

Project Documentation

Project Title: **Monitoring and mitigating misinformation that disrupts adaptation to climate driven health threats**

Team Members:

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- **Capstone I:** Roberto Lopez-Trigo, Colleene Mccurdy, Augusto Castro, Titus Thomas

Product Owner(s): Sam Malloy

Mentor(s): Sam Malloy, Mowafak Allaham, Ayse Lokmanoglu

Instructor: Masoud Sadjadi

Abstract

This document presents the foundation of our work over the course of the Spring 2022 semester. The primary goal of this program is to create a system that involves a general dashboard to help monitor misinformation in the climate space. The information used to populate the dashboard comes from various sources such as FEMA, Newswhip, and Media Bias Fact Check. The project is broken up into three spaces; the data pipeline that automates the influx of data that comes in daily, the Database to house and organize the data, and a dashboard that helps users infer from this data.

Table of Contents

INTRODUCTION

.....
6

CURRENT SYSTEM

.....
6

USER STORIES

7.....
.

IMPLEMENTED USER STORIES

.....
7

PENDING USER STORIES

.....
8

PROJECT PLAN

HARDWARE AND SOFTWARE REQUIREMENTS

.....
9

SPRINT PLANS

.....
10

Sprint 1

.....
10

Sprint 2

.....
12

Sprint 3

.....
14

Sprint 4

.....
15

Sprint 5

.....
17

Sprint 6

.....
19

Sprint 7

.....
22

SYSTEM DESIGN

WIREFRAME NOTES ARCHIVE

.....
25

DATASET DESIGN NOTES ARCHIVE

.....
30

DIAGRAMS

.....
34

APPENDIX

APPENDIX A - CODE BREAKDOWN

.....
39

APPENDIX B- SPRINT REVIEW REPORTS

..... 45

Sprint 1

.....
45

Sprint 2

.....
47

Sprint 3

.....
49

Sprint 4

.....
51

Sprint 5

.....
53

Sprint 6

.....
55

Sprint 7

.....
58

APPENDIX C - INSTALLATION / MAINTENANCE/ USER MANUAL

61.....

APPENDIX D - SHORTCOMINGS & WISHLIST DOCUMENT

65.....

REFERENCES

67.....

INTRODUCTION

We created a prototype of a tool that will help researchers identify patterns that occur in the climate social space. This was achieved through the use of a dashboard that pulled data from various sources into one highly interactive space. This gives power to researchers for studying the social attitude towards climate.

There are similar implementations applied to other topics such as Covid(Covaxxy). Our approach differs by offering an indepth look into the articles that cause misinformation campaigns on the publisher/article scale. Every project comes with its risks and ours is the risk of misrepresentation of data. Visuals and sources must be vetted thoroughly before being adopted, in order to be reliable.

Overall, this is the first iteration of the project and with any first time there comes a lot of uncertainty. It was demanding of the team, but tested us in ways that we found enlightening. In the following document you will find a detailed outline of our current system, the user stories we focused on during this iteration, and pending use cases for the next iteration.

Current System

The presentation tier displays information specified by a criteria chosen by the user. Interactive features are implemented for organization and ease of use. Pare down your reports using filters. For news articles, filter by source and sub filters include article and, furthermore, headline, keyword, and total engagement count. FEMA data can be filtered by disaster type, displaying states with a color scheme classified by quantity. The overall system atmosphere provides a data model, view, and control.

The Application tier functions as a middleware between the backend and the frontend. The data is currently a static file but in future iterations it will be served by a database. The database is currently being served using SQLite within a django framework. Throughout the document, you will find out our archive and the current plans that are set-in-place for the project.

USER STORIES

Due to some constraints earlier through the semester, there were not many user stories to implement since we've been in a lengthy planning phase of the project. Unlike some other Capstone projects that carry over from previous iterations, this project is created entirely from scratch.

All Implemented User Stories

- User Story 1 - Prepare and handle documentation of Sprint Documents.
- User Story 2 - Install and configure Python Tools
- User Story 3 - Install and configure compatible IDE.
- User Story 4 - Review Python Programming skills
- User Story 5 - Research Technical Implementation
- User Story 6 - Create a visual representation of wireframes
- User Story 7- Setup a Github repository where the group can collaborate
- User Story 8 - Research on Dataset Implementation
- User Story 9 - Learn to effectively navigate and utilize github repository
- User Story 10 - Create a video presentation in a certain aspect of the project
- User Story 11 - Research Front-End development approaches
- User Story 12 - Visuals QA, assure that visualizations follows PO's expectations
- User Story 13 - Continue working on Dataset Implementation data
- User Story 14 - Project Documentation, archive any progression as part of our deliverables.
- User Story 15 - Team rework, split group into teams to start making significant progress.

- User Story 16 - Creation of Backend team, responsible for organizing the data and creating scripts that generate data visualizations from various sources such as newswhip.
- User Story 17 - Creation of Middleware team, creating the logic to invoke backend scripts for creating data visualizations.
- User Story 18 - Clean up the Headings and Titles
- User Story 19 - Implement Date Range options for dashboards.
- User Story 20 - Implement Credibility Options
- User Story 21 - Import data to Django db as csv
- User Story 22 - Implement In-house Filter Tool
- User Story 23 - Create a histogram of SOURCE engagement count
- User Story 24 - Implement FEMA Disaster Declarations
- User Story 25 - Create a histogram of ARTICLE engagement count
- User Story 26 - Implement Date Range Slider
- User Story 27 - Enable word count for bar graph labels
- User Story 28 - Implement the graphs linked into one dashboard
- User Story 29 - Analyze ways to implement a color code bar to show general bias through a color coding system.

All Pending User Stories

- User Story 30 - Implement frontend development
- User Story 31 - Have weekly PowerPoint to present progression

PROJECT PLAN

From this part of the document, we'll demonstrate our progression through utilizing daily scrum user stories, software/hardware requirements for the project, and other related dependencies that were involved in the project.

Hardware and Software Req

Hardware:

- Any computer with an OS. There isn't any particular hardware that is needed for this project.

Software:

- Python - The main language that is used for this project.
- Visual Studio Code 2019 - Typically our main IDE that's used to implement most of our features. Any other IDE should be fine.
- Django - Assists in managing the database and plotly app.
- Plotly - Allows a point & click interface. Assists in the creation of the project's dashboard.

Sprint Plans

Sprint #1 Planning Meeting

Project: Monitoring and mitigating misinformation that disrupts adaptation to climate driven health threats

Date: Jan. 18th, 2022

Start Time: 9:30 pm

End Time: 10:20 pm

Attendees:

Developers:

- Capstone 2
 - Kevin Da Silva (KD) (**Capstone II Leader**)
 - Jesus Fernandez (JF)
 - Santiago Alvarez de Araya (SA)
 - Tyler Nguyen (TN)
 - Zackary Wright (ZW)
- Capstone 1
 - Roberto Lopez-Trigo (RLT) (**Capstone I Leader**)
 - Colleene Mccurdy (CM)
 - Augusto Castro (AC)
 - Titus Thomas (TT)

The product owner introduced us to the abstract of the project. He wants us to form a data pipeline to collect data from social media sites to identify and combat misinformation. After introducing ourselves and getting to know with the product owner, the following user stories have been conducted:

Sprint User Stories:

- User Story 1 - Google Drive

Description - Prepare and handle documentation of Sprint Documents.

Assigned to - KD, RLT

- User Story 2 - Software Downloads

Description - As the strong possibility of using the Python language will arise from using this project, everyone is required to download Python tools.

Assigned to - Everyone

- User Story 3 - Training

Description - As we wait for the next meeting with the Product Owner, besides doing real-life obligations and other classes we must refine our coding skills – more particularly at least get a grip of some Python.

Assigned to - Everyone

Sprint #2 Planning Meeting

Project: Monitoring and mitigating misinformation that disrupts adaptation to climate driven health threats

Date: Jan. 31st, 2022

Start Time: 6:00 pm

End Time: 7:00 pm

Attendees:

Developers:

- Capstone 2
 - Kevin Da Silva (KD) **(Capstone II Leader)**
 - Jesus Fernandez (JF)
 - Santiago Alvarez de Araya (SA)
 - Tyler Nguyen (TN)
 - Zackary Wright (ZW)
- Capstone 1
 - Roberto Lopez-Trigo (RLT) **(Capstone I Leader)**
 - Colleene Mccurdy (CM)
 - Augusto Castro (AC)
 - Titus Thomas (TT)

The product owner has given us more prep time and resources for us to formulate the idea of how we'll approach this project.

Sprint User Stories:

- User Story 1 - Google Drive

Description - Prepare and handle documentation of Sprint Documents.

Assigned to - KD, RLT

- User Story 2 - Read Product Owner's Resources

Description - As we wait for future meetings with the Product Owner, everyone is responsible for reading all the material given to us in order to get an idea of what we'll do for the project.

Assigned to - Everyone

- User Story 3 - Training

Description - As we wait for several meetings with the Product Owner, besides doing real-life obligations and other classes we must refine our coding skills – more particularly at least get a grip of some Python.

Assigned to - Everyone

Sprint #3 Planning Meeting

Project: Monitoring and mitigating misinformation that disrupts adaptation to climate driven health threats

Date: Feb. 14th, 2022

Start Time: 6:00 pm

End Time: 7:00 pm

Attendees:

Developers:

- Capstone 2
 - Kevin Da Silva (KD) (**Capstone II Leader**)
 - Jesus Fernandez (JF)
 - Santiago Alvarez de Araya (SA)
 - Tyler Nguyen (TN)
 - Zackary Wright (ZW)
- Capstone 1
 - Roberto Lopez-Trigo (RLT) (**Capstone I Leader**)
 - Colleene Mccurdy (CM)
 - Augusto Castro (AC)
 - Titus Thomas (TT)

Sprint User Stories:

- User Story 1 - Software Downloads

Description - Everyone is required to look up Figma and Balsamiq to understand the process of the implementation of wireframing and the construction of the UI..

Assigned to - Everyone

- User Story 2 - Google Drive

Description - Prepare and handle documentation of Sprint Documents.

Assigned to - KD, RLT

- User Story 3 – Technical Implementation

Description – Technical implementation is our main concern, trying to push for something coding-wise to be done by the end of February.

Assigned to - Everyone

Sprint #4 Planning Meeting

Project: Monitoring and mitigating misinformation that disrupts adaptation to climate driven health threats

Date: Feb. 23th, 2022

Start Time: 6:00 pm

End Time: 7:00 pm

Attendees:

Developers:

- Capstone 2
 - Kevin Da Silva (KD) **(Capstone II Leader)**
 - Jesus Fernandez (JF)
 - Santiago Alvarez de Araya (SA)
 - Tyler Nguyen (TN)
 - Zackary Wright (ZW)
- Capstone 1
 - Roberto Lopez-Trigo (RLT) **(Capstone I Leader)**
 - Colleene Mccurdy (CM)
 - Augusto Castro (AC)
 - Titus Thomas (TT)

Sprint User Stories:

- User Story 1 - Front End Build

Description - As we approach for the next few sprints, working on a build is our main concern as we need to present our project by the end of the semester.

Assigned to - Everyone

- User Story 2 - Visuals for Datasets

Description - We'll need to find ways on how to visualize and display the given datasets given to us by the PO.

Assigned to - KD, JF, SA, TN, ZW

- User Story 3 - Project Documentation

Description - Handle group documentation

Assigned to - KD, RLT

- User Story 4 - Video Tutorial Quality Assurance

Description - Capstone I will assist with quality assurance in regards to my video presentation tutorial.

Assigned to - RLT, CM, AC, TT

Sprint #5 Planning Meeting

Project: Monitoring and mitigating misinformation that disrupts adaptation to climate driven health threats

Date: March. 21st, 2022

Start Time: 6:00 pm

End Time: 7:00 pm

Attendees:

Developers:

- Capstone 2
 - Kevin Da Silva (KD) **(Capstone II Leader)**
 - Jesus Fernandez (JF)
 - Santiago Alvarez de Araya (SA)
 - Tyler Nguyen (TN)
 - Zackary Wright (ZW)
- Capstone 1
 - Roberto Lopez-Trigo (RLT) **(Capstone I Leader)**
 - Colleene Mccurdy (CM)
 - Augusto Castro (AC)
 - Titus Thomas (TT)

Sprint User Stories:

- User Story 1 - Further Dataset Representations

Description - Continue with work on visualizations and create potentially final plans for them to present to the PO.

Assigned to - (KD), (JF), (SA), (TN), (ZW)

- User Story 2 - Visual Quality Assurance

Description – Capstone I Students are expected to review visual representations of datasets and determine possible changes to be made or plans for implementation to assist the Capstone 2 students.

Assigned to – (RLT), (CM), (AC), (TT)

- User Story 3 - Project Documentation

Description - Handle group documentation

Assigned to - (KD),(RLT)

- User Story 4 - Video Tutorial Quality Assurance

Description - Capstone I will assist with quality assurance in regards to other Capstone II students' video presentation tutorials.

Assigned to - (RLT), (CM), (AC), (TT)

Sprint #6 Planning Meeting

Project: Monitoring and mitigating misinformation that disrupts adaptation to climate driven health threats

Date: April 4th, 2022

Start Time: 9:00 pm

End Time: 10:00 pm

Attendees:

Developers:

- Capstone 2
 - Kevin Da Silva (KD) **(Capstone II Leader)**
 - Jesus Fernandez (JF)
 - Santiago Alvarez de Araya (SA)
 - Tyler Nguyen (TN)
 - Zackary Wright (ZW)
- Capstone 1
 - Roberto Lopez-Trigo (RLT) **(Capstone I Leader)**
 - Colleene Mccurdy (CM)
 - Augusto Castro (AC)
 - Titus Thomas (TT)

Sprint User Stories:

- User Story 1 - Frontend
 - Kevin Da Silva (KD)
 - Santiago Alvarez de Araya (SA)

This team will be responsible for creating the website layout and necessary JS logic.

This team will be responsible for creating frontend components to be used for future Capstone iterations of the project.

As of yet, the main focus at the moment is to initialize development of the date slider and the drop down menu.

- User Story 2 - Backend
 - Augusto Castro (AC)
 - Jesus Fernandez (JF)
 - Titus Thomas (TT)
 - Colleene McCurdy (CC)

Responsible for organizing the data and creating scripts that generate data visualizations from various sources such as newswhip.

- User Story 3 - Middleware
 - Tyler Nguyen (TN)
 - Zackary Wright (ZW)

This team is responsible for connecting the react frontend to the Django backend and creating the logic to invoke backend scripts for creating data visualizations.

- User Story 4 – Documentation
 - Kevin Da Silva (KD)
 - Roberto Lopez-trigo (RLT)

As we approach the end of the semester, documentation is **necessary** to demonstrate all of our findings, as well as contributing instructions for future Capstone students that take over this project

- User Story 5 – Google Drive Documents

- Kevin Da Silva (KD)
- Roberto Lopez-trigo (RLT)
- Colleene McCurdy (CC)

As part of our changes towards the organization of the project, logs are no longer going to be manually handled by one person after a meeting..

Sprint #7 Planning Meeting

Project: Monitoring and mitigating misinformation that disrupts adaptation to climate driven health threats

Date: April 18th, 2022

Start Time: 3:00 pm

End Time: 5:00 pm

Attendees:

Developers:

- Capstone 2
 - Kevin Da Silva (KD) **(Capstone II Leader)**
 - Jesus Fernandez (JF)
 - Santiago Alvarez de Araya (SA)
 - Tyler Nguyen (TN)
 - Zackary Wright (ZW)
- Capstone 1
 - Roberto Lopez-Trigo (RLT) **(Capstone I Leader)**
 - Colleene Mccurdy (CM)
 - Augusto Castro (AC)
 - Titus Thomas (TT)

Sprint User Stories:

- User Story 1 - In-house Filter Tool
 - Titus Thomas (TT)

Description: Filters data efficiently for team research purposes.

- User Story 2 - Histogram of source engagement count
 - Kevin Da Silva (KD)
 - Jesus Fernandez (JF)
 - Santiago Alvarez de Araya (SA)
 - Tyler Nguyen (TN)
 - Zackary Wright (ZW)
 - Roberto Lopez-Trigo (RLT)
 - Colleene Mccurdy (CM)
 - Augusto Castro (AC)
 - Titus Thomas (TT)

- User Story 3 - FEMA Disaster Declarations
 - Jesus Fernandez (JF)

Description: Dashboard map for users to visualize the amount/type of disasters that happened in each state based on FEMA disaster declarations.

User Story 4 - Histogram (Article Engagement Count)

- Kevin Da Silva (KD)
 - Jesus Fernandez (JF)
 - Santiago Alvarez de Araya (SA)
 - Tyler Nguyen (TN)
 - Zackary Wright (ZW)
 - Roberto Lopez-Trigo (RLT)
 - Colleene Mccurdy (CM)
 - Augusto Castro (AC)
 - Titus Thomas (TT)
- User Story 5 - Date Range Slider
 - Kevin Da Silva (KD)
 - Zackary Wright (ZW)
 - Jesus Fernandez (JF)

Description: This has been worked on before, but the PO wanted the slider to be a double range slider. One node is for starting and the other is for ending timeframe.

- User Story 6 - Word Count for bar graph labels
 - Roberto Lopez-Trigo (RLT)
 - Titus Thomas (TT)

Description: Currently we have a character count, now's our time to implement word count. We're trying to have headlines to not cluster.

- User Story 7 - Large Linked Dashboard
 - Augusto Castro (AC)
 - Santiago Alvarez de Araya (SA)

Description: Put graphs together on one dashboard.

- User Story 8 - Color code bar by bias
 - Colleene Mccurdy (CM)
 - Tyler Nguyen (TN)

Description: Objective is to show the bias of a source using their media bias rating from <https://mediabiasfactcheck.com> and show their general bias through a color coding system.

SYSTEM DESIGN

Wireframe Notes Archive

In this section, these are just an archive of attempted wireframe designs that were utilized in forming our plans of a construction of a wireframe.

Many of these designs have been scrapped or have been derived to the basis of our current wireframe. From the pages below are a series of images that demonstrate and explain the concept of each wireframe.

To Capstone students who work on future iterations of the project, please try to grasp an idea from one of these and attempt to formulate what the final version would look like.

DESIGNS:

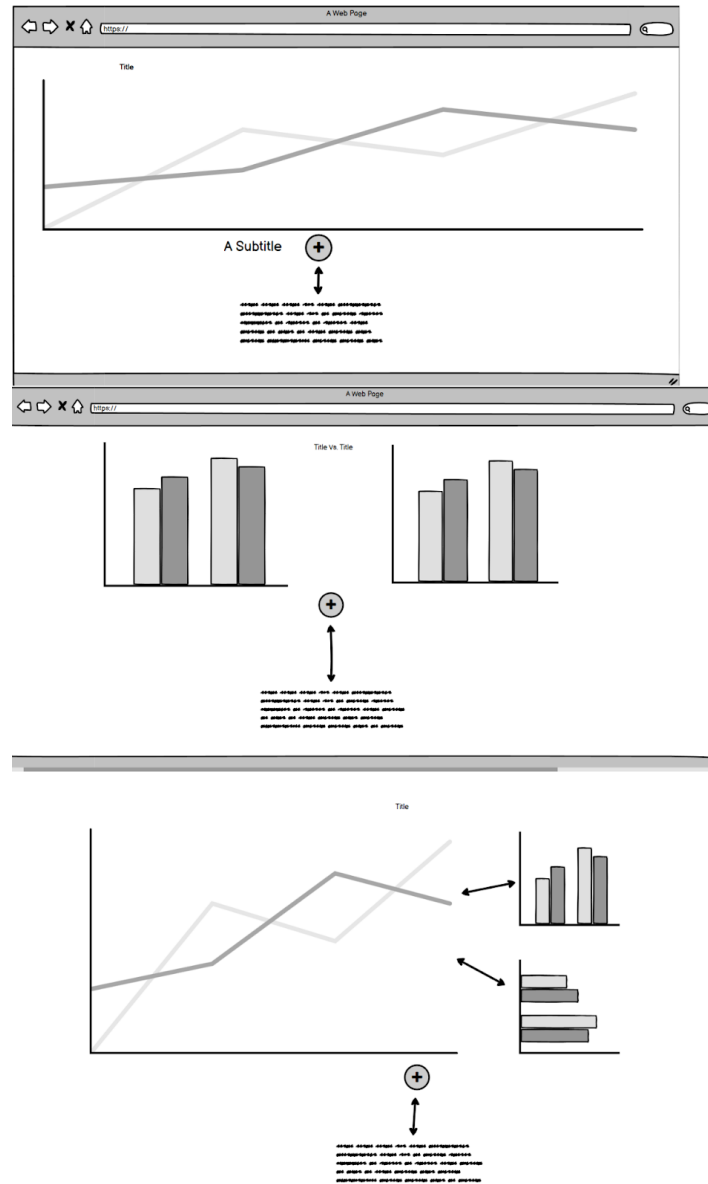
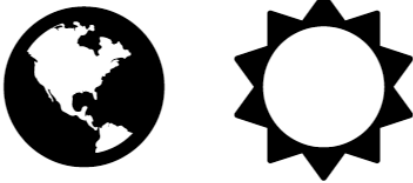


Image 1: An old concept of a wireframe. Supposedly, the circle would hide/expand a description.

Scrapped in favor of other wireframes.

Climate TruthWatch

We look to analyze the flow of misinformation on climate change through the spread of information on different social media sites



The Online Climate Discussion Map ?

Social Media Engagement across the U.S.



% of Climate Change Support

Social Media Engagement and Climate Change Support: Corelations ?

Climate Denial (% of pop) ▼

Percentage of low credible sources shared ▼
By Social Media

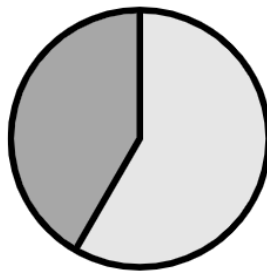
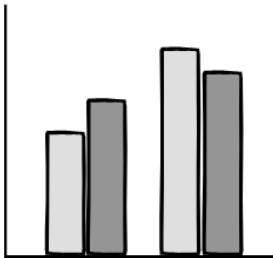


Image 2: Another concept of a wireframe. Scrapped in favor of other wireframes.

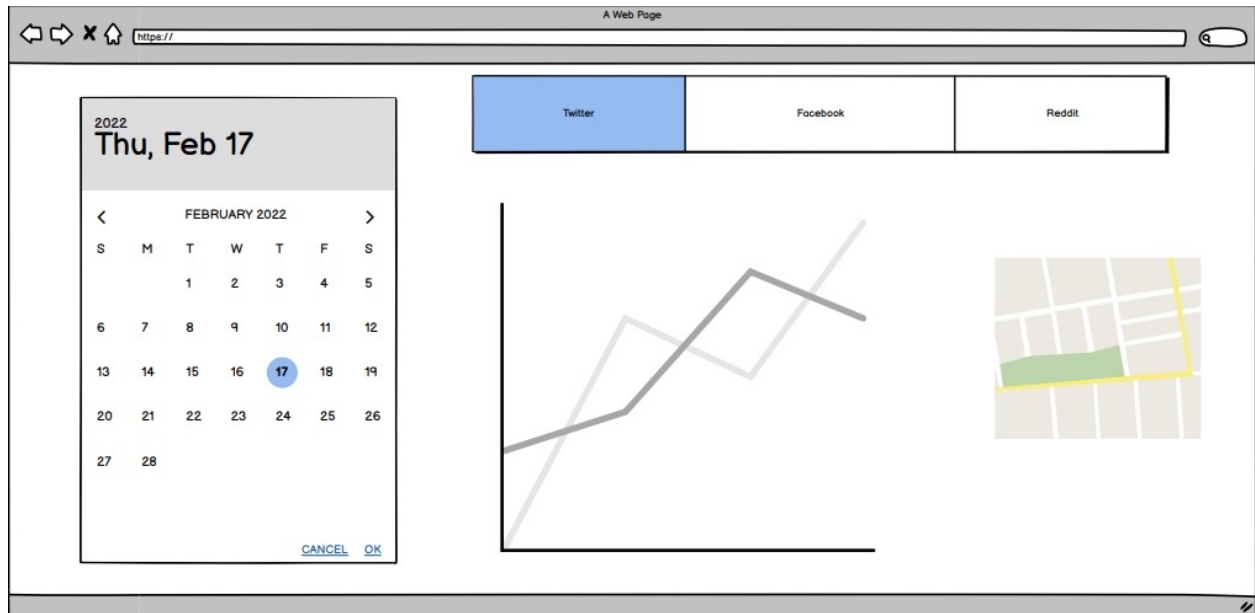


Image 3: Yet another concept of a Wireframe. Scrapped because of the impractical GPS and calendar. We would later derive a piece of this concept to include a drop down menu, a map of the U.S. population affected, and initializing centered text for the tool bars.



Image 4: Last concept of our wireframe. Truth section isn't feasible. Claim text is good, it can be used to summarize frequencies with each URL. This concept allowed us to focus on URL sources and credibility scores regarding information fact checking.

Dataset Design Notes Archive

The pages below are concepts of dataset visuals that are used to display claims from a dataset.

Down here serve some illustrations of which laid a foundation for the dataset can be seen in our current dashboard.

DESIGNS:

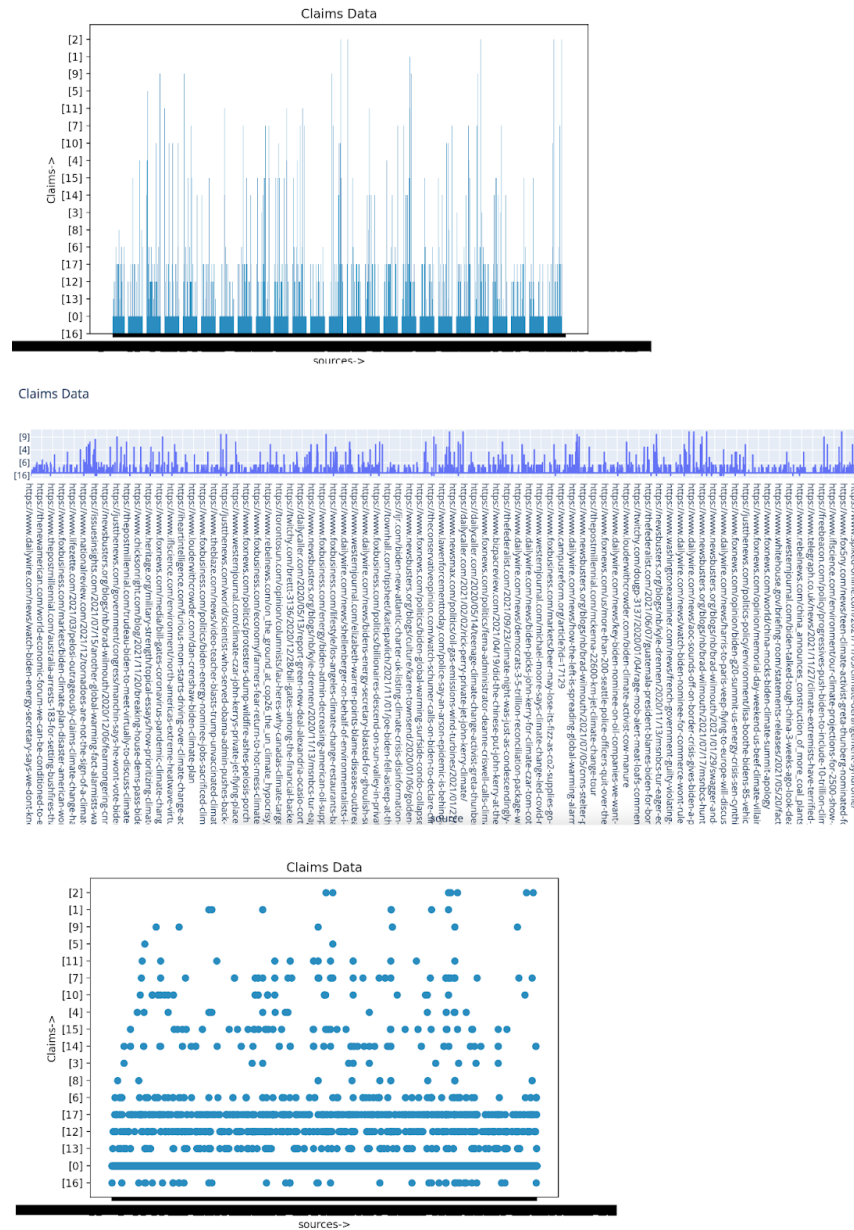


Image 5: Varying Dataset visuals. All of these concepts served a future foundation using pandas and plot.ly for assistance with our graphs.

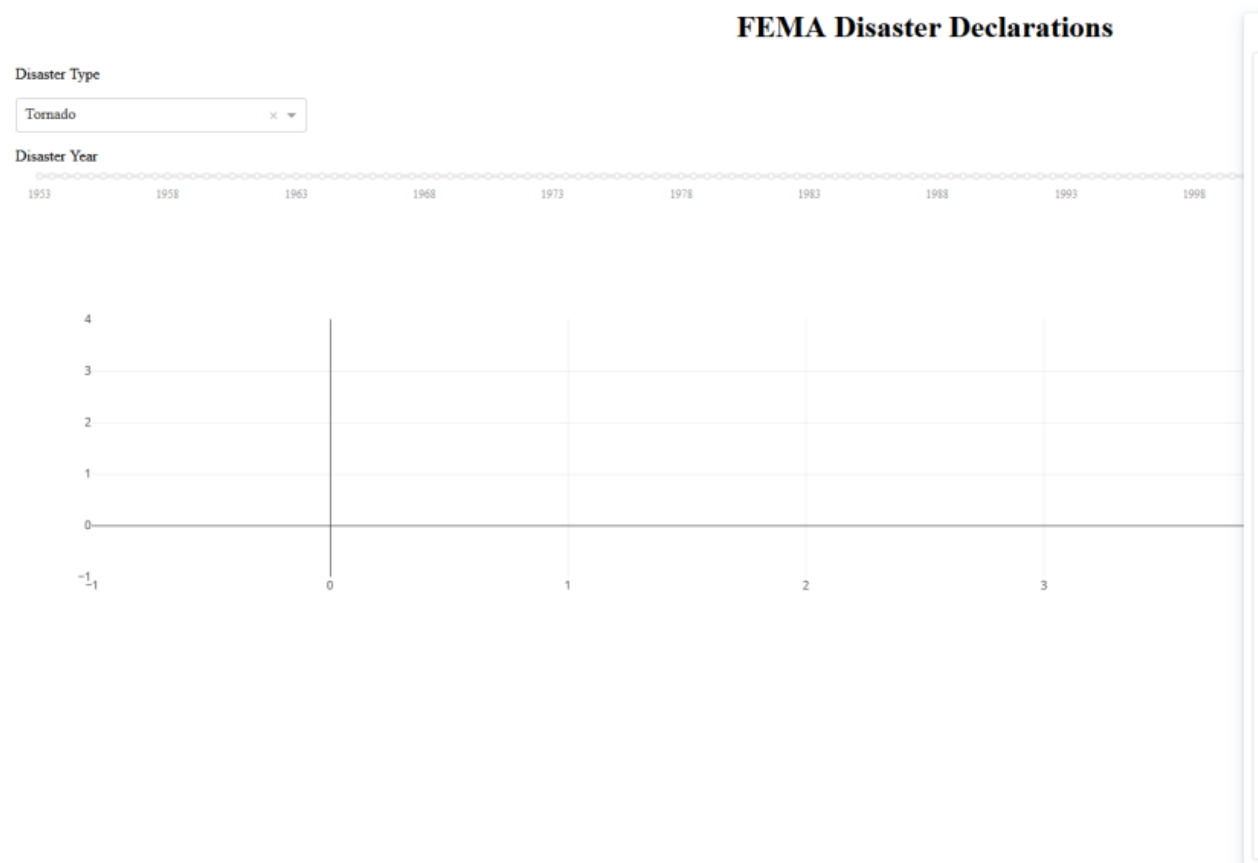


Image 6: A scrapped visual – not exactly what the PO was looking for. However, the disaster type menu and timeline served as inspiration in construction of our drop down filter and date range slider.

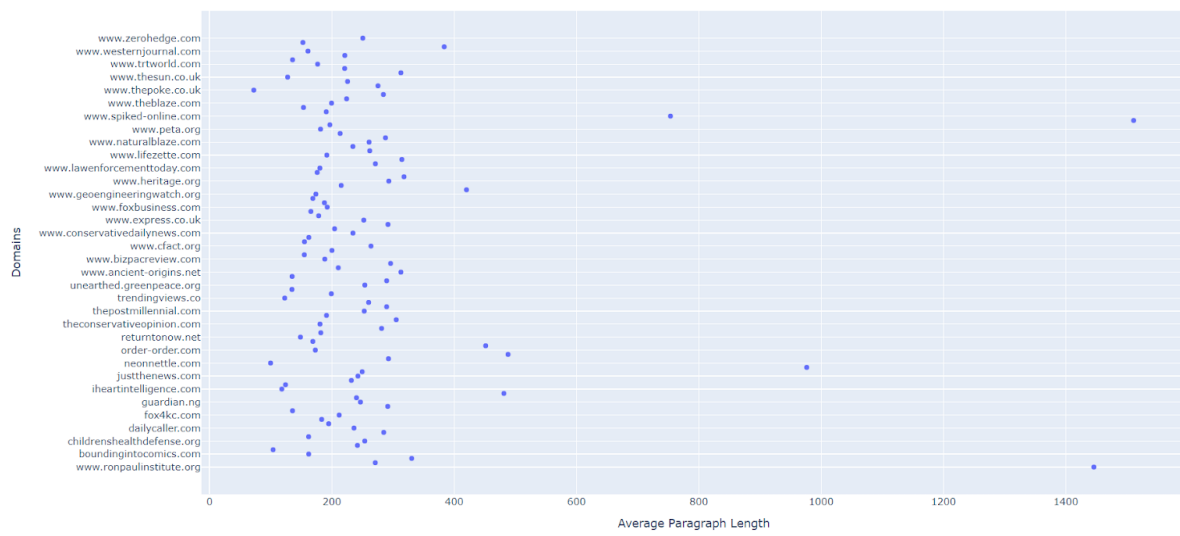


Image 7: The last concept used before implementing our dataset design.

Diagrams

Down here serve some illustrations of which consists an architectural pattern, a diagram of system dependencies, a class Diagram, and sequence diagram

These designs are subject to change, but as of yet it has been initialized for us to see the project in this form.

To Capstone students who work on future iterations of the project, please try to grasp an idea from these designs and try to incorporate new ideas.

Primary Architecture:

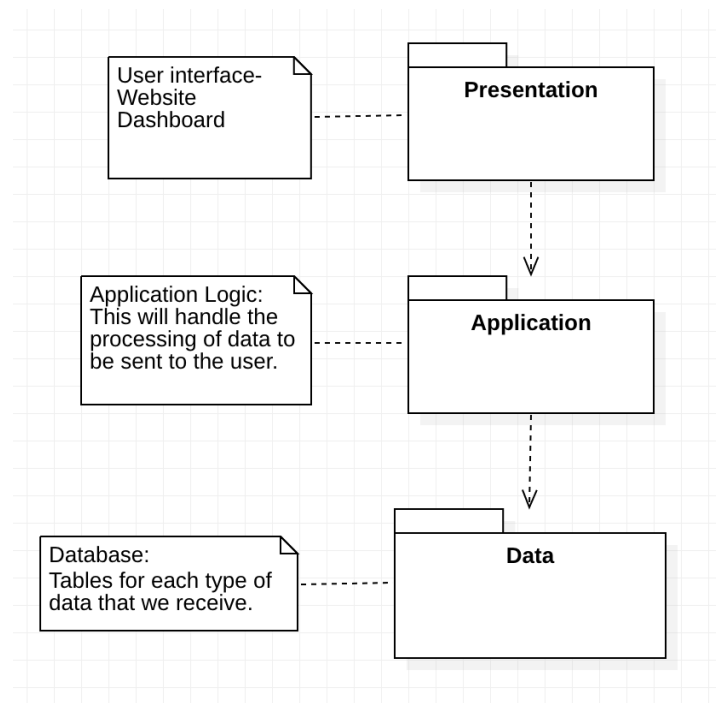


Image 8: Architectural Pattern #1

Secondary Architectures:

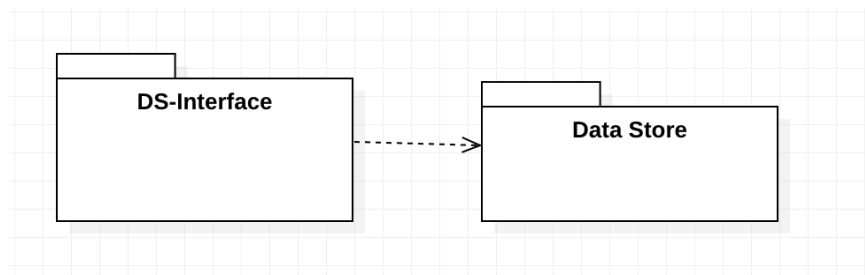
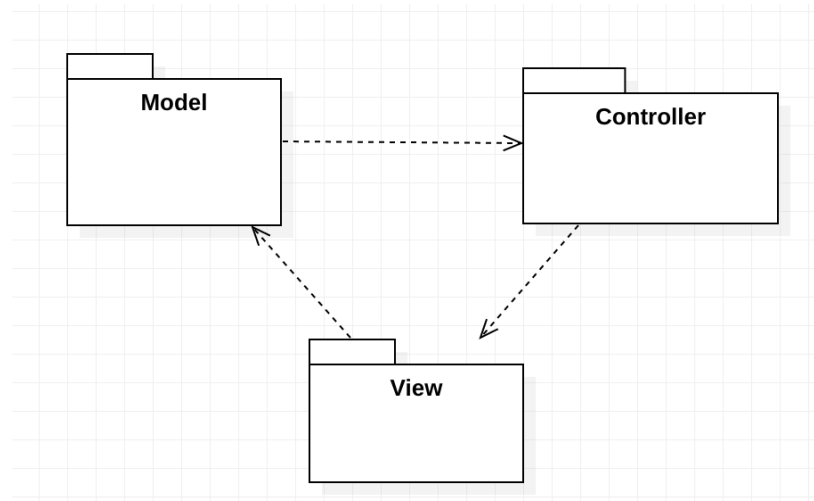


Image 9: Architectural Pattern #2

Minimal Class Diagram

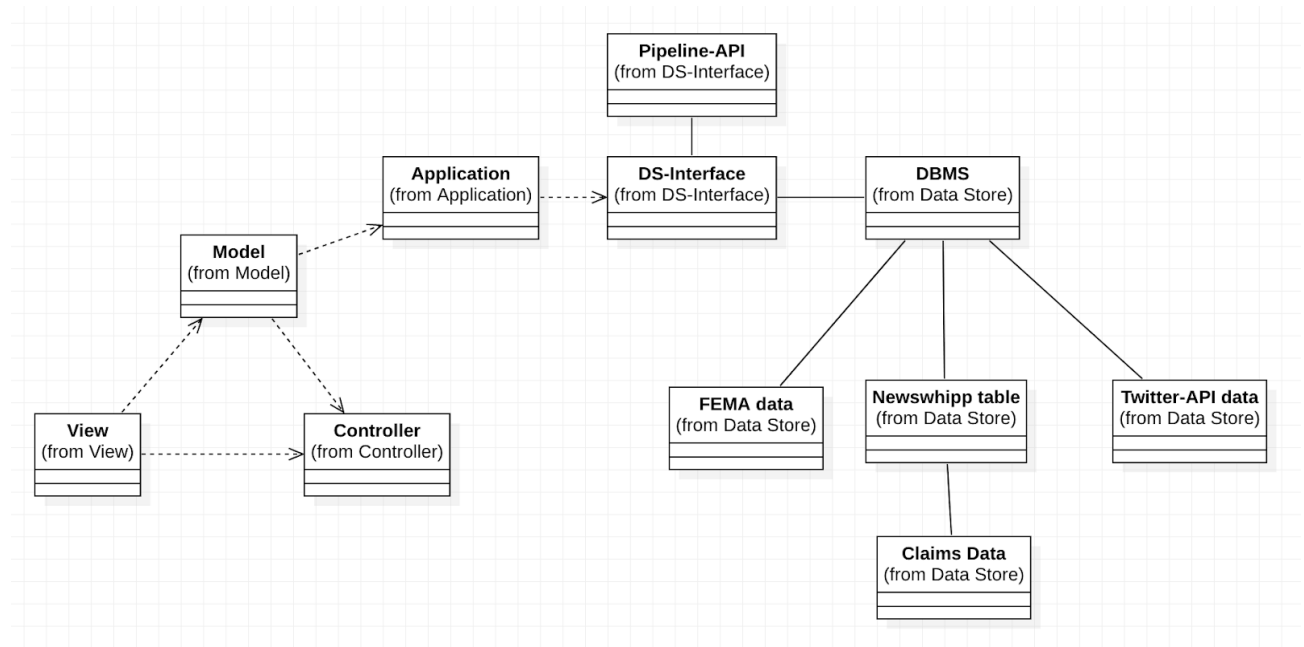


Image 10: Minimal class diagram

Sequence and Use Case Diagrams

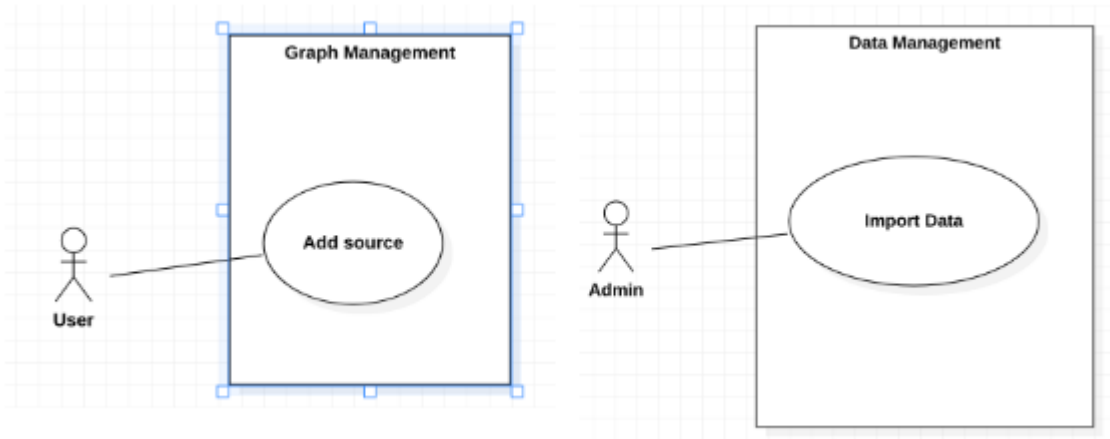


Image 11: Use Case Diagram

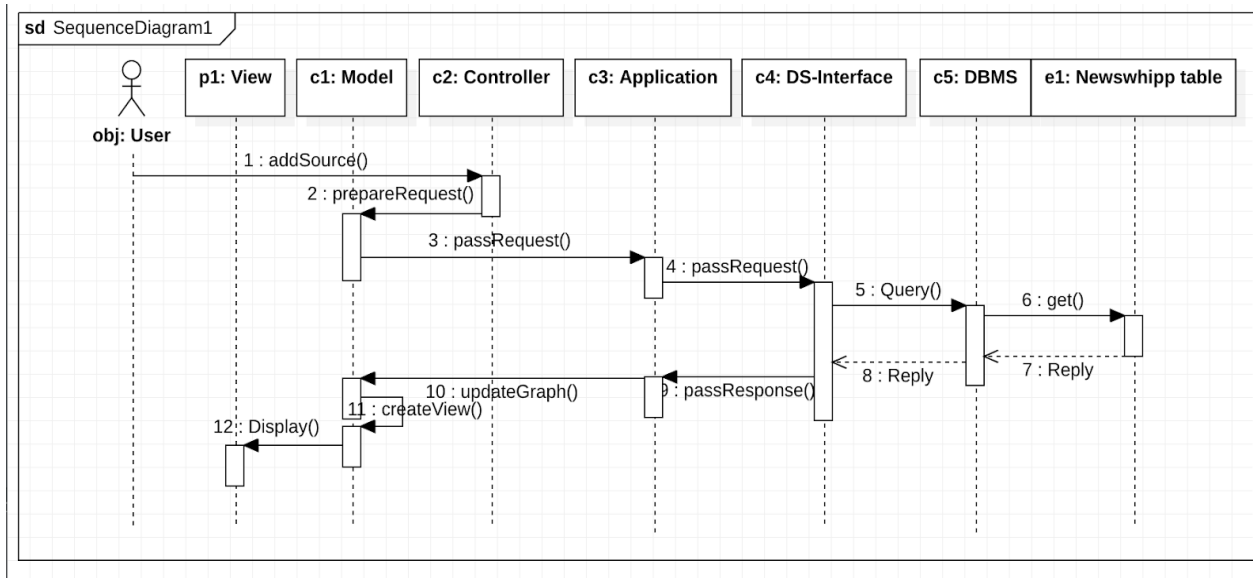


Image 12: Sequence Diagram

APPENDIX

Appendix A - Code Breakdown

Code Breakdown

A compilation of significant codes that affect the overall architectural design of the program.
Image must have a title associated with the code. Explanation towards them must be in PowerPoint

```
df = pd.read_csv('dataENapril20.csv')
df = df[['link', 'headline', 'keywords', 'fb_data.total_engagement_count']]

app = Dash(__name__)

app.layout = dash_table.DataTable(
    columns=[
        {'name': 'Link', 'id': 'link', 'type': 'text'},
        {'name': 'Headline', 'id': 'headline', 'type': 'text'},
        {'name': 'Keyword', 'id': 'keywords', 'type': 'text'},
        {'name': 'FB_data.total_engagement_count',
         'id': 'fb_data.total_engagement_count', 'type': 'numeric'}
    ],
    data=df.to_dict('records'),
    filter_action='native',

    style_table={
        'height': 400,
    },
    style_data={
        'width': '150px', 'minWidth': '150px', 'maxWidth': '150px',
        'overflow': 'hidden',
        'textOverflow': 'ellipsis',
    }
)
```

Image 13: Filtering .CSV Document by column

```

def filterData(arrayOfColumns,columnToSortBy,divider):
    #array of collumns are the columns you want in your new data frame
    #column to sort by example sort by engagement count or by alphabetical
    #percent of data you want
    copyOfDf= df[arrayOfColumns].copy()

    sortedData=copyOfDf.sort_values(by=columnToSortBy,ascending=False)

    return sortedData.head(int(len(sortedData)*(divider/100)))
def amountOfPublishers(dataFrame):
    sourcesOnly= dataFrame['source.publisher'].copy()
    sortedData= sourcesOnly.sort_values()
    noDupsData= sortedData.drop_duplicates()
    return noDupsData

def createListOfSets(optionsList):
    newList=[]
    for x in optionsList:
        newList.append({'label':x,'value':x})
    return newList

```

Image 14: Filter Data Functionality



Image 15: Filtering dataframe interactive menu

```
def update_graph(source_selected,date_selected):

    #format container
    container = "Source(s): {}".format(source_selected)
    #load in dataframe
    GraphDF = setup_source_engagement(
        updatedDataFrame,
        datevalues[date_selected[0]],
        datevalues[date_selected[1]],
        source_selected)

    #create graph
    fig = px.histogram(GraphDF,
        x='fb_data.total_engagement_count',
        y='source.publisher',
        color='MBFC_category')

    #clean up axis title
    fig.update_xaxes(title_text='Engagement Count')
    fig.update_yaxes(title_text='Source')

    return container, fig

#Do data frame manipulations here that do not need to be dynamic.
# Store them in variable so they are ready
# at load and do not need to be recalculated
updatedDataFrame=df[NEEDED_COLUMNS].copy() #we only need certain columns
MBFC_reference= publisher_bias(updatedDataFrame) #makes a reference table
updatedDataFrame['date_time']=updatedDataFrame['date_time'].astype('datetime64[ns]')

#Completely sets up dataframe for source vs. engagement
def setup_source_engagement(dataFrame,time_start,time_end,source_selected):
    #filter by date
    tempFrame=dataFrame[(dataFrame['date_time'] > time_start) & (dataFrame['date_time'] < time_end)]
    #group by source and sum
    groupedData= tempFrame.groupby('source.publisher',as_index=False)['fb_data.total_engagement_count'].sum()
    #filter grouped data by chosen source
    groupedData = groupedData[groupedData['source.publisher'].isin(source_selected)]
    #merge table with MBFC_category
    groupedData= groupedData.merge(MBFC_reference,on='source.publisher',how='left')

    return groupedData
```

Image 16: Filtering dataframe interactive menu (Code)

FEMA Disaster Declarations

Disaster Type

Hurricane

Disaster Type: Hurricane

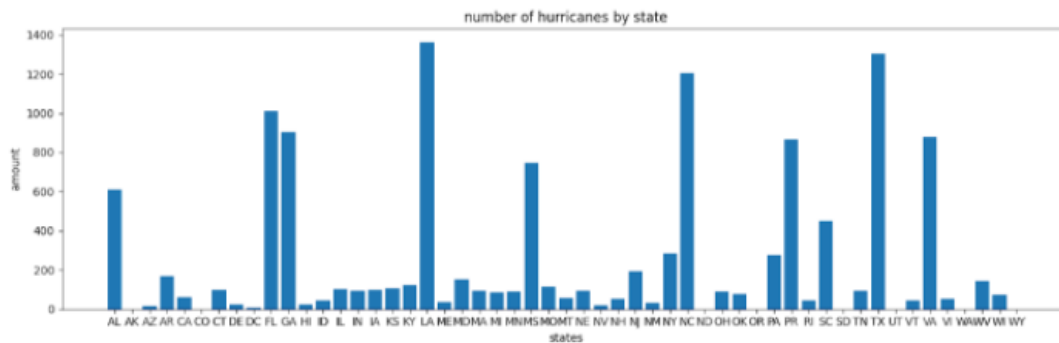
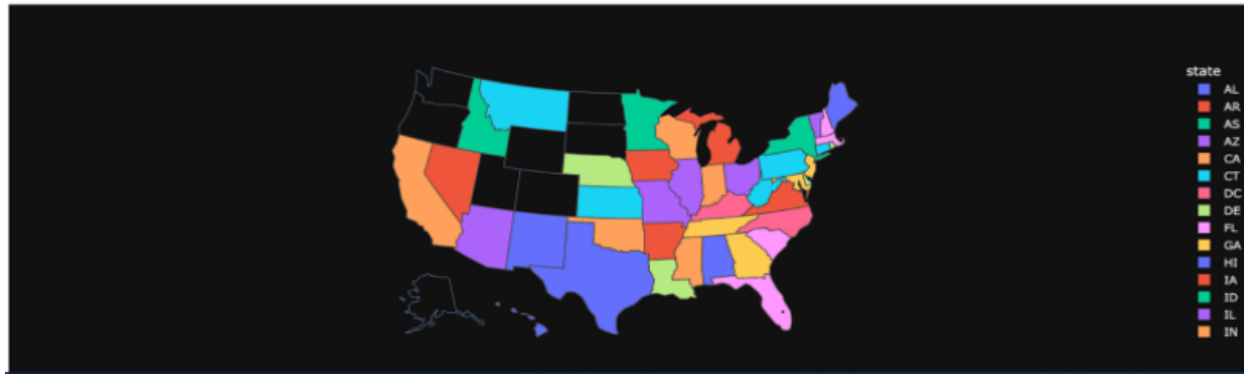


Image 17: Map & Graph

```
app.layout = html.Div([
    html.H1("FEMA Disaster Declarations", style={'text-align': 'center'}),
    html.P("Disaster Type", style={'margin-top': '5px', 'color': 'black'}),
    dcc.Dropdown(id="select_type",
        options=[{"label": "Tornado", "value": "Tornado"},
                  {"label": "Hurricane", "value": "Hurricane"},
                  {"label": "Flood", "value": "Flood"},
                  {"label": "Fire", "value": "Fire"},
                  {"label": "Severe Storms", "value": "Severe Storm(s)"},
                  {"label": "Drought", "value": "Drought"},
                  {"label": "Coastal Storm", "value": "Coastal Storm"},
                  {"label": "Snow", "value": "Snow"},
                  {"label": "Freezing", "value": "Freezing"},
                  {"label": "Severe Ice Storm", "value": "Severe Ice Storm"}],
        multi=False,
        value="Tornado",
        style={'width': "40%"}),
    html.Div(id="output_container", children=[]),
    html.Br(),
    dcc.Graph(id="disaster_map", figure=())
])

def update_graph(option_selected):
    container = "Disaster Type: {}".format(option_selected)

    dff = disasters_data.copy()
    dff = dff[dff['incidentType'] == option_selected]

    fig = px.choropleth(
        data_frame=dff,
        locations='state',
        locationmode='USA-states',
        scope='usa',
        color='state',
        hover_data=['state', 'incidentCount'],
        color_continuous_scale=px.colors.sequential.YlGnBu,
        labels={'incidentType': 'Incident Type'},
        template='plotly_dark'
    )

    return container, fig
```

Image 18: Map Creation (Left code is html, right is graph)

```

app = dash.Dash(__name__)

app.layout = html.Div([
    html.H1("NewsWhipPublishers", style={'text-align': 'center'}),
    html.P("Publisher", style= {'margin-top': '5px', 'color': 'black'}),
    dcc.Dropdown(id="select_publisher",
                 options= dropDownPublishers,
                 searchable=True,
                 multi=False,
                 value="cnn.com",
                 style={'width': "40%"}),

    dcc.Dropdown(id="select_topic",
                 options= dropDownTopics,
                 searchable=True,
                 multi=False,
                 value="ALL",
                 style={'width': "40%"}),

    dcc.Dropdown(id="select_percentage",
                 options= dropDownPercentages,
                 searchable=True,
                 multi=False,
                 value="10",
                 style={'width': "40%"}),

    html.Div(id='output_container', children=[]),
    html.Br(),

    dcc.Graph(id='publisher_histog', figure={}),

])

@app.callback([
    Output(component_id='output_container', component_property='children'),
    Output(component_id='publisher_histog', component_property='figure')],
    [Input(component_id='select_publisher', component_property='value'),
     Input(component_id='select_topic', component_property='value'),
     Input(component_id='select_percentage', component_property='value')])

def update_graph(option_selected, topic_selected, percentage_selected):

    container = "Publisher Source: {}".format(option_selected)
    print(option_selected)
    print(topic_selected, topic_selected)
    print(percentage_selected)
    dff = preliminaryDff

    ###Splice by source
    dff = dff[dff['source.publisher'] == option_selected]

    ###Splice by keyword
    if(topic_selected != 'ALL'):
        dff = dff[dff['keywords'].astype(str).str.contains(topic_selected)]

    print(dff['keywords'])
    dff = dff.sort_values(by='fb_data.total_engagement_count', ascending=False)
    dff = dff.head(int((len(dff)*(int(percentage_selected)/100))))

    fig = px.histogram(
        dff,
        y='headline',
        x='fb_data.total_engagement_count',
    )

    fig.update_xaxes(title_text='Engagement Count')
    fig.update_yaxes(title_text='Article')

    fig.update_traces(texttemplate="%{y}")

    return container, fig

```

Image 19: Histogram Script

```

import json

newString = ""
newJson = {}
finalJson = []
with open('dataENapril20.json', encoding="utf8") as json1:
    document = json.load(json1)

for data in document:
    for item in data:
        if '.' in item:
            for letter in item:
                if letter == '.':
                    newString += '_'
                else:
                    newString += letter
            newJson[newString] = data[item]
            newString = ""
        else:
            newJson[item] = data[item]
    finalJson.append(newJson.copy())

#print(json.dumps(finalJson[0], indent=4))

with open('jsonresult.json','w',encoding='utf-8') as f:
    json.dump(finalJson, f, ensure_ascii=False, indent=4)

```

Image 20: Algorithm for JSON Keys to allow Django to recognize data

Appendix B- Sprint Review Reports

Sprint 1 Review Meeting Minutes

Project: Monitoring and mitigating misinformation that disrupts adaptation to climate driven health threats

Date: Jan. 30th, 2022

Attendees:

- Capstone 2
 - Kevin Da Silva (KD) (**Capstone II Leader**)
 - Jesus Fernandez (JF)
 - Santiago Alvarez de Araya (SA)
 - Tyler Nguyen (TN)
 - Zackary Wright (ZW)
- Capstone 1
 - Roberto Lopez-Trigo (RLT) (**Capstone I Leader**)
 - Colleene Mccurdy (CM)
 - Augusto Castro (AC)
 - Titus Thomas (TT)

Start Time: 9:30 pm

End Time: 10:00 pm

After a show and tell presentation, the implementation of the following user stories were accepted by the product owners: All.

- User Story 1 - Google Drive

Description - Prepare and handle documentation of Sprint Documents.

Assigned to - KD, RLT

- User Story 2 - Software Downloads

Description - Everyone is required to download Python tools.

Assigned to - Everyone

- User Story 3 - Training

Description – Everyone will need to have Python knowledge – more especially with data pipelines.

Assigned to – Everyone

The following ones were rejected and moved back to the product backlog to be assigned to a future sprint at a future Sprint Planning meeting.

- User Story 4 – Technical Implementation

Description – Product Owner advised us to do more research, so technical implementation is being pushed for the next sprint.

Assigned to - Everyone

- User Story 5 – PowerPoint Presentation

Description – We can start possibly adding concepts and changes to our codes regarding each meeting w/ the Product Owner next Sprint. (Undiscussed with Product Owner)

Assigned to – KD, RLT

Sprint 2 Review Meeting Minutes

Project: Monitoring and mitigating misinformation that disrupts adaptation to climate driven health threats

Date: Feb. 9th, 2022

Attendees:

- Capstone 2
 - Kevin Da Silva (KD) **(Capstone II Leader)**
 - Jesus Fernandez (JF)
 - Santiago Alvarez de Araya (SA)
 - Tyler Nguyen (TN)
 - Zackary Wright (ZW)
- Capstone 1
 - Roberto Lopez-Trigo (RLT) **(Capstone I Leader)**
 - Colleene Mccurdy (CM)
 - Augusto Castro (AC)
 - Titus Thomas (TT)

Start Time: 6:00 pm

End Time: 7:00 pm

After a show and tell presentation, the implementation of the following user stories were accepted by the product owners: All.

- User Story 1 - Google Drive

Description - Prepare and handle documentation of Sprint Documents.

Assigned to - KD, RLT
- User Story 2 - Software Downloads

Description - Everyone is required to look up Figma and Balsamiq to understand the process of the implementation of wireframing and the construction of the UI.

Assigned to - Everyone
- User Story 3 - Github

Description – Everyone will need to join in two github repositories in our imminent time to start technical implementation.

Assigned to – Everyone
- User Story 4 – Technical Implementation

Description – Technical implementation is our main concern, trying to push for something coding-wise to be done by the end of February.

Assigned to - Everyone

The following ones were rejected and moved back to the product backlog to be assigned to a future sprint at a future Sprint Planning meeting.

- User Story 5 – PowerPoint Presentation (Pushed again)

Description – We can start possibly adding concepts and changes to our codes regarding each meeting w/ the Product Owner next Sprint. It's entirely possible that we will only start the PowerPoint once we have a clear conscience of understanding our own code and showing our plans for the future.

Assigned to – KD, RLT

Sprint 3 Review Meeting Minutes

Project: Monitoring and mitigating misinformation that disrupts adaptation to climate driven health threats

Date: Feb. 23th, 2022

Attendees:

- Capstone 2
 - Kevin Da Silva (KD) **(Capstone II Leader)**
 - Jesus Fernandez (JF)
 - Santiago Alvarez de Araya (SA)
 - Tyler Nguyen (TN)
 - Zackary Wright (ZW)
- Capstone 1
 - Roberto Lopez-Trigo (RLT) **(Capstone I Leader)**
 - Colleene Mccurdy (CM)
 - Augusto Castro (AC)
 - Titus Thomas (TT)

Start Time: 6:00 pm

End Time: 7:00 pm

NOTES:

- Everyone attended the meeting, but JF left earlier as they were in class, a much better improvement over the previous PO meeting where only 3 attended)
- Tyler's appearances are rare because sadly he is extremely occupied with other things. He catches up through our recorded zoom meetings.

After a show and tell presentation, the implementation of the following user stories were accepted by the product owners:

- User Story 1 – Dataset implementation

Description – We were given a task to see and find ways to use the dataset provided by the PO for our project.

Assigned to -

(KD), (RLT),(ZW), (SA),(TN)

- User Story 2 - Github Spectating

Description – Capstone I Students are expected to spectate and get familiar with the github repositories as we slowly go ahead and use our given datasets.

Assigned to – (RLT), (CM), (AC), (TT)

- User Story 3 - End of Semester Documentation

Description - Prepare to handle and start archiving research and other findings for documentation of Capstone II.

Assigned to - (KD), (JF)

- User Story 4 - Video Presentation

Description - Prepare and find ways to fit in a reasonably lengthy video that makes the prerequisite for Capstone II video presentation. Potentially, as we go on in our research we can finally make a tutorial video on how to get around a certain aspect in our project.

Assigned to -
(KD), (JF), (SA),(TN), (ZW)

The following ones were rejected and moved back to the product backlog to be assigned to a future sprint at a future Sprint Planning meeting.

- User Story 5 – PowerPoint Presentation

Description – This might be entirely left in the backburner since we'll need A LOT of progression to present something feasible.

Assigned to – All

Sprint 4 Review Meeting Minutes

Project: Monitoring and mitigating misinformation that disrupts adaptation to climate driven health threats

Date: Mar. 20th, 2022

Attendees:

- Capstone 2
 - Kevin Da Silva (KD) **(Capstone II Leader)**
 - Jesus Fernandez (JF)
 - Santiago Alvarez de Araya (SA)
 - Tyler Nguyen (TN)
 - Zackary Wright (ZW)
- Capstone 1
 - Roberto Lopez-Trigo (RLT) **(Capstone I Leader)**
 - Colleene Mccurdy (CM)
 - Augusto Castro (AC)
 - Titus Thomas (TT)

Start Time: 6:00 pm

End Time: 7:00 pm

NOTES:

- Meetings during this sprint began as lackluster due to scheduling conflicts and other uncontrollable circumstances, however, attendance took a turn for the better with the final meeting having nearly everyone in attendance.
- Synergy within the group has progressed and grown as people become more familiar with the project and with one another.

After a show and tell presentation, the implementation of the following user stories were accepted by the product owners:

- User Story 1 – Front-End build

Description – We were given a task to begin development on the front end build for the next meeting to present a foundation.

Assigned to -

(KD), (RLT),(ZW), (SA),(TN)

- User Story 2 - Visual QA

Description – Capstone I Students are expected to review visual representations of datasets and determine possible changes to be made or plans for implementation to assist the Capstone 2 students.

Assigned to – (RLT), (CM), (AC), (TT)

- User Story 3 - Further Dataset Representations

Description - Continue with work on visualizations and create potentially final plans for them to present to the PO.

Assigned to - (KD), (RLT),(ZW), (SA),(TN)

- User Story 4 - Project Documentation

Description - Begin work on proper outline and planning document for each member to access and use as a guide during development.

Assigned to - Everyone

The following ones were rejected and moved back to the product backlog to be assigned to a future sprint at a future Sprint Planning meeting.

- User Story 5 – PowerPoint Presentation

Description – Potentially holding up for the final sprint, may or may not be canned.

Assigned to – All

Sprint 5 Review Meeting Minutes

Project: Monitoring and mitigating misinformation that disrupts adaptation to climate driven health threats

Date: April 3rd, 2022

Attendees:

- Capstone 2
 - Kevin Da Silva (KD) **(Capstone II Leader)**
 - Jesus Fernandez (JF)
 - Santiago Alvarez de Araya (SA)
 - Tyler Nguyen (TN)
 - Zackary Wright (ZW)
- Capstone 1
 - Roberto Lopez-Trigo (RLT) **(Capstone I Leader)**
 - Colleene Mccurdy (CM)
 - Augusto Castro (AC)
 - Titus Thomas (TT)

Start Time: 9:50 pm

End Time: 10:10 pm

After further discussion, the following tasks have been assigned to each subgroup.

- User Story 1 - Frontend Dev
 - Kevin Da Silva (KD)
 - Santiago Alvarez de Araya (SA)

This team will be responsible for creating the website layout and necessary JS logic.

This team will be responsible for creating frontend components to be used for future Capstone iterations of the project.

- User Story 2 - Backend
 - Augusto Castro (AC)
 - Jesus Fernandez (JF)
 - Titus Thomas (TT)
 - Colleene McCurdy (CC)

Responsible for organizing the data and creating scripts that generate data visualizations from various sources such as newswhip.

- User Story 3 - Middleware
 - Tyler Nguyen (TN)
 - Zackary Wright (ZW)

This team is responsible for connecting the react frontend to the Django backend and creating the logic to invoke backend scripts for creating data visualizations.

The following ones were rejected and moved back to the product backlog to be assigned to a future sprint at a future Sprint Planning meeting.

- User Story 4 – Documentation
 - Kevin Da Silva (KD)
 - Roberto Lopez-trigo (RLT)

As we approach the end of the semester, documentation is going to be crucial to demonstrate all of our findings, as well as contributing instructions for future Capstone students that take over this project

- User Story 5 – Google Drive Documents
 - Kevin Da Silva (KD)
 - Roberto Lopez-trigo (RLT)
 - Colleene McCurdy (CC)

As part of our changes towards the organization of the project, logs are no longer going to be manually handled by one person after a meeting..

Sprint 6 Review Meeting Minutes

Project: Monitoring and mitigating misinformation that disrupts adaptation to climate driven health threats

Date: April 13th, 2022

Attendees:

- Capstone 2
 - Kevin Da Silva (KD)
 - Jesus Fernandez (JF)
 - Santiago Alvarez de Araya (SA)
 - Tyler Nguyen (TN)
 - Zackary Wright (ZW)
- Capstone 1
 - Roberto Lopez-Trigo (RLT) (**Capstone I Leader**)
 - Colleene Mccurdy (CM)
 - Augusto Castro (AC)
 - Titus Thomas (TT)

Start Time: 6:00 pm

End Time: 7:00 pm

After further discussion, the following tasks have been assigned to each subgroup.

- User Story 1 - Poster/Documentation/Presentation Slides
 - Kevin Da Silva (KD)
 - Roberto Lopez-Trigo (RLT)
- User Story 2 - Clean up the Headings and Titles
 - Santiago Alvarez de Araya (SA)
- User Story 3 - Date range option for dashboards
 - Tyler Nguyen (TN)
 - Zackary Wright (ZW)

Description: Refining among the likes of filters/dropdown menus related to them.

- User Story 4 - Add credibility options
 - Roberto Lopez-Trigo (RLT)

Description: Adding media bias fact check to the group of data.

- User Story 5 - Import data to Django db as csv
 - Augusto Castro (AC)
 - Colleene Mccurdy (CM)

Description: Leverage Import/Exchange packages in Django to set up db in batches.

- User Story 6 - In-house Filter Tool
 - Titus Thomas (TT)

Description: Filters data efficiently for team research purposes.

- User Story 7 - Histogram of source engagement count
 - Kevin Da Silva (KD)
 - Jesus Fernandez (JF)
 - Santiago Alvarez de Araya (SA)
 - Tyler Nguyen (TN)
 - Zackary Wright (ZW)
 - Roberto Lopez-Trigo (RLT)
 - Colleene Mccurdy (CM)
 - Augusto Castro (AC)
 - Titus Thomas (TT)
- User Story 8 - FEMA Disaster Declarations
 - Jesus Fernandez (JF)

Description: Dashboard map for users to visualize the amount/type of disasters that happened in each state based on FEMA disaster declarations.

User Story 9 - Histogram (Article Engagement Count)

- Kevin Da Silva (KD)
- Jesus Fernandez (JF)
- Santiago Alvarez de Araya (SA)
- Tyler Nguyen (TN)
- Zackary Wright (ZW)
- Roberto Lopez-Trigo (RLT)
- Colleene Mccurdy (CM)
- Augusto Castro (AC)
- Titus Thomas (TT)

The following ones were rejected and moved back to the product backlog to be assigned to a future sprint at a future Sprint Planning meeting.

- User Story 10– Front-End

Description – We found more significant tasks to do, so after considering this we've decided to move forward with other user stories in preparation for the upcoming deadline. We hope that future iterations of the project can revisit this user story.

Assigned to – All

Sprint 7 Review Meeting Minutes

Project: Monitoring and mitigating misinformation that disrupts adaptation to climate driven health threats

Date: April 27th, 2022

Attendees:

- Capstone 2
 - Kevin Da Silva (KD)
 - Jesus Fernandez (JF)
 - Santiago Alvarez de Araya (SA)
 - Tyler Nguyen (TN)
 - Zackary Wright (ZW)
- Capstone 1
 - Roberto Lopez-Trigo (RLT) (**Capstone I Leader**)
 - Colleene Mccurdy (CM)
 - Augusto Castro (AC)
 - Titus Thomas (TT)

Start Time: 6:00 pm

End Time: 6:50 pm

After further discussion, the following tasks have been assigned to each subgroup.

- User Story 1 - Final Deliverables
 - Kevin Da Silva (KD)
 - Roberto Lopez-Trigo (RLT)
- User Story 2 - Clean up the Headings and Titles
 - Santiago Alvarez de Araya (SA)
 - Kevin Da Silva (KD)

- User Story 3 - Date range option for dashboards
 - Tyler Nguyen (TN)
 - Zackary Wright (ZW)

Description: Refining among the likes of filters/dropdown menus related to them.

- User Story 4 - Add credibility options
 - Roberto Lopez-Trigo (RLT)
 - Jesus Fernandez (JF)

Description: Adding media bias fact check to the group of data.

- User Story 5 - Import data to Django db as csv
 - Augusto Castro (AC)
 - Colleene Mccurdy (CM)

Description: Leverage Import/Exchange packages in Django to set up db in batches.

The following ones were rejected and moved back to the product backlog to be assigned to a future sprint at a future **iteration!**

- User Story 6 - Histogram (Article Engagement Count)
 - Kevin Da Silva (KD)
 - Jesus Fernandez (JF)
 - Santiago Alvarez de Araya (SA)
 - Tyler Nguyen (TN)
 - Zackary Wright (ZW)
 - Roberto Lopez-Trigo (RLT)
 - Colleene Mccurdy (CM)
 - Augusto Castro (AC)

- Titus Thomas (TT)
- User Story 7 - Histogram of source engagement count
 - Kevin Da Silva (KD)
 - Jesus Fernandez (JF)
 - Santiago Alvarez de Araya (SA)
 - Tyler Nguyen (TN)
 - Zackary Wright (ZW)
 - Roberto Lopez-Trigo (RLT)
 - Colleene Mccurdy (CM)
 - Augusto Castro (AC)
 - Titus Thomas (TT)

Among many more...

Not many user stories have been created for this sprint, we more or less conducted a final meeting laying out future plannings and wishlist with the Product Owner. In regards as to what exactly is expected, you will find this list in the shortcomings/wishlist presentation video OR near the end of the documentation.

Appendix C - Installation / Maintenance / User Manual

Step 1: Download the GitHub Desktop application.

Step 2: Clone the current repository that exists for this application.

Step 3: Use an IDE, preferably Visual Studio Code.

Step 4: In a terminal, use `cd` to navigate to the directory of the project.

Step 5: Create a virtual environment for you to test your code with this following command:
`"-m venv projectNameVenv"`

Step 6: From that directory, go to scripts with `"cd scripts"`.

Step 7: You will need to install the last items you will need through pip.

Type the following commands:

`"pip install pandas"`

`"pip install dash"`

`"pip install matplotlib"`

`"ciso8601"`

Step 8: When running the program, you'll notice that there is no such file as `"NW_Data"`. This is because the file is too large to fit in a limited space that GitHub allows us to use. You'll be granted access through this data either through Product Owner or through the final deliverable.

USER MANUAL

Facebook Engagement by Source

A histogram with source domains located on y-axis and Facebook engagement count located on x-axis

Filter data by source and view Facebook engagement count for a specified source

1. Navigate to filter box located above histogram
2. Insert Cursor into filter box
3. A drop down menu will appear, allowing you to select from all optional source(s)
4. To search for a specific source, begin typing (text field) and the drop down options will be limited to match what is being entered into the text field.
5. Select enter key to apply filter or select desired source(s) from the drop down menu.
6. Multiple sources can be added.

Facebook Engagement Count by Article

A histogram with article headline located on y-axis and Facebook engagement count located on x-axis

Filter data by source and view Facebook engagement count for a specified source(s) and/or a percentage of that source(s) articles

1. Navigate to the top box in the filter box located above histogram.
2. Insert Cursor.
3. A drop down menu will appear, allowing you to select from all optional source(s)
4. To search for a specific source, begin typing (text field) and the drop down options will be limited to match what is being entered into the text field.
5. Select enter key to apply filter or select desired source(s) from the drop down menu.

6. Multiple sources can be added.

Keyword Filter Box (middle box): designated to filtering by keyword(s) (in production)

1. Navigate to the middle box in the filter box located above histogram.
2. Insert Cursor.
3. A drop down menu will appear, allowing you to select from a menu of optional keywords. Select the desired keyword.
4. To filter by a specific keyword, begin typing (text field).
5. Select enter key to apply filter or select keyword from drop down menu.

Article Percentage Filter Box (bottom box)

1. Navigate to the bottom box in the filter box located above histogram.
2. Insert Cursor.
3. A drop down menu will appear, allowing you to select from a menu of commonly used article percentages. Select the desired percentage.
4. To filter by a specific percentage, begin typing (text field).
5. Select enter key to apply filter or select percentage from drop down menu.

Master Filter with Link, Headline, Keyword, and Facebook Total Engagement Count

A filter can be applied alongside other filter(s) for desired variations to further refine information.

Link Column

1. Navigate to column labeled "Link"
2. Insert cursor into row directly below the column label
3. Links will appear in the rows below, allowing you to select from a menu of optional links. Select the desired link.
4. To filter by a specific link, begin typing (text field).
5. Select enter key to apply filter or select from rows below.

Headline Column

1. Navigate to column labeled "Headline"
2. Insert cursor into row directly below the column label
3. Headlines will appear in the rows below, allowing you to select from a menu of optional headlines. Select the desired headline.
4. To filter by a specific headline, begin typing (text field).
5. Select enter key to apply filter or select link from rows below.

Keyword Column

1. Navigate to column labeled "Keyword"
2. Insert cursor into row directly below the column label
3. Keywords will appear in the rows below, allowing you to select from a menu of optional keywords. Select the desired keyword.
4. To filter by a specific link, begin typing (text field).
5. Select enter key to apply filter or select link from rows below.

FB_data.total_engagmenmt_count Column

1. Navigate to column labeled "FB_data.total_engagmenmt_count"
2. Insert cursor into row directly below the column label
3. Links will appear in the rows below, allowing you to select from a menu of optional counts. Select the desired link.
4. To filter by a specific count number (quantity), begin typing (text field) using numeric characters.
5. Select enter key to apply filter or select count from rows below.

FEMA Disaster Declarations

On a map layout, view Tornado or Hurricane disasters using a color for quantity, designated to a U.S. state. Color assigned by quantity is specified when hovering over a state on the map or in the state column to the right of the map.

Filter data by disaster type and view disaster quantity on a map layout for U.S. states.

1. Navigate to the disaster type filter box located above the map layout.
2. Insert Cursor.
3. A drop down menu will appear, allowing you to select from a menu of optional disaster types. Select the desired disaster type.

4. To filter by a specific disaster type, begin typing (text field).
5. Select enter key to apply filter or select keyword from drop down menu.

Quantity of Hurricanes by U.S. State

A bar graph with the quantity of hurricanes located on the y-axis and the state located on x-axis.

–Unfinished Feature–

Appendix D - Shortcomings/Wishlist

Shortcomings

As mentioned earlier throughout the document, there were a few shortcomings that we initially had with the project when we started out. Unlike some other Capstone projects, this is a foundation that's being built from scratch with very little context to derive from. We had the ambition, but lacked the communication earlier on throughout the semester to make any sufficient progress. We've been in the planning phase for too long, and miscommunication was our biggest weakness. We had to take action in response to an impending seizure of cancellation – something had to be done.

In the last month of the project, we started communicating extremely often and scheduled bi-weekly meetings with the product owner. We have made considerable progress in terms of kickstarting the technical implementation of the project, and there were always constant updates that were well received by the product owner. It was an absolute pleasure working with the team. It is only with our regret that we did not communicate earlier, since it was extremely an engaging and productive experience to work with the team.

We like to urge every Capstone member that decides to work on future iterations on this project to be careful. Plan your time accordingly, and use it as a basis to develop a timeframe for a given task. You must stay diligent and communicate with your team to tackle down objectives together. This is just one of the ways to prevent any future shortcomings with the project.

Wishlist

- Room for front-end development. As of yet, other objectives must be satisfied to approach this part of the project.
 - Having the data linked between visuals that are structured in tiers.
 - Tier one: source vs engagement
 - Tier two: articles from a source vs engagement
 - Tier three: Article vs claims made
 - Wire frame this to see how best to show this tier system.
- Create an automated pipeline that pulls data at regular time intervals from NewsWhip.
 - Create a portal that allows for admin upload of csv files from Ayse(PO)
 - Portal can be made using the django admin page that was created in the github repo.
- Including high level analysis functions to show correlation between data sets.
 - On Covaxxy, they correlate between political orientation and vaccination rates.
- Find a way to show how the data is pulled.
 - Look into component architecture for clean implementation of this
 - Possible implementation: modal box, question mark, diagram that shows how data is pulled, but very open to suggestions. Be creative here.
 - (Overall we need to show data transparency), EX: New york times, Covaxxy, Wall street journal graphics
- Organize the data into a bonafide database. Currently, the dashboard is loading using static data in the project folder.
 - Pull the data from the database that could be used in the dashboard.
 - Create tables within the database that maximize the efficiency of the dashboard.
 - Incorporate claims data into the dashboard (PO will let you know more about this)..
- Form a future ideation regarding the exploratory analysis for the project.

REFERENCES

Sources of Data:

<https://mediabiasfactcheck.com/>
<https://www.fema.gov/about/openfema/api>

Documentation and Software:

<https://plotly.com/python/histograms/>
<https://www.codespeedy.com/pandas-groupby-sort-in-python/>
<https://dash.plotly.com/dash-core-components/dropdown>
<https://balsamiq.com/>

Tutorials:

Django Plotly Dash: <https://www.youtube.com/watch?v=psvU4zwO3Ao&list=WL&index=121>

Github:

<https://www.youtube.com/watch?v=RGOj5yH7evk>

Django: <https://www.youtube.com/watch?v=VBqJ0-imSMU>

Inspiration:

<https://osome.iu.edu/tools/covaxxy>

<https://arxiv.org/abs/2112.01379>

<https://www.climatechangecommunication.org/resources/>

<https://covid19obs.fbk.eu/#>