NIST COLLEGE

**Tribhuvan University**

**Institute of Science and Technology**

**social networking**

**A** **PROJECT report**

**Submitted to**

**Department of Computer Science and Information Technology**

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***In partial fulfillment of the requirement for the Bachelor Degree in Computer Science and Information Technology***

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Supervisor’s Recommendation

I hereby recommend that this project prepared under my supervision by Achyut Dahal, Aruna Shrestha, Rajan Prasad Bhattarai and Sabin Nepal entitled “Social Networking” in partial fulfillment of the requirements for the degree of B.Sc.in Computer Science and Information Technology be processed for the evaluation.

…………………………

Mr. Indra Chaudhary

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**ABSTRACT**

The documentation on “Social networking for developers” overviews the social network development and potential application and intended community. With the idea in mind to focus for the creation of the common platform for the developers, the project is aimed to fulfill the intended objectives and ideas of uniting the developers under one platform either for sharing the knowledge or getting help from fellow developers in conclusion or both.

**Chapter 1: Introduction**

1.1 Background

Social networking has been the 21st century’s new tool for socializing. Social networking is the grouping of individuals into specific groups, like small rural communities or a neighborhood subdivision. Social network is the mapping and measuring of relationships and flows between people, groups, organizations, computers, URLs, and other connected information/knowledge entities. The nodes in the network are the people and groups while the links show relationships or flows between the nodes. Social network provides both a visual and a mathematical analysis of human relationships.

People are almost used to with this type of communication system that it is easier for people to find them in social network rather than in real life. Social network is popular in every field not because it is effective means to communicate between people but also to share the knowledge between them. This case can be explained with possibly in the scenario like university, offices, school.

Social networks are major platform nowadays because of the wide availability of the internet since the past decade which explode like a wildfire. Even if we compare the internet user in the past decade, then based on the fact we can say that the user in the internet has been increased by almost 4 times in between 2000 and 2010. To be exact, there were 361Million user around 2000 which increased by 1967 Million in 2010 [1]. This figure even rose to 3835 Million in 2017 [2].

In the proposed system, it is planned to develop the social network for the developers/programmers. The project focuses on mainly two things, sharing the user content through the posts known as blogs, asking and getting answers for the questions.

1.2 Problem Definition

In today’s context, there is group divided into two sections that either have online presence or wish to seem totally ghost. It is because people are searching from site to site for the information they need. For eg, One have to use a platform for posting his experience using

site A, while for asking for some help he has to go through site B. Sites like medium.com, stackoverflow.com would provide these type of service but often provide specialized services only. This would make people very annoying because many people believe that even though being addicted to social network, it is waste of time to spend on too many social networks. Countries like ours have even worse problem scenario because the developers and the programmers who are city apart are unable to recognize the group of similar interest without actual being connected. With the idea of this in mind the project was born.

1.3 Objectives

The following are the objectives of the proposed social network:

* To make a platform for posting the user experience as blog stories
* To recommend similar user stories based on the interest of the user
* To ask and answer the questions for and by the users.

**Chapter 2: Requirement**

2.1 Literature Review

Even though there are a lot of social network for developers, some popular platform for developers are: Stack Overflow, medium.com which are quite popular in the foreign countries but in the local context, such system were not in the highlight.

2.1.1 Medium.com:

Medium.com offers the user to post the lengthy post on the user experience.

“Interesting ideas that set your mind in motion[4]” is as set by medium.com Currently it offers this type of service to general user. Similar to the medium, it provides user the capacity to share their stories but is focused on the developer’s side.

2.1.2 Stack overflow:

Stack overflow offers the complete forum alike site for the developers and the general people on various topics[4]. User can follow such topics and problems in the field of computer programming.

2.1.3. Forrst:

Forrst is a forum for Web designers and developers where they can share designs and code to get feedback from other designers and developers, or write posts about designtopics and ultimately getting better at their craft. It also offers an About.me-like profile page for designers called Forrst.me. Users can make public posts and share them with non-users. Forrst is an Invite only community [5]

2.2 Tools

**Front-End**

As it is a web-based application, the front-end of the application is going to implemented using HTML, CSS, JavaScript and Bootstrap.

**Back-End**

The server side programming language of the application is Ruby and MySQL as database. The Ruby programming language is rich in various libraries that can be used within the application.

**Chapter 3 System Analysis**

3.1 Software Requirement Specification

Before the development of our system, following requirements are taken into consideration

3.1.1 Functional Requirements

Functional requirements are the main functions which the system is supposed to have. The functional requirements of our system are

a) Messaging

In our system, private messaging feature is available, users can send and receive messages.

b) Blog stories

User can post blogs and also comment in the blog posts.

c) Forum

Users can get help from forum where they can ask question and get answers from other users of the related field.

3.1.2 Non Functional Requirements

a) user friendly

The proposed system is user friendly with easy to use nav and other features

b) responsive

Our system is responsive; it uses Bootstrap, which improves the responsiveness of the web application. Since it uses Bootstrap, it also concur the mobile-first technology which would enhance the functionality of web application in mobile devices. This nature could prove to be extremely beneficial to people living in areas with limited access to computers.

c) reliability

With a reliable source and tools, the outcome would be reliable as well.

d) speed

The response time of the system is fast.

e) performance

The performance of the system is determine by various factor like response time, throughput, resource utilizations etc.

3.2 Feasibility Analysis

Feasibility Analysis is an assessment of the practicality of a proposed project. It provides the degree of viability of a proposed project. A feasibility analysis helps us determine the value of the proposed project, determine whether or not there is a market for the proposed project, determine if the proposed project is financially viable, and eventually, decide whether or not it is worth investing time and money into the proposed project.

In short, a feasibility analysis evaluates the project‟s potential for success. Following Feasibility Analysis was performed prior to working on the project:

3.2.1 Technical Feasibility

The technical issue usually raised during the feasibility stage of the investigation includes the following:

* Does the necessary technology exist to do what is suggested?
* Does it can be accessible by both large and small devices?

The web app will have responsive design. In the development perspective, the tools and frameworks are easily usable. Website can be hosted on the Rails supporting platform. Because of the use of the bootstrapping technique, any modern browser can be used to access the site.

3.2.2 Operational Feasibility:

The proposed project is beneficial only if it meet operating requirements. Operational feasibility aspects of the project are to be taken as an important issues raised are to test the operational feasibility of the project include

* Will the system be used and work properly if it is being developed and implemented?

The user needs an active internet connection and the browser to have access to the social network. After onwards, user can go the site, follow other developers, browse the topic of their interest and get support.

3.2.3 Economical Feasibility:

The social network is completely free to sign up/login beside the cost of accessing which depends on the user device.

**Chapter 4.System Design**

4.1 System Architecture

System design is simply the design of systems. It is the process of defining the architecture, components, modules, interfaces and data for a system to satisfy specified requirements. Our system makes use of internet and computer peripherals. This system is supported by any different devices that can access the internet. The system architecture is shown below:

Fig4.1.1 System Diagram

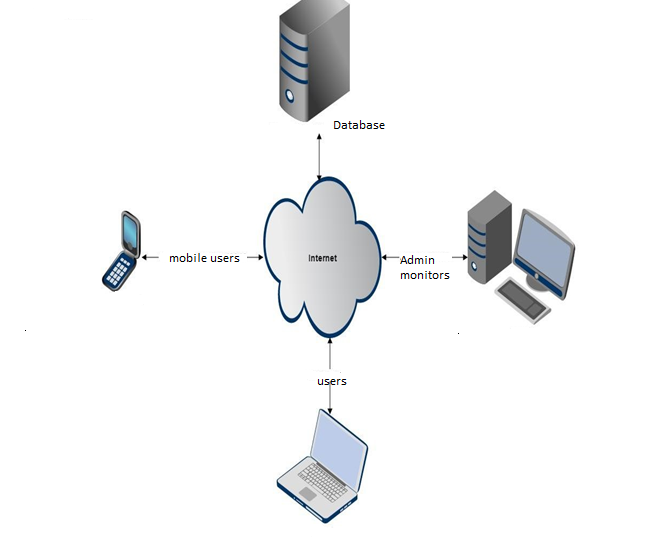


Fig: 4.1.2 Context free diagram

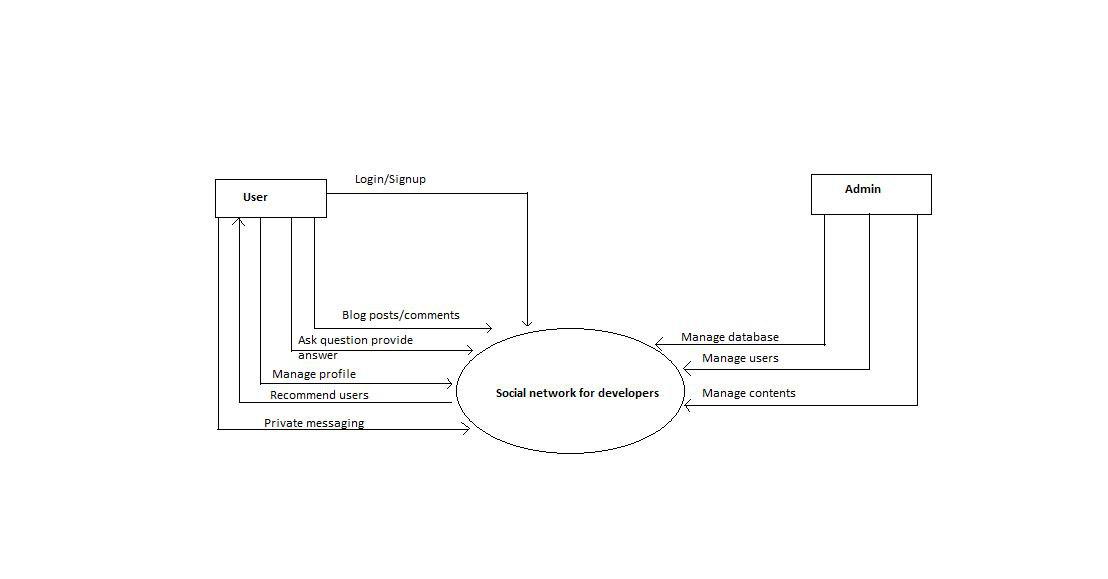


Fig:4.1.3 Use case Diagram

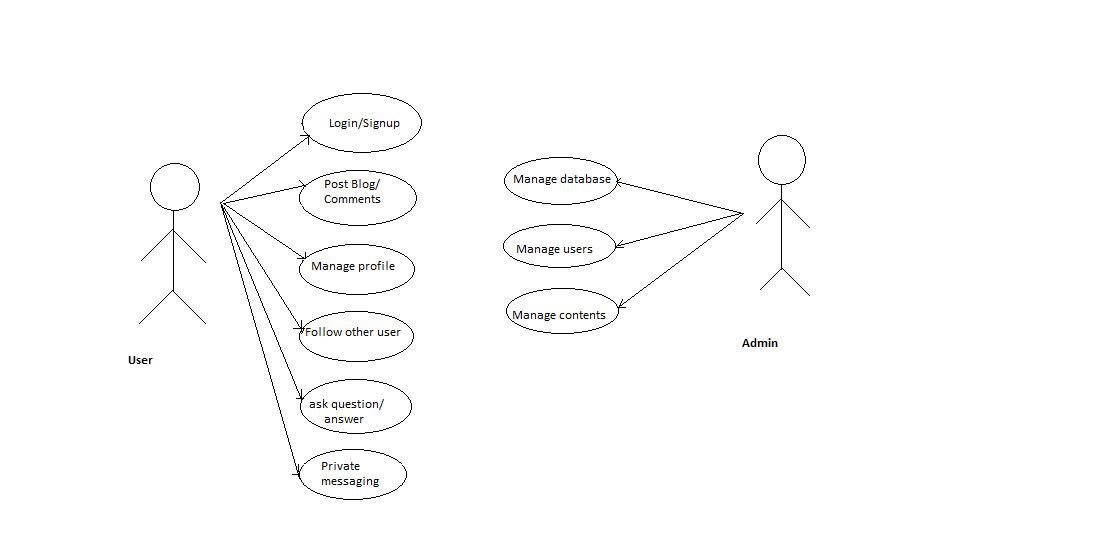


Fig 4.1.4 Activity Diagram

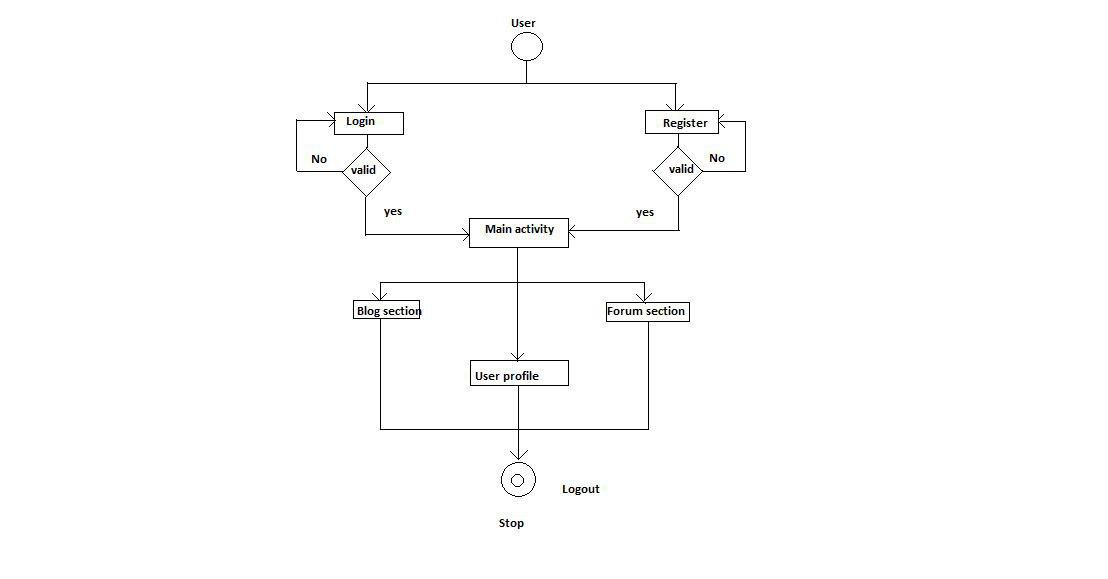
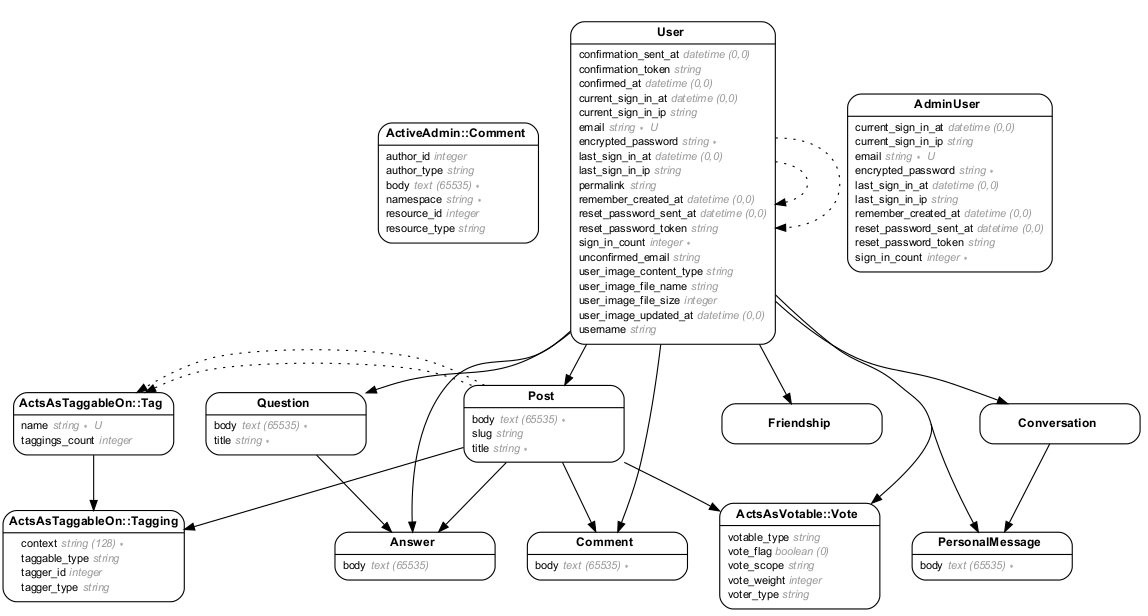


Fig 4.1.5 ERD



**Chapter 5. Implementation**

5.1 Recommendation System Algorithm

Cosine similarity as it's name suggests identifies the similarity between two(or more) vectors .The dot product and norm has been identified, then the cosine similarity of two vectors is simply the dot product of two unit vector [6].

1. Term Frequency(TF)

Term Frequency also known as TF measures the number of times a term(word) occurs in a document. Given below are the terms and their frequency on each of the document [7].

For example:

document = "I live in Nepal and Nepal is the best country in the world"

term frequencies can be listed as:

I = 1, live = 1 , in = 2, Nepal = 2, and = 1, is = 1, the = 2, best = 1, country = 1, world = 1

2. Normalized Term Frequency

I = 1/13, live = 1/13, in = 2/13, Nepal = 2/13, and = 1/13, is = 1/13, the = 2/13, best = 1/13, country = 1/13, world = 1/13

3. Inversed Document Frequency(IDF)

In the above document for IDF(Nepal):

For example:

IDF(Nepal) = 1 + log(Total Number of Documents / Number of Documents with term "Nepal" in it)

4. TF\*IDF

We are trying to find out the relevant document that are similar to a given document.

We should find tf\*idf for all the terms in the given document.

5. Vector Space Model(Cosine Similarity)

Cosine Similarity(d1,d2) = Dot product(d1, d2) / ||d1|| \* ||d2||

Dot product (d1,d2) = d1[0] \* d2[0] + d1[1] \* d2[1] \* … \* d1[n] \* d2[n]

||d1|| = square root(d1[0]2 + d1[1]2 + ... + d1[n]2)

||d2|| = square root(d2[0]2 + d2[1]2 + ... + d2[n]2)

6. In this way similarity between posts are determined.

5.2 TESTING

At the completion time of this system, entire testing has been done and system has been made free as far as possible. For testing purposes, following testing methods has been used:

5.2.1 Unit Testing

Each of the modules of the system are tested separately in unit testing. The functionality of a specific section of code, usually at the function level are verified. Blogs, users are some modules functionality has been tested and compared with desired output. The test explorer has been used to check and manage each tests. User with their level to the access when logging and registering has been checked and compared with the desired output.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| S.N | Email | Password | Expected result | Actual result | Remarks |  |
| 1. | [rajan@gm](mailto:rajan@gm)ail.com | 123456 | Blog posts | Blog posts | No error |  |
| 2 | [sabin@gmail.com](mailto:sabin@gmail.com) | 9865421 | Blog posts | Blog posts | No error |  |
| 3. | ach@gmail.com | ach985689 | Blog posts | Blog posts | No error |  |
| 4. | As@gmail.com | aruna98 | Blog posts | Blog posts | No error |  |

Table 5.2.1 Unit Testing

5.2.2 Integration Testing

After unit testing the modules are integrated one by one and then tested the system for problems arising from component interaction. In integration testing, modules are combined and tested as a group to make sure that one unit does not cause problems to other unit. During integration testing phase, recipe add and user add module are tested to ensure proper functionality. Similarly, all other modules are also integrated and tested. Test cases for integration test between displaying user details:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Test | User | Expected result | Actual result | Remarks |
| 1 | Cdrrazan | Profile, blog, forum | Profile blog forum | No errpor |
| 2. | Neymarsabin | Profile, blog, forum | Profile, blog, forum | No error |
| 3. | Achyutd | Profile, blog, forum | Profile, blog, forum | No error |

Table 5.2.2: Integration testing table

5.2.3 System Testing

System testing is done after all the units and integration testing are successfully completed,. Entire system test has been done to verify that it meets its requirements and if any problems are found, they are fixed and the system is tested again.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| SN | Test case | Expected | Actual | Remarks |
| 1. | Registration | Register user and send confirmation link | Register user and send confirmation link | No error |
| 2. | Login | Access the blog | Access the blog | No error |
| 3. | Create Blog | Write new blog | Write new blog | No error |
| 4. | Forum | View and ask question | View and ask question | No error |
| 5. | Profile | View user blog and forum question | View user blog and forum question | No error |
| 6. | Conversation | Message sent and received | Message sent and received | No error |
| 7. | Edit profile | Change user’s details | Change user’s details | No error |
| 8. | Commmenting | Post comments and replies to the thread | Post comments and replies to the thread | No error |
| 9. | Settings | Delete user account | Delete user account | No error |

Table 5.2.3: System testing table

**Chapter 6. Limitation and Future Enhancement**

6.1 Limitation

Currently there is no user online viewing system. So, for the messaging platform users will have to use private messaging features. Sharing features will also not be available for now. Also the system has no question searching feature.

6.2 Future Enhancements

1. Real time Chatting system

2. Notification system

3. Jobs for developer and recommendation system,

**7.Project-references**

[1] *The incredible growth of the Internet since 2000*[online]. Available http://royal.pingdom.com/2010/10/22/incredible-graowth-of-the-internet-since-2000/

[2] *World Internet Users and 2017 Population Stats*[online]. Available <http://www.internetworldstats.com/stats.htm>

[3] *Medium homepage*[online]. Available https://medium.com/

[4] *Welcome to Stack Overflow*[online]. Available https://stackoverflow.com/tour

[5] *10 Social Networks for Developers*[online]. Available https://www.awwwards.com/10-social-networks-for-developers.html

[6] *Cosine similarity*[online]. Available http://www.thefactmachine.com/cosine-similarity/

[7]*Tf-Idf cosine similarity* [online]. Available https://janav.wordpress.com/2013/10/27/tf-idf-and-cosine-similarity/

Source Code

1. Post

class Post < ActiveRecord::Base

# include PublicActivity::Model

# tracked owner: ->(controller,model ) { controller && controller.current\_user },

# title: ->(controller, model ) { controller && model.title }

validates :title,:body, presence: true

belongs\_to :user

delegate :email, to: :user

delegate :username, to: :user

has\_many :comments,dependent: :destroy

acts\_as\_votable

# extend FriendlyId

# friendly\_id :title, use: :slugged

def to\_param

"#{id} #{title}".parameterize

end

acts\_as\_taggable

end

1. Forum

class Question < ApplicationRecord

validates :title, presence: true

validates :body, presence: true

has\_many :answers

belongs\_to :user

def to\_param

"#{id} #{title}".parameterize

end

end

1. Admin

class AdminUser < ApplicationRecord

# Include default devise modules. Others available are:

# :confirmable, :lockable, :timeoutable and :omniauthable

devise :database\_authenticatable,

:recoverable, :rememberable, :trackable, :validatable

End

Controller

1. User

class UsersController < ApplicationController

def index

@users = User.search(params[:search])

end

def show

#@user = User.find\_by\_permalink(params[:id])

find\_user

@posts = @user.posts.all

end

def my\_friends

@friendships = current\_user.friends

@friendships\_inverse = current\_user.inverse\_friends

end

def add\_friends

@friend = User.find(params[:friend])

current\_user.friendships.build(friend\_id: @friend.id)

if current\_user.save

redirect\_to my\_friends\_path, notice: "Friend was successfully followed"

else

redirect\_to my\_friends\_path, flash[:error] = "There was an error with adding user as friend"

end

end

private

def find\_user

@user = User.find(params[:id])

end

end

1. Questions

class QuestionsController < ApplicationController

before\_action :authenticate\_user!, except: [:index,:show]

before\_action :set\_question, only: [:show, :edit, :update, :destroy]

# GET /questions

# GET /questions.json

def index

@questions = Question.all

end

# GET /questions/1

# GET /questions/1.json

def show

end

# GET /questions/new

def new

@question = current\_user.questions.build

end

# GET /questions/1/edit

def edit

authorize! :update, @question

end

# POST /questions

# POST /questions.json

def create

@question = current\_user.questions.build(question\_params)

respond\_to do |format|

if @question.save

format.html { redirect\_to @question, notice: 'Question was successfully created.' }

format.json { render :show, status: :created, location: @question }

else

format.html { render :new }

format.json { render json: @question.errors, status: :unprocessable\_entity }

end

end

end

# PATCH/PUT /questions/1

# PATCH/PUT /questions/1.json

def update

if current\_user == @question.user

@question.update(question\_params)

@question.save

flash[:notice] = "Edit sucessful: #{@question.title}"

redirect\_to @question

# respond\_to do |format|

# if @question.update(question\_params)

# format.html { redirect\_to @question, notice: 'Question was successfully updated.' }

# format.json { render :show, status: :ok, location: @question }

# else

# format.html { render :edit }

# format.json { render json: @question.errors, status: :unprocessable\_entity }

# end

end

end

# DELETE /questions/1

# DELETE /questions/1.json

def destroy

authorize! :destroy, @question

@question.destroy

respond\_to do |format|

format.html { redirect\_to questions\_url, notice: 'Question was successfully deleted.' }

format.json { head :no\_content }

end

end

private

# Use callbacks to share common setup or constraints between actions.

def set\_question

@question = Question.find(params[:id])

end

# white listing params

def question\_params

params.require(:question).permit(:title, :body)

end

end

1. Application

class ApplicationController < ActionController::Base

include Pundit

include PublicActivity::StoreController

protect\_from\_forgery with: :exception

before\_action :configure\_permitted\_paramaters, if: :devise\_controller?

before\_action :configure\_permitted\_paramaters\_for\_registration, if: :devise\_controller?

#rescue\_from ActiveRecord::RecordNotFound, :with => {:render => "404"}

rescue\_from CanCan::AccessDenied do |exception|

redirect\_to question\_path, :alert => exception.message

end

def get\_current\_user\_email

current\_user.email

end

protected

def configure\_permitted\_paramaters

devise\_parameter\_sanitizer.permit(:account\_update, keys: [:user\_image,:username])

end

def configure\_permitted\_paramaters\_for\_registration

devise\_parameter\_sanitizer.permit(:sign\_up, keys: [:username])

end

end