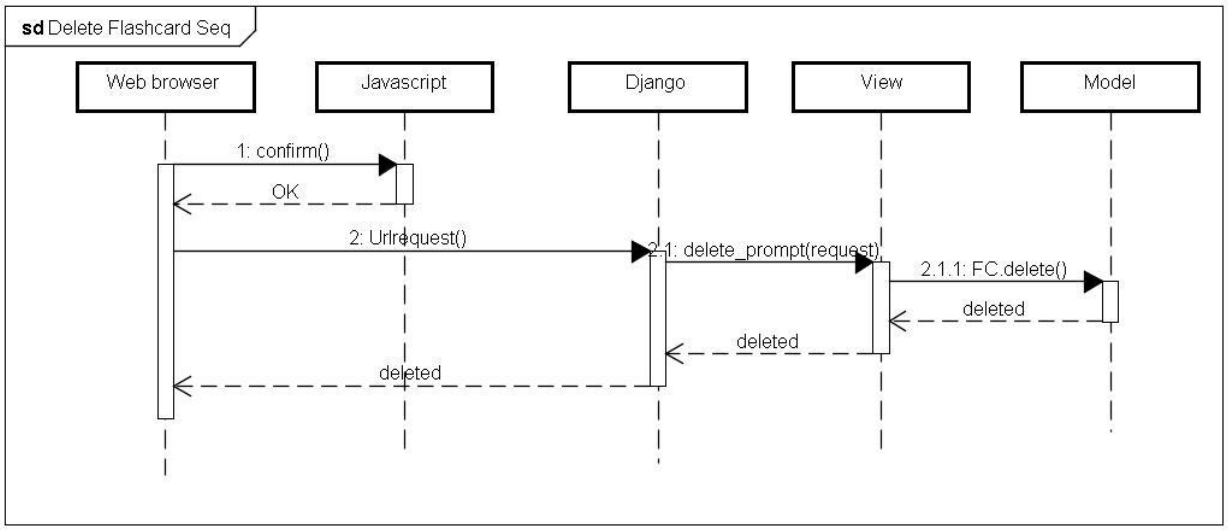


Figure 24: Delete Flashcard Sequence Diagram

d. Like flashcards

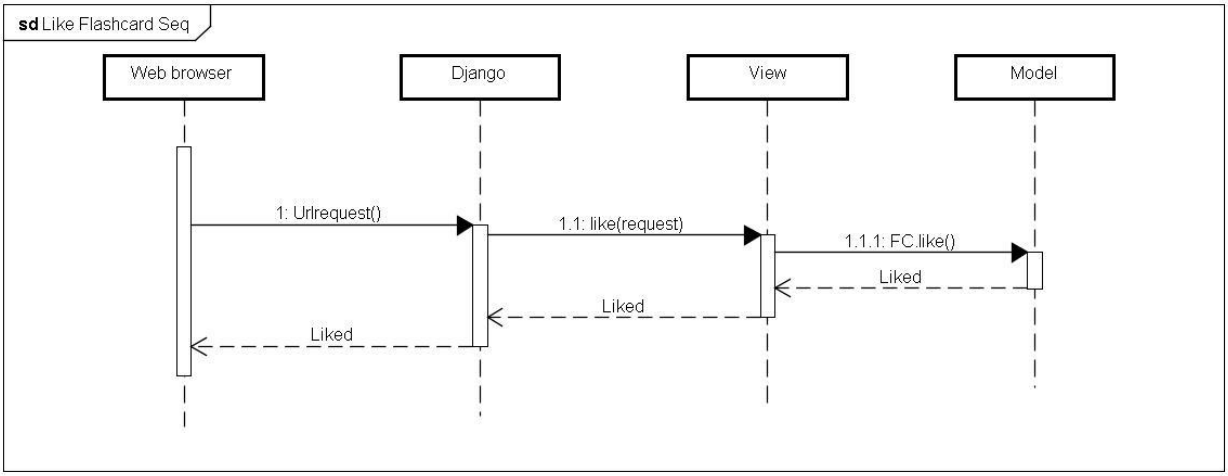


Figure 25: Like Flashcard Sequence Diagram

e. Search flashcard

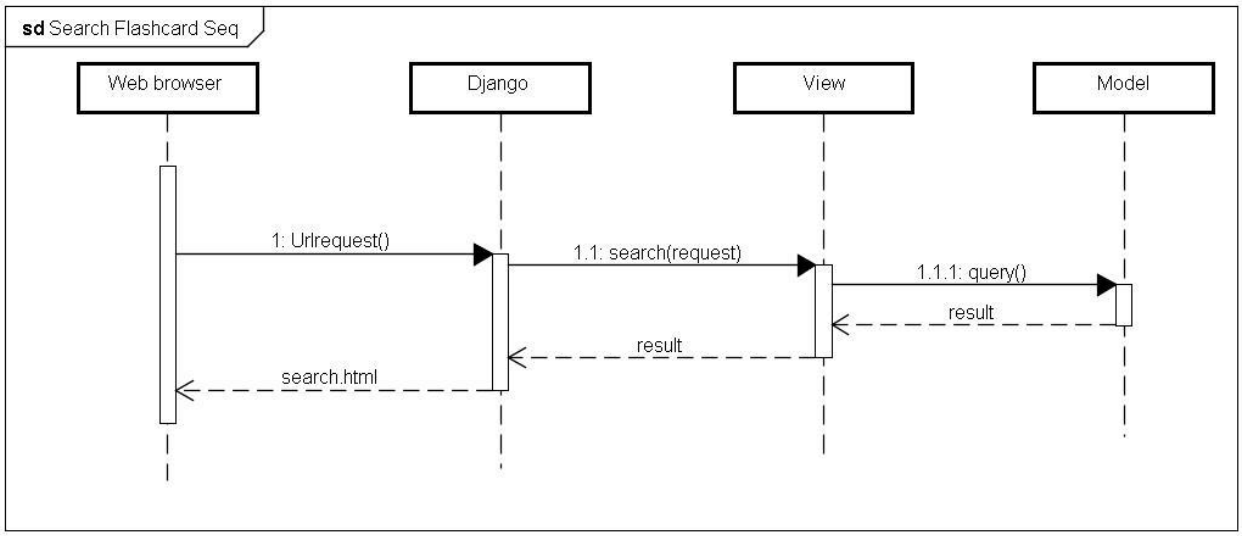


Figure 26: Search Flashcard Sequence Diagram

8 System evolution

System release version 1.0 and later version maybe add for function and improve existing function.

Some function may appear in later version:

Functions	Description
Copy	Users can copy other's flash to be their flashcards. So they can manage it, but do not take time to create.
Bookmark	User can bookmark the flashcards they have used. So it do not take to search.
Cross-browser Ajax	Use Ajax will improve performance of some function. For example, when people like a flashcard, it will not reload all the page.
Verify account	This function will improve security for users.

9 Appendices

References:

Books: Software Engineering 9th edition, Sommerville

Internet:

Flashcard http://en.wikipedia.org/wiki/Flashcard

http://vi.wikipedia.org/wiki/Flashcard

UML http://www.uml.org/

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