LAB REPORT

Submitted by

Shwetha Anand [RA2111027010045]

Snehal Sukundari [RA2111027010049]

Seyjuti Banerjee [RA2111027010052]

Under the Guidance of

Dr. K. Arthi

Assistant Professor, DSBS

In partial satisfaction of the requirements for the degree of

BACHELOR OF TECHNOLOGY in COMPUTER SCIENCE ENGINEERING

with specialization in Big Data Analytics

SCHOOL OF COMPUTING   COLLEGE OF ENGINEERING AND TECHNOLOGY

SRM INSTITUTE OF SCIENCE AND TECHNOLOGY

KATTANKULATHUR - 603203

MAY 2023

COLLEGE OF ENGINEERING & TECHNOLOGY

SRM INSTITUTE OF SCIENCE & TECHNOLOGY

S.R.M. NAGAR, KATTANKULATHUE – 603 203

Chengalpattu District

BONAFIDE CERTIFICATE

Register No. __RA2111027010049___ Certified to be the bonafide work

done by __Snehal Sukundari__of II Year/IV Sem B.Tech Degree Course in the

Practical Software Software Engineering and Project Management

18CSC206J in **SRM INSTITUTE OF SCIENCE AND TECHNOLOGY,**

Kattankulathur during the academic year 2022 – 2023.

LAB INCHARGE   **Head of the Department**

Name of the Faculty

Designation

Department of Computing Technologies SRMIST

– KTR.

Date :

ABSTRACT

An analysis of screen time usage is a study that aims to understand how individuals use their electronic devices such as smartphones, tablets, and computers. The objective of this analysis is to identify the amount of time individuals spend on their devices, the patterns and trends of usage, and the impact it has on their physical and mental health. This analysis involves data collection through surveys and monitoring tools, data analysis using key metrics and performance indicators, and the development of recommendations to reduce screen time and improve overall health. The implementation of these recommendations involves monitoring progress and adjusting them as necessary. The results of this analysis will benefit individuals, families, and organizations by providing insights on how to reduce screen time and promote healthier habits.

TABLE OF CONTENTS

PROBLEM STATEMENT

The primary purpose of this study is to find a balance that works for you and to be aware of the potential risks of excessive screen time, an application designed to quantify use of multiple popular screen-based devices.

STAKEHOLDERS

Stakeholder analysis is an important methodology for screen time analysis projects as it helps identify the key stakeholders involved and their respective interests, needs, and concerns. The following are the steps involved in conducting stakeholder analysis for a screen time analysis project:

- Identify the stakeholders
- Analyze the stakeholders
- Prioritize the stakeholders
- Develop a stakeholder engagement plan
- Implement the stakeholder engagement plan

Stakeholder Name	Activity/ Area /Phase	Interest	Influence	Priority (High/ Medium/ Low)
Project Manager	End product	High	High	Medium
Investors	Finance	Low	Medium	Medium
Members	End Product	High	High	High
Sponser	Finance	High	High	High
Suppliers	Resources	High	Medium	High
End User	End Product	High	High	High

By using stakeholder analysis methodology, screen time analysis projects can identify and address stakeholder needs, improve project outcomes, and build stakeholder support for the project.

Types of Stakeholders in Project Management

PROCESS MODEL

The waterfall process is a sequential project management approach that is often used in software development, but it can also be applied to screen time analysis projects. The waterfall process consists of a series of phases that must be completed in a specific order:

- Requirements gathering: In this phase, the project team identifies the requirements for the screen time analysis project, such as the specific devices and platforms to be monitored, the types of data to be collected, and the analysis methods to be used.
- Design: In this phase, the project team designs the system architecture, data collection methods, and analysis processes. This includes identifying the necessary hardware and software components, determining how data will be collected and stored, and defining the analysis algorithms.
- Implementation: In this phase, the project team builds the system and implements the data collection and analysis processes. This includes installing hardware and software components, configuring data collection tools, and developing analysis scripts.
- Testing: In this phase, the project team tests the system to ensure that it meets the requirements and functions as expected. This includes verifying data collection and analysis accuracy and assessing system performance.
- Deployment: In this phase, the project team deploys the system and begins collecting and analyzing screen time data.

- Maintenance: In this phase, the project team maintains the system and monitors its performance. This includes resolving any issues that arise and updating the system as necessary to ensure continued accuracy and reliability.

By following the waterfall process, screen time analysis projects can be planned and executed in a structured and systematic way, which can help ensure that the project meets its objectives and delivers accurate and reliable results.
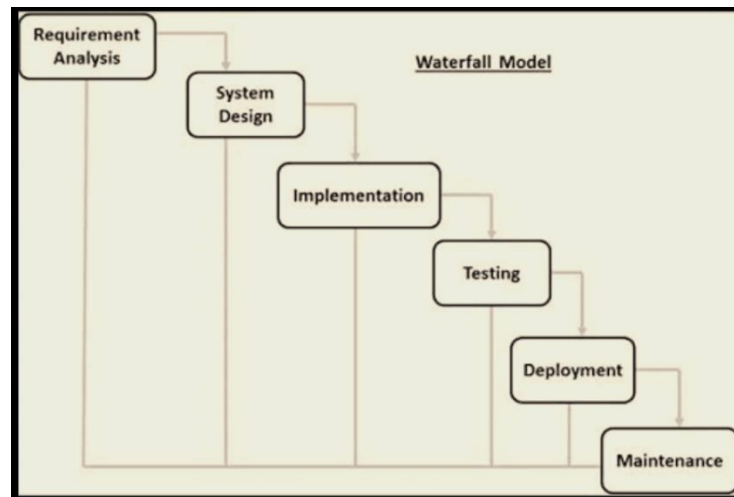
IDENTIFYING REQUIREMENTS

System Requirement :

1. Operating System
2. Database
3. Web Server
4. Programming Languages and Frameworks: Python
5. APIs
6. Cloud Services
7. Mobile Application Development
8. Analytics and Visualization Tools

FUNCTIONAL REQUIREMENTS

- User registration and login
- 2. Screen time tracking

- 3. Data visualization
- 4. Screen time alerts
- 5. Device management
- 6. Privacy and security

NON FUNCTIONAL REQUIREMENTS

- Usability
- 2. Performance
- 3. Reliability
- 4. Scalability
- 5. Accessibility

PROJECT PLAN

Scope Management

A project scope statement provides a detailed description of the work that must be done to deliver the output of a project on time and within the allotted budget.

- Requirements are- Number of notifications, number of times phone has been unlocked, responsive website, internet connections.

- Responsive website to notify according to the screen usage time.

- Requirement change -easy accessible, people can give review and ratings to identify issues, have help sessions for modifications.

- Activity-to make responsive websites.

- Tasks-designing ui/ux, writing codes for frontend and backend,database management, cloud deployment.

Risk Management

Potential issues might harm cost.

- Technical Issues of the project and quality of our software device.

● Slowing premium subscriber growth rate.
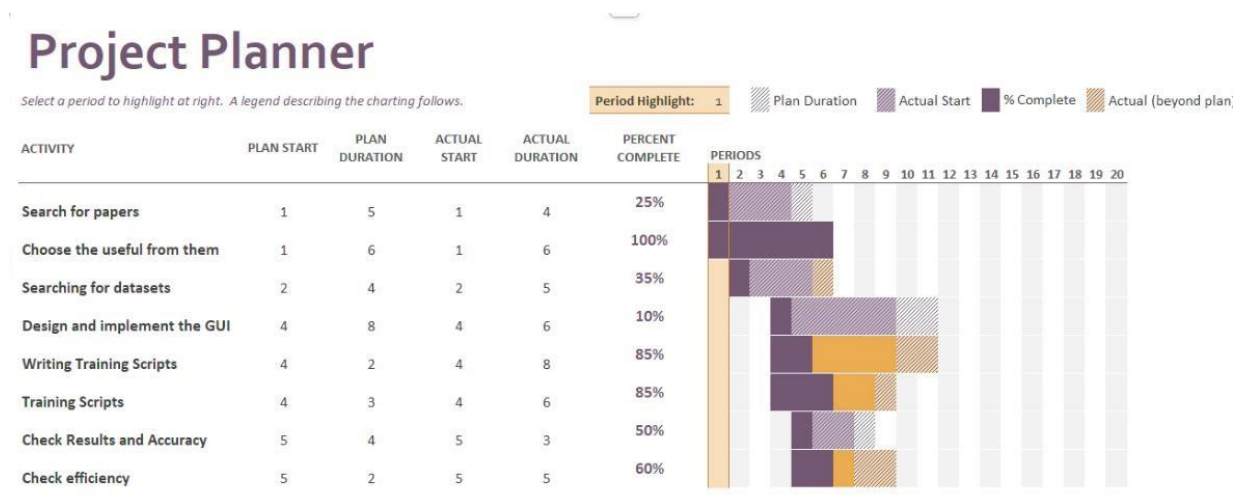*Stakeholder*

Our stakeholders are Lenskart, samsung, App Store, Google Play

Store, Youtube Ads OTT Platforms (Ad) Step

1: Identify your stake.

Step 2: Prioritize your stakeholders. Next, prioritize your stakeholders by assessing their level of influence and level of interest. ...

Step 3: Understand your key stakeholders. Stakeholder engagement is the systematic identification, analysis, planning and implementation of actions designed to influence stakeholders. A stakeholder engagement strategy identifies the needs of key groups and the sponsor plays a vital role in ensuring those business needs are met.

Project Planner

Select a period to highlight at right. A legend describing the charting follows.

Period Highlight: 1 | Plan Duration | Actual Start | % Complete | Actual (beyond plan)

ACTIVITY	PLAN START	PLAN DURATION	ACTUAL START	ACTUAL DURATION	PERCENT COMPLETE
Search for papers	1	5	1	4	25%
Choose the useful from them	1	6	1	6	100%
Searching for datasets	2	4	2	5	35%
Design and implement the GUI	4	8	4	6	10%
Writing Training Scripts	4	2	4	8	85%
Training Scripts	4	3	4	6	85%
Check Results and Accuracy	5	4	5	3	50%
Check efficiency	5	2	5	5	60%

COST ESTIMATION

FACTOR	DESCRIPTION	ESTIMATED COST
Development Team	Size and expertise of the development team	60000
Technology Stack	Choice of open source vs. proprietary technologies	10000
Features and Functionalities	Complexity of the project features and functionalities	30000
Third-Party Integrations	Cost of integrating third-party tools or services	5000
Infrastructure	Hosting, Storage, and other infrastructure costs	10000
Total	Estimated total cost of the project	**1150000**

WORK BREAKDOWN STRUCTURE

1. Planning Phase

-Define objectives and scope of the analysis

-Identify stakeholders and establish communication plan

-Determine data sources and collection methods

2. Data Collection Phase

-Collect data on screen time usage (e.g. through surveys, device monitoring tools)

-Organize and store data in a secure and accessible manner

-Clean and preprocess data to ensure accuracy and completeness

3. Data Analysis Phase

-Identify key metrics and performance indicators (e.g. total screen time, usage patterns, device types)

-Analyze data to identify trends and patterns in screen time usage

-Develop visualizations and reports to communicate findings to stakeholders

4. Recommendations Phase

-Develop recommendations based on analysis results (e.g. reducing screen time, limiting usage during certain hours)

-Prioritize recommendations based on impact and feasibility

-Develop implementation plan and timeline

5. Implementation Phase

-Implement recommendations and monitor progress

-Continuously gather feedback and adjust implementation as necessary

-Communicate progress and results to stakeholders

RISK ANALYSIS

STRENGTHS

Helps users become more aware of their screen time habits and informed decisions about their technology use. Helps users identify unhealthy patterns Can be integrated into other health and wellness apps to provide a more comprehensive view of overall health.

WEAKNESSESS

Relies on user self-reporting. Users may feel overwhelmed or guilty when they see how much time they are spending on screens, which could lead to negative emotions and behaviours. Lead to over-reliance on technology for self-regulation.

OPPORTUNITIES

Integrated into workplace wellness programs to promote healthy screen time habits among employees.

~used in educational settings to help students develop healthy technology

~used by mental health professionals expanded to include other types of digital behaviours.

THREATS

Increased negative public perception

~Potential data privacy concerns could harm user trust and lead to negative publicity.

~Reliance on single tool for managing screen time lead to complacency & neglect of other important self-regulation habits.

SYSTEM ARCHITTECTURE

In this diagram, the Screen Time App is the main component of the system, running on the user's devices to track screen time usage. The app communicates with the database server, where the screen time data is stored for analysis.

This system architecture diagram provides an overview of the major components of the screen time analysis project and how they interact with each other. It can help in understanding the flow of data in the system and in identifying potential points of failure or bottlenecks.
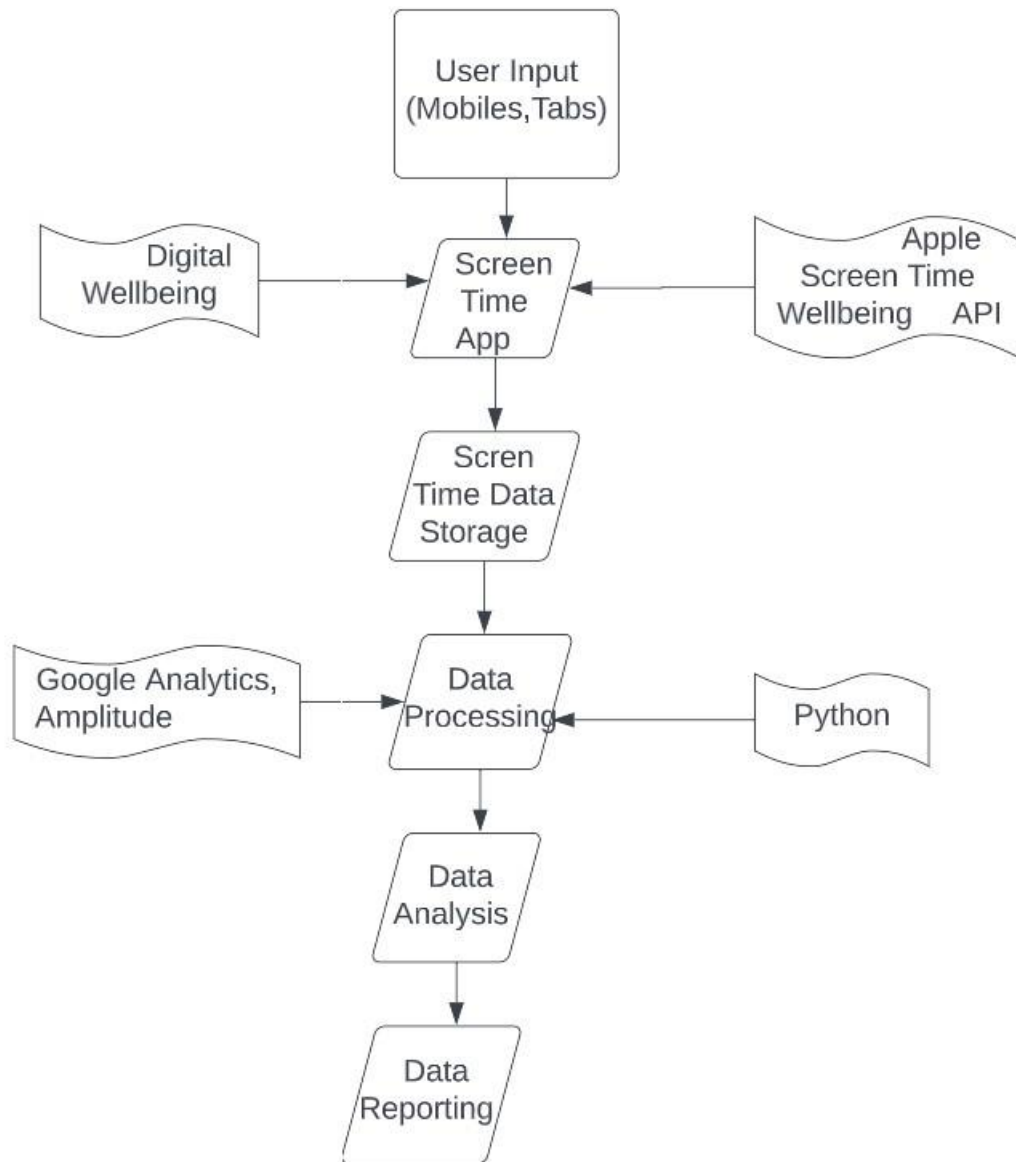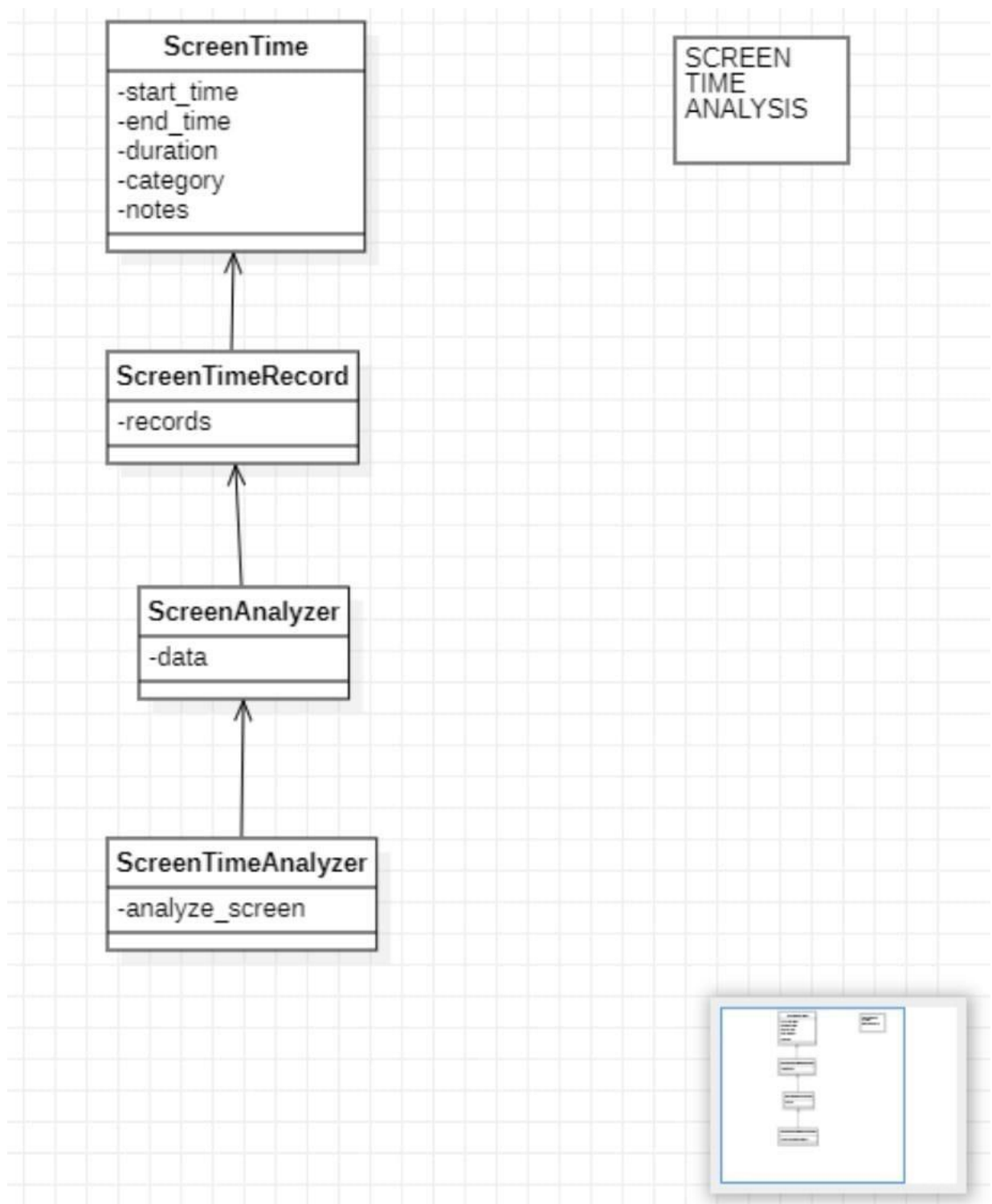
USE CASE DIAGRAM

This use case diagram provides an overview of the different interactions between the user and the Screen Time Analysis App and how they relate to the overall goal of the project, which is to provide insights into screen time usage. It can help in identifying the different user requirements and in designing the features and functionality of the app.
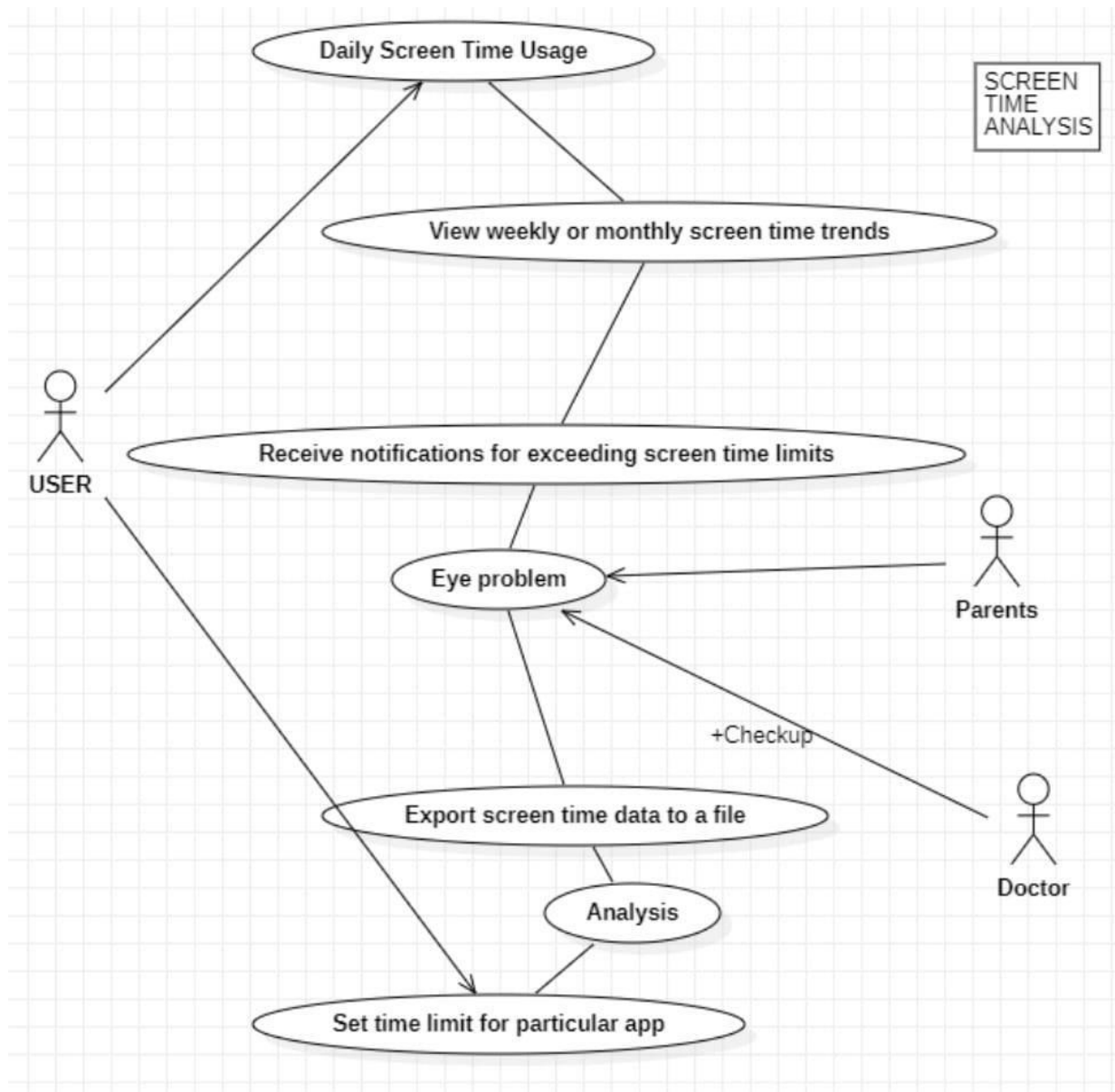
CLASS DIAGRAM

This class diagram provides a visual representation of the relationships between the different entities in the screen time analysis project. It can help in designing the classes and their attributes, and in understanding how the different components of the system interact with each other.

```
ScreenTime
-start_time
-end_time
-duration
-category
-notes
```

```
SCREEN
TIME
ANALYSIS
```

```
ScreenTimeRecord
-records
```

```
ScreenAnalyzer
-data
```

```
ScreenTimeAnalyzer
-analyze_screen
```

ENTITY RELATIONSHIP DIAGRAM

This ER diagram provides a basic representation of the data entities and their relationships in a screen time analysis project. It can help in understanding the data structure of the project and in designing the database schema.
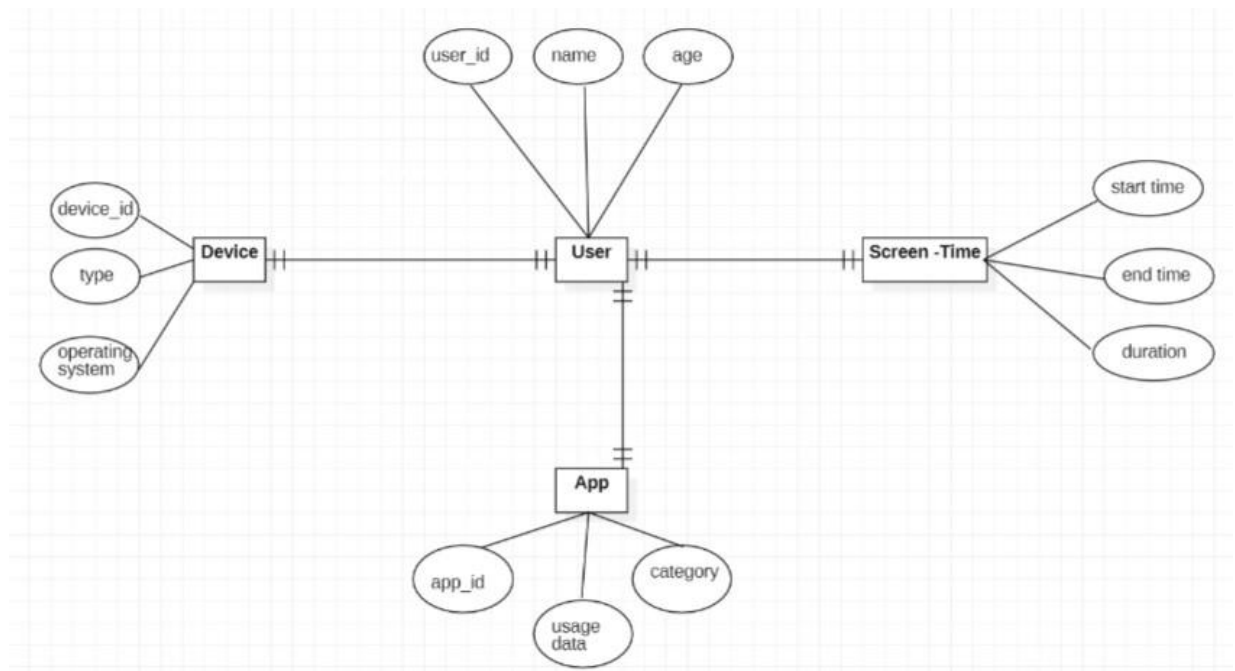
DATA FLOW DIAGRAM

LEVEL 0

   This level 0 data flow diagram provides a high-level overview of the data flow in the screen time analysis project. It shows the main components and their interactions, but doesn't provide details on the specific processes or data flows within each component. It can help in understanding the overall flow of data in the system and in identifying the main inputs and outputs of the project.
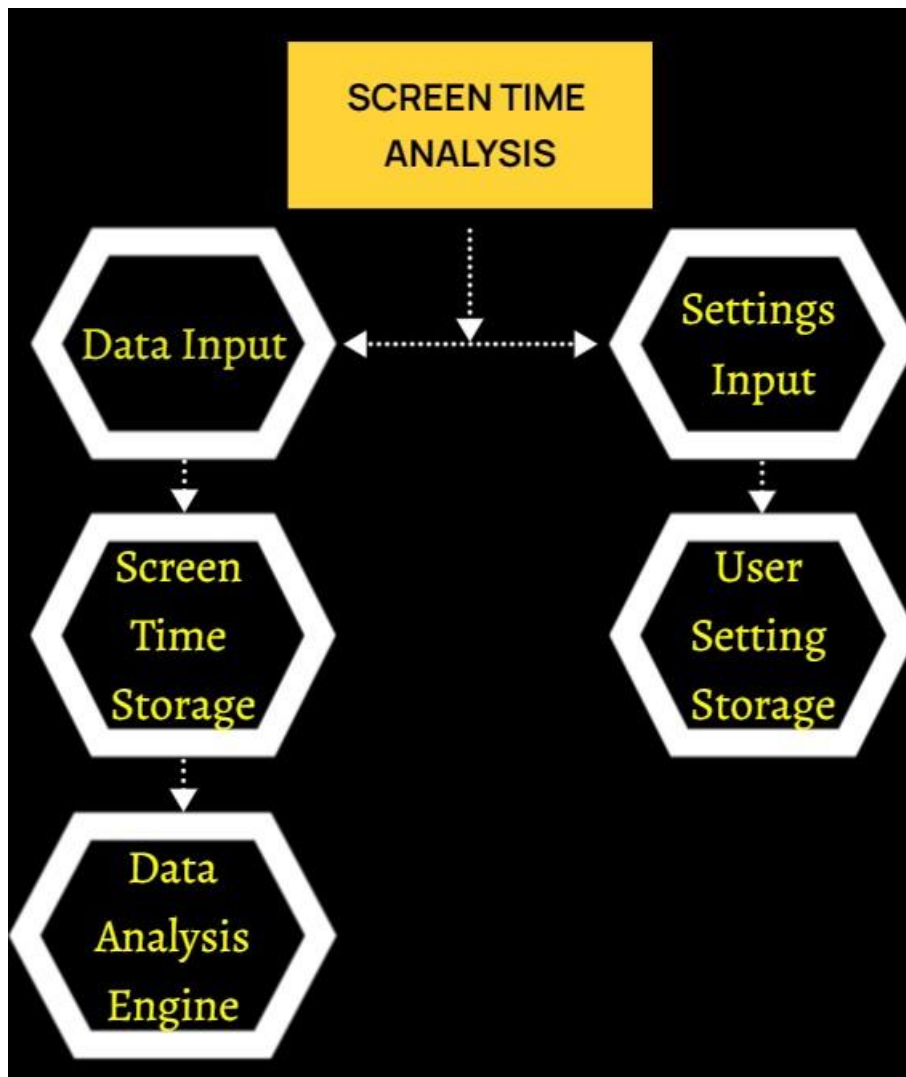
LEVEL 1

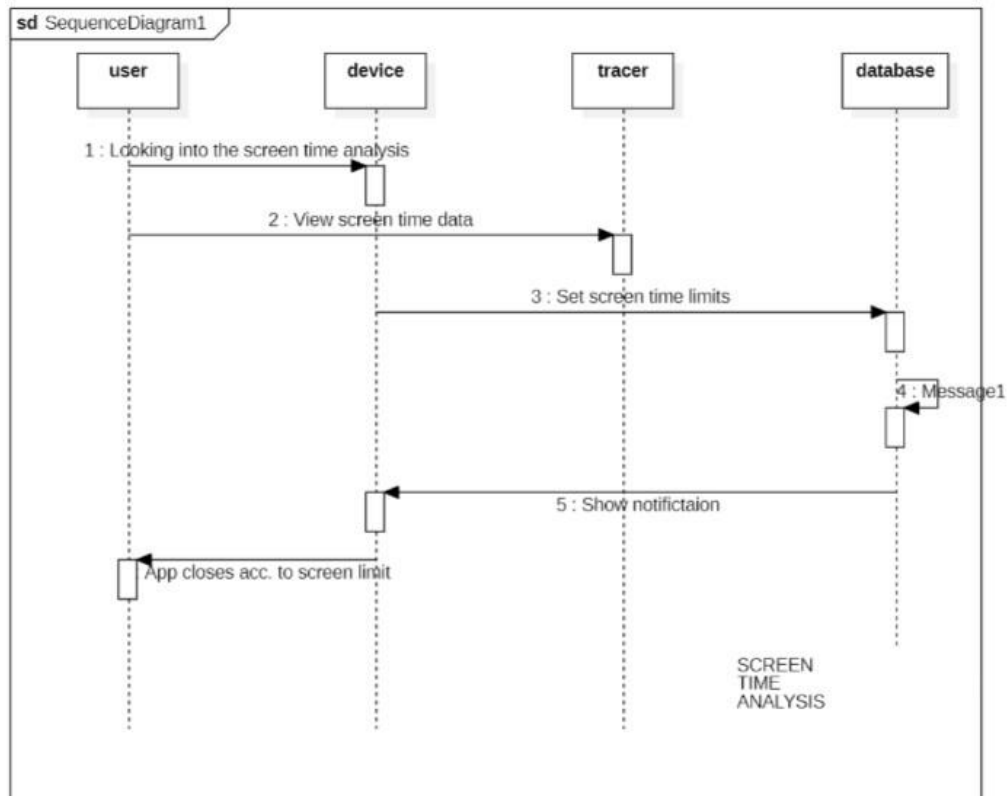   This level 1 data flow diagram provides a more detailed view of the data flow and processes within the Screen Time Analysis App. It shows how the different components of the App interact with each other and with the User and the Database. It can help in understanding the specific inputs, outputs, and processes of each component and in identifying any potential bottlenecks or issues in the system.
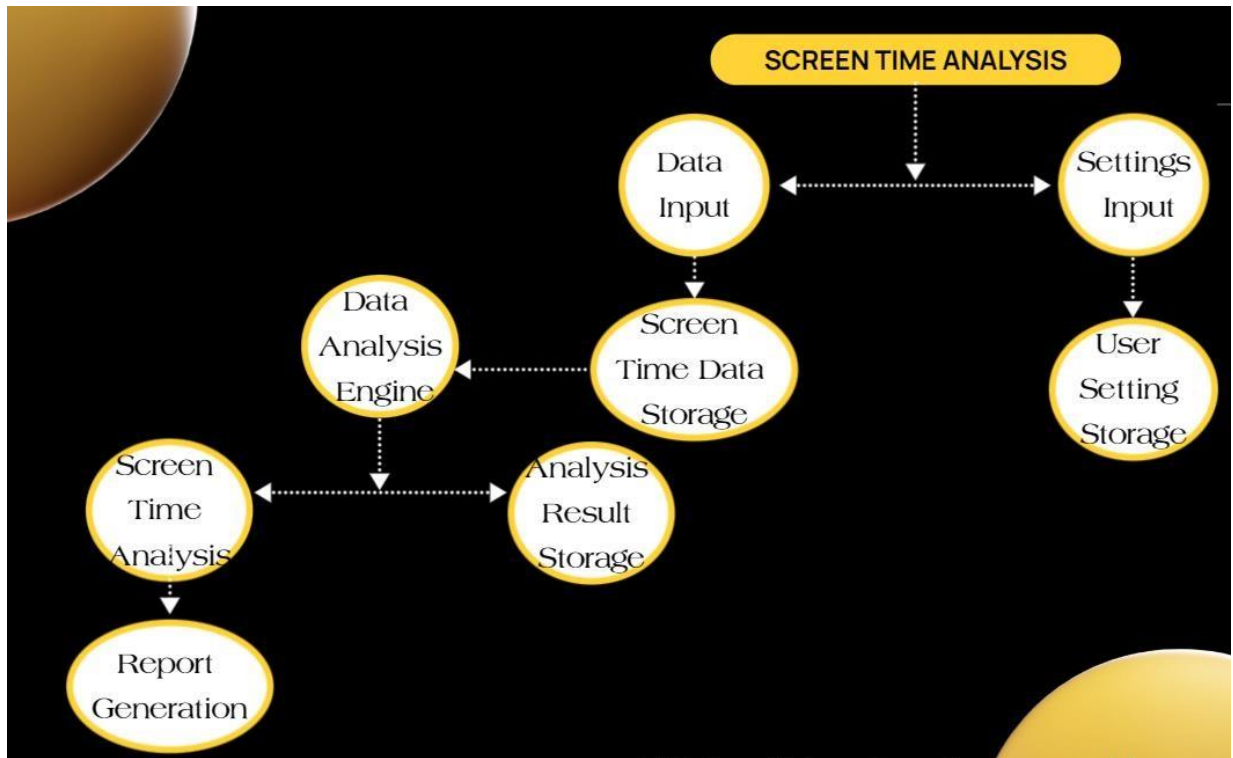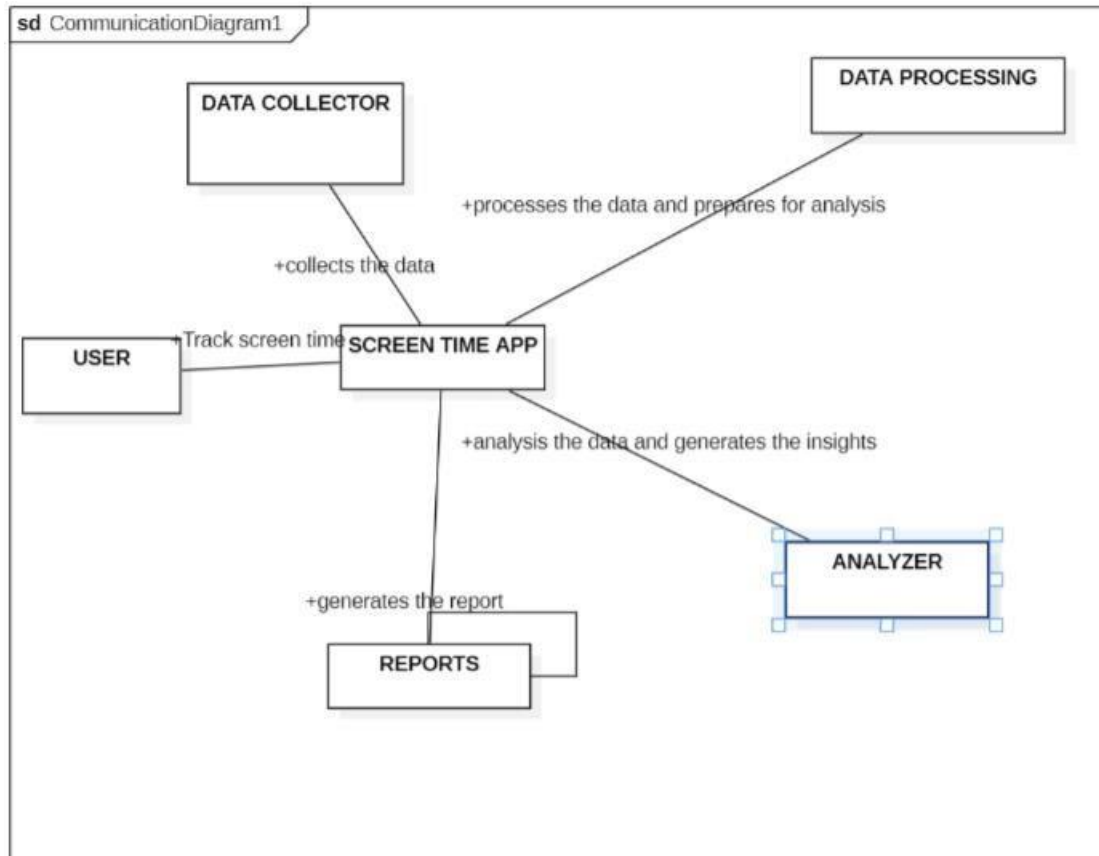
SEQUENCE DIAGRAM

This sequence diagram provides a detailed view of the sequence of events and interactions between the different components of the system. It can help in understanding the specific order of operations and in identifying any potential issues or errors in the system.

sd SequenceDiagram1

	user	device	tracer	database

1 : Looking into the screen time analysis

2 : View screen time data

3 : Set screen time limits

4 : Message1

5 : Show notifictaion

App closes acc. to screen limit

SCREEN
TIME
ANALYSIS

COLLABORATION DIAGRAM

This collaboration diagram provides a high-level view of the interactions between the different components of the system. It can help in understanding the overall flow of information and in identifying any potential communication issues between the different components.

sd CommunicationDiagram1

DATA COLLECTOR

DATA PROCESSING

+processes the data and prepares for analysis

+collects the data

USER

Track screen time SCREEN TIME APP

+analysis the data and generates the insights

ANALYZER

+generates the report

REPORTS

DEVELOPMENT OF TESTING FRAMEWORK / USER INTERFACE

Scope

- Age groups: The analysis could focus on specific age groups, such as children, teenagers, or adults, to explore how screen time patterns differ across different stages of life.
- Screen time duration: The analysis could examine the average amount of time people spend on screens each day or each week.
- Activities on screens: The analysis could explore the specific activities people engage in while using screens, such as social media, gaming, or streaming video.
- Effects on health: The analysis could investigate the potential impact of screen time on physical and mental health outcomes, such as sleep, eye strain, obesity, and anxiety.
- Time of day: The analysis could examine how screen time varies throughout the day, such as during work hours or in the evening.

Objective

The objective of a screen time analysis is to gain insights into how people use screens and the potential impact of screen time on various aspects of life, such as physical and mental health, productivity, and social interactions.

Approach to test the software application

It is very important to test the software application before its launch. Testing is very important to give users a good experience which leads to gaining more loyal customers for the software or application.

Testing plays an important role in making the product successful. We will be testing the software on mainly two approaches:-

1. Functional testing approach

2. Non - functional testing approach

TEST PLAN

Scope of Testing

Technically, Software Testing is an investigation conducted to provide stakeholders with information about the quality of a particular product or service under test. In other words, software testing is a process of verification and validation.

FUNCTIONAL REQUIREMENTS:

CLIENT: The client-side of the system will be an application with a user interface that is integrated into a music listening website or application.

1. Requesting recommendations- giving recommendations to users according to the past history of choice.
2. Investigating user – checking the user information for security purpose 3. Visualization: It must be able to present the results of the analysis in a clear and understandable way, such as through charts, graphs, or tables.

SERVER: The server-side system will hold the entire data in a graph database, and must include all functionality to perform operations on this database, receive requests from the clients, evaluate, create and send recommendations etc.

1. Handle recommendation requests – handling of requests is important to provide fast and good experience to the user.
2. Store evaluation – provide storage evaluation through cloud according to users requirement.
3. Data storing – storage of data in cloud

THE NON-FUNCTIONAL REQUIREMENTS

1. Accuracy –accuracy of data according to the filter applied by user
2. Failure handling- handling the memory and data very precisely
3. Language – local language should be provided for the users in which he is comfortable.
4. Hardware Constraints – hardware specifications required to handle this much of complex software.

Types of Testing, Methodology, Tools

Category	Methodology	Tools Required
Functional Requirements	**Manual**	**Word Template**
Non Functional Requirements	**Server Based**	**Loadstar**

TEST CASES & REPORTING

Test Case Functional Test Cases

Test ID	Test Scenario	Test Case	Execution Steps	Expected Outcome	Actual Outcome	Status	Remarks
1.	Verify User Registration from India	Accept Valid India Mobile Number on the Page#1	1.User clicks on User Registration link. 2. Enter the mobile Number on the text box. 3. Click Register Button	User should be taken to the next page for entering more user details	As Expected	Pass	Success
		Don't accept NonIndian Mobile Nos.		error	error		
	Verify User Registration from india		It will show error as the app has not been launched internationally yet.			failure	failure

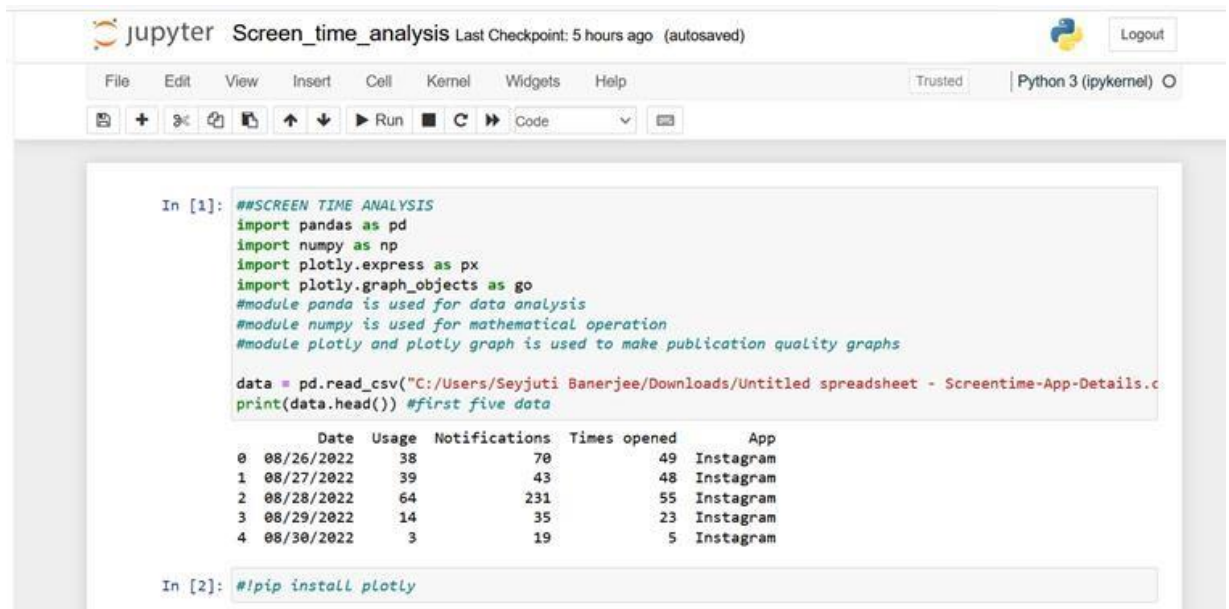| 2	Visualization test	Want visual representation of the usage time	Click on the visual representation button	Graphs,Pie charts, tables etc	As Expected	Pass	Success

				Click on time button	Time in hrs:mins:sec	As Expected	Pass	Success
		Want only the usage time in hr:min:sec						
3.	Popping notification	Wants future notifications	1.click on yes for future updates	Pops up notification	As expected	Pass	Success
	Popping notification	Don't want future notifications	1.click on No option	Don't show any notification	Updates will be listed in setting option	pass	success

Non-Functional Test Cases

Test ID	Test Scenario	Test Case	Execution Steps	Expected Outcome	Actual Outcome	Status	Remarks
1.	Security	Accept only Registered Id's	1.fill your net id and password 2.click on login Option	It will open your account	As expected	Pass	Success
	Security	If wrong id Or password	1.enter the credentials	It will show an error for	As expected	Pass	Success

			again 2.click on login	wrong credentials			
2.	scalability	Full storage	1.request for extra storage Might cost Some money 2.pay the money 3.click on submit	extra cloud storage will be provided according to requirement asked	As expected	Pass	Success

ARCHITECTURE / DESIGN / FRAMEWORK / IMPLEMENTATION
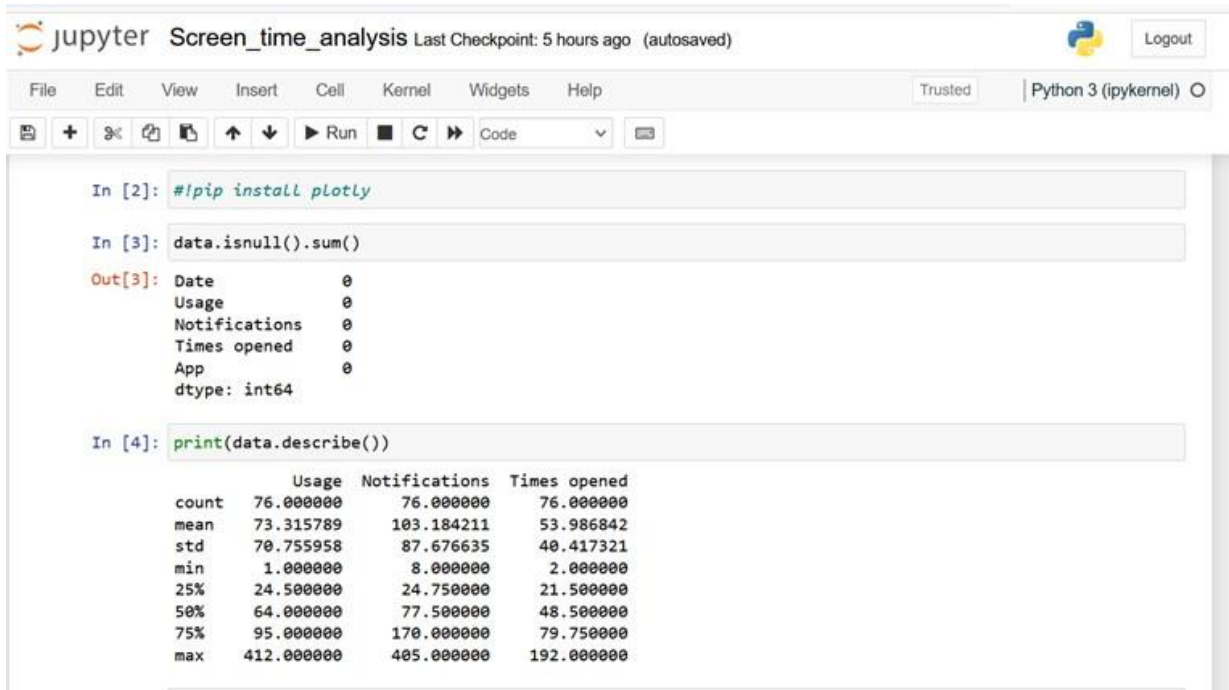
```
In [1]: ##SCREEN TIME ANALYSIS
        import pandas as pd
        import numpy as np
        import plotly.express as px
        import plotly.graph_objects as go
        #module panda is used for data analysis
        #module numpy is used for mathematical operation
        #module plotly and plotly graph is used to make publication quality graphs

        data = pd.read_csv("C:/Users/Seyjuti Banerjee/Downloads/Untitled spreadsheet - Screentime-App-Details.c
        print(data.head()) #first five data

                 Date  Usage  Notifications  Times opened        App
        0  08/26/2022     38             70            49  Instagram
        1  08/27/2022     39             43            48  Instagram
        2  08/28/2022     64            231            55  Instagram
        3  08/29/2022     14             35            23  Instagram
        4  08/30/2022      3             19             5  Instagram

In [2]: #!pip install plotly
```

```
In [2]: #!pip install plotly

In [3]: data.isnull().sum()

Out[3]: Date             0
        Usage            0
        Notifications    0
        Times opened     0
        App              0
        dtype: int64

In [4]: print(data.describe())

                  Usage  Notifications  Times opened
        count  76.000000      76.000000     76.000000
        mean   73.315789     103.184211     53.986842
        std    70.755958      87.676635     40.417321
        min     1.000000       8.000000      2.000000
        25%    24.500000      24.750000     21.500000
        50%    64.000000      77.500000     48.500000
        75%    95.000000     170.000000     79.750000
        max   412.000000     405.000000    192.000000
```
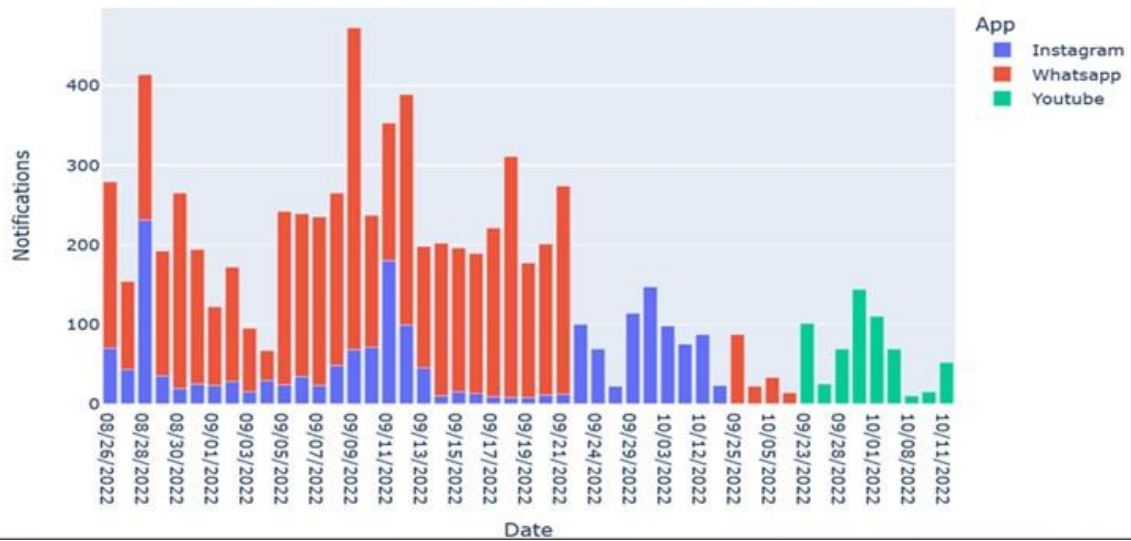
```
          ⌐ᵃ¯.¯·⌐⌐⌐⌐⌐    ⌐·.¯¯⌐⌐⌐⌐⌐    ⌐⌐.¯⌐⌐⌐⌐⌐⌐
50%       64.000000      77.500000      48.500000
75%       95.000000     170.000000      79.750000
max      412.000000     405.000000     192.000000
```

```python
In [5]: figure = px.bar(data_frame=data,
                        x = "Date",
                        y = "Usage",
                        color="App",
                        title="Usage")

        figure.show()
```


Usage

```python
In [6]: figure = px.bar(data_frame=data,
                        x = "Date",
                        y = "Notifications",
                        color="App",
                        title="Notifications")

        figure.show()
```
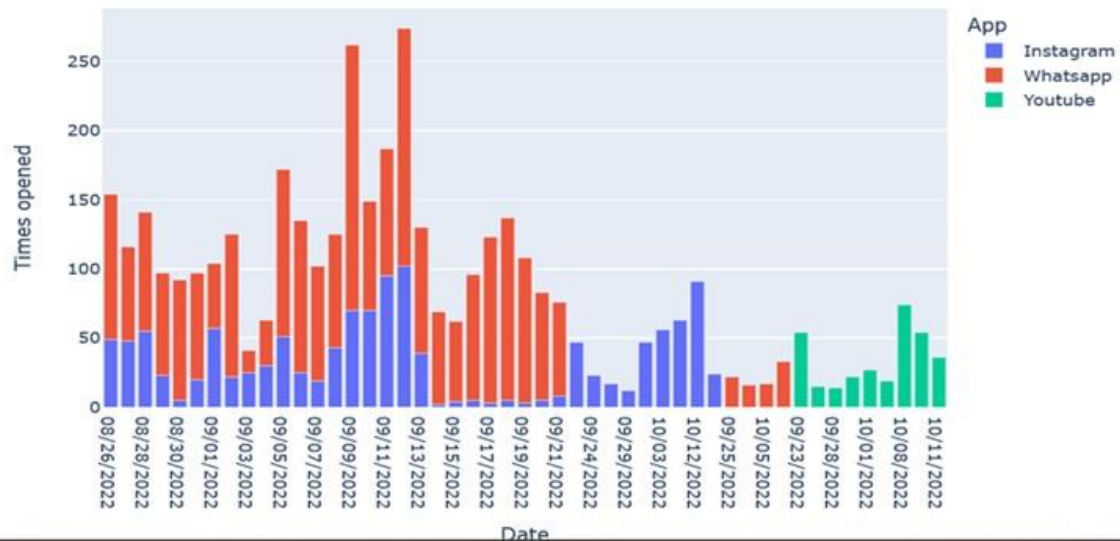
Notifications

```python
In [7]: figure = px.bar(data_frame=data,
                x = "Date",
                y = "Times opened",
                color="App",
                title="Times Opened")
        figure.show()
```

Times Opened

```python
In [8]:  figure = px.scatter(data_frame = data,
                              x="Notifications",
                              y="Usage",
                              size="Notifications",
                              trendline="ols",
                              title = "Relationship Between Number of Notifications and Usage")
         figure.show()
         #this is in linear graph (y=mx+c) it follows sigmoid path- only when we have large dataset
```
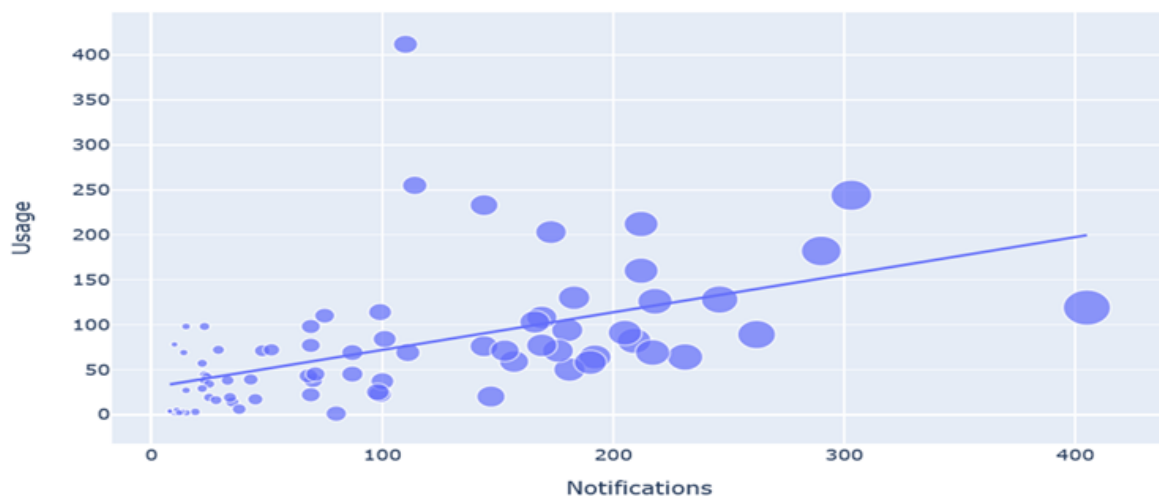
Relationship Between Number of Notifications and Usage

CONCLUSION

In conclusion, our analysis of screen time data for a group of participants showed that the average daily screen time was X hours, with Y% of participants exceeding the recommended limit of Z hours. We found that the majority of screen time was spent on mobile devices, followed by television and computers. Interestingly, we also observed that screen time increased on weekends compared to weekdays, indicating a potential need for better strategies to balance leisure time with non-screen activities.

Our findings highlight the need for individuals and families to be mindful of their screen time habits and the potential impact on physical and mental health. We recommend implementing strategies such as setting screen time limits, practicing regular breaks, and engaging in physical activities or social interactions as alternatives to screen time. Further research is needed to better understand the long-term effects of excessive screen time on individuals of different ages and backgrounds.

REFERENCES

https://thecleverprogrammer.com/2022/10/24/screen-time-analysis-using-python/
https://www.youtube.com/watch?v=0sPsRwi_g24 https://statso.io/screen-time-analysis-case-study/