Software Requirements Specification

for

DataMea

Version 1.0

Prepared by Mike Carroll, Tyler Dominick, Ethan Osborne, and Dylan Rizzo

September 2018

1. Table of Contents

2. Revision History

Sign-Off Name	Sign-Off Date	Version
Dylan Rizzo	Sept. 4, 2018	0.01
Dylan Rizzo	Sept. 17, 2018	0.02
Dylan Rizzo	Sept. 20, 2018	0.03
Mike Carroll	Sept. 24, 2018	0.1
Dylan Rizzo	Sept. 27, 2018	0.11
Dylan Rizzo	Oct. 11, 2018	1.0

3. Overview

3.1. Scope

DataMea is an application that its users can analyze some general statistics of their IMAP email.

3.2. Participants

At this given time, the Software Design project team consists of the following ten individuals:

Ray Breton, Mike Carroll, Tyler Dominick, Cedric Hansen, Gaoping Lin, Douglas Myrdek, Ethan Osborne, Sylvia Pericles, Dylan Rizzo, and Andy Vadnais.

Each member is involved with their respects departments as follows:

Database/Networking
Breton, Raynier
Carroll, Michael
Dominick, Tyler
Hansen, Cedric
Lin, Gaoping
Myrdek, Douglas
Osborne, Ethan
Pericles, Sylvia
Rizzo, Dylan
Vadnais, Andrew

Engine
Dominick, Tyler
Hansen, Cedric
Lin, Gaoping
Myrdek, Douglas
Rizzo, Dylan
Vadnais, Andrew

GUI
Breton, Raynier
Myrdek, Douglas
Rizzo, Dylan
Vadnais, Andrew

Quality Assurance
Hansen, Cedric
Lin, Gaoping
Myrdek, Douglas
Pericles, Sylvia
Vadnais, Andrew

Requirements
Carroll, Michael
Dominick, Tyler
Osborne, Ethan
Rizzo, Dylan

Usability
Breton, Raynier
Carroll, Michael
Osborne, Ethan
Pericles, Sylvia

3.3. Document Conventions

This document was created based on the IEEE Recommended Practice for Software Requirements Specifications template.

All diagrams will be labeled by their section, subsection, and then order in which it has appeared in its respected subsection (i.e. first being 1).

4. References

IEEE. (1998). *IEEE Recommended Practice for Software Requirements Specifications*. New York, NY: Author.

Varvoutas, K. (2017). *Software Requirements Specification for Gephi.* Aristotle University of Thessaloniki, Thessaloniki, Serres, Greece: Gephi.org

5. Definitions

DataMea: an application in which can be installed compatible computers to then analyze a user's emails from an IMAP server.

Email Client: also known as mail user agent (MUA), is a computer program designed to read, write, and edit a user's email.

GUI: an acronym for Graphical User Interfaces, which is a designed display whose function is to display and intake information for a user aesthetically as possible.

IEEE: Institute of Electrical and Electronics Engineers, the world's largest organization made up of technical professionals that set global standards for electronics and advanced technologies.

IMAP: Internet Message Access Protocol, is a type of protocol used by certain email clients to fetch a user's emails from its server.

TLD: an acronym for Top Level Domain. This means the site domain of which the email is associated with (i.e. jdoe@something.com; the domain would be something.com).

UML: an acronym for Unified Modeling Language.

6. Overall Description

6.1. Product Perspective

This project was developed for SUNY Oswego's Software Design class. Specifically, it is designed for anyone who has an interest in generic statistics of their IMAP emails. DataMea analyzes the user's IMAP email to then output the information on an easy-to-read dashboard with graphs and lists.

6.2. Product Functions

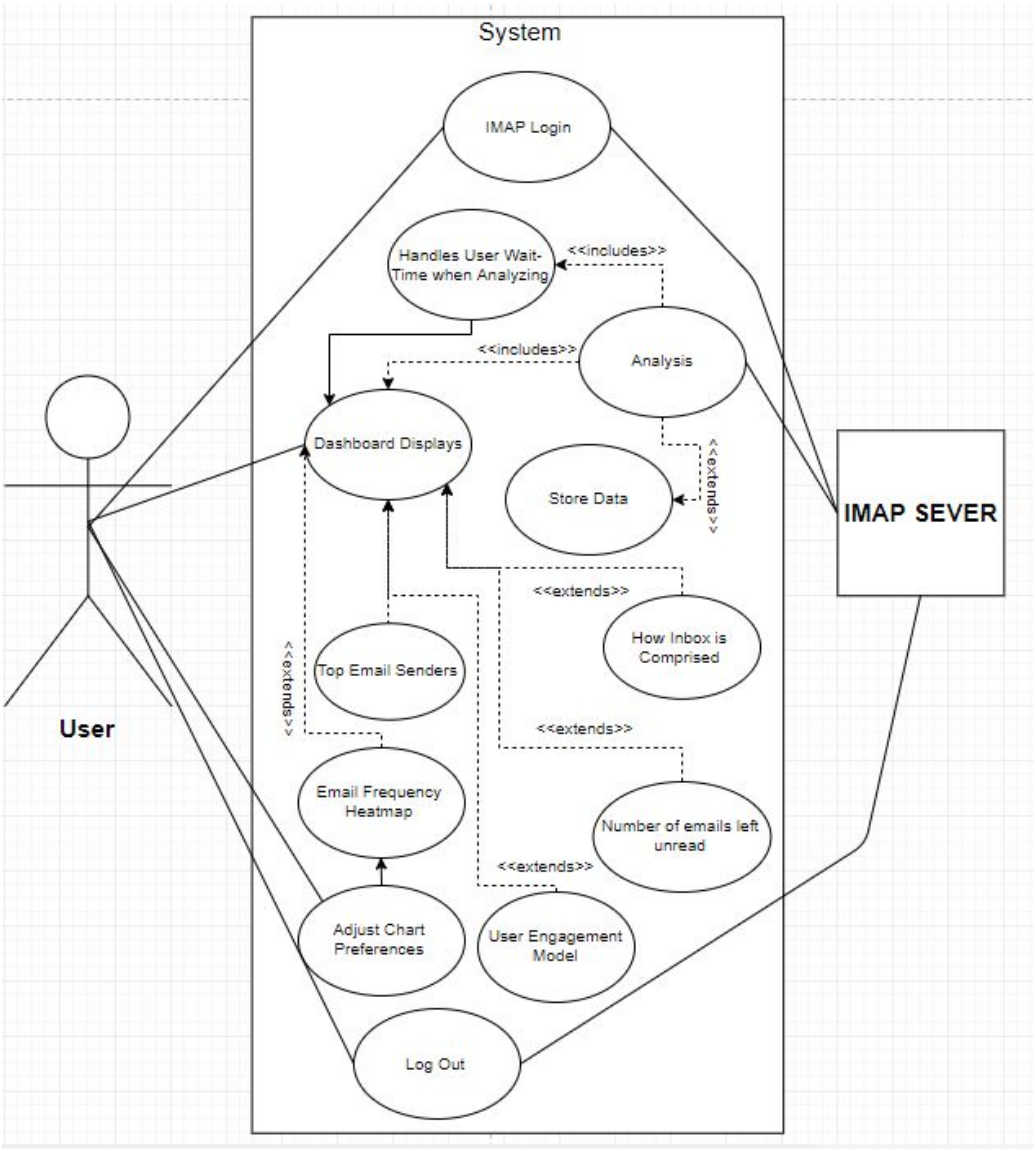
Analyze Email: the action of signing in to one's email via DataMea to then have the application analyze the IMAP data which will display on the product's dashboard automatically.

Exit: the action in which the application closes out of itself safely and ceases running on the user's device.

Store Data: DataMea will store basic incremental/decremental data in a read/write file on the user's local storage where the software is installed. No personal email data will be logged/saved besides the sender and receiver email usernames which will be encrypted along with the entirety of the file(s).

Process Request Waiting Screen: Once the IMAP data analysis is being processed, a seperate window will display with a brief tutorial on how to use the software and a progress bar.

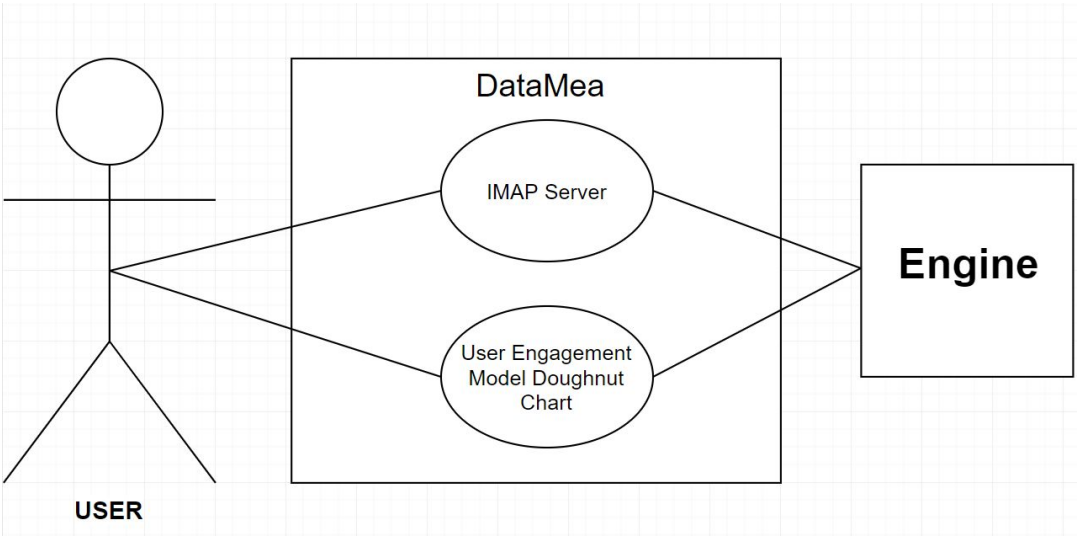
6.3. Use Cases



Entirety of DataMea UML: ***Diagram 6.3.1***

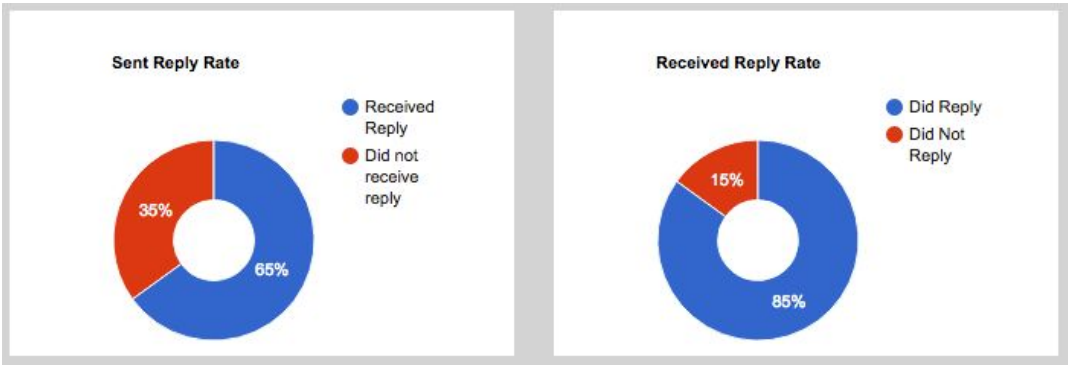
After a user has installed DataMea on their compatible computer, the user shall start the program. Then DataMea will verify the user's login information with the respected credentials. Thereafter, DataMea will open a separate window displaying a tutorial on the software and a progress bar. Once the DataMea engine's analysis is completed, the user shall interact with the interface by clicking on different portions of the GUI. The user shall exit the program by clicking EXIT in which DataMea will close out, delete, encrypt, or overwrite any necessary information stored on the read/write files. *See Picture 6.3.1 for more.*

Mockup Design of DataMea Dashboard: ***Picture 6.3.1***

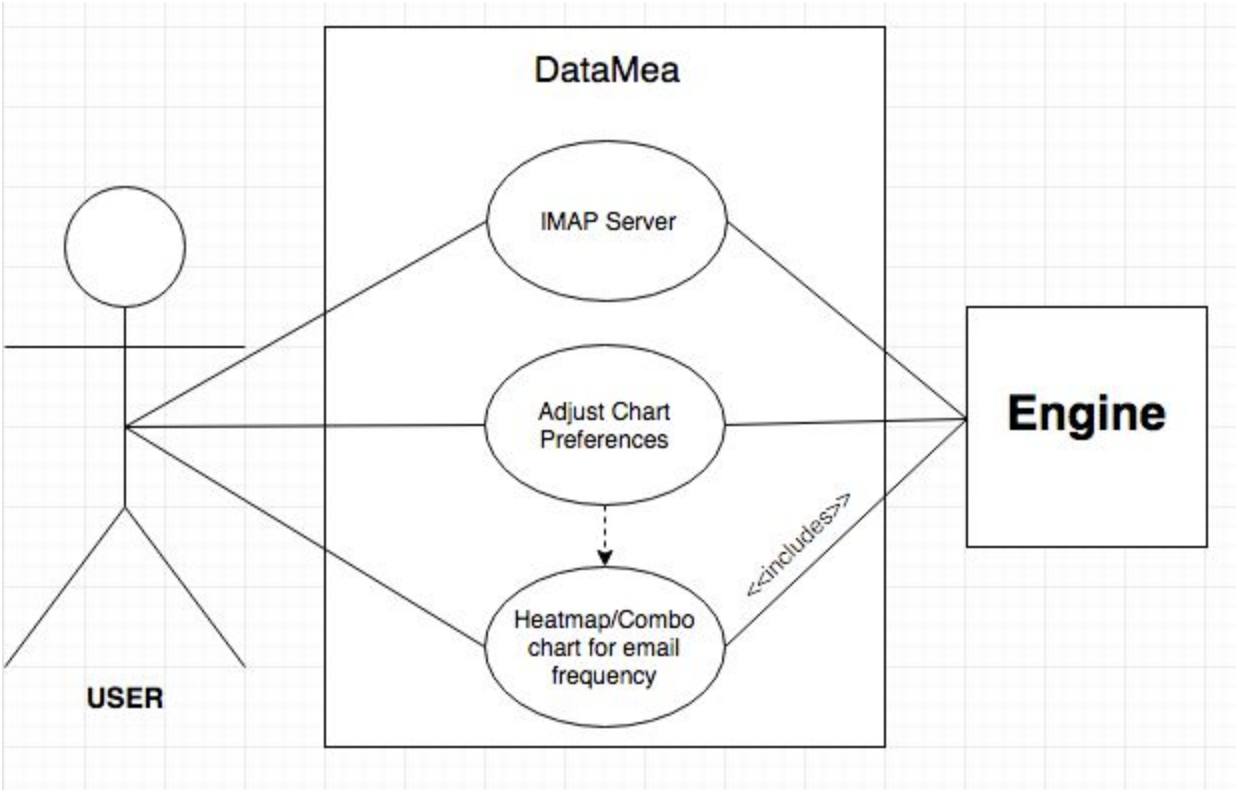


UML of User acting Engagement Model Chart: ***Diagram 6.3.2***

Once the user has logged in to their IMAP email through DataMea, the user shall be able to see a doughnut chart style graph on the dashboard. The graph shows overall interaction between the user and the user's send/receive recipients. *See Picture 6.3.2 for more*



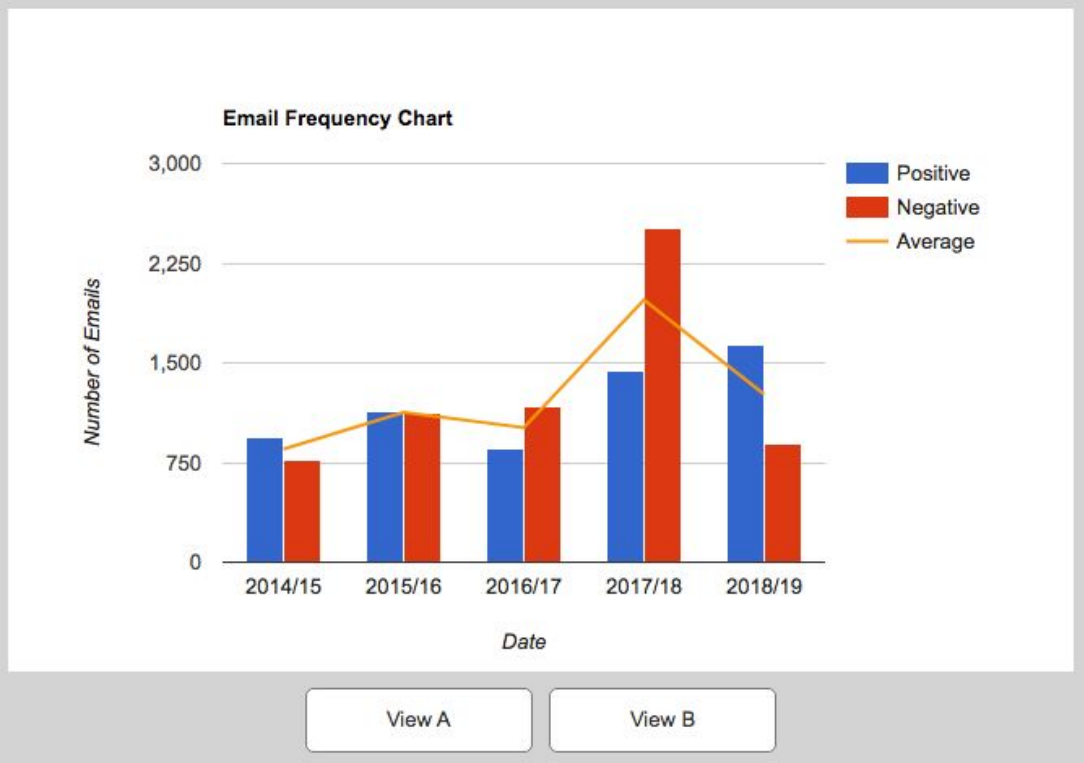
Picture 6.3.2



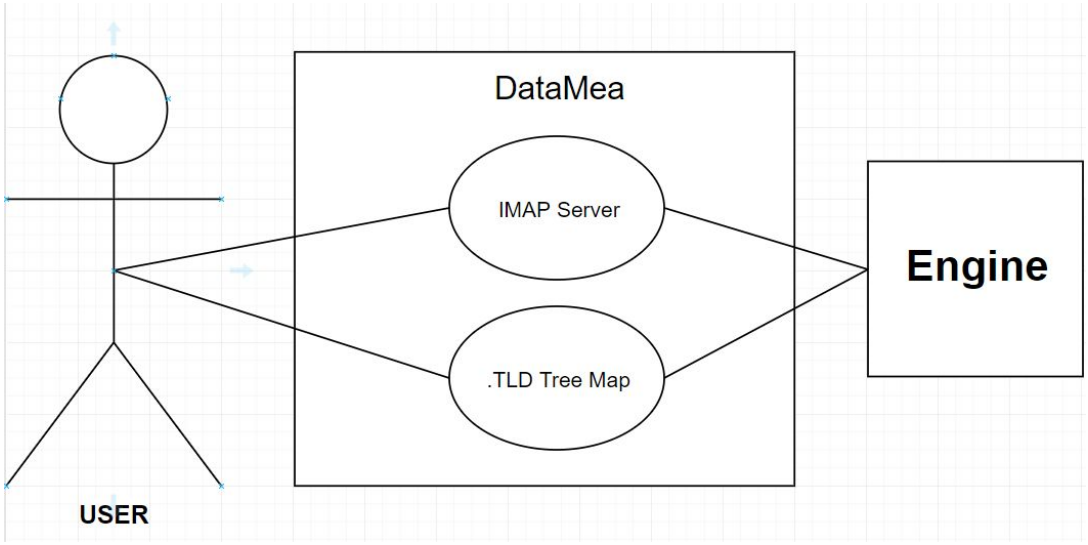
UML of User acting with Email Frequency Heatmap/Combo Chart and the Chart Preferences: ***Diagram 6.3.3***

Once logged in and the DataMea analysis has run on the user's IMAP email, the user shall be able to interact with the Email Frequency Heat Map preferences. This can be done by filtering what time frame the user is interested in (i.e. current month, last year, etc.). The user shall be able to change the chart from a Heatmap to a comparison bar chart by clicking the respected button. This will give the user another version of the same information but just presented in a different way. *See Picture 6.3.3 and 6.3.4 for more*

Heat Map Mockup: ***Picture 6.3.3***

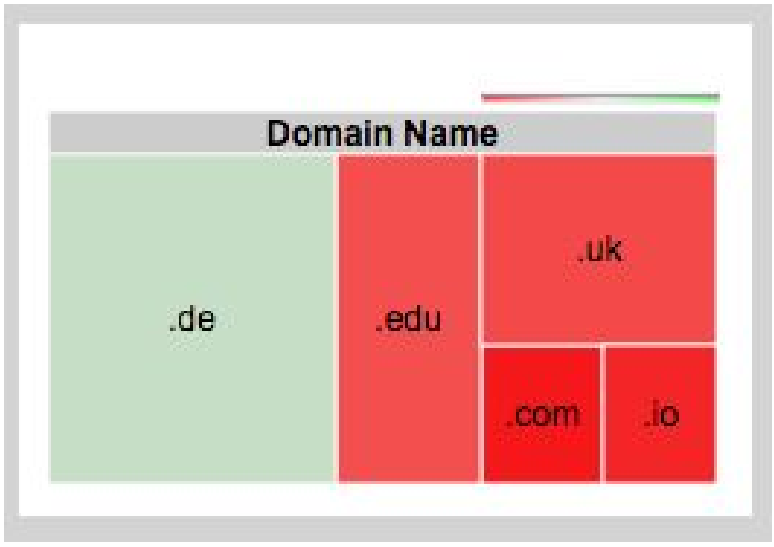


Bar Chart Mockup: ***Picture 6.3.4***

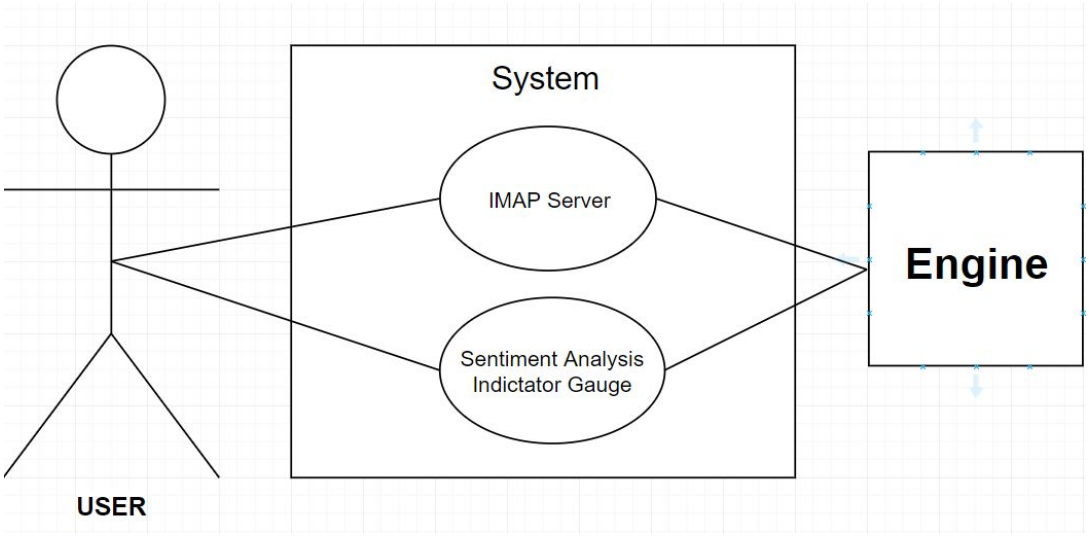


UML of User acting with Top Level Domain Chart: ***Diagram 6.3.4***

After the user has logged in to their IMAP email through DataMea and the engine's analysis is complete and are under the RECEIVED tab, the user should be able to see a chart in which is organized by top-domain names from email senders. The user shall be able to see a similar chart by clicking the SENT tab button on towards the top of the GUI. However, the data will correlate with the top-domain names of the user's sent mail. *See Picture 6.3.5 for more*

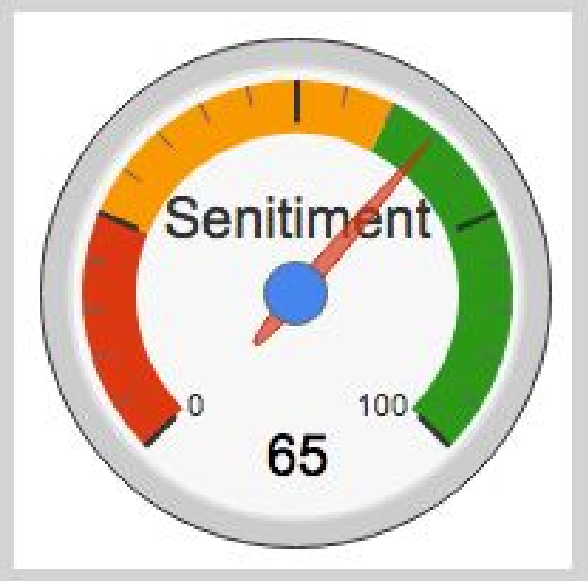


Picture 6.3.5

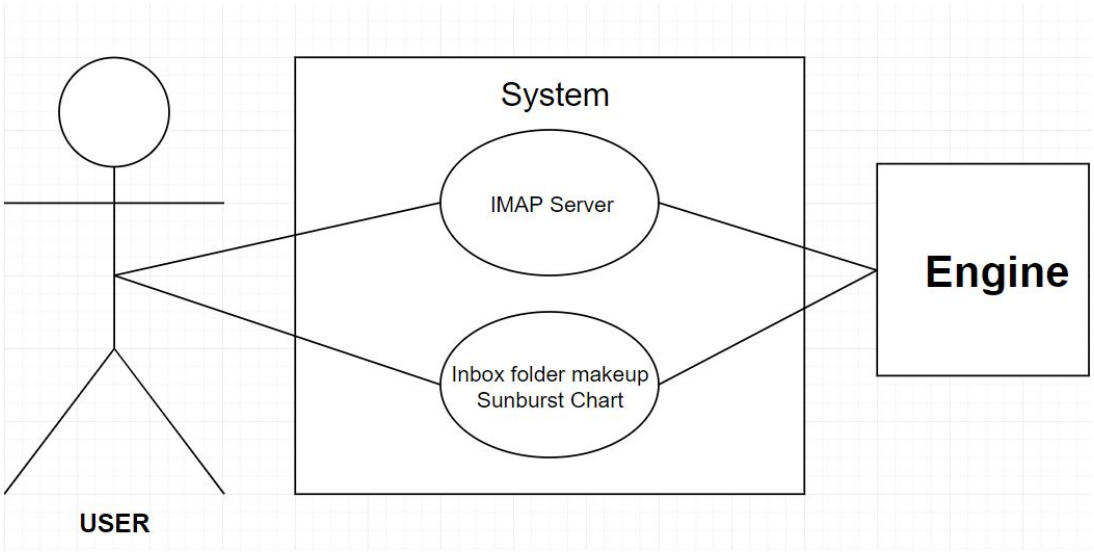


UML of User acting with Sentiment Analysis Chart: ***Diagram 6.3.5***

Once the user has logged into the DataMea program, the engine shall review the users emails and produce an overall sentiment score. This sentiment score will be displayed in an indicator gauge. *See Picture 6.3.6 for more*

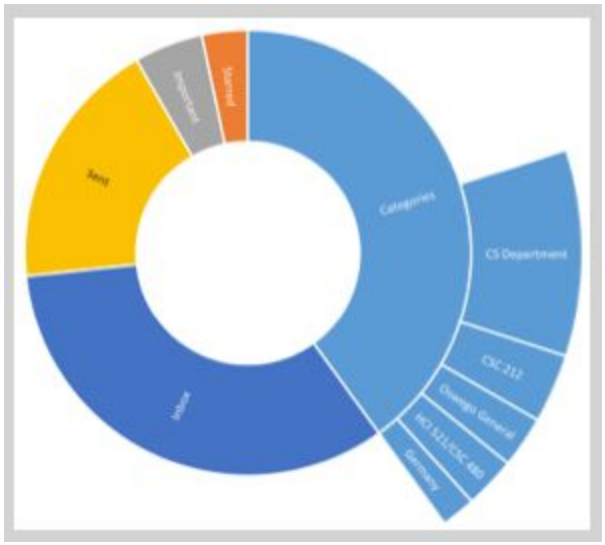


Picture 6.3.6

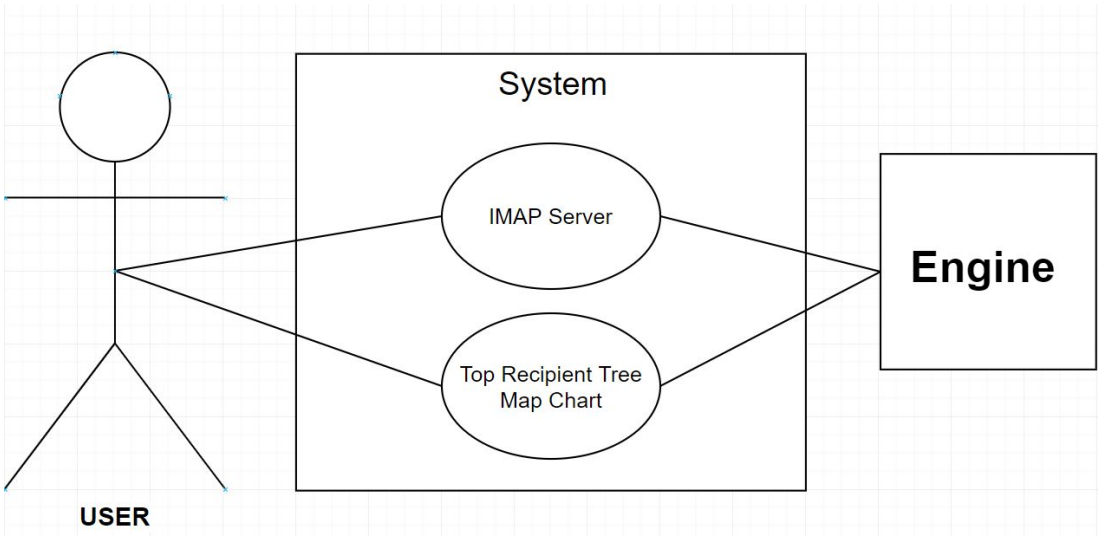


User acting with Sunburst Chart of the User's Inbox Makeup: ***Diagram 6.3.6***

Once the user has logged into the DataMea software the user shall be able to view a makeup of their IMAP folders via a sunburst chart. This graph will provide the user with a detailed look at the folder structure within their IMAP account. *See Picture 6.3.7 for more.*



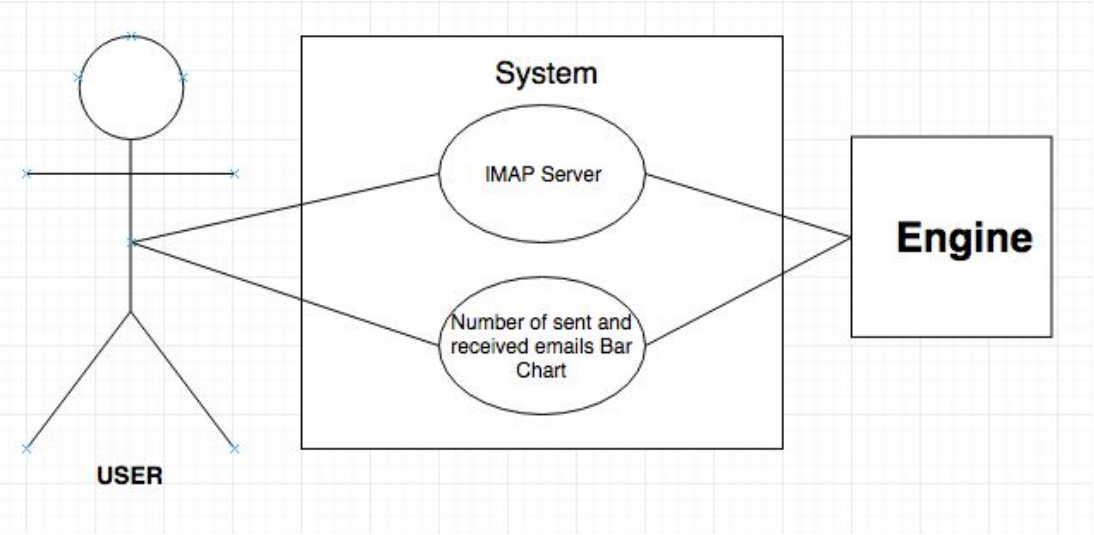
Picture 6.3.7



UML of User acting with the Top Sender/Receiver Chart: ***Diagram 6.3.7***

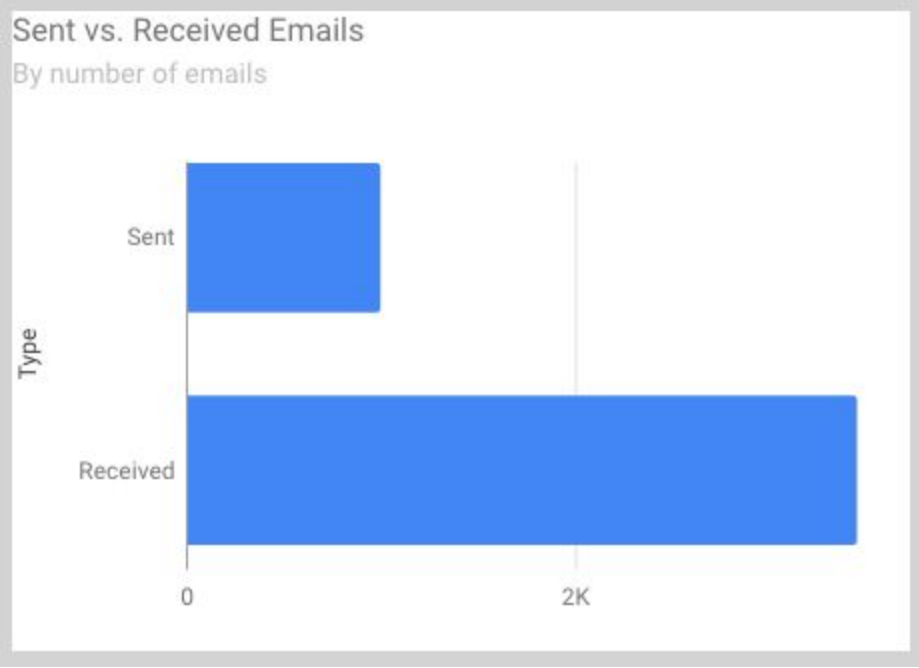
Once the user has signed into their IMAP server through DataMea and are under the RECEIVED tab, the user shall be able to see an interactive tree map diagram displaying their top senders. When the user clicks on part of the tree map diagram they should be presented with more information on that sender specifically. When the user navigates to the SENT tab they shall be presented with a similar tree map diagram, however this diagram will display email accounts the user sends emails to. *See Picture 6.3.8 for more*

Picture 6.3.8

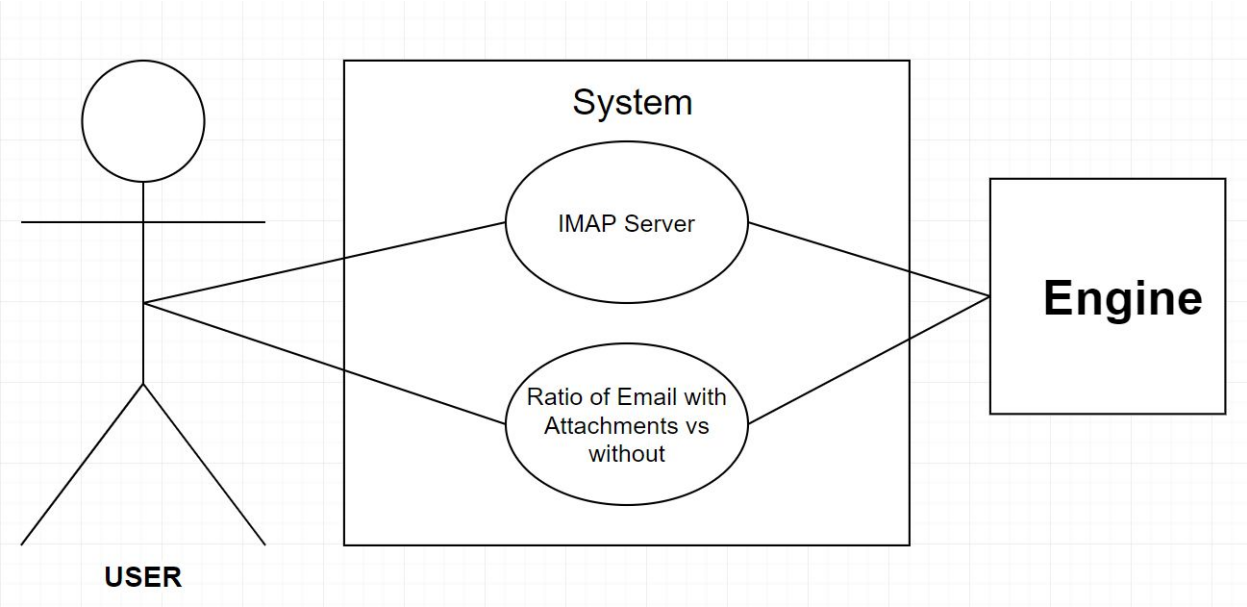


UML of User acting with the Number of Sent and Received Emails Chart: ***Diagram 6.3.8***

Once the user has signed into their IMAP server through DataMea the system shall display the number of sent and received emails. The user will be able to view the number of emails that they have sent and received. This chart will be able to change in accordance to user's selected filters. *See Picture 6.3.9 for more*

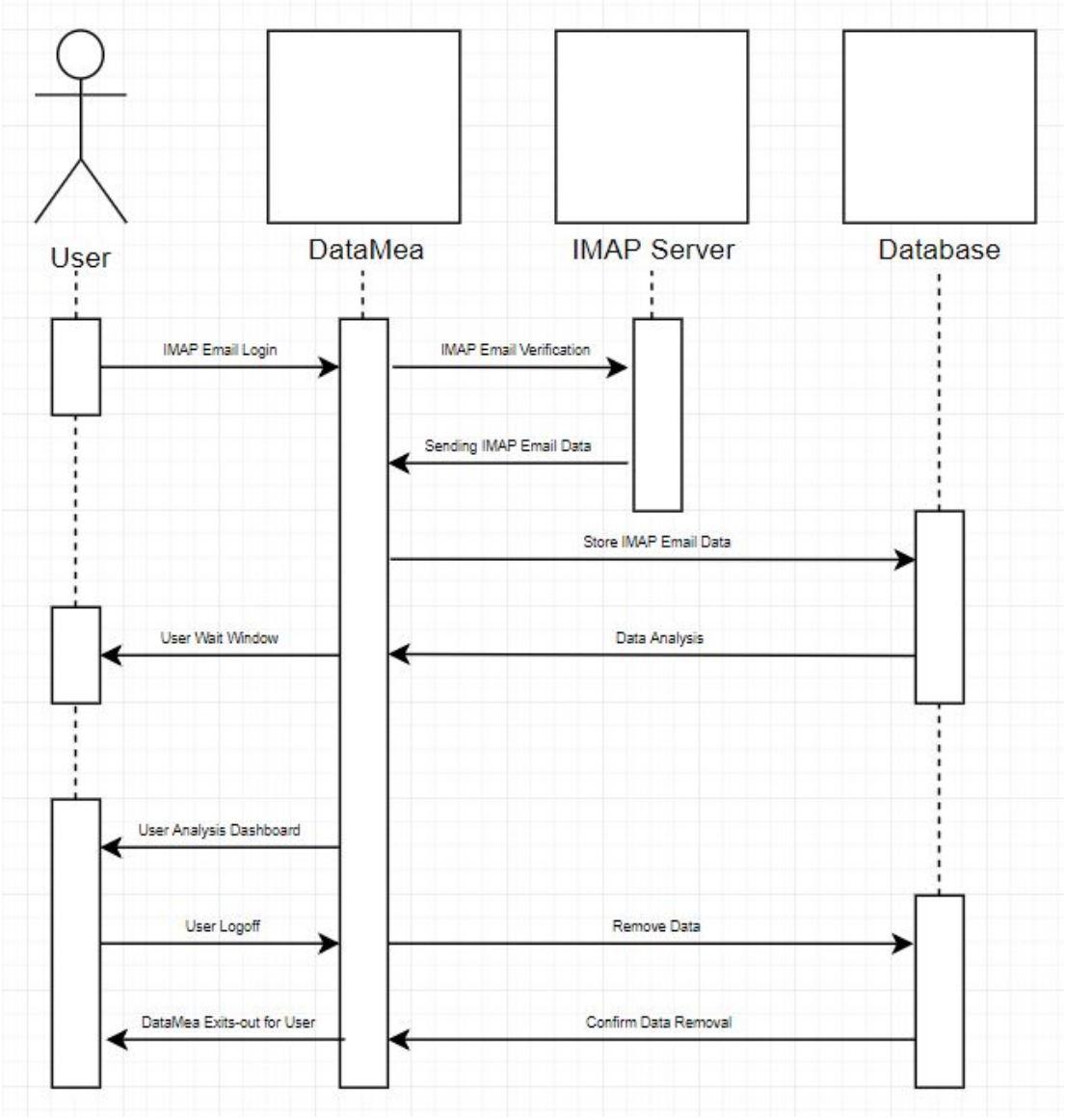


Picture 6.3.9

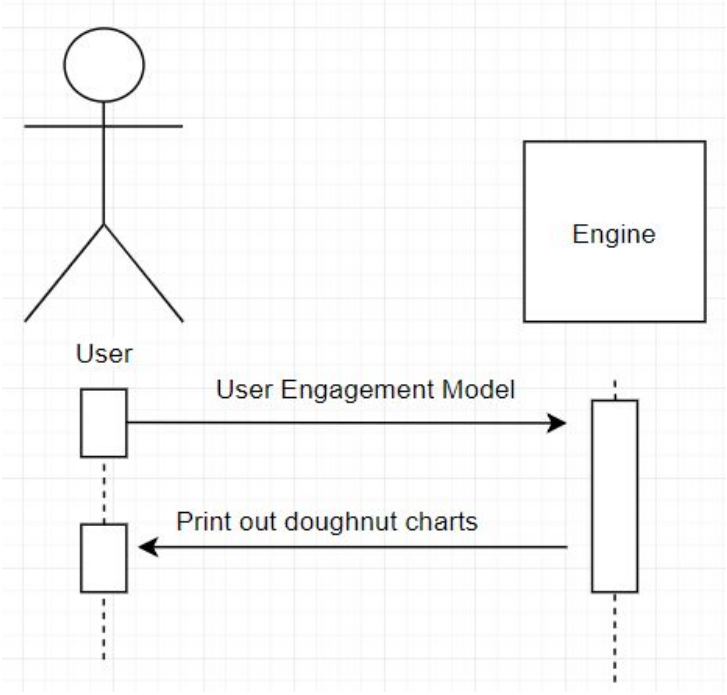


UML of User acting with the Ratio of Emails with Attachements and without Chart: ***Diagram 6.3.9***

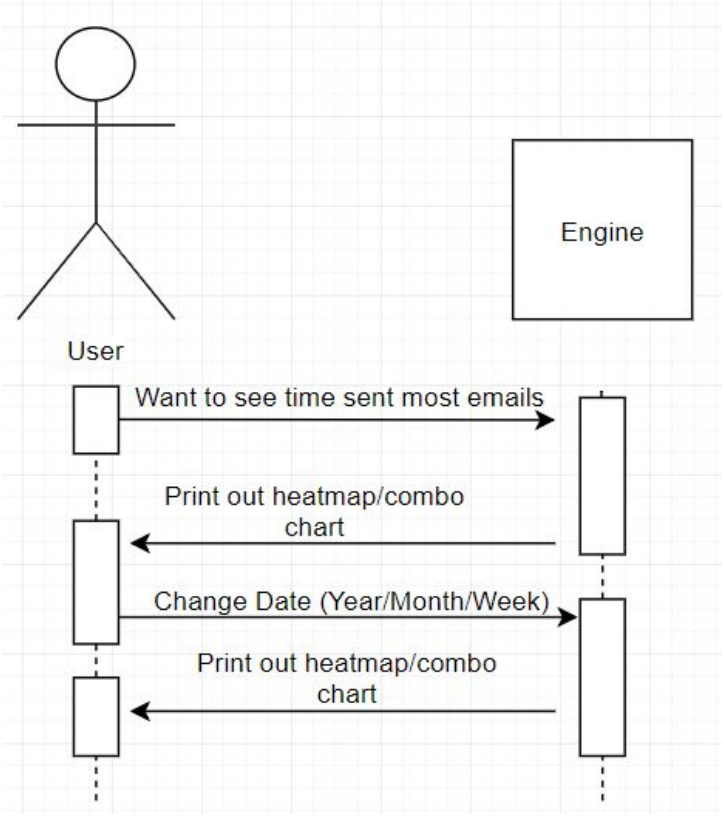
6.4. Sequence Diagrams



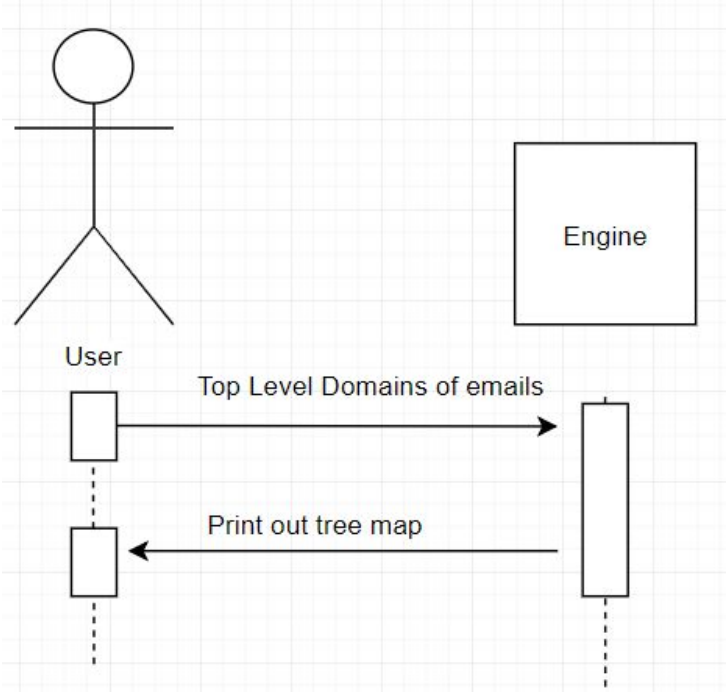
Overall Sequence Diagram: ***Diagram 6.4.1***



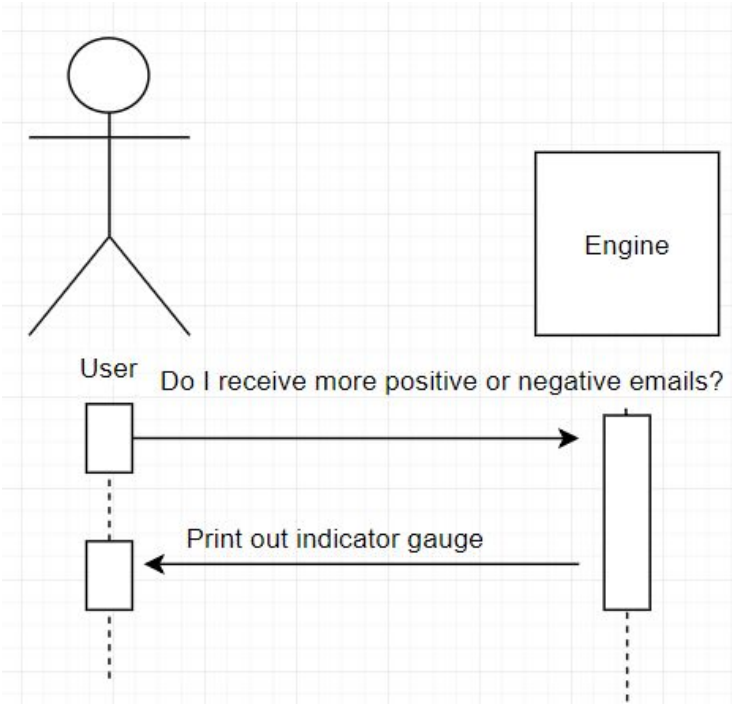
User Engagement Model Sequence Diagram: ***Diagram 6.4.2***



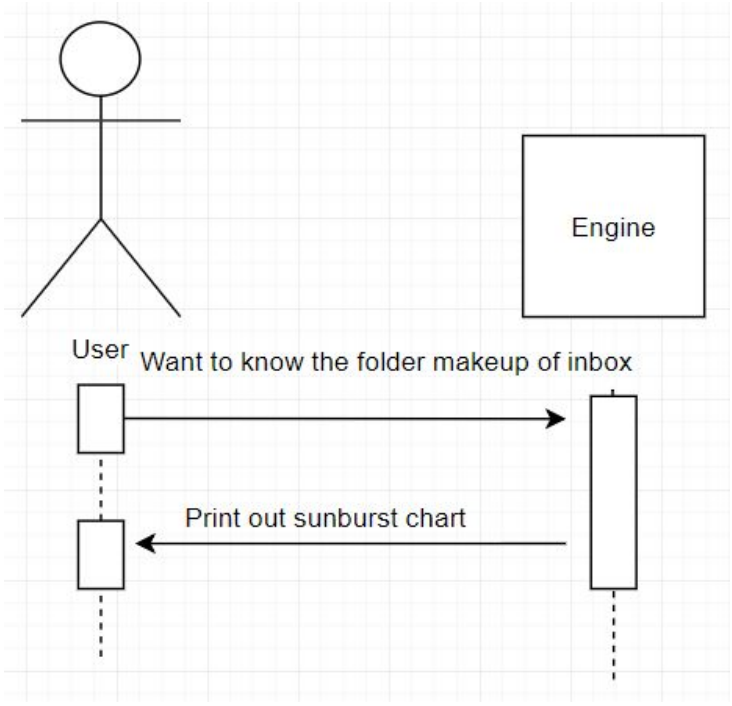
User Acting with Email Frequency Heatmap/Combo Chart and the Chart Preferences Sequence Diagram: ***Diagram 6.4.3***



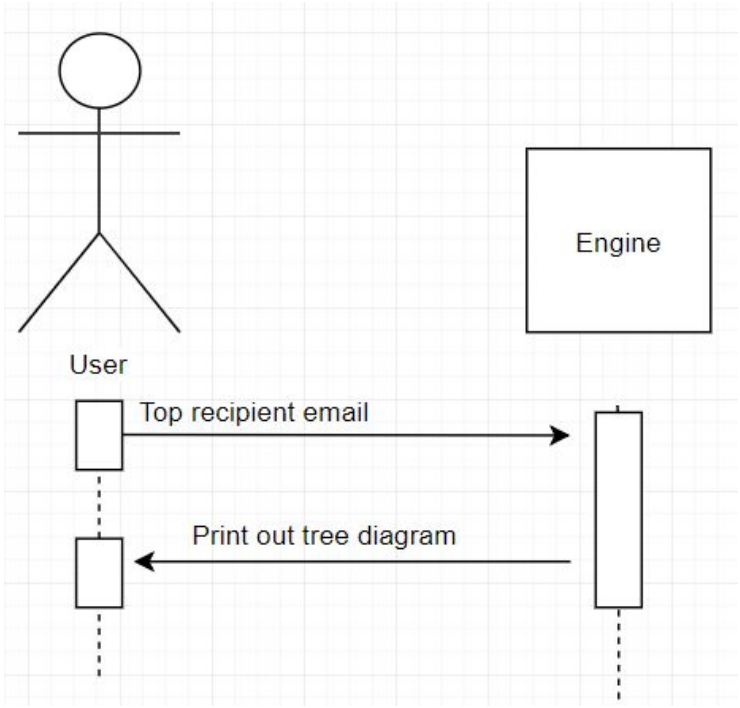
Top Level Domain Sequence Diagram: ***Diagram 6.4.4***



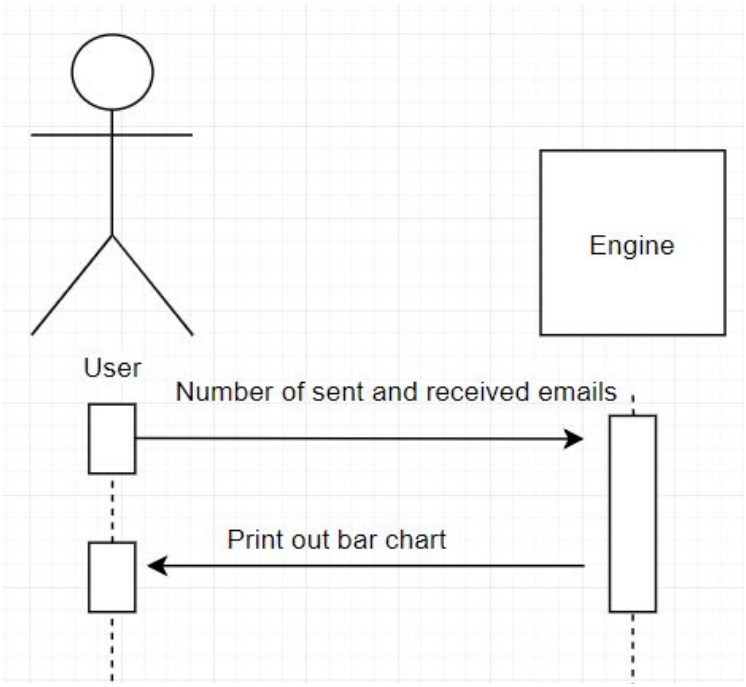
Sentiment Sequence Diagram: ***Diagram 6.4.5***



Email Folders Sequence Diagram: ***Diagram 6.4.6***

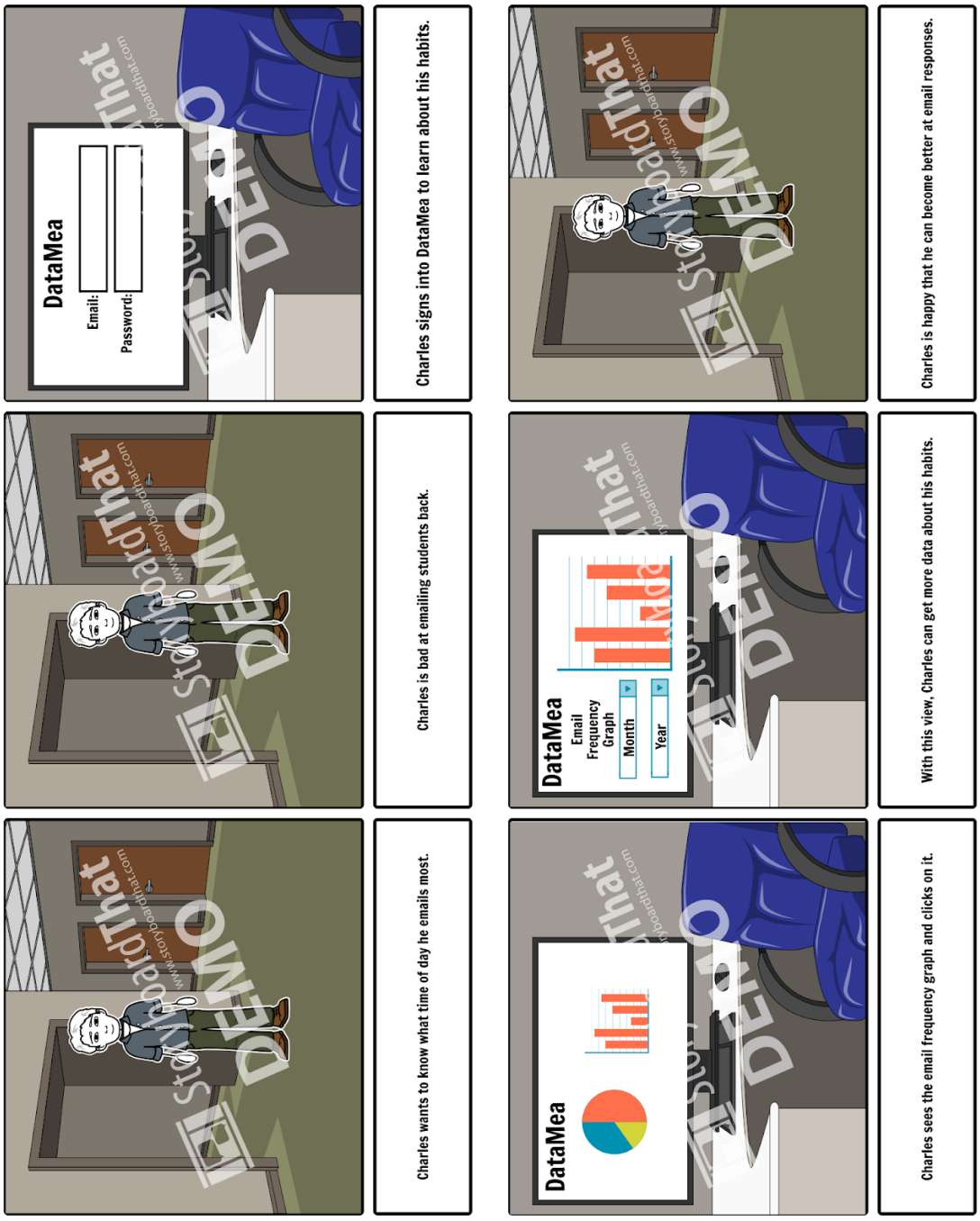


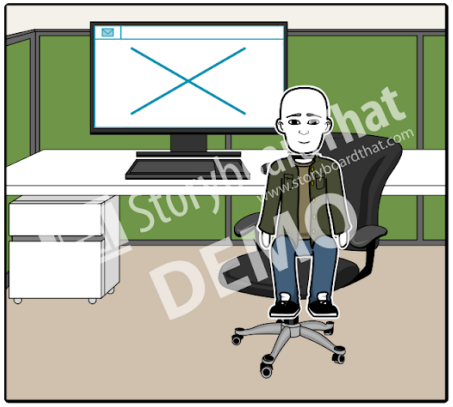
Top Recipient Sequence Diagram: ***Diagram 6.4.7***



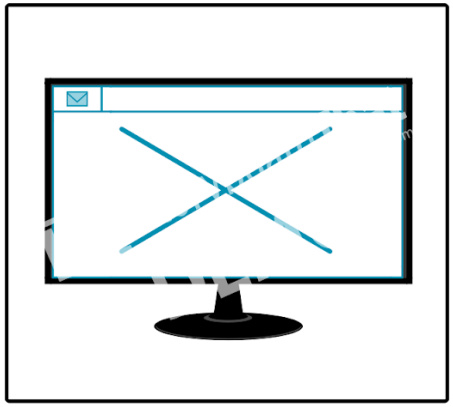
Number of Sent and Received Emails Sequence Diagram: ***Diagram 6.4.8***

6.5. Storyboards





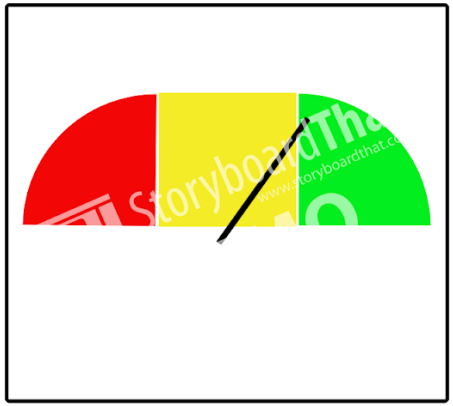
Richard, a professor, is combing through his work during finals week.



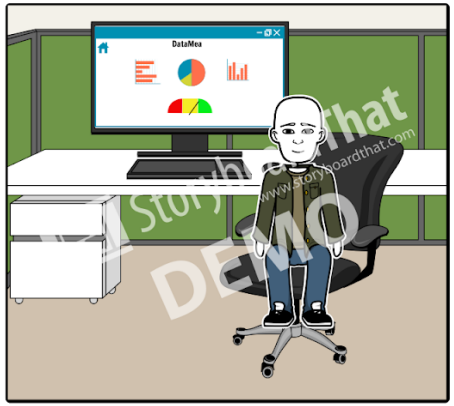
While reading through the many emails he has received from students, Richard is wondering how his students are feeling about the classes

Richard decides to open DataMea and look at the sentiment scores of the emails he's received from his classes

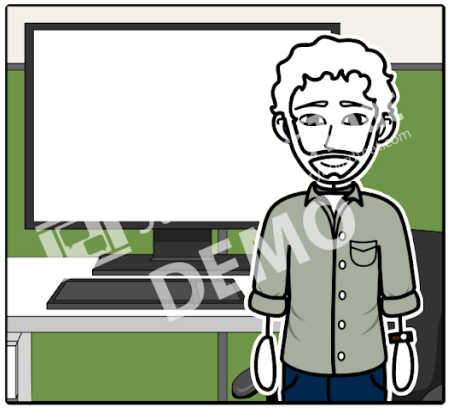
After Richard has logged into DataMea and it has finished the analysis Richard is able to view the results



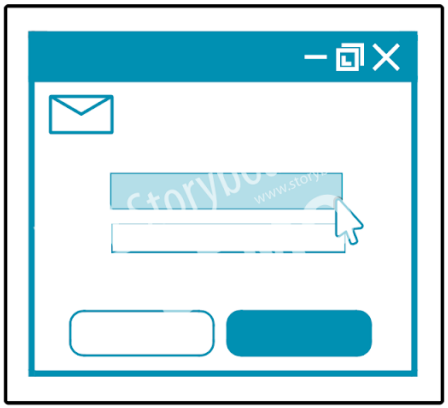
Richard locates the sentiment indicator and is able to view that most of the emails that have been coming in are mostly positive



Richard is very happy to find that his students are feeling good about his class in finals week



Carl would like to analyze his IMAP email using DataMea. So, Carl gets on his compatible computer to run the program.

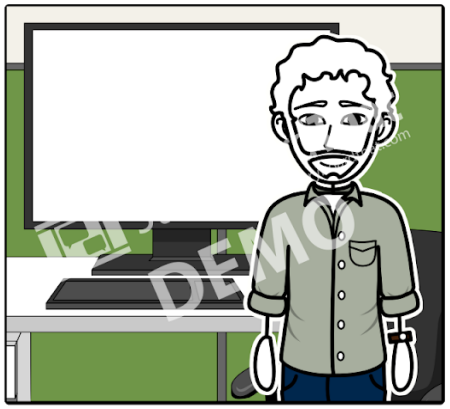


Carl opens up DataMea and enter in his IMAP email username and password into the respected text fields and then clicks ANALYZE or clicks EXIT to close out the the application.

After clicking ANALYZE, Carl sees the waiting screen which proved a brief tutorial on the app, and the progress bar. Carl could click the CANCEL button to stop the analysis, but Carl decides to continue.

After the analysis wait time, Carl sees the DataMea Dashboard which displays his IMAP email analysis results.

Carl can now shutdown the program by pressing the EXIT button



Carl now knows the aspect of his email analysis with the help of DataMea

6.6. Personas

Charles Smith

Xtensio

*"Never trust a **computer** you can't throw out a window."*

Age: 42
Work: Computer Science Professor at University
Character: Busy, short on time

Goals

- Learn about emailing habits (Time of Day).
- Optimize how he uses his email to stay more organized.

Challenges

- With a busy schedule, Charles is short on time and often finds himself behind with emails.
- Charles does not utilize the folder system of his email and so he spends long amounts of time searching for emails that are not so recent.

Bio

Charles is a 42 year old professor of Computer Science. With a packed teaching schedule, balancing multiple projects he is running with other professors and students, and advising, he finds himself with little to no time for emails.

Charles is looking for a visualization of his emailing habits, specifically when he emails the most and least. Comparing the visualization to his schedule, Charles is hoping that he can find some extra time in which he can respond to emails.

Charles also is interested in seeing who he receives the most emails from, and what TLD they come from. By understanding this, he feels as if he can begin to logically separate these emails into appropriate folders and become more organized.

Richard O'Connell

Xtensio

"To err is human, but to really foul things up you need a computer" - Paul R. Ehrlich

Age: 53
Work: Project Manager
Family: Married with 2 kids
Location: Philadelphia, PA

Friendly | Professional | Analytical | Outgoing

Goals

- To understand who he frequently contacts with via email
- Determine the amount of emails he receives versus the number he sends
- Determine the sentiment of those he contacts
- Wants to make sure he is using his time effectively

Frustrations

- Hard to determine how frequently his emails are replied to
- Isn't able to gather the overall feelings of those he contacts
- Hard to determine whether he receives or sends more emails

Bio

Richard is a project manager at a medium sized tech company. Richard manages a team for 12 workers and is in constant contact with them. Richard lives a busy work life and world like to understand how much time and effort is spent using email. Since Richard spends a lot of time using his email, it is important to him to be able to understand how he really uses his email.

Motivation

Incentive
Fear
Growth
Power
Social

Personality

Introvert — Extrovert
Thinking — Feeling
Sensing — Intuition
Judging — Perceiving

Harry Miller

Xtensio

"A trained librarian is a powerful search engine with a heart."

Age: 47
Work: **Penfield Library, Librarian**
Family: Married, 3 children
Location: Oswego, New York
Character: Friendly and Open

Personality

Introvert	Extrovert
Thinking	Feeling
Sensing	Intuition
Judging	Perceiving

Goals

- To make sure students are receiving and opening his sent emails and better understand the content of emails in his mailbox.
- To visualize the content of his emails from day to day interactions with students.
- Enjoys simple, easy to read content, graphs and charts.

Passionate | Caring | Physical | Worldly

Frustrations

- Gets easily frustrated because he is not able to track the status of his emails or visualize what he receives from student.
- Hard to keep up with the number of emails received everyday.
- Finds technology overwhelming.

Motivation

Incentive
Fear
Growth
Power
Social

Bio

Harry Miller has a Master's Degree from the State University of New York at Oswego. Ever since he graduated, he got his first job at the Penfield Library to help students find the necessary resources and tools in the library to help them succeed. Harry is the most knowledgeable librarian the Penfield Library has ever had in the history of SUNY Oswego.

Remember - you may modify this template, remove any of the modules or add new ones for your own purpose.

Jane Doe

Xtensio

"I want to look at my email from a new perspective"

Age: 50
Work: Music Professor
Character: Busy, enthusiastic

Goals

- Manage Email habits
- Use data as a tool for organization

Frustrations

- Jane receives too many emails, and its not categorized
- Jane cannot keep track of how many emails she received form her music students

Must Haves

- Ability to filter information
- Ability to move around the user-interface quickly

Bio

Jane is a 50 year old professor of Music at The Julliard School. With hundreds of students and many music shows to attend , checking email is overwhelming to Jane.
Jane finds that reading her emails and searching for how many of her students emailed her from music courses is overwhelming. Jane wishes that there was a way she could have some sort of visualization for her email. She wants to keep track of how many emails she replies to and how many emails she receives.

6.7. Operating Environment

DataMea is a desktop application that can be installed on Mac (<specify versions>), Windows (<specify versions>), and Linux (<specify versions>). The application will only analyze those email account that utilize Internet Message Access Protocol (IMAP).

6.8. Privacy Policy

In accordance to Gmail, DataMea cannot and will not store a users personal data from their respected IMAP email account whether it be an external database or on the user's local disk. Any information such as receiver or sender email accounts will be encrypted along with any read and write files that are read or written by DataMea.

7. Interface Requirements

7.1.1 Sent Email Reply Rate Donut Chart

See Diagram 6.3.2 and Picture 6.3.2

7.1.1.1 The donut chart shall display the rate at which other users have replied to emails that were sent from the current user's IMAP account.

7.1.1.2 The donut chart shall display two percentages, one showing the percentage of sent emails that were replied to and one showing the percentage of sent emails that were not replied to.

7.1.1.3 The donut chart shall allow the user to hover their cursor over a percentage section to learn the total number of sent emails that were replied to or not replied to.

7.1.1.4 The donut chart shall allow for the user to click on either the percentage of sent emails that were replied to and those that were not replied to.

7.1.1.5 The donut chart shall update in accordance to the different filters that are applied by the user.

7.1.1.6 The donut chart shall display a legend which allows the users to understand what is represented by each section.

7.1.2 Received Email Reply Rate Donut Chart

See Diagram 6.3.2 and Picture 6.3.2

7.1.2.1 The donut chart shall display the rate at which the user has replied to emails that were received in their IMAP account.

7.1.2.2 The donut chart shall display two percentages, one showing the percentage of emails that were received and replied to by the user and one showing the percentage of sent emails that were not replied to by the user.

7.1.2.3 The donut chart shall allow the user to hover their cursor over a percentage section to learn the total number of received emails that were replied to or not replied to.

7.1.2.4 The donut chart shall allow for the user to click on either the percentage of received emails that were replied to and those that were not replied to.

7.1.2.5 The donut chart shall update in accordance to the different filters that are applied by the user.

7.1.2.6 The donut chart shall display a legend which allows the users to understand what is represented by each section.

7.1.3 Email Frequency Heatmap Chart

See Diagram 6.3.3 and Picture 6.3.3

7.1.3.1 The heatmap shall display the time of day at which the user utilizes their IMAP account to send and receive emails.

7.1.3.2 The heatmap shall display the most frequent times during any week at which the user utilizes their IMAP account to send and receive emails.

7.1.3.3 The heatmap shall display the most frequent times during any month at which the user utilizes their IMAP account to send and receive emails.

7.1.3.4 The heatmap shall display the most frequent times during any year at which the user utilizes their IMAP account to send and receive emails.

7.1.3.5 The heatmap shall allow the user to adjust the results that are displayed based on time (day/week/month/year).

7.1.3.6 The heatmap shall update in accordance to the different filters that are applied by the user.

7.1.3.7 The heatmap shall allow the user to hover their cursor over a section to view the total number of emails that were sent and received during that specific period.

7.1.3.8 The heatmap shall allow the user to click on a section of the heatmap, and the rest of the dashboard will update in accordance to the user's selection.

7.1.3.9 The user shall be able to adjust the date and time preferences from a dropdown menu.
7.1.3.10 The user shall be click a ‘view as’ button which will update the dashboard to display a heatmap or a combo bar chart showing the user’s IMAP account sent and received email frequencies.
7.1.3.11 The heatmap shall allow the user to understand what time(s) during the period selected were populated by the highest email frequencies, lowest email frequencies, and those that are moderate frequencies. This shall be done utilizing a color scheme, where red correlates to highest frequency, green correlates to lowest frequency, and yellow correlates to moderate frequency.
7.1.3.12 The heatmap shall display a legend which allows the users to understand what is represented by each section.

7.1.4 Email Frequency Combo Bar Chart

See Diagram 6.3.3 and Picture 6.3.4

7.1.4.1 The combo bar chart shall display the time of day at which the user utilizes their IMAP account to send and receive emails.
7.1.4.2 The combo bar chart shall display the most frequent times during any week at which the user utilizes their IMAP account to send and receive emails.
7.1.4.3 The combo bar chart shall display the most frequent times during any month at which the user utilizes their IMAP account to send and receive emails.
7.1.4.4 The combo bar chart shall display the most frequent times during any year at which the user utilizes their IMAP account to send and receive emails.
7.1.4.5 The combo bar chart shall allow the user to adjust the results that are displayed based on time (day/week/month/year).
7.1.4.6 The combo bar chart shall update in accordance to the different filters that are applied by the user.
7.1.4.7 The combo bar chart shall always display to the user the total number of emails that were sent and received during that specific period.
7.1.4.8 The combo bar chart shall allow the user to hover their cursor over a section to view the total number of emails that were sent and received during that specific period.
7.1.4.9 The combo bar chart shall allow the user to click on a section of the combo bar chart, and the rest of the dashboard will update in accordance to the user’s selection.

7.1.4.10 The user shall be able to adjust the date and time preferences from a dropdown menu.
7.1.4.11 The user shall be click a ‘view as’ button which will update the dashboard to display a heatmap or a combo bar chart showing the user’s IMAP account sent and received email frequencies.
7.1.4.12 The combo bar chart shall allow the user to view the sentiment of their IMAP account emails via color coding the bars within the chart. Sentiment scores that are positive will produce a green bar, negative scores will produce a red bar, and moderate scores will produce a yellow bar.
7.1.4.13 The combo bar chart shall display a legend which allows the users to understand what is represented by each section.

7.1.5 Top Level Domain Tree Map Chart

See Diagram 6.3.4 and Picture 6.3.5

7.1.5.1 The tree map chart shall display the top level domains of emails the user has interacted with using their IMAP account.
7.1.5.2 The tree map chart shall be clickable and allow the user to find out the individual domains sending emails to their IMAP account.
7.1.5.3 The tree map chart shall update in accordance to the different filters that are applied by the user.
7.1.5.4 The tree map chart will display the number of emails sent to the users IMAP account when the cursor hovers over each different section.
7.1.5.5 The tree map chart sections shall resize dependent upon the amount of emails sent by a particular top level domain.

7.1.6 Top Sender Tree Map Chart

See Diagram 6.3.7 and Picture 6.3.8

7.1.6.1 The tree map chart shall display the top sender of emails the user has interacted with using their IMAP account.
7.1.6.2 The tree map chart shall be clickable and allow the user to find out the individuals whom are the most frequently communicated with in their IMAP account.
7.1.6.3 The tree map chart shall update in accordance to the different filters that are applied by the user.
7.1.6.4 The tree map chart shall display the number of emails sent by a particular individual to the users IMAP account when the cursor hovers over each different section.
7.1.6.5 The tree map chart sections shall resize dependent upon the amount of emails sent by a particular top level domain.

7.1.7 Sentiment Analysis Indicator Chart

See Diagram 6.3.5 and Picture 6.3.6

7.1.7.1 The sentiment analysis chart shall show the users average email sentiment score from their IMAP account.

7.1.7.2 The user shall have the ability to use their mouse arrow to hover over one of the color sentiment arcs which then DataMea will display the number of emails that correspond to that sentiment rating.

7.1.6.3 The sentiment analysis indicator chart shall update in accordance to the different filters that are applied by the user.

7.1.6.4 The user shall be able to click on a color section of the sentiment chart and DataMea will update the dashboard to display emails corresponding to positive (green), neutral (yellow), and red (negative) sentiment scored emails.

7.1.8 IMAP Folders Sunburst Chart

See Diagram 6.3.6 and Picture 6.3.7

7.1.8.1 The sunburst chart shall display IMAP folders.

7.1.8.2 The chart shall provide the user with a detailed look at the folder structure within their IMAP account.

7.1.8.3 The chat's center circle shall represent the root node, with the hierarchy moving outward from the center.

7.1.8.4 The chart displays the necessary amount of pie charts on top of each other in a stack.

7.1.8.5 The diagram should afford for clicking , and should direct users to the data related to the clicked folder.

7.1.9 Sent vs Received Emails Bar Graph

See Diagram 6.3.8 and Picture 6.3.9

7.1.9.1 The graph shall be in display as soon as a user logs onto their IMAP server through DataMea.

7.1.9.2 The graph shall display the number of emails sent and received per day.

7.1.9.3 The graph shall include filters that allow users to change their view accordingly.

7.1.10 DataMea Dashboard

See Diagram 6.3.1 and Picture 6.3.1

7.1.10.1 Once the user executes the DataMea program, DataMea will present its login screen which will have a username textfield, password textfield, login button, and an exit button.

7.1.10.2 The username textfield shall reference the user's IMAP email username. The user shall be able to type said username into the field by clicking in the field.
7.1.10.3 The password textfield shall reference the user's IMAP email password. The user shall be able to type in their password into the field by clicking in the field. The characters typed into the password text field will be visually altered to asteriscs (*) for privacy purposes.
7.1.10.4 The exit button shall allow the user to exit the DataMea program.
7.1.10.5 The login button shall be clicked upon by the user which will start the DataMea engine analysis. The login window will close out and the loading screen will appear.
7.1.10.6 The loading screen shall show a tutorial for the software, a progress bar, and a cancel button. The user shall be able to click on the cancel button to terminate the program in which the analysis will cease to run; which afterwards the loading screen will close. DataMea will stop running as a program in the users OS.
7.1.10.7 DataMea shall send the user an email to their provided email they used in the username textfield. The email from DataMea will indicate that the analysis is completed and the user's data is ready for the user.
7.1.10.8 Once the DataMea engine analysis of the user's IMAP email is complete, the loading screen will close out and the main dashboard will appear. The dashboard will have the respective charts indicated above. Three tab buttons for sent emails, received emails, and all emails. Towards the top left of the GUI is a hamburger icon which shall open the directory layout of the user's IMAP email once clicked on by the user.
7.1.10.9 The user shall be able to click on the all tab option and the dashboard will update the above graphs to include all emails within the user’s IMAP account
7.1.10.10 The user shall be able to click on the sent tab option and the dashboard will update the above graphs to include only emails that are sent by the user.
7.1.10.11 The user shall be able to click on the received tab option and the dashboard will update the above graphs to include only emails that are received by the user.
7.1.10.12 The user shall be able to click on the “filter by top sender” option, and DataMea will update the above graphs to show data pertaining to the top sender.

7.1.10.13 The user shall be able to click on the “filter by date” option, and DataMea will update the above graphs to show data pertaining to the date specified.

7.1.10.14 The user shall be able to click through the tutorial to progress, this progression will show the user what each chart represents and how to read the analyzed data.