Group No..

3

Project Title: News Curation and Discussion App

CCS 3104 - Software Engineering 2 1st Semester A.Y 2021 - 2022

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CHAPTER 1 INTRODUCTION

1.1. Purpose

The News Curation and Discussion App is a project that aims to create a platform for people to discuss relevant and updated news. The web application acts as a usual forum site where a topic is discussed by threads of comments, and replies. Each participant interacts with one another via these threads, either through discussions, debates, or simply just giving their reactions to the topic.

However, unlike most forum applications, the News Curation and Discussion App does not just randomly deliver topics to the user's front page, but rather they receive topics based on their preset interests, therefore users no longer have to scroll through their feed in hopes of finding something that interest them. In addition, the site has a fake news-detecting algorithm to ensure that users receive news of reliable and trustworthy information.

1.2. Scope and Limitation of Project

The scope of the project is only limited to creating an application for intelligent discussion in which written articles by the users will be subjected for classification through machine learning.

The users of the application are limited only to Filipino netizens, news agencies, journalists, and scholars.



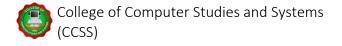
1.3. Glossary

Table 1.3.1 - Definition of Terms

| Term | Definition |
|---------------------|---|
| Curation | Cambridge Dictionary defines curation as "the selection of something such as documents, music, or internet content to be included as part of a list or collection or on a website." In this paper, curation specifically refers to the gathering of relevant news and information depending on the topics of interests of a user. |
| Feed | According to Socialmediawall.io, a feed is "a constantly updating list of stories from one social network." In this paper, it refers to the part of the application where a series of relevant news and posts are available to individual users where they can discuss with each other. |
| Filtering Algorithm | In this proposal, the filtering algorithm refers to the technology that will be used to segregate the news coming from different sources according to their relevance. This will help make sure that the contents in each user's feed are relevant to the current issues, trends and their topics of interests. |
| Forum | Based on the definition of Merriam-Webster's dictionary, a forum is a "a public meeting place for open discussion." Here, it pertains to the platform where the users can freely discuss and share information with one another. |
| Thread | Merriam-Webster's dictionary describes a thread as "a series of electronic messages (as on a message board or social media website) following a single topic or in response to a single message." In this paper, it pertains to the discussion or chain of comments from different users under a single post. |

1.4. References

Cambridge Dictionary. (n.d.). *Curation*. Retrieved May 19, 2021, from https://dictionary.cambridge.org/us/dictionary/english/curation





socialmediawall.io. (2016, October 22). Social media walls - what are they and why you may need one?

Social Media Wall.

https://www.socialmediawall.io/blog/socialwall/social-media-walls-whatare-they-and-why-you-may-need-one

Forum. (n.d.). The Merriam-Webster.Com Dictionary. Retrieved May 19, 2021, from https://www.merriam-webster.com/dictionary/forum

Thread. (n.d.). The Merriam-Webster.Com Dictionary. Retrieved May 19, 2021, from https://www.merriam-webster.com/dictionary/thread

1.5. Overview of Document

The rest of the document covered two major aspects before a software is engineered, each section rigorously detailed all the elements, especially the tools involved in the development process.

The section on the software's overall description expanded upon the frameworks used, the minimum system requirements for each tool involved, the characteristics of target users, and the constraints considered. Users of the application as well as interested developers might refer to this section as a detailed resource in understanding the system and its predecessors.



CHAPTER 2 OVERALL DESCRIPTION

2.1. System Environment

The News Curation, and Discussion App is a software with the purpose of being an online platform for sharing relevant news, and users interacting with each other via discussions on the said news. The app functions much like a forum wherein a main topic is posted by a user, which then, can be viewed by other users and the post itself being a place of discussion.

Usage of the app involves a set of users being divided into two subcategories. These are the regular users (users that are proper members of the app), and the anonymous users (or more commonly known as the lurkers.)

The app's system consists of multiple functions that are already commonly seen in other forum websites such as the log-in prompt, the feed, and the various interactions with content such as posting, rating, discussion, and saving. Although there is a difference in access between the regular users, and the anonymous users. Since anonymous users tend to be lurkers with no validated account, their access is only restricted to viewing contents. Should they wish to participate in any discussion, they must first create an account in the app as a regular user. The content interaction also has a function that first verifies the user before further actions are done to ensure the integrity of the actions done. Lastly, a filtering algorithm is involved to properly segregate the relevant news with respect to the

user's preset topics. This is to make sure that all of the news posted on the website is relevant to the current issues, or trends, depending on the user's interests.

Use-Case Diagram:

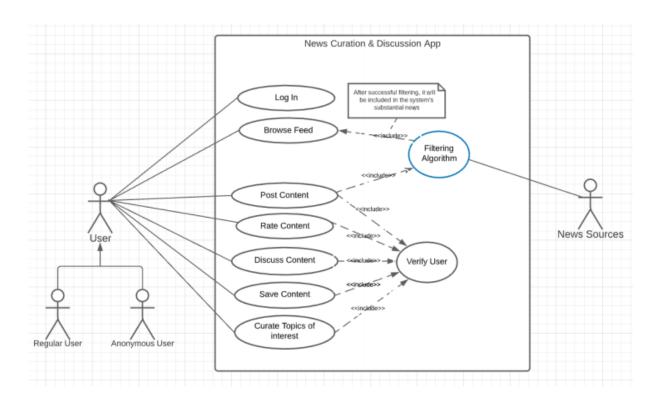
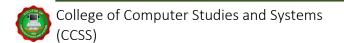


Figure 2.1.1 Use case diagram

2.2 Functional Requirements Specification

This section briefly discussed what each use case the web application have to offer for each actor. More details regarding the action taken are found in the next chapter.

Regular and Anonymous User use cases:



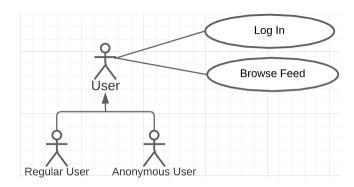


Figure 2.2.1 Use cases for both regular and anonymous users

• Log In

Users were able to access his personal account if valid.
 Corresponding validation would be made after an attempt.

Browse Feed

 Users were able to view and read the contents in the web application.

Regular Users use cases:

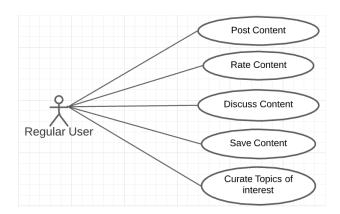


Figure 2.2.2 Use cases for registered users

Post Content

 Users were able to post contents they wish to discuss with other users.

• Rate Content

 Users were able to evaluate the contents by giving ratings to each post.

Discuss Content

 Users were able to make comments on contents to discuss with other users.

Save Content

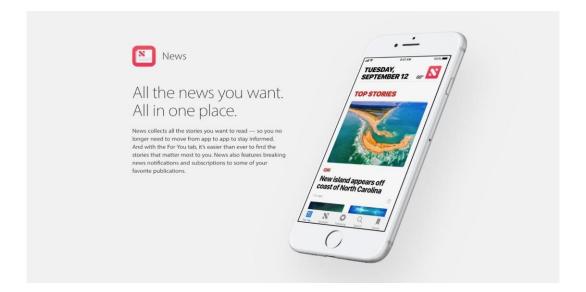
 Users were able to save the contents in the web application.

Curate Topics of Interest

 Users were able to customize their feed by indicating the topics and discussions that are relevant to them.



2.3 User Characteristics



The focus of the study is to observe the patterns of this News Curation and Discussion App within the context of the rise of the Internet which, in turn, has led to a process of transformation of the mass media and the creation of significant amount of online content by users, empowered by online tools such as blogs, video sharing sites and social network sites, collectively known as social media. Work had progressed to the point where we have an app that allows posts to be sent to the server and recalled by other users, the graphic interface is fairly straightforward and easy to use and hopefully it will gather a following among Filipino netizens, journalists and news agencies in the Philippines.

Digital platforms have changed the news. Consumption, distribution and production have altered fundamentally. For news producers, the pre-digital business model had crumbled. Journalism has multiple roles: it monitors and curbs



power; it supports and creates public debate; and it educates and entertains. News is a public good — it serves a purpose beyond the immediate needs of advertisers and consumers — but it is difficult to monetize that 'good'. Hence, it has traditionally needed a cross subsidy in the form of advertising or, in some cases, government support. To attract audiences, news producers make their content available to search engines and social media with little or no financial return. And to satisfy the workings of digital platforms, news producers create content that is more emotive and shareable.

2.4 Non-Functional Requirements

The application is essentially a social media technology and the participation of the primary and secondary parties, as defined in the system environment, necessitates the strict implementation and reinforcement of acceptable use policies. The application provides a concise set of guidelines to help its users contribute to a valuable and fun online community for news.

The nature of the system developed is to operate in real-time to actively facilitate user inputs such as votes, comments, posts, and others. This entails the development of an asynchronous web application that can send and retrieve data from the server asynchronously without disrupting the operation of the interface. The application server is expected to be working at all times in order to serve the project's goal of providing an active and fruitful platform for civilized discourse.



Since the web application must operate in real-time, it is essential that the system perform well and return results quickly and efficiently. More so that this is a news and discussion app, users expect the application to load and react instantaneously. Shumway (2014) cited a study which shows that a majority of users tend to abandon the website when it takes more than 3 seconds to load. Additionally, for every 1 second of delay in page response, conversions are reduced by 7%.

It should also be assumed that at the beginning, in any given time, the website may have somewhere between 500-1000 users concurrently using it.

Users are also expected to be either on a macOS or Windows computer since these are the most commonly used OS by the general public.

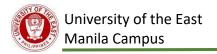
Therefore, performance-wise and considering all these points, the application must be able to support 1 thousand users on a daily basis and provide a response time not exceeding 3 seconds. All the content of the main page must be rendered within 3 seconds, including texts and images and on an LTE connection. These requirements must be satisfied regardless whether the user is on a Windows or macOS computer.

Regarding compatibility and portability, the web application must be crossplatform and cross-browser, meaning it must be able to support different browsers that are common today. It is also imperative that the website is responsive and able to load smoothly across all screen resolutions and devices, especially on mobile. Doing so will provide an optimal experience for users across the board. It



also means a higher conversion rate for the web application. At the minimum, the web app must be optimized for Google Chrome, Safari, Mozilla Firefox, Microsoft Edge, and Opera since these are the most used browsers today according to W3Counter.

Lastly, for the hardware requirements, the web app should be able to run effectively on a computer with a minimum of 1Ghz processor, 1GB memory, and a display with a resolution of 1024 x 768. This ensures that the website reaches a wide spectrum of users while still delivering a satisfying experience.



CHAPTER 3 REQUIREMENT SPECIFICATION

3.1 External Interface Requirements

Our app's interface consisted of essential interfaces that could be seen on most discussion, or forum platforms. First of all, since it is a web application, it is accessible through our web browsers, however since not all of us use the same one, it is one of the goals to make it compatible with all, at least known, browsers out there. Aside from that, there is also the fact that there are two potential types of users according to the device used, therefore our system should be able to comply with both the PC users and mobile users.

After that are the interfaces of the app itself, mentioned in section 2.1. First off is the login screen which acts like most login screens of other websites, verifying the information of users with accounts in the webapp. Lurkers, or guests, can skip this interface if they merely wish to browse the discussions and not participate. Next, there is a profile page for regular users to view their information, should they choose to disclose it, and recent posts. Finally there is the main body of the web app which are divided into the feed interface, and discussion interface. The feed interface acts as a filtering mechanism that serves to segregate news that may or may not interest the user, although since it is user based, lurkers would not be able to access this feature and instead would be fed with random, albeit relevant, news. The discussion interface is, as the name implies, where the discussions about the



news will take place. The thread is initiated with either a news clipping or a post from a user, then others will participate by commenting, or debating about the topic.

3.2 Functional Requirements

This section discussed in detail the services, which was explained briefly in chapter 2.2, each use case will have to offer to the actors of the web application. This includes validation, sequence of operations, and response to abnormal situations. The application is simply a news forum with advanced filtering. Hence, the operations used are straightforward and do not require complex thinking from the users. It was also designed in a way that the usage is intuitive.

Regular and Anonymous User use cases:

Log In

- Users are able to access their personal account by logging in using their username and password of a maximum of 60 alphanumeric characters. After an attempt, input details are queried in the server to look for matching details and log the user in. If there is none, the user will be given an alert that the account is invalid.
- Valid alphanumeric characters both for username and password are also limited to prevent attacks such as SQL injection.
- Validation will also be done in the backend to prevent users from overriding frontend constraints.

 Log in submissions also comes with a server generated cross site request forgery (CSRF) token to be also validated by the server itself to prevent such attacks.

Browse Feed

- Users are able to view and read the contents in the web application in the home page. However, each page will check if the current session is logged in to decide whether to display functionalities that are available only to valid users. This ensures that anonymous users would not be able to interfere with valid users.
- Valid pages are predetermined by the system. Hence, routes that are invalid simply return an error 404.
- In case the server does not respond properly or if the page is forbidden, appropriate http errors are returned.

Regular Users use cases:

Post Content

- Users are free to discuss topics with other users but validation will take place to ensure proper discourse.
- Upon posting, the amount of input is limited but not the valid characters. However, proper sanitizing is done in the backend on submission to attacks like SQL injection.
- Similar validation are also done on comments.
- Posts are subjected to the machine learning model to determine whether it is factual or not. If so, the post will

proceed to be posted. This will hopefully maintain the integrity of the application.

- Post submissions will also come with a server generated cross site request forgery (CSRF) token to be also validated by the server itself to prevent such attacks.
- In the case the server does not respond properly while validating or classifying posts, it returns the appropriate http error back to the user.

Rate Content

- Users are able to rate contents on their feed by either upvoting
 or downvoting posts and comments. If a user likes or agrees
 with what is written in a post or comment, they can upvote it.
 On the contrary, they can downvote a content if they don't like
 it, disagree with it or if they think that it is off topic.
- Contents with higher rating according to their number of upvotes and downvotes are shown on top. This ensures that contents that users see first are relevant based on other users' ratings.
- If the system does not respond properly when users are rating the contents, appropriate http errors are returned.

Discuss Content

- Users are able to discuss topics with the other users through comments. However, validation will be done to ensure proper discourse.
- As mentioned, similar validation applied in creating posts are also done on comments. When users make comments on posts, the amount of input is limited but not the valid characters. However, proper sanitizing is done in the backend on submission to prevent attacks like SQL injection.
- Comment submissions will also come with a server generated cross site request forgery (CSRF) token to be also validated by the server itself to prevent such attacks.
- In the case the server does not respond properly while validating the comments, it returns the appropriate http error back to the user.

Save Content

- Users are able to bookmark posts and comments from their feed that they think they would be needing later.
- Contents that are saved by the users can be viewed and read through a separate section in the web application. This makes it easier for the users to find or locate these posts and comments again.
- If ever the server does not respond properly, appropriate http errors are returned to the user.



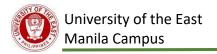
Curate Topics of Interest

- Users are able to customize their own feed by following different topics of interest. The application provides topics to the users where they can choose from depending on what contents they need or want to see.
- The application will select related contents through user interest filtering algorithm. This will make sure that only related posts according to the user's interest are shown in their feed.
- In the case the server does not respond properly while validating the comments, it returns the appropriate http error back to the user.

3.3 Detailed Non-Functional Requirements

A full listing of the non-functional requirements, accompanied by proposed specifications, are provided in this section.

For the logical database, users are able to post 'opinion' news, often requiring corroborating articles or other information. The discussions that takes place are all collected and stored on multiple physical disk files and hard drives within the server that hosted the application. The logical database can span multiple physical hard disks depending on the current size of contents. To have a logical database, all given hard disks and information files are required to be accessible from a single source.



Several design constraints were considered during the entire development process. Collected user information were handled accordingly and users were given complete control over their personal information. Forum activities would also be managed by assigning apt features to users in order to ensure the integrity of discussions. The schedule that was decided or imposed upon the developers affected the overall prioritization of features and models. The work breakdown structure was helpful in managing components of prime concern within the time span allotted. A handful of resources were gathered across the internet that helped the developers maximized the efficiency of the web application.

Various software standards have been issued by Government and industry groups to ensure the safety and security of software usage. In order to deliver a trustworthy and secure web application for news dissemination and discussion, compliance to these standards are of utmost importance. The source code was reviewed repeatedly, with emphasis to security and readability. IT security goals were defined and processes such as vulnerability management was implemented. The webapp strictly adhered to the Data Privacy Act and guaranteed the protection of all forms of user information - private, personal, or sensitive.

Below is an entity-relationship diagram representing the different entities within the news curation web app and how they relate to each other.

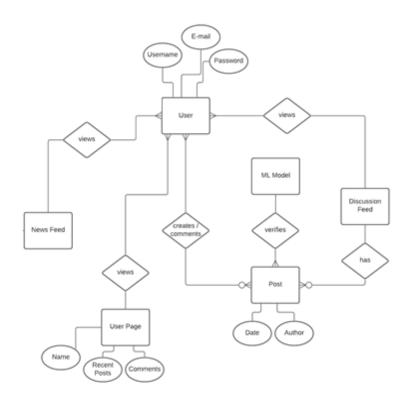
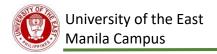


Figure 3.3.1- Entity-relationship diagram



CHAPTER 4 THE SYSTEM'S SOFTWARE STUDY

4.1. Description of the Current Study

This section will discuss the currently existing system that our project was mostly based upon. Our project was mostly based from an online forum platform called Reddit. It is a website which, at the same time has a mobile app version to make it compatible to mobile users. Reddit has a wide variety of topics to choose from, even having denominations called subreddits, each one dedicated for posts regarding a certain subject.

Like other forum-type websites, Reddit allows its users to post topics relating to a certain subject. Other users can then comment on these topics, and other users can reply to these comments, creating a thread. Also, posts and comments can be 'upvoted' or 'downvoted', increasing, or decreasing, respectively, the karma value of the post/comment, and the user. Post, and comments with high Karma value are more likely to be seen by the public eye, meanwhile user's Karma are merely there as reputation points.

Other Users Sign Up Information Chat Login Details

Sign Up Logged In? Create Thread Logged In?

Figure 4.1.1 - Flowchart of Main Reddit Functions

4.1.2. Narrative Description of the System

4.1.1. Context Flowchart of the Study

As mentioned, Reddit is an online platform for discussion among its users. Though that is not to say that non-users don't get to experience it as it is also available even to those without an account, albeit with limited functions.

Covering a wide variety of topics may prove difficult to keep track for users, and so in order to remedy that, there are denominations of reddit called subreddits. These subreddits can be accessed by adding r/ followed by the specific category as long as it exists. Regular users can also join these specific subreddits, doing so will prioritize posts from these subreddits to the user's front page.

4.1.2.1. General Transactions Involved in the System

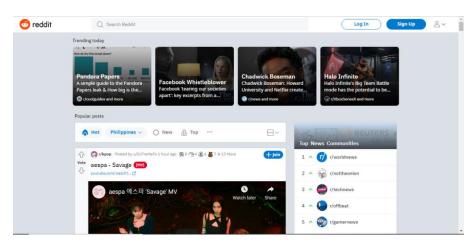


Figure 4.1.2 - Homepage

This is the first thing that new visitors shall be viewing on Reddit. It acts as the sites frontpage, showing popular topics that users may find interested in which can be affected by their recent search history.

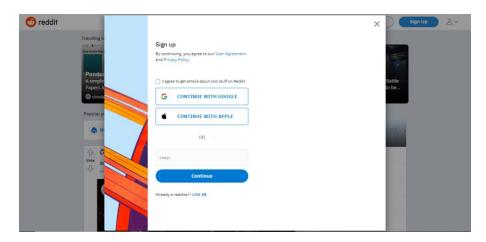


Figure 4.1.3 – Sign Up

This is where visitors can create accounts in the site which gives them more interactive functions than the non-regular users or the lurkers.

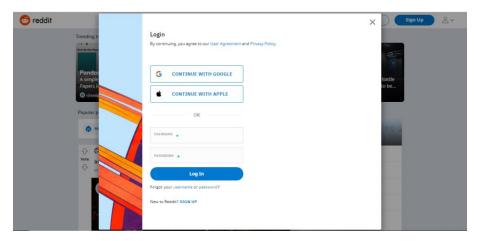


Figure 4.1.4 - Log In

Once new users have created their accounts, they can then login to Reddit, upgrading them from view only users, to regular users.

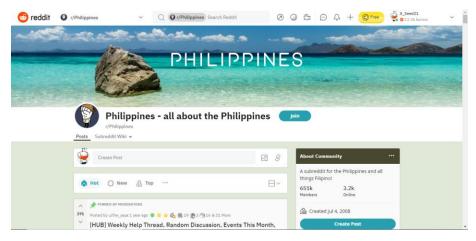


Figure 4.1.5 – Subreddit

These are the denominations that are dedicated to a specific topic/function. Regular users can join these subreddits and their front

page shall prioritize posting of threads from these subreddits. These subreddits can be accessed directly by adding r/(category) to the URL. (Example for this subreddit, it can be accessed by typing https://reddit.com/r/philippines)

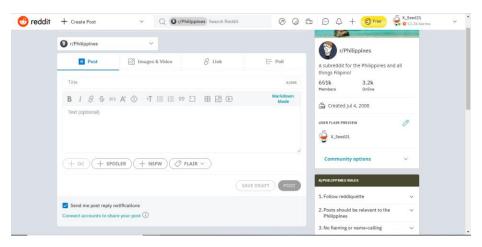


Figure 4.1.6 – Create Thread

This is the UI for creating threads. Users can start topics by selecting the Create Post option from the homepage/subreddit. Doing so will direct them to this interface which prompts them to a title and a content box (both fields are required to be filled.) If the user accessed this from the front page, an additional option at the top is added where they will be asked which subreddit/community should the post be sent to. Additionally, there are optional selections that can be include which further filters the topic such as spoiler (for content that users may not view unless selected, useful other movie/games/book subreddits), NSFW (for content that may be deemed as inappropriate such as graphic images/videos, 18+ artworks, and the likes), and Flairs (further filtering for each subreddit.) Lastly, most subreddits do not require users to join for them to post.

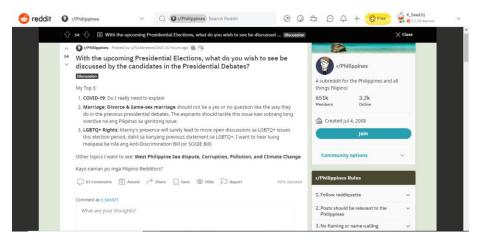


Figure 4.1.7 - Thread Proper: Commenting

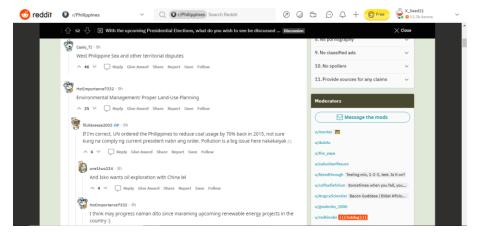


Figure 4.1.8 – Thread Proper: Comment Section

This is where discussions take place. The first image shows the topic posted by other users (or you), and the comment box below where you can type your thoughts on the matter at hand. The second image shows the flow of discussion wherein a comment is replied upon by other users. A visible line is seen beside the replies to keep track of where the reply was directed to. Replies can branch out indefinitely but only a limited amount of them can shown on screen. To view

more, users will simply have to select a dropdown box below that isolates the comment chain from the main thread.

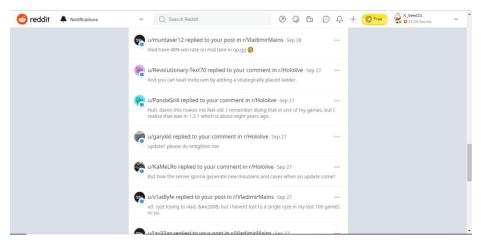


Figure 4.1.9 - Notification

This can be accessed through the bell icon on the main menu bar. The Notification is where users are alerted for any interactions to their previous activities (creating post, and commenting.) Users are notified of other users commenting on their posts, other users replying to their posts, or posts rejected from being posted due to some rule breaks, or unauthorized posts.

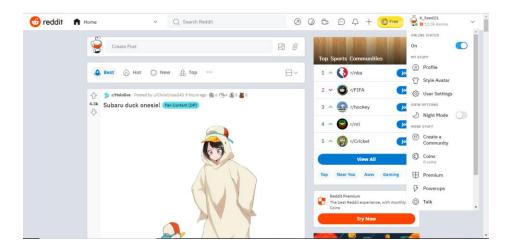


Figure 4.1.10 – Other Interfaces

There are other minor interfaces in Reddit with straightforward functions such as the Chat (chat icon beside the bell icon) which allows the user to private message other users, Reddit Live (camera icon beside the chat icon) which allows the user to livestream in a community, Profile, Style Avatar, and User Settings which are for user customizations.

4.2. Description of the System

This section shall discuss the specifics of our project, which includes its different functions, and features. Our system, the News Curation and Discussion App, is a forum application, much like Reddit, that allows its users to discuss about news posted on the application.

Through here, they are able to converse, share opinions, or simply voice out their thoughts on any relevant news. In addition, users are able to filter out news that they will see on their homepage through a category selection system on account creation, which can be edited later on.

4.2.1. Context Flowchart of the System

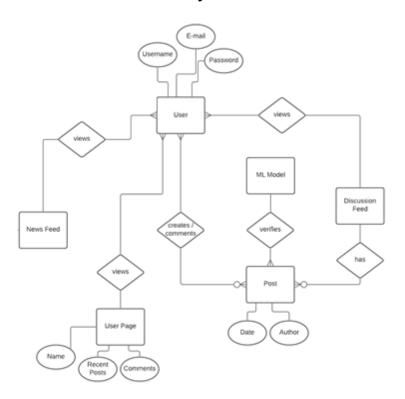
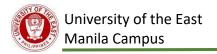


Figure 4.2.1 – Context Flowchart of the System

4.2.2. Narrative Description of the System

The News Curation and Discussion App is a forum application that allows users to converse through topic threads. These topic threads are either news—taken from reliable sources, or other users creating posts on their own. These news are then posted on the user's front page. The contents of the front page may vary depending on the user's selected area of interests.



Similar to Reddit, users can post comments, reply to other people's comments, or upvote/downvote threads as they see fit. There is also a save function that allows them to save the thread into their profile for later viewing.

4.2.3. User Level Specification

There are three levels of users that may access the application; the Admin, the Regular Users, and the Lurkers.

Admins – They are responsible for the overall administration of the application. They have special admin privileges such as deleting posts that are not appropriate for viewing, ban regular users who may have committed violations of proper etiquettes, or delete comment chains that are going out of hand.

Regular Users – These are what makes up most of the app's population. Regular Users have access to majority of the app's function such as creating posts, commenting, saving posts, upvoting, downvoting, or simply viewing.

Lurkers – They are users that does not have an account on the app. They can still take a look around the app, view posts, read comments. They do not have the permission to do any more than the mentioned functions. If they wish to participate, they will have to create an account and join the Regular Users.



4.2.4. User Interface Specification

4.2.4.1. Screen Designs and Description of the Modules

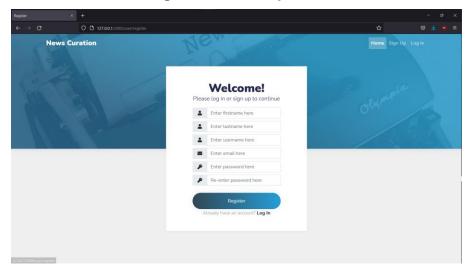


Figure 4.2.2 - Sign Up

This is where interested users can create an account which allows them access to most of the app's functions. Apart from the username, and password, all the other fields are simply used for recording purposes and therefore does not affect their experience in the application, nor their personal data be used by the system.

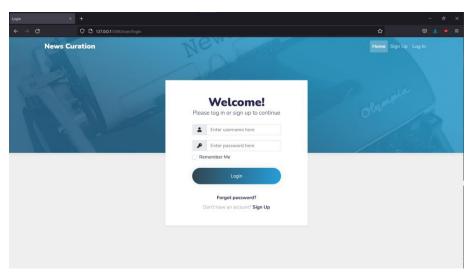


Figure 4.2.3 - Log In

This is where regular users with created accounts login and experience the application as intended.

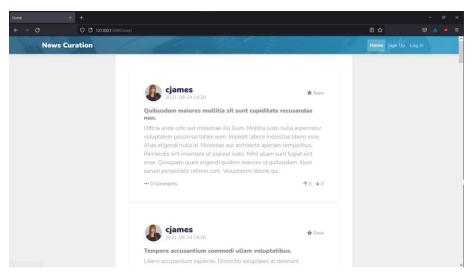


Figure 4.2.4 – Homepage/Frontpage

This is what greets the users as they login, or simply access the application. It shows the most recent, and relevant news relating to their selected topics of interests. Lurkers however are shown with

unfiltered relevant news as the system does not have the data that filters their interest.

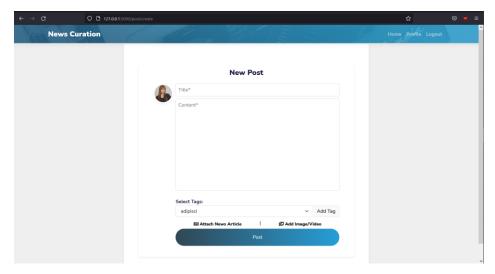


Figure 4.2.5 – Create Post

This is the interface that greets the user should they select the create post option. In here, they are given two fields to fill up, the title that will show up as their post's headline on the front page. The second field is where the content of their post shall be typed in. Although users have the freedom to type in whatever they wish to share, the system may prevent a post from being published if it is deemed that the topic is of no reliable source, or purely just fake information.

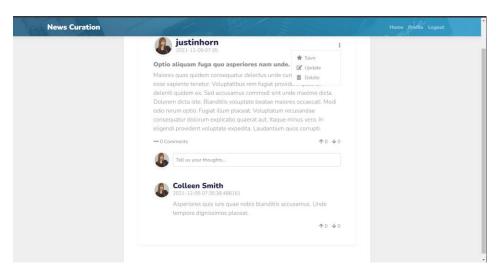


Figure 4.2.6 – View/Comment on Post

This figure shows the interface of a user viewing a post. The post is shown in the middle along with the username of the author. Regular users are allowed to post their comments regarding the topic on the field shown below, however, like the create post module, if the user's comment is of no reliable source, or outright just fake information, the system will prevent it from being published. Additionally, there is an upvote, and downvote system for posts and comments shown by the up and down arrow, respectively. Regular users can select one as they see fit which increase, or decrease a post, or comment's 'points.' A post, or comment with more points are more likely to be seen on top of the frontpage/thread than the rest.

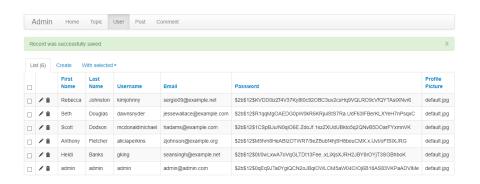


Figure 4.2.7 – Admin Dashboard

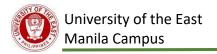
This is an interface, accessible only by users with Admin-level authority. Through this dashboard, admins are able to monitor the regular user's accounts, and with this, they can edit information when asked by the users, or delete accounts of malicious users that are violating common internet ethics, or is observed too much to attempt to post, or comment fake news.

4.2.5. Software Specifications

The News Curation and Discussion App does not ask much in terms of software as it should be able to run on the most commonly used web browsers such as Microsoft Edge, Mozilla Firefox, Opera, and Google Chrome.

4.2.6. Hardware Specifications

As for the hardware requirements, the application should be able to run effectively on a computer with at least a 1Ghz processor, 1GB Memory, and a 1024 x 768 screen resolution.



CHAPTER 5 – SUMMARY, CONCLUSION, AND RECOMMENDATION Summary

The News Curation and Discussion App is an online discussion platform where users are able to share news articles and discuss them with each other. The app is mostly based on Reddit, which is also an online discussion platform but with a more broader topic. However, with this app, a built in fake news detector is implemented in order to filter out the fake news that any malicious user, or simply users who failed to verify the source, would have posted. With this, the site is assured to be free of any false information; therefore, other users will not be fed with any fake news. It is the goal of our project to provide avid news readers a platform where they can discuss legitimate news with other people.

Conclusion

At the end of the development period, the developers were able to create the News Curation and Discussion App with the aforementioned features. The overall design of the application is relatively simple but the text are easy to read, and pleasant for the eyes. Throughout the entire system, the design remains consistent as to not include any unnecessary eye candy that will only serve as a distraction to an informative app.

As for the modules, numerous combination were tested for the log-in app in order to satisfy the constraints for the fields. The Homepage was properly created to show the proper topics to be posted on it. As for the Create Post, and commenting features, the fake news filtering was properly implemented to prevent news, or comments with fake information to be posted on the app, therefore maintaining its integrity as an informative webapp for news readers.



Recommendation

For our recommendation for future possible developers of this application, we would recommend the filtering algorithm to extend to the lurkers of the app. This may be done by observing users' activity via the logged in account on their browser, such as what activities have they been doing lately, in order for lurkers to have an already generated filtered feed once they visit the application. With this, they may find interest on logging onto the app themselves and joining the regulars on their discourse. Also, for aesthetical purposes, future developers may also implement a design-change feature, and a background music feature to give users a comfortable experience while using the app.

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