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CMPT 475

Artistic Style Platform

Project Plan OverView

Date	Milestone	Tasks	Responsible	Notes
8/31/2015	Project Start	Form team: make introductions; inventory skill strengths and weaknesses; formulate and document initial roles and responsibilities (to be modified as needed later).	All	
8/31/2015	Project Start	Schedule 1st team meeting - and attempt to choose recurring team meeting times that work for everyone (can be established later); establish a communications plan (ie. share emails, cell#'s, and establish how you will stay in touch)	All	
8/31/2015	Project Start	Further develop this project plan (it is part of HW1) - THINK through your time management and what you will accomplish as the weeks progress.	All	
9/8/2017	Team Meeting; 1st homework started	First time meeting as a group, started working on Homework #1	All	
9/10/2017	Team meeting	Work on the UML diagrams and the project plan (activity, sequence, UML)	All	
9/12/2017	Team meeting	Finish up all the requirements for Homework #1 and assign tasks to group members		
9/13/2017	Homework #1 Due!	Have met at least twice - this is your last reminder from me in this template that you need to meet regularly outside of class - if you are not, you will not do well in this class; Have HW1 done; Have this	All	

		project plan completely filled in for review and comments back so you will know if you have a good plan to get to end-game; Have your client questionnaire finalized and be prepared to interview the client.		
	Object Recognition	Implement VGG and MS COCO for image detection and segmentation	Mike	
	ER Diagram	*Work on E-R diagram, and documention as well as IT requirements*	All	
9/20/2017	Homework #2 Due	E-R diagrams complete with supporting documentation if explanation is required for anything you document in your diagrams.	All	
	Mock-ups	Create wireframes of UI for Homework #3 using inVision	All	
	Style Transfer Algorithm for static images	Develop an algorithm that will combine content and style of arbitrary images	Mike	
9/27/2017	Homework #3 Due	Complete mock-ups (ie. wireframes) of your user interface.	All	
	Testing and Debugging of Algorithm on static images	Testing needs to be done to make sure algorithm is producing high quality artistically styled photos and is not too computationally expensive	mike	
	Database Design	Design postgres database	Morgan, Tony, Eric	
	Final Project Plan	Review comments of Project Plan Draft and complete the Project Plan final	All	

10/4/2017	UML diags final; proj plan final	Final Project Plan - updated with all input from instructor Final UML Diagrams		
	Front End	Build the front end of the system	Morgan, tony, Eric	
	Style Transfer on video	Update style algorithm so that it will work on videos	mike	
10/11/2017	Database design draft	Draft database design		
	Style Transfer on video	Continue same work as last week	mike	
	Data Store	Build back end for the platform. User should be able to create profile, save customized settings, upload content, store content, link profile with social media profiles.	Morgan, Eric	
	Private Cloud	Build a private cloud environment to enable the APIs	tony	
10/18/2017	Mid-semester peer reviews due	Complete initial (ie. first pass feedback) peer reviews		
	Style Transfer on video	Continue same work as last week	mike	
	IT requirements	Complete IT requirement draft	All	
	Admin Functions	Build the admin functions - edit order of queue of processes, clear the logs, access a report of system usage by a range of dates and see reports of users that get flagged	Morgan	
10/25/2017	Draft IT requirements,			

	including network design		
	Testing and Debugging of Algorithm	Further testing of our Deep Neural Network needs to done to insure the highest quality of style transfer	mike
	Database Prototype	Use the draft database design and build the database prototype	Morgan, tony, Eric
	Test Plan	Come up with the test plan	
11/1/2 017	Homewor k #4 Due	Database prototype complete	
	Testing and Debugging of Algorithm	More testing and debugging of the Algorithm	mike
	APIs	API will let user authenticate credentials, send media, send parameters, and retreive media	morgan, tony, Eric
	Project Demo	Work on integration btw different parts of the system to insure a successful project demo	All
11/8/2 017	First Demo of Prototype	Complete project prototype first-pass demo ready	
	Platform Improvem ent	Take critiques of demo and improve the platform as well as fixing issues if need be	All
	Test plan	Use prototype to finish up the test plan	All
11/15/ 2017	User Validation & Test plan finalized	Test plan for all aspects of the prototype complete User validation tests to be performed by client documented	

	User validation	Document user validation tests and update the platform if need be	All	
11/22/ 2017	Client Visit	Updates to user validation complete (as required) One key question to ask the client dcoumented		
	Draft Document ation	Complete draft of project documentation	All	
11/29/ 2017	Draft Document ation	All documentation required for the project in Draft form	All	
	Final Document ation	Complete final project documentation	All	
12/6/2 017	Paper Due - Final Document ation	All documentation required for the project in FINAL form	All	
	Presentati on	Prepare for the presentation!	All	
12/7/2 017	Final Peer Evaluatio ns	Complete final peer evaluation forms and submit	All	
	Presentati on	Prepare for the presentation!	All	
12/13/ 2017	FINAL PRESEN TATION!	Git er dun!	All	

Client Interview

- 1. What are the functions of the admin?
    - Be able to edit order of queue of processes, clear the logs, see reports of users that get flagged.
- 2. Is the user able to upload multiple photos at once?
    - Users will be able to upload one photo at a time.
- 3. What artists should we use to draw our artistic styles from?
    - Will have predefined set to choose from; however, premium users will be able to upload their own style images.
- 4. What social media platforms can the user upload to?
    - Facebook and Twitter
- 5. What are the customized settings that a user can save?
    - Customized settings include setting a profile picture and reusing the same style from previous stylized photo.
- 6. What is the maximum length video that a user can upload?
    - File size/length limit see youtube standards...most likely bound by the algorithm.
- 7. What is the maximum/minimum resolution for video/image provided on the platform?
    - 5 megabytes, increased resolution for paid users/ youtube video size.
- 8. If the user doesn't download or share images/videos to social media platforms are their images removed from our platform if they navigate away?
    - Premium users able to have unlimited number of pictures, 2 photo limit for free users.
- 9. If the user navigates away from our platform as they are applying a style on their content image/video does the process drop?
    - Yes, the process drops
- 10. Can the user upload their own style images?
    - See answer to question 3
- 11. If the user is able to upload multiple photos at once, would they be able to augment them all at the same time if using the same art style for each photo?
    - See answer to question 2
- 12. When user creates a profile is there any authentication requirement such as email confirmation?
    - User facebook or twitter api for confirmation
- 13. Acceptable turnaround time?
    - Kill it if it hangs for a long time
- 14. What file formats are accepted?
    - Mp4 for video/jpg and png for images
- 15. Difference between free and paid users?
    - Paid users get to use the api, save a large number of photos, no watermark, and upload their own style content, premium user can also have private user (Free version should have a watermark)

- 16. Can users view other users profiles?
    - Paid users can view other users profiles, throttle non paid users activities, must have some way to monitoring user activity (X power and space usage)
- 17. What platforms should this be deployed on?
    - Chrome, Safari
- 18. How much storage can premium users have on the ASP platform?
    - Premium users can store up to 15 Gb of images/videos on ASP

Global Requirements
- Web platform that can serve up to one million people in 2 years and at least 100 concurrent users
- Deep learning backbone that performs the image enhancement services. Must produce high quality artistically styled images/videos but must also be not be excessively computationally expensive. Content within a video must be stylized in a consistent way
- Data store that allows the users to store credentials as they authenticate onto the platform, authenticate into their social media profiles and save customized settings
- APIs need to be developed that allow premium users to authenticate credentials, send media, send parameters and retrieve media
- APIs need to be enabled on a Private Cloud that meets DoD standards
- Front end allows user to create a profile, choose from set list of style images to enhance their content images/videos, enhance their content media and share photos to facebook and twitter, and needs to be responsive
- Needs to be compatible with the LAPP server
- Needs to run well on Chrome and Safari
- Uploaded images must be a png or jpg file
- Uploaded videos must be a mp4 file
- The file size for images and videos has to follow Youtube standards
- Full report of tests done with respect to the cloud, and concurrent access increasingly varying the number of users up to 100

Admin Requirements
- Edit order of queue processes
- Clear the logs
- Access a report of system usage by a range of dates for data uploaded, processing time spent in the style transfer process and bandwidth

- Change priorities for users
- Access reports filed by users for profanic content

Free User Specific Requirements
- Is not allowed to have more than two photos or videos stored on their profile
- Does not have access to the APIs
- Cannot view other users profiles
- Premium User activity holds higher precedence
- Stylized photos will display a watermark

Premium User Specific Requirements
- 15 Gb limit on photo or video storage
- Is allowed access to the APIs
- Can view other users profiles
- Can upload their own style content
- Holds higher activity precedence than free user
- Stylized photos will not have a watermark

Use Case Diagram

Admin

View Reports

Clear Logs

Edit Queue

Change Priorities

View Usuage Reports

Login

Create Profile

Upload Own Style

Upload Image/Video

Style Image/ Video

Post Image/Video to profile/social Media Account

Free User

Premium User

Upgrade to premium user

Save content to local device or web platform

View Profiles

Report Images/Profiles

Access to API

Customize Account Settings

<p align="center">**Use Case Documentation**</p>

User:

- Create a profile
  - Users can make a username and password
- Login
  - Users can login through a social media platform
- Upload Content
  - Users can upload images and videos onto the platform
- Style Content
  - Users can stylize images and videos using the platform deep learning services
- Share with Social Media
  - Stylized content can be shared to Facebook and Twitter
- Save content to local device or web platform
  - Users are allowed to save stylized content to local devices or web platform
- Report Content
  - Content that contains profanity can be reported by users
- Customize Account Settings
  - Profile picture can be set
  - Users will be able to use the style that was just used prior to the content being styled now

Additional features if the user is a Premium user:

- Upload own style
  - Premium users can upload their own styles that can be used to style content
- View Profiles
  - Premium users can view other users profiles
- Customize account settings
  - Premium users can also update their payment information if it has changed
- Save content to local device or web platform
  - Premium users are allowed 15 gigabytes of storage
- Access to API
  - Premium users have access to platform's API

Additional features if the user is a Free user:
- Upgrade Account to premium Account
  - Free users have the option to upgrade their account to a free account
Admin User

- Login

- ○ Admin can login to the system with special system privileges
- ● View Reports
  - ○ Admin can view reports that have been filed by users
- ● Clear Logs
  - ○ An admin can clear system logs so that their Administrative Events log is empty
- ● Edit Queue
  - ○ The queue can be edited by an admin so that certain tasks are given certain precedence over others and to stop tasks that are slowing performance
- ● Change Priorities
  - ○ Admin can give premium users priority over free users if need be
- ● View Usage Reports
  - ○ Admin can view usage reports for:
    - ■ Data uploaded
    - ■ Processing time spent in the style transfer process
    - ■ Bandwidth

Free and Premium User Login Activity Diagram
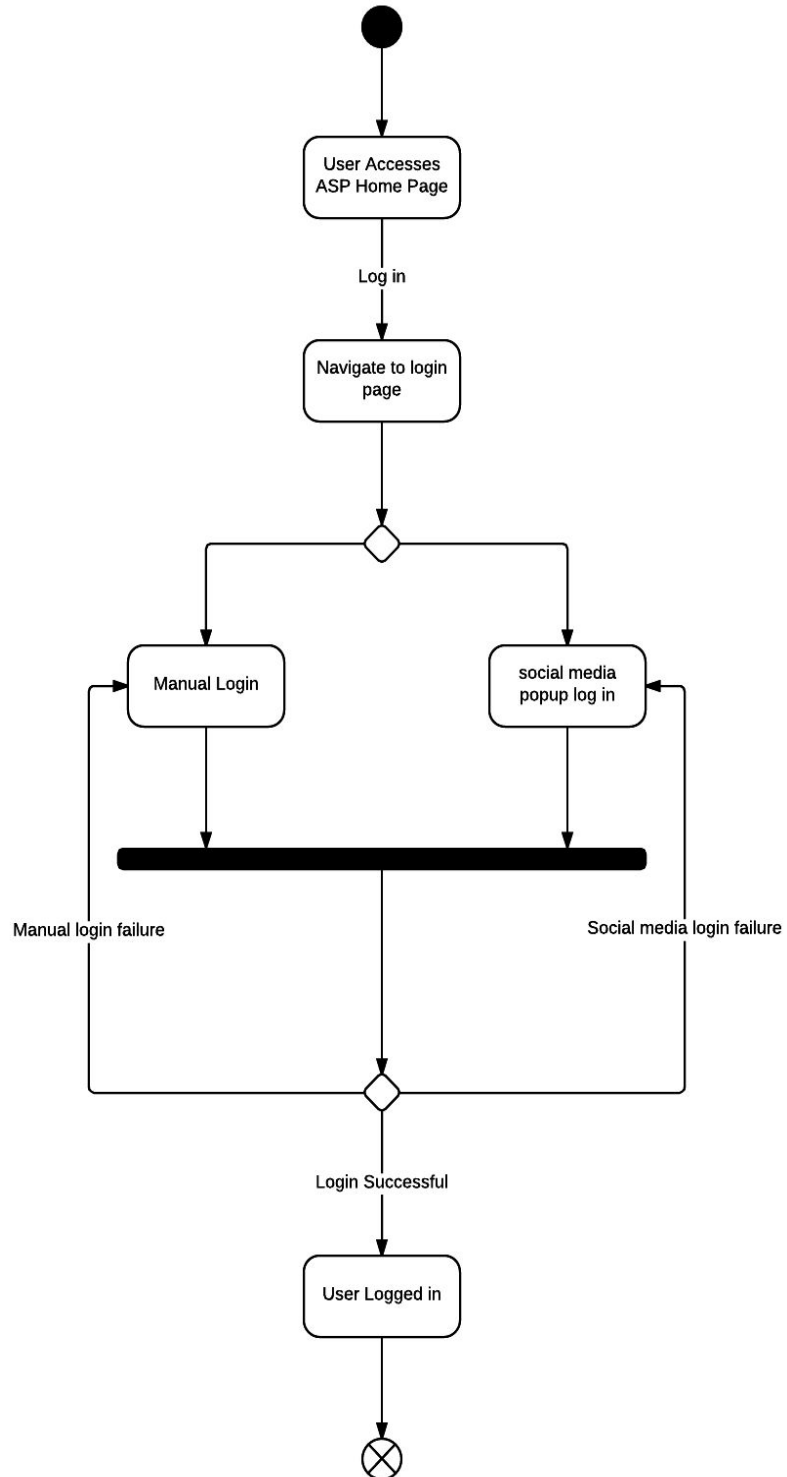
User Accesses
ASP Home Page

Log in

Navigate to login
page

Manual Login

social media
popup log in

Manual login failure

Social media login failure

Login Successful

User Logged in

Free and Premium User Login Activity Diagram Documentation

- **User Accesses ASP homepage**
  - When user selects the login option they will be brought to the login page

- **Navigate to Login Page**
  - **Decision Node:** Once on the login page user can choose to login with social media or do a manual login

- **Social Media Popup Login**
  - User will choose to login using facebook or twitter and then enter their login information
- **Manual login**
  - User will login using their login information for the platform
- **Decision Node**
  - **Social Media Login Failure**
    - User will be redirected to the social media popup
  - **Manual Login Failure**
    - User will be redirected to the manual login
  - **Login Successful**
    - If login credentials were correct then the user will gain access to the system

Admin Reported Content Activity Diagram
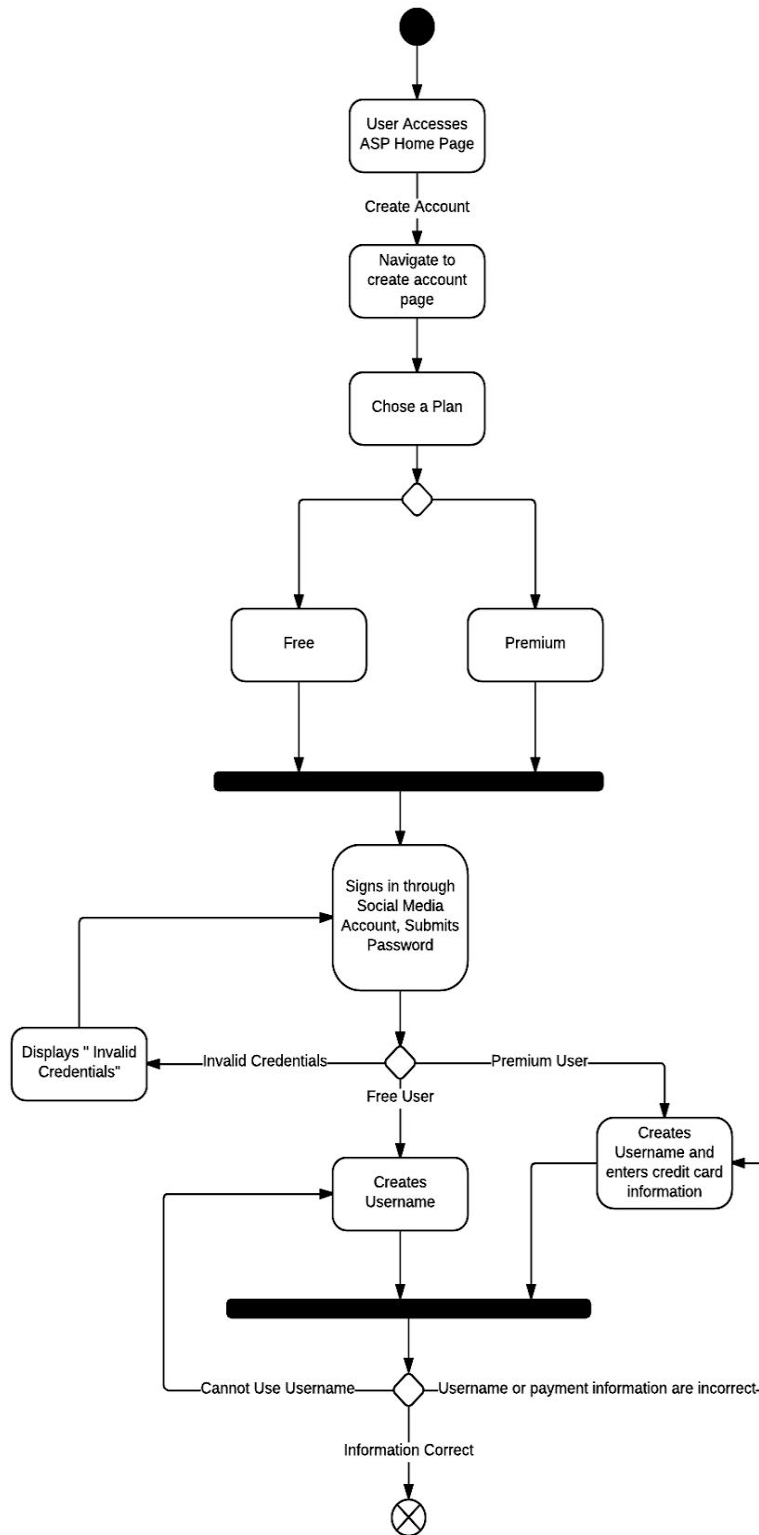
```
                    ●
                    │
          ┌─────────────────┐
          │ Admin Accesses  │
          │ ASP Home Page   │
          └─────────────────┘
                    │
                 Log in
                    │
          ┌─────────────────┐
          │ Navigate to     │
          │ login page      │
          └─────────────────┘
                    │
          ┌─────────────────┐
┌──────────┐       │ Navigate to     │
│Clears Logs│◄──────│ report logs    │
└──────────┘       └─────────────────┘
     │                   │
     │          ┌─────────────────┐
     │          │ Report Section  │
     │          └─────────────────┘
     │                   │
     │                  ◇
     │        Nudity    │    Grotesque Violence
     │                   │
     │           Vulgar Language
     │                   │
     │          ═══════════════════
     │                   │
     │          ┌─────────────────┐
     │          │ Decided whether │
     │          │ content contains│
     │          │ profanity       │
     │          └─────────────────┘
     │                   │
  ┌────────┐             ◇
  │Deletes │  Yes      ◇  No  ┌─────────┐
  │content,│◄──────       ──────►│Doesn't  │
  │warns   │                    │delete   │
  │profile │                    │content  │
  │about   │                    └─────────┘
  │possible│                         │
  │ban or  │                         │
  │bans    │         │               │
  │user    │         │               │
  └────────┘         │               │
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```
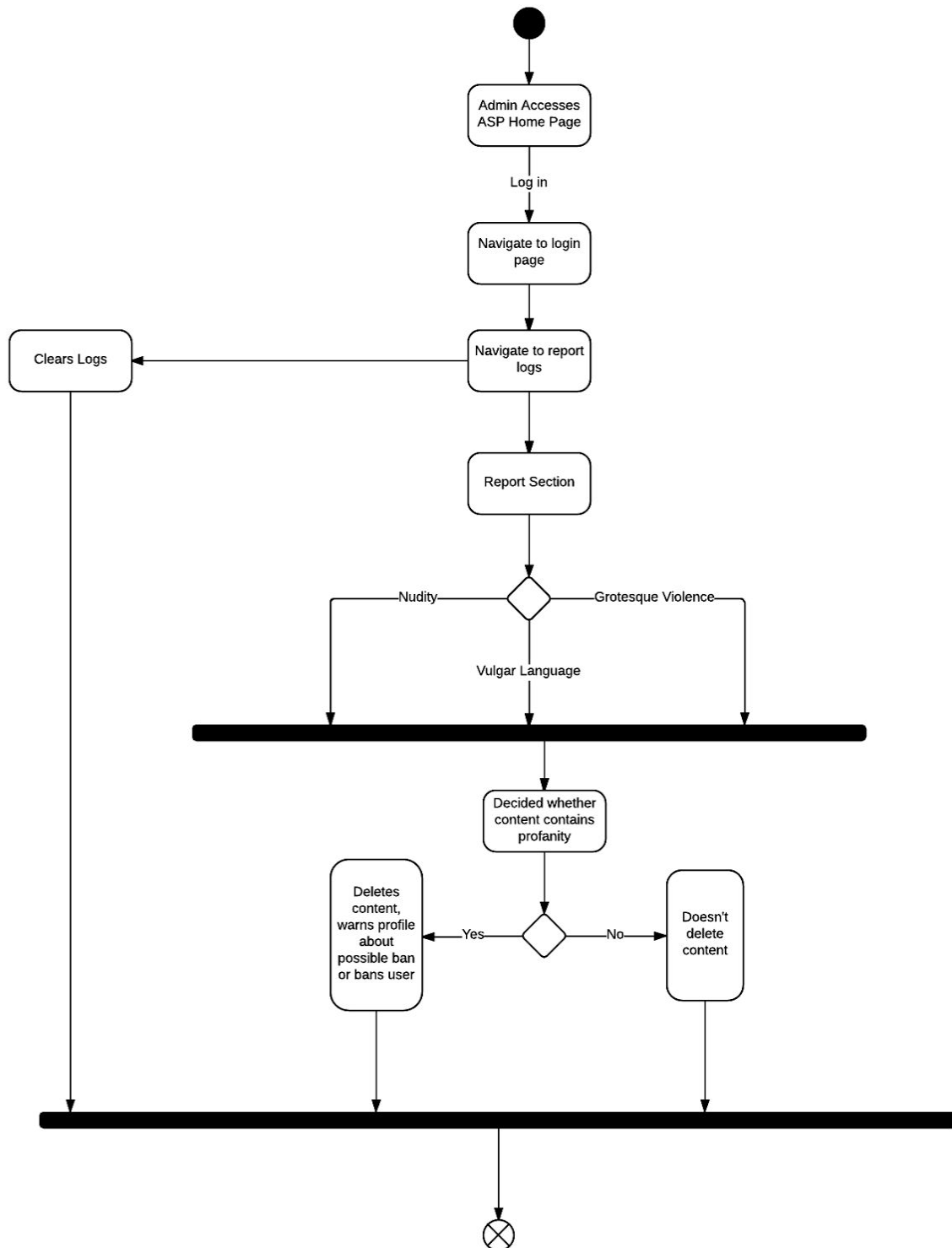
Admin Reported Content Activity Diagram Documentation

- **Admin Accesses ASP Home Page**
  - Admin accesses the home page
- **Navigate to login page**
  - Admin accesses the login page from the page and then logs in
- **Navigate to report logs**
  - Once logged in an admin user can either clear the logs or view the reports
- **Clear Logs**
  - When an admin clears the logs their Administrative Events List will be clear
- **Report Section**
  - **Decision Node:** The report section gets separated into three sections
    - **Nudity**
    - **Vulgar Language**
    - **Grotesque Violence**
- **Decided whether content contains profanity**
  - **Decision Node:** The admin will have to decide if the reported content contains the profanity that it was reported to have
    - **Yes**
      - **Deletes Content, warns profile about possible ban or ban user**
        - If the content does have profanity than the admin should delete it from the system. The admin can send a warning to the owner of the content if it is their first time, but if it has happened more than once than the admin can ban the user
      - **Doesn't delete content**
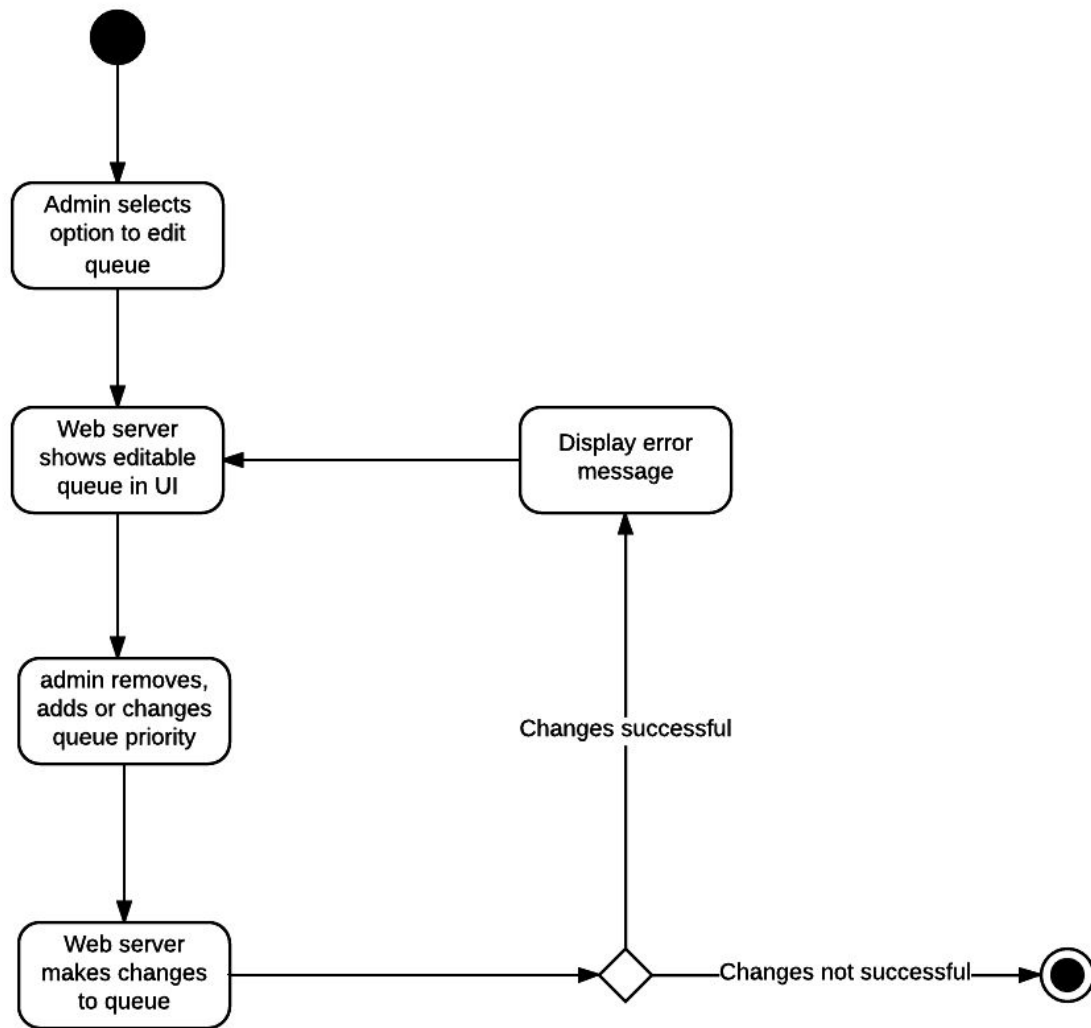   - If the content does not include profanity than the admin will not delete it from the system

Create Account Activity Diagram

User Accesses ASP Home Page

Create Account

Navigate to create account page

Chose a Plan

Free

Premium

Signs in through Social Media Account, Submits Password

Displays " Invalid Credentials"

Invalid Credentials

Premium User

Free User

Creates Username

Creates Username and enters credit card information

Cannot Use Username

Username or payment information are incorrect

Information Correct

Create Account Activity Diagram Documentation

- **User Accesses ASP Home Page**
  - When a user accesses the home page he or she will have the option to create an account
- **Navigate to Create Account Page**
  - On the create account page the user will have the option to choose a plan that he or she can sign up for
- **Choose a Plan**
  - **Decision Node:** The user can choose between a free and premium plan
    - Free
      - User will be directed to sign into a social media platform
    - Premium
      - User will be directed to sign into a social media platform
- **Signs in through Social Media Account, Submits Password**
  - **Decision Node:** User will be directed to the form pertaining to their account plan or if their login information was incorrect they will be asked to submit their login information again
    - **Invalid Credentials**
      - Display "Invalid Credentials" and ask user to sign in to social media platform again
    - **Free User**
      - User will be asked to input a username
    - **Premium User**
      - User will be asked to input a username and credit card information
  - **Decision Node:** User will be redirected depending on the information entered
    - **Cannot Use Username**
      - If a username the free user entered is already being used then he or she will be asked to enter another username
    - **Username or payment information are incorrect**
      - If the username a premium entered is already used or the payment information is incorrect he or she will be asked to enter the information again
    - **Information Correct**
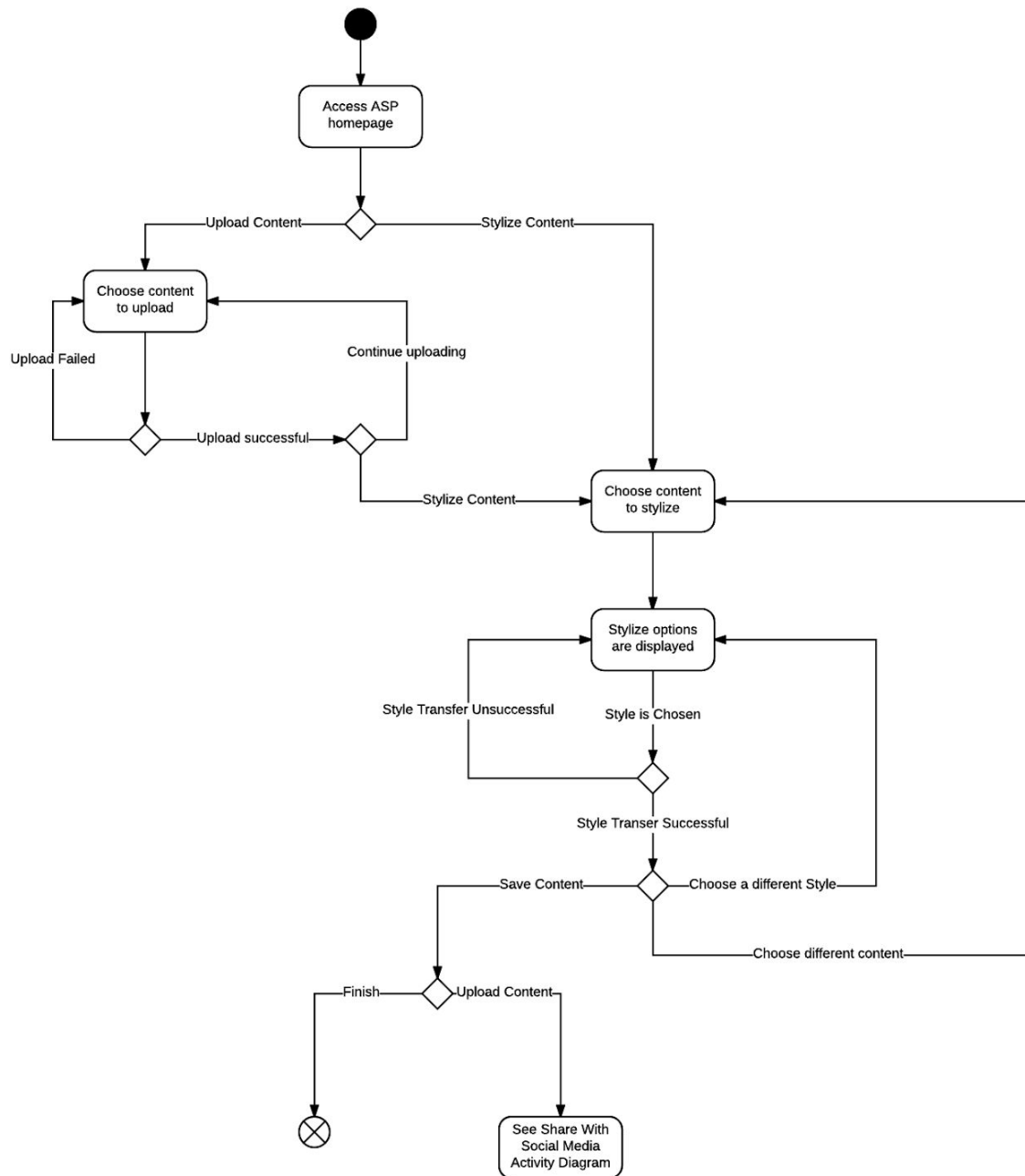   - If all information entered is valid than an account will be created for the free or premium user

Admin Edit Queue Activity Diagram

Admin selects
option to edit
queue

Web server
shows editable
queue in UI

Display error
message

admin removes,
adds or changes
queue priority

Changes successful

Web server
makes changes
to queue

Changes not successful

Admin Edit Queue Activity Diagram Documentation

- **Admin selects option to edit queue**
  - Once the admin is logged in he or she can choose the edit queue option on the home page
- **Web server shows editable queue in UI**
  - When the admin selects the option to edit the queue, the editable queue will be displayed in the user interface
- **Admin removes, adds or changes queue priority**
  - The admin is then able to change the queue priority to how he or she wants it
- **Web server makes changes to queue**
  - **Decision Node:** After the admin finalizes the queue priorities the web server will attempt to make changes to the queue
    - **Changes Successful**
      - If the changes to the queue were successful then the process is successful
    - **Changes not successful**
      - If the changes to the queue were not successful then an error message will be displayed and the web server will display the editable queue again

Upload/Save/Style Content Activity Diagram

Access ASP homepage

Upload Content — Stylize Content

Choose content to upload

Upload Failed

Continue uploading

Upload successful

Stylize Content

Choose content to stylize

Stylize options are displayed

Style Transfer Unsuccessful

Style is Chosen

Style Transer Successful

Save Content

Choose a different Style

Choose different content

Finish — Upload Content

See Share With Social Media Activity Diagram

Upload/Save/Style Diagram Documentation

- **Access ASP homepage**
  - **Decision Node:** When user logs in they will be first brought to the home page and they will have the option to upload a photo or stylize content
    - **Upload Content**
      - User will be able to choose content to upload if he or she chose to upload content

    - **Stylize Content**
      - User will be able to choose content to style if he or she chose to stylize content

- **Choose content to Upload**
  - **Decision Node:** When a user uploads content it will either fail to upload or be successfully uploaded
    - **Upload failed**
      - If the upload fails then the user can try upload content again
    - **Upload Successful**
      - **Decision Node:** If the upload of content was successful then the user has the option to continue uploading content or stylize content
        - **Continue Uploading**
          - If the user chooses to continue uploading he or she will be able to upload more content
        - **Stylize Content**
          - If the user chooses to stylize content he or she will first choose the content that they want styled

- **Choose Content to Style**
  - All the user's content will be displayed and he or she will have to choose the image or video that will be styled
- **Style Options are Displayed**
  - After the user chooses the content that will be stylized, the style options will then be displayed
    - **Decision Node:** The transfer of style will be successful or unsuccessful
      - **Style Transfer Unsuccessful**
        - User will be given an error message and will have to choose another style
      - **Style Transfer Successful**
        - **Decision Node:** If the style transfer was successful then user will be able to save the content or choose another style
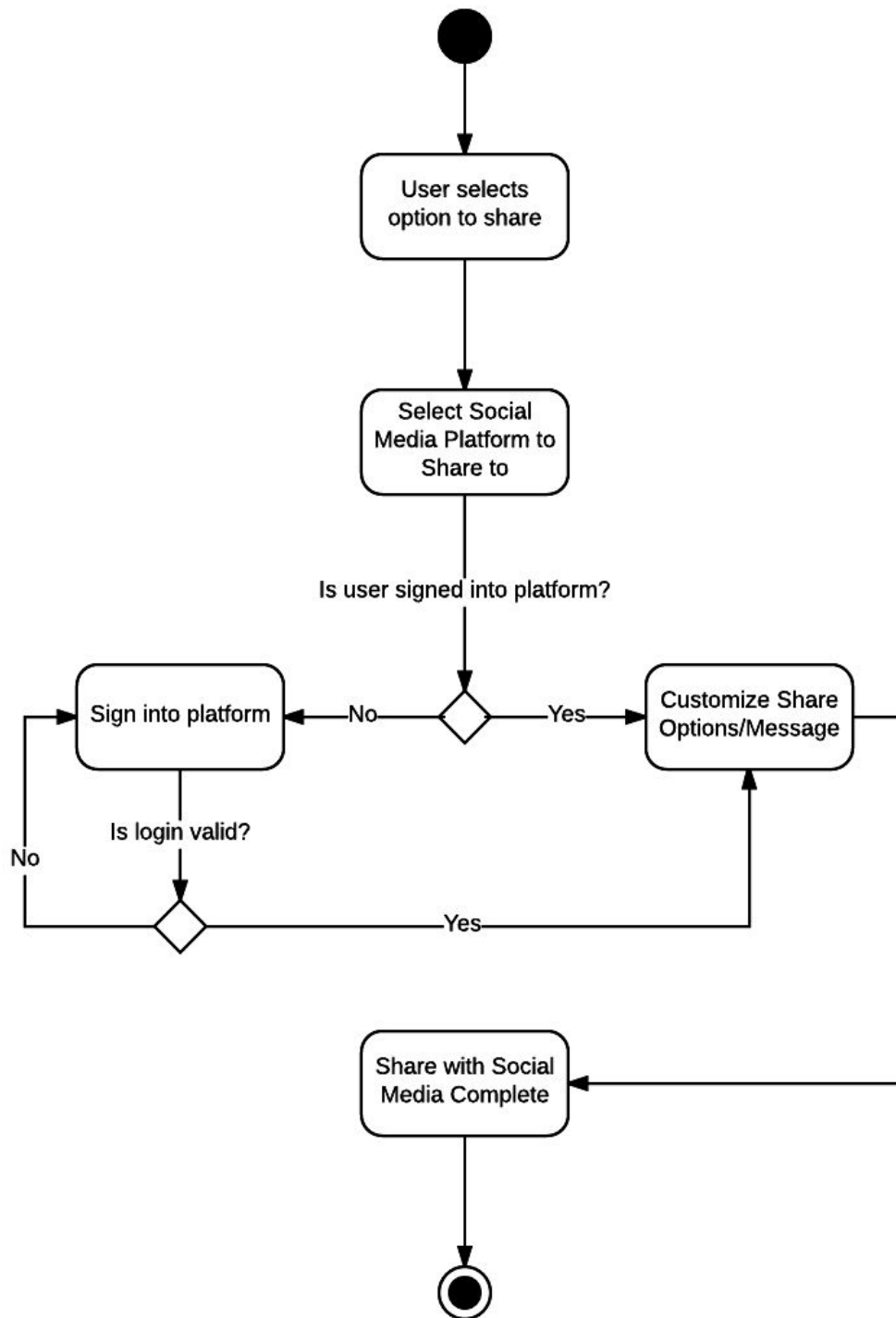
- **Choose a Different Style**
    - If user want to choose another style then he or she will be shown the style options again
- **Save Content**
    - If the user chooses to save content then the stylized content will be saved to the database and the user can then choose to upload the photo social media if he or she wants.

Share with Social Media Activity Diagram

User selects
option to share

Select Social
Media Platform to
Share to

Is user signed into platform?

Sign into platform ←No— ◇ —Yes→ Customize Share
Options/Message

Is login valid?
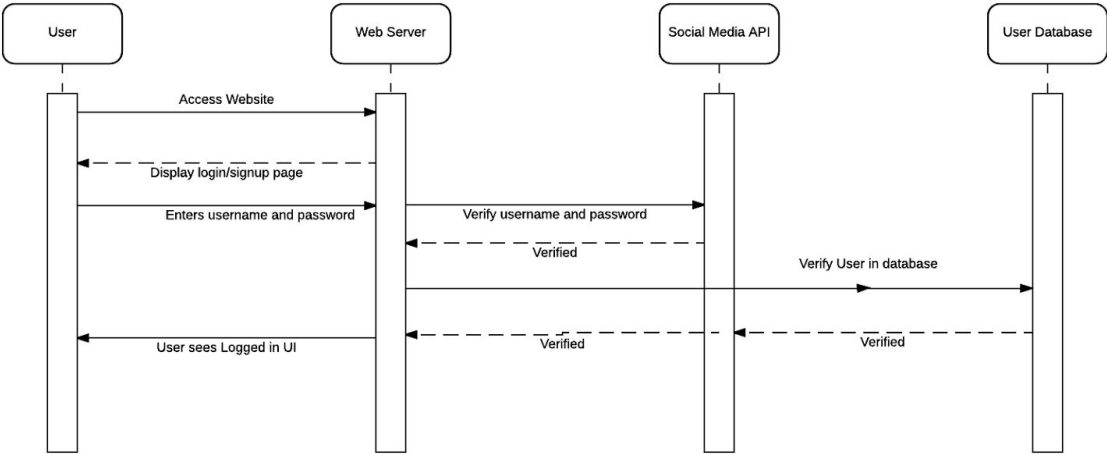
No

◇ —Yes—

Share with Social
Media Complete

Share with Social Media Documentation

- **User Selects Option to Share**
  - User chooses whether they want to share content on social media

- **Select Social Media Platform to share to**
  - User will be able to select a social media platform to share media content to

- **Is user signed into platform?**
  - **Decision Node:** Checks whether user is signed on any social media platform in order to share media content

  - **Yes:**
    - **Customize Share Options/Messages**
      - User is given options on how to share content on the social media platform
  - **No:**
    - **Sign into platform**
      - User would sign into their social media account if they are signed off
- **Is login valid?**
  - **Decision Node:** Checks to see whether user credentials are valid in order to sign in

  - **No:**
    - User is asked to re-enter username and password

  - **Yes:**
    - User is now able to choose options to share content to social media

- **Share with Social Media complete**
  - Content is uploaded to social media platform

User login Sequence Diagram

User	Web Server	Social Media API	User Database

Access Website

Display login/signup page

Enters username and password → Verify username and password

Verified

Verify User in database

User sees Logged in UI ← Verified ← Verified

User Login Sequence Diagram Documentation

User-

- Accesses website through Web Server

- If User doesn't have profile they enter their desired username and password into the web server

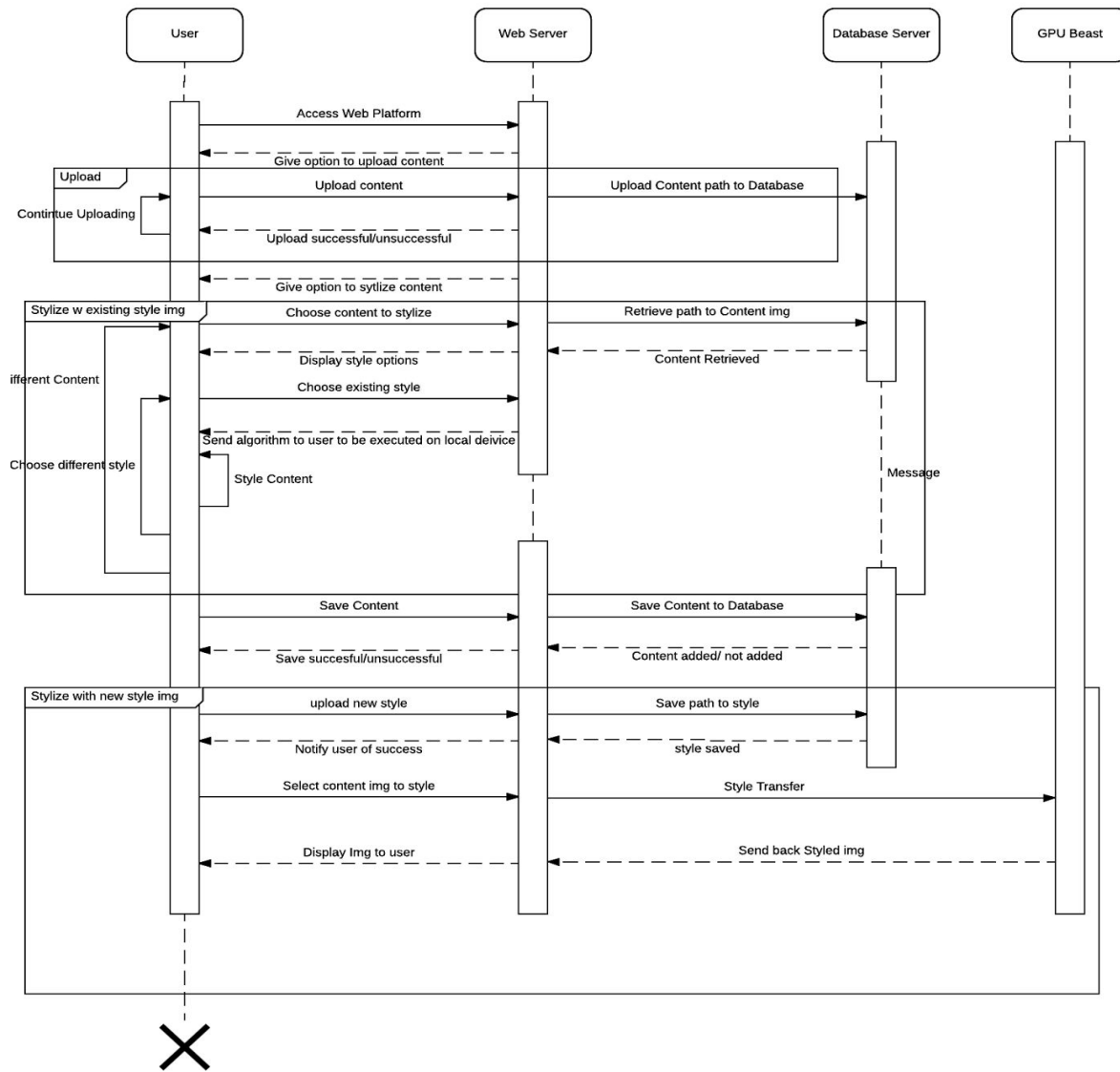- If User has profile they sign into the Web Server by entering username and password

Web Server-

- Displays login/signup page to User

- If User does have an account it will verify the inputted username and password with the User Database

- If User not have an account already it will check if the new username hasn't already been taken with the User Database

User Database-

- If User has an account it will verify the Web Server that the username and password is correct

- If User doesn't have an account it will verify the Web Server if the new username is available or not

Upload/Save/Style Content Sequence Diagram

	User	Web Server	Database Server	GPU Beast

Access Web Platform

Give option to upload content

Upload

Continue Uploading

Upload content → **Upload Content path to Database**

Upload successful/unsuccessful

Give option to sytlize content

Stylize w existing style img

Choose content to stylize → **Retrieve path to Content img**

Display style options ← **Content Retrieved**

ifferent Content

Choose existing style

Send algorithm to user to be executed on local deivice

Choose different style

Style Content

Message

Save Content → **Save Content to Database**

Save succesful/unsuccessful ← **Content added/ not added**

Stylize with new style img

upload new style → **Save path to style**

Notify user of success ← **style saved**

Select content img to style → **Style Transfer**

Display Img to user ← **Send back Styled img**

Upload/Save/Style Content Sequence Diagram Documentation

User-

- User accesses ASP web platform through web server

- User uploads their content image or video

- Users selects existing style image they want to apply to content image or video, Premium users are given the option to upload their own style image

- Premium users can choose option to save stylized content

Web Server-

- Web server gives users option to upload their content image or video

- Web server displays whether the upload was successful or unsuccessful

- When users uploads content web server logs paths of uploaded content to the database server.

- Give user option to stylize content when user chooses which content to stylize web server retrieves path to the content image from database server and returns the paths to the web server.

- Web server prompts user to select style to apply to content image or video

- Web server sends model files to User to apply style transfer algorithm on local device.

- Display stylized image/video for user

- Prompt user to save image/upload new style if premium user.

- If upload new style image web server sends new style image to GPU machine to retrain model

- Web server then receives new model file resulting from new style image training

Database Server-

- Database server logs path to new content when webserver sends it path to new image/video content

- Database server returns path to image/video content when requested from web server.

- When user selected to save content web server sends path of content to be saved to database server to save it's path.

GPU Server-

- When premium user uploads new style image web server sends the new style image to the GPU server to train a new model. Once the new model is trained on the new style image then the model file is sent back to the web server.

Admin Edit Queue Sequence Diagram
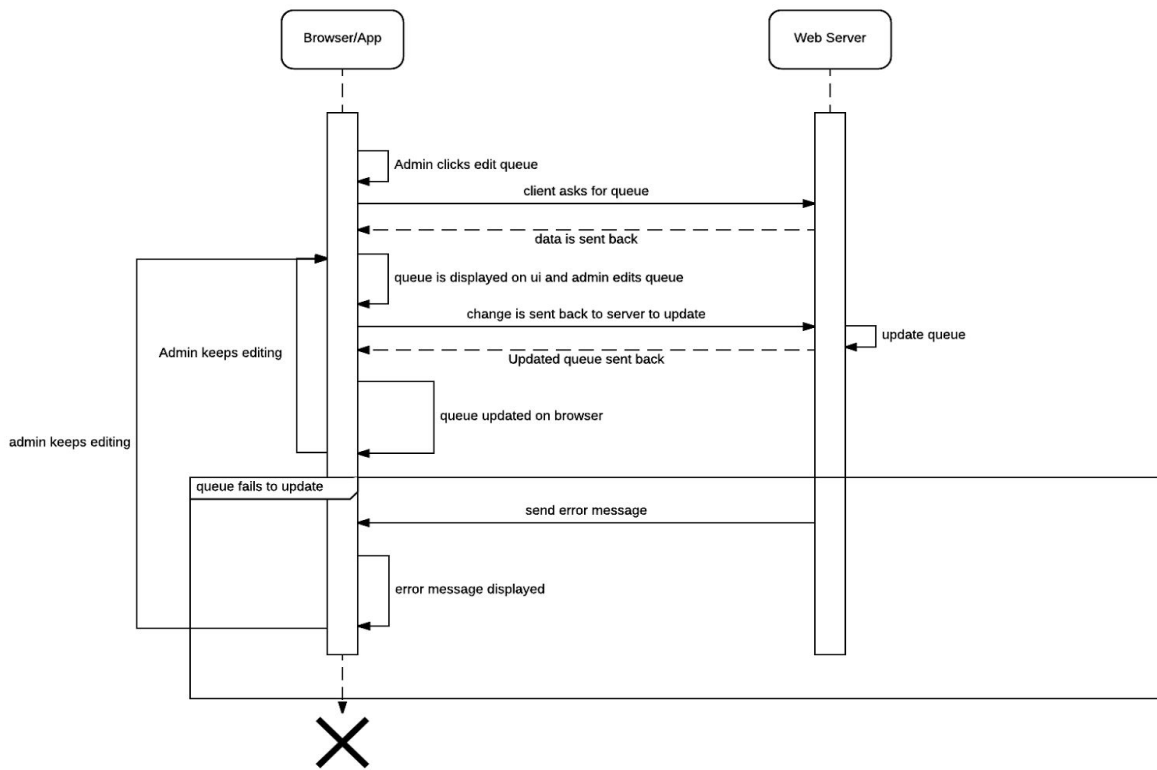
Admin Edit Queue Sequence Diagram Documentation
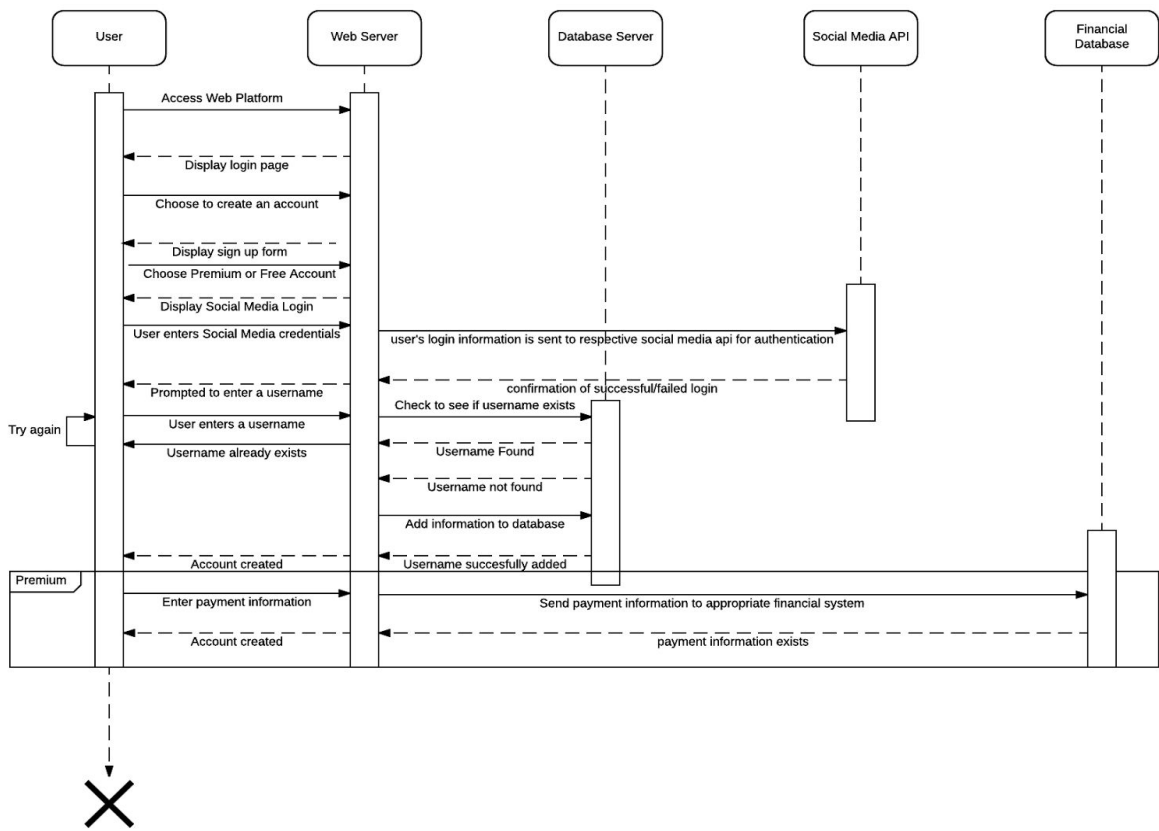
Browser/App (admin user)-

- Admin user selects to edit queue

- Browser/App client asks for queue from web server

- Queue is displayed on UI allowing admin to edit queue

- When admin makes to change to the queue he/she submits it and Browser/App sends

  changes back to the web server.

- Updated queue returned back from web server and displayed for admin user.

- If an error occurs because queue update fails then error message displayed.

Web Server-

- Web server returns queue data when requested from Browser App (admin user)

- When Browser App sends changed queue back that indicate how queue was changed then

  queue is updated on web server.

- Updated queue returned back to Browser/App client if update is successful; if queue

  update is unsuccessful then error message returned.

Create Account Sequence Diagram

User	Web Server	Database Server	Social Media API	Financial Database

Access Web Platform

Display login page

Choose to create an account

Display sign up form

Choose Premium or Free Account

Display Social Media Login

User enters Social Media credentials

user's login information is sent to respective social media api for authentication

confirmation of successful/failed login

Prompted to enter a username

Check to see if username exists

Try again

User enters a username

Username already exists

Username Found

Username not found

Add information to database

Account created

Username succesfully added

Premium

Enter payment information

Send payment information to appropriate financial system

Account created

payment information exists

Create Account Sequence Diagram Documentation

User-

- User accesses platform through Web Server

- User chooses to create an account through Web Server

- User decides whether they want a free or premium account through Web Server

- User enters social

Web Server-

- Sends login information to API

- Prompts user to write a message for image post

- Stores message in Database

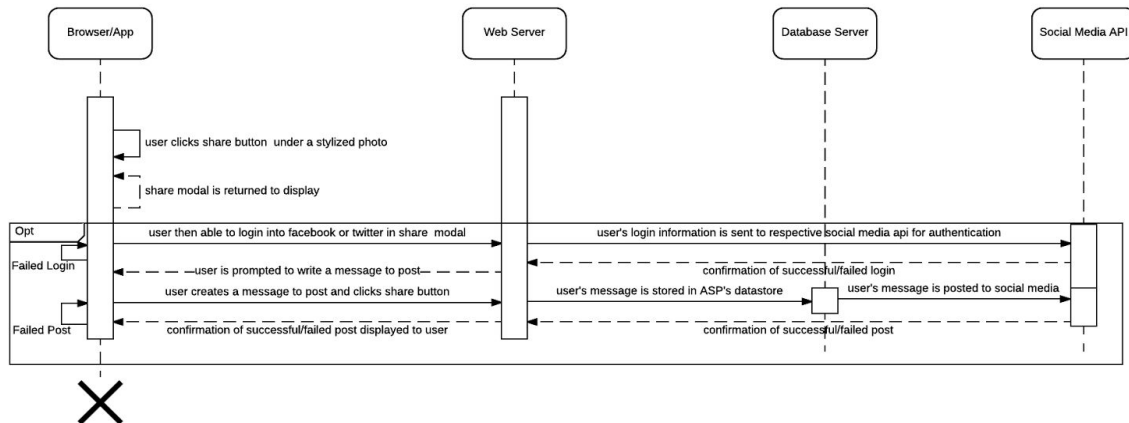- Confirms the User if post was successfully posted or not

Database Server-

- Sends User's message to API to be posted

Social media API-

- Confirms to the Web Server if successful login

- Confirms to the Webserver if the post was successfully posted

Share With Social Media Sequence Diagram

Share with Social Media Sequence Diagram Documentation

Browser/App

- User Shares stylized Photo

- User logs in through Web Server using social media authentication

- User creates status post with image when sharing

Web Server-

- Sends login information to API

- Prompts user to write a message for image post

- Stores message in Database

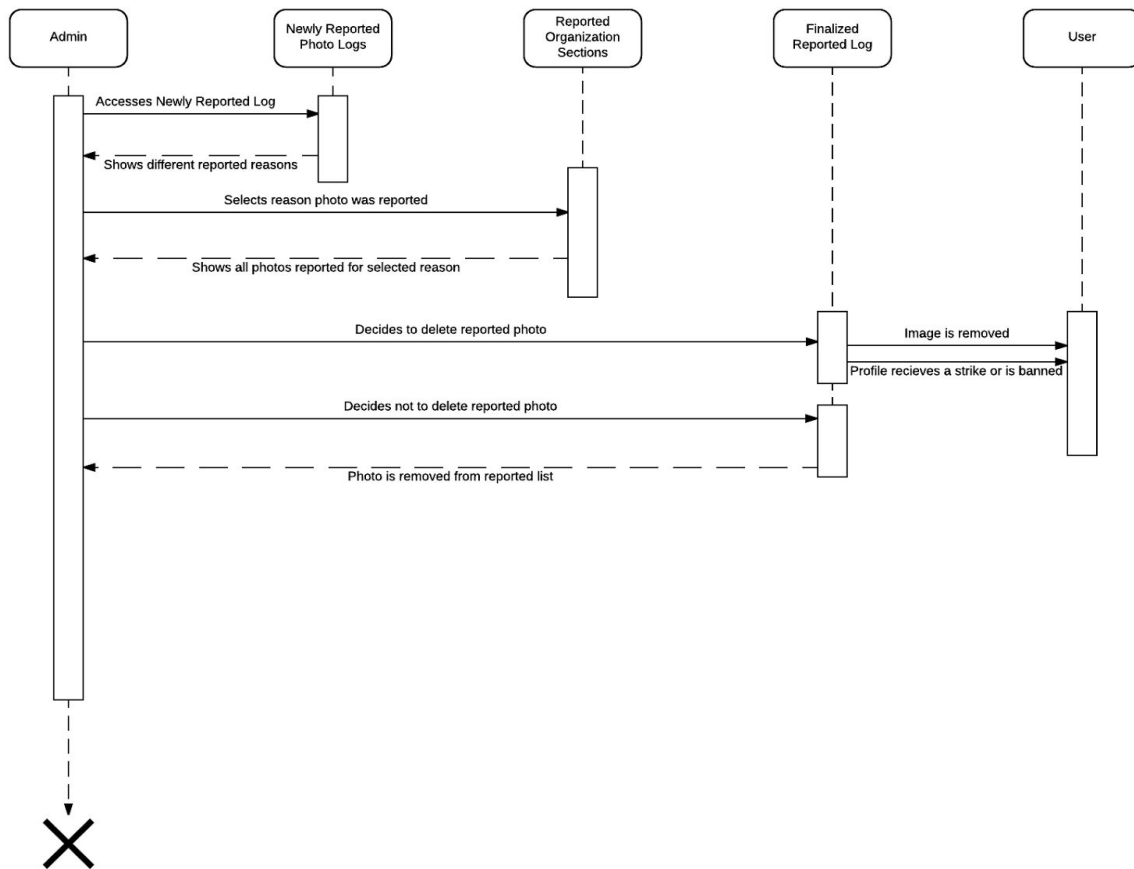- Confirms the User if post was successfully posted or not

Database Server-

- Sends User's message to API to be posted

Social media API-

- Confirms to the Web Server if successful login

- Confirms to the Webserver if the post was successfully posted

Admin Reported Photos Sequence Diagram

Admin Reported Content Sequence Diagram Documentation

Admin-

- Admin Accesses Log showing all unviewed reported photos interacting with the Newly Reported Photo Logs

- Admin reviews the Reported Organization Sections that sort images based on why they were reported

- Admin decides whether or not to delete reported picture, logging it in the Finalized Report

Newly Reported Photo Logs-

- Shows Admin different reported options

Reported Organization Sections-

- Shows User all photos reported by whatever reason user selected

Finalized Reported Log-

- If Admin removes photo it sends User a message explaining why photo was removed and issues a ban strike.

- Determines if User has collected three strikes in order to ban account

User-

- Receives removed picture message and potential banning from Admin