

EFFECT OF MOBILE APPLICATIONS IN HUMAN LIFE

BY

Md Takimul Hasan Nihal
ID: 191-15-12127

Ashraful Islam Santo
ID: 191-15-12757

Aronya Ahmed Shihab
ID: 191-15-12817

This Report Presented in Partial Fulfillment of the Requirements for the
Degree of Bachelor of Science in Computer Science and Engineering

Supervised By

Most. Hasna Hena
Assistant Professor
Department of CSE
Daffodil International University



DAFFODIL INTERNATIONAL UNIVERSITY

DHAKA, BANGLADESH

JANUARY 2023

APPROVAL

This Project titled “Effect of Mobile Applications in Human Life”, submitted by Md Takimul Hasan Nihal, ID No:191-15-12127 , Ashraful Islam Santo, ID No:191-15-12757 and Aronya Ahmed Shihab, ID No: 191-15-12817 to the Department of Computer Science and Engineering, Daffodil International University, has been accepted as satisfactory for the partial fulfillment of the requirements for the degree of B.Sc. in Computer Science and Engineering and approved as to its style and contents.

BOARD OF EXAMINERS



Dr. Touhid Bhuiyan

Professor and Head

Department of Computer Science and Engineering
Faculty of Science & Information Technology
Daffodil International University

Chairman

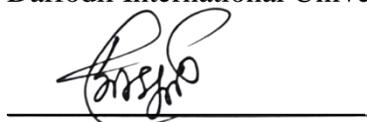


Dr. Md. Monzur Morshed

Professor

Department of Computer Science and Engineering
Faculty of Science & Information Technology
Daffodil International University

Internal Examiner

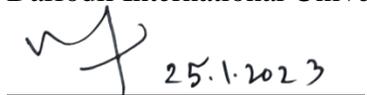


Dewan Mamun Raza

Senior Lecturer

Department of Computer Science and Engineering
Faculty of Science & Information Technology
Daffodil International University

Internal Examiner



Dr. Ahmed Wasif Reza

Associate Professor

Department of Computer Science and Engineering
East West University

External Examiner

DECLARATION

We hereby declare that, this project has been done by us under the supervision of **Most. Hasna Hena, Assistant Professor, Department of CSE** Daffodil International University. We also declare that neither this project nor any part of this project has been submitted elsewhere for award of any degree or diploma.

Supervised by:



Most. Hasna Hena
Designation
Department of CSE
Daffodil International University

Submitted by:



Md Takimul Hasan Nihal
ID: -191-15-12127
Department of CSE
Daffodil International University



Ashraful Islam Santo
ID: -191-15-12757
Department of CSE
Daffodil International University



Aronya Ahmed Shihab
ID: -191-15-12817
Department of CSE
Daffodil International University

ACKNOWLEDGEMENT

First, we express our heartiest thanks and gratefulness to almighty God for His divine blessing makes us possible to complete the final year project/internship successfully.

We really grateful and wish our profound our indebtedness to **Most. Hasna Hena, Assistant Professor**, Department of CSE Daffodil International University, Dhaka. Deep Knowledge & keen interest of our supervisor in the field of “Machine Learning” to carry out this project. His endless patience, scholarly guidance, continual encouragement, constant and energetic supervision, constructive criticism, valuable advice, reading many inferior drafts and correcting them at all stage have made it possible to complete this project.

We would like to express our heartiest gratitude to **Dr. Touhid Bhuiyan**, Professor, and Head, Department of CSE, for his kind help to finish our project and also to other faculty member and the staff of CSE department of Daffodil International University.

We would like to thank our entire course mate in Daffodil International University, who took part in this discuss while completing the course work.

Finally, we must acknowledge with due respect the constant support and patients of our parents.

ABSTRACT

Smartphones have opened numerous doors for advancement for users. One of the main features of smartphone is Applications. Previous research shows that users mostly use social media applications such as Facebook, Instagram, YouTube, TikTok, and many others. Research shows the impact of using this application in a good way and also the bad impacts. Comparative analysis and challenges have been discussed. This research is done to figure out the awareness of these effects on the users. Classification models in machine learning is used to predict the awareness. Collecting data from many users of different age levels and occupations we tried to figure out the relation between usage of time and awareness of wastage of that time by using machine learning and classifications models. We have also presented a data of mental and physical impact on users and presented a statistical result in the report. People are wasting their valuable time using these applications. Awareness should be raised about wasting time on mobile applications.

TABLE OF CONTENTS

CONTENTS	PAGE
Approval Page	i
Declaration	ii
Acknowledgements	iii
Abstract	iv
CHAPTER	
CHAPTER 1: INTRODUCTION	1-3
1.1 Introduction	1
1.2 Motivation	2
1.3 Rationale of the Study	2
1.4 Research Questions	3
1.5 Expected outcome	3
1.6 Project Management and Finance	3
1.7 Report Layout	3
CHAPTER 2: BACKGROUND	4-6
2.1 Preliminaries	4
2.2 Related Works	4-5
2.3 Comparative Analysis and Summary	6
2.4 Scope of the Problem	6
2.5 Challenges	6

CHAPTER 3: RESEARCH METHODOLOGY	7-17
3.1 Research Subject and Instrumentation	7
3.2 Data Collection Procedure	7
3.3 Statistical Analysis	7-15
3.4 Proposed Methodology	15-16
3.5 Split the Data & pre-process	17
3.6 Model Implementation	17
CHAPTER 4: EXPERIMENTAL RESULT AND DISCUSSION	18-22
4.1 Experimental Setup	18
4.2 Experimental Results and Analysis	18-22
4.3 Discussion	23
CHAPTER 5: IMPACT ON SOCIETY, ENVIRONMENT AND SUSTAINABILITY	23
5.1 Summary of the Study	23
5.2 Conclusion	23
5.3 Recommendation and Further Study	23
CHAPTER 6: SUMMARY, CONCLUSION, RECOMMENDATION	24
6.1 Summary of the Study	24
6.2 Conclusion	24
6.3 Recommendation and Further Study	24
REFERENCES	25
APPENDIX	26-33

LIST OF FIGURES

FIGURES	PAGE NO
Figure3.3.1: Gender related data	8
Figure 3.3.2: Age of the respondents	9
Figure3.3.3: Respondents occupation	9
Figure3.3.4: Different mobile app usage related data	10
Figure3.3.5: Preferable app for solution	11
Figure3.3.6: User opinion related data chart	14
Figure3.3.7: Reason of using mobile app related data	15
Figure3.4.1: System design	16
Figure4.2.1: Model accuracy on 'Strongly agree'	19
Figure 4.2.2: Model's performance on the training and test sets of “Random forests	19
Figure 4.2.3: Precision-recall curve of “Random forests” for “Strongly Agree”	20
Figure 4.2.4: Model accuracy on 'Strongly disagree'	21
Figure 4.2.5: Model's performance on the training and test sets of “Random forests”	22
Figure 4.2.6: Precision-recall curve of “Random forests” for “Strongly Disagree”	22

LIST OF TABLES

TABLES	PAGE NO
Table 3.3.1: Summary for Demographic Data of the Respondents	7
Table 3.3.2: Summary for Demographic Data of mobile app usage	10
Table 3.3.3: Preferable app for solution	11
Table 3.3.4: User opinion table	12
Table 3.4.1: Data preprocess table	16
Table 4.2.1: Model accuracy,precision,recall table on ‘Strongly Agree’	18
Table 4.2.2: Model accuracy, precision,recall table on ‘Strongly disagree’	21

CHAPTER 1

INTRODUCTION

1.1 Introduction

The first smartphone was invented by IBM in 1992 which is known as the Simon smartphone. It was a great advancement in technology and for human needs. As the name implies, smartphones themselves make the world of simple, fast, and affordable information resources easier. An electronic device that is able to effectively perform the functions installed on a combination of both hardware and software. It uses various types of applications dedicated to different tasks to perform many tasks that a computer can do, anyone can talk, send messages, take pictures and watch and share videos, screen, business, entertainment, etc. It has become a necessity for our young generation because its easy communication mode help to revolutionize all aspects of human development like Education and Research, Business, Health, Sports, Entertainment, etc.

Many consider the first mobile app as the arcade game called “Snake” which was built-in in the Nokia 6110 in 1997. From then everything has been developed. We were introduced to android phones which have an app store consisting of millions of mobile applications. People using most of the mobile apps are mostly social media apps. Now a days, application has developed so much that there are different types of applications for work, online marketing, buy-sell apps and many more. Previous research has stated young children are addicted to mobile applications.[6] The most valuable thing of life is time. We get only 24 hours in a day. It is great matter of concern how much time we are spending on these applications.

Research has shown that most people, especially the younger generation, are busy with calls, checking messages, watching or sending videos, updating, chatting, etc.[9], so it has become an indispensable part of one's life. It seems that the life of the youth cannot go smoothly without the use of smartphones. With Internet access, anything, anytime, anywhere is known in a matter of seconds and at the same time spreads around the world very quickly. However, the use of smartphones has adversely affected social, psychological, and physical life, especially among the younger generation. It has both positive and negative effects. It can act as a trainer, reminder, educational tool, entertainer,

etc. On the other hand, it distracts you from doing important work with irrelevant notifications and disturbs your social life. It also causes disturbance in places of worship like mosques, temples, churches, etc. In this context, the current study is an attempt to explore and test the impact of smartphone applications on the lives of the people of all ages. Awareness should be known to all users of their doing. So, a model was run to determine if they knew that they were wasting the valuable time of their day by using mobile apps and a relation between heavy usage and awareness was explored by the model. Though all positive and negative sides, people are day by day attracted to more innovative and attractive applications. To fulfill their demand, the app developers' companies are always ready to come out with different types of applications with highly innovative features in the current situation, so that they can attract more people as their customers.

1.2 Motivation

People are ignorant that they are spending huge amount of time using mobile apps or behind smartphone screen. They don't feel necessary to maintain a certain amount of time that should be given for mobile apps. They are also ignorant about the negative effects of using mobile apps for huge amount of time. Often, they get this news of negative effects of using so much mobile apps but they ignore them. Most of the children now a days are addicted to smart phone because of the innovative and addictive mobile apps. So, this survey will let them know how much time they are spending and ask them about the awareness of their ignorance. And by using the model we will figure out if the usage of time and knowledge of their awareness is related or not. And we will also discuss about the positive and negative effect of the usage.

1.3 Rationale of the Study

The Rationale of this research are given below

- To find out the relationship between total usage of time behind mobile apps and the awareness about the wastage of time.
- The negative effects caused by the usage of mobile apps is also our objective.
- Most time spent on which application.
- Attachment to mobile apps over hardware controller.

1.4 Research Questions

During our research we worked on some questions to find out our results. These questions are as follows:

1. How is the usage of mobile applications effecting human life?
2. How all the factors that presented in data set is affecting our outcome?
3. Which model is more accurate to our study?

1.5 Expected Outcome

In this research the expected outcome is to find out the effect of using mobile applications both mentally and physically. And by using machine learning algorithm we will find out prediction of awareness on mobile application usage by prediction algorithms. We will run multiple algorithms to check which one is more accurate.

1.6 Project Management and Finance

At first, we selected our topic of research. Then we figured out how to implement machine learning in our research and faced Title defense. Then we started our research and made a questionnaire to collect data according to our aim. It took two months to collect the data from online platforms. And then we started pre-processing the data and find out the results accordingly. Then we started our report writing, faced pre-defense and we were told to do some correction and finally complete our report.

1.7 Report Layout

In chapter 1, we tried to cover basic concepts of mobile application and effects of using it and discuss motivation, objective, and expected outcome of our research.

In chapter 2, focus on related works, the brief overview on summary, the scope of the problem and the challenges.

In chapter 3, discuss about research methodology

In chapter 4, describes the details of experimental results.

In chapter 5, the impact of our research on society and environment.

The final chapter 6, We have concluded about evaluation result and also about some other features that can be included in future works for the better of my research work.

CHAPTER 2

BACKGROUND

2.1 Preliminaries

This chapter includes the discussion about other researches about the positive and negative impacts of using mobile applications. Previous research discussed about the effects on the youth, parents, in a particular location, effect on business, health, education, society. They presented a lot of aspects about the impacts of mobile apps. We have focused our research on the awareness of using mobile app's effects.

2.2 Related Work

This paper indicated that previous research was done on adolescent about the social media effects were resulted only an average result. So, they established that it's not always average but it can be different from person to person. The research done on teenagers both boys and girl. Rather than presenting an average result of the sample group, they conducted survey on each person multiple times to figure out that average result cannot be the end product. This effect can be different from person to person. They gathered data from 100 adolescent conducting 43 assessment per adolescent in a week and prepared a result. The result was shown by running four models which shown the random effects and fixed effect on the participants. Questions was asked how happy they were during the assessment and from that feedback a model was run to measure the effect of social media. [1]

Social Networking sites provide a platform for discussion on burning issues that has been overlooked in today's scenario. This research is conducted to check the impact of social networking sites in the changing mind-set of the youth. It is survey type research and data were collected through the questionnaire. e. The main objectives were as

- (i) To analyze the influence of social media on youth social life
- (ii) To assess the beneficial and preferred form of social media for youth
- iii) To evaluate the attitude of youth towards social media and measure the spending time on social media
- (iv) To recommend some measure for proper use of social media in right direction to inform and educate the people.

Collected data was analyzed in term of frequency, percentage, and mean score of statements. Findings show that the Majority of the respondents show the agreements with these influences of social media. The descriptive method was used to carry this study. And survey type research was conducted, through the questionnaire public opinion. [2]

In this paper they tried to discussed about the positive and negative aspects of social media on various fields. They selected education, business, youth and society. There is descriptive discussion of positive and negative effect on these fields. They have shown a data table of increasing social media user from 2012- 2014. By social media they have selected Facebook, Linked in, Pinterest, Instagram, Twitter. This survey was conducted by Pew Research Center. They have also shown a data table where they showed (what percentage of teens use social media for Fig: usage of social media by youth). [3]

On this research paper discussed about introduction, history of smartphone and the positive impact and negative impact of smartphone on our society.

On this paper shown the percentage of smartphone user and also shown why they use smartphone. Most of users are highly addicted to their smartphone without any reason or work they use their phone long time. Here is an idea about the positive impact and negative impact of mobile phones such as workplace, education, health, society, psychological.

First data collection is done here then the data is arranged in different sets and presented through pie chart. So that we can easily get an idea about the pros and cons of using the phone in different places. [4]

From this paper we get an overview of mobile application. How many types of mobile application are available for user. Learn about past and present application. After collecting data of which user use which apps, which apps most uses its shown-on graph and pie chart. Also shown mobile apps sale revenue in global market of different year (2009-2013).

Also showing Mobile applications effect on society from the ethical perspective and limitation of mobile application.

2.3 Comparative Analysis and Summary

There is study on adolescent to find out their emotional condition using mobile application by giving them assessments. [1] Other study shows the influence of social media on youth. [2] Positive and negative aspects are shown. All of them includes impact of mobile application. In our research we will find out the effects and also find out how machine learning can help user to realize or take steps on their usage reports.

2.4 Scope of the Problem

People are using mobile phones or electronic devices as if they are bind to it or they cannot live without it. But this needs to change. They need to be aware of the critical situation. That's why we are doing this research which will open future scope to bring this awareness to the users.

2.5 Challenges

The main challenge is to get people to participate in our research and help us with correct data. The accurate data is the key to successful research. People are not willing to participate in surveys now a days. So main challenge is to collect data from the people as many as possible and as accurate as possible. We tried to reach out as far as we could to collect the data.

CHAPTER 3

RESEARCH METHODOLOGY

3.1 Related Work

In this session various steps are considered, initial of all, Data pre-processed, and covert string data to integer, Follow appropriate format to train. After training step then take a look at data for testing.

3.2 Data Collection Procedure

We collected data via google form. A questionnaire was presented to collect the data. We mostly collected data from online platforms. We received 512 responses. These data are used to make a statistical analysis and also for the machine learning algorithms for test and train data set.

3.3 Statistical Analysis

TABLE 3.3.1: Summary for Demographic Data of the Respondents

Demographic	Variable	%
Gender	Male	64.5
	Female	35.5
Age	14 to 18	11.7
	19 to 23	50.4
	24 to 28	24.4
	29 or more	13.5
Occupation	Student	55.9
	Service holder	21.2
	Housewife	10.7
	Businessman	10.4
	Jobless	0.6
	Freelancer	0.4
	Doctor	0.2
	Teacher	0.4
	Retired Officer	0.2

In our survey questions, we added questions about Gender, Age, Occupation. Figure 3.3.1 shows the full respondent's group of this survey analysis. It explained that 64.5% Male respondents and 35.5% Female respondents participated.

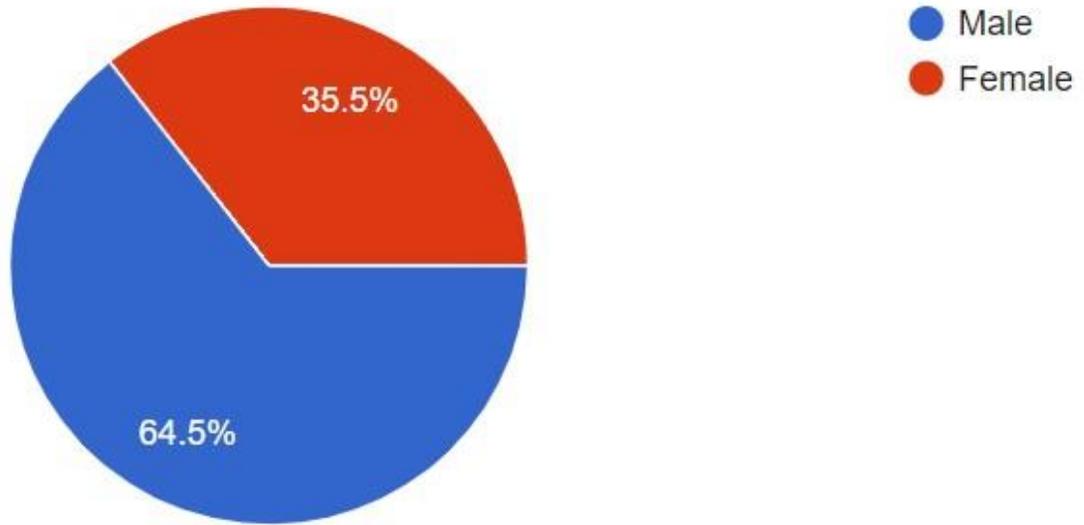


Figure3.3.1: Gender related data

From this result, we can conclude that our sample size is truly representative and able to explain analysis by using proper respondents. In addition, age limit is also there to understand the different viewpoints of respondents. Age limit divided into four groups: 14 to 18 Years, 19 to 23 Years, 24 to 28 Years, 29 years or more.

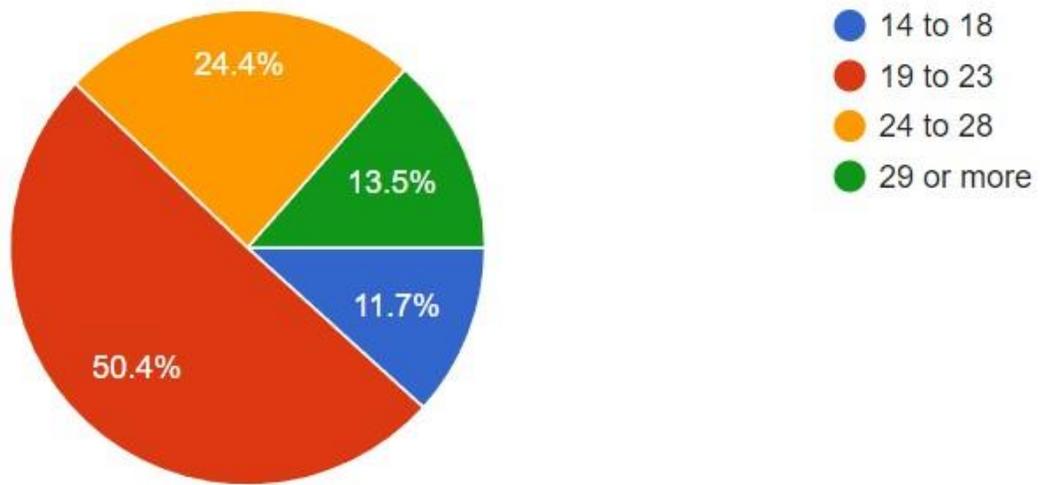


Figure 3.3.2: Age of the respondents

From Figure 3.3.2, 19 to 23 years are people who responded more than other groups which is 50.4% of total respondent. 24.4% respondent are between 24 to 28 years old, 13.5% respondents are above 29 years old and 11.7% respondents are between 14 to 18 years old.

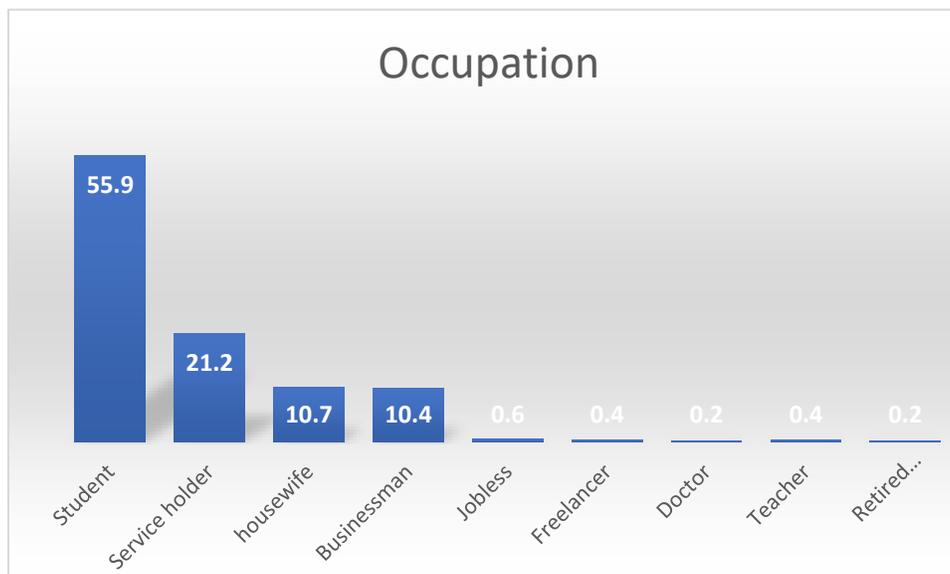


Figure3.3.3: Respondents occupation

In our survey, we also identified the occupations of our respondents. In Figure 3.3.3 we see the result is most interestingly 55.9% of the respondents are Students. That is because we reached out to our online friends mostly but there are other occupations also. 21.2% respondents are Service holder, 10.7% of the respondents are Housewife, 10.4% of the respondents are Businessman, 0.6% are Jobless, 0.4% of the respondents are Freelancer, 0.2% respondents are Doctor, another 0.4% of the respondents are Teacher, and last 0.25 of the respondents are Retired Officer.

TABLE 3.3.2: Summary for Demographic Data of mobile app usage

App Name	0 to 30 minutes	31 to 60 minutes	61 to 120 minutes	121 to 180 minutes	More than 180 minutes
Facebook	20.7	34.6	21.3	9.8	13.7
Instagram	46.7	27.9	14.6	7	3.7
YouTube	22.3	34.8	23.4	10.2	9.4
TikTok	62.7	20.9	12.3	2.9	1.2

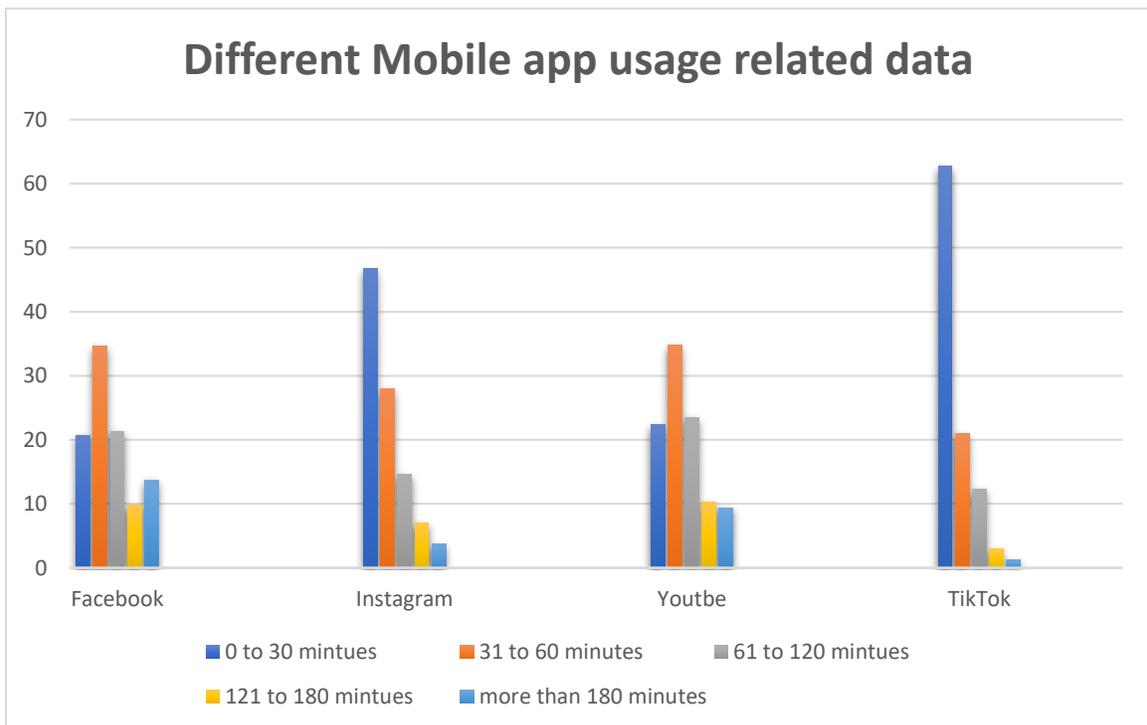


Figure 3.3.4: Different mobile app usage related data

From the gathered data we came to know that 20.7% of the respondents use Facebook 0 to 30 minutes, 34.6% of the respondents use Facebook 31 to 60 minutes, 21.3% of the

respondents use Facebook 61 to 120 minutes, 9.8% of the respondents use Facebook 121 to 180 minutes and 13.7% of the respondents use Facebook more than 180 minutes.

The result also shows that 46.7% of the respondents use Instagram 0 to 30 minutes, 27.9% of the respondents use Instagram 31 to 60 minutes, 14.6% of the respondents use Instagram 61 to 120 minutes, 7% of the respondents use Instagram 121 to 180 minutes and 3.7% of the respondents use Instagram more than 180 minutes.

The result also shows that 22.3% of the respondents use YouTube 0 to 30 minutes, 34.8% of the respondents use YouTube 31 to 60 minutes, 23.4% of the respondents use YouTube 61 to 120 minutes, 10.2% of the respondents use YouTube 121 to 180 minutes and 9.4% of the respondents use YouTube more than 180 minutes.

The result also shows that 62.7% of the respondents use TikTok 0 to 30 minutes, 20.9% of the respondents use TikTok 31 to 60 minutes, 12.3% of the respondents use TikTok 61 to 120 minutes, 2.9% of the respondents use TikTok 121 to 180 minutes and 1.2% of the respondents use TikTok more than 180 minutes.

TABLE 3.3.3: Preferable app for solution

Application Name	Total Count
Google	309
YouTube	186
Other Application	17

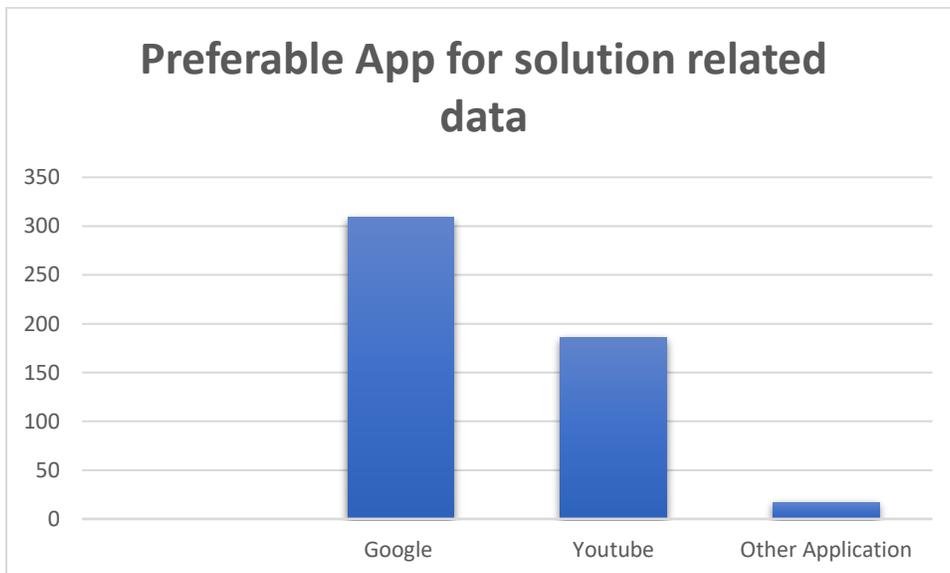


Figure 3.3.5: Preferable app for solution

A question was asked which is “Which one do you prefer most searching any solution?”. From the data we get 309 of the people uses Google, 186 of the people use YouTube and only 17 of them use other application.

TABLE 3.3.4: User opinion table

Question	Strongly Agree (%)	Agree (%)	Neutral (%)	Disagree (%)	Strongly Disagree (%)
We prefer using mobile apps to control our home appliances (E.g.: AC, TV etc.)	26	37.3	20.3	11.7	4.7
Are you aware that you are wasting a valuable time of your day on mobile applications-	27	40.8	18.2	10.9	3.1
You ever experienced neck pain, eyestrain or any other health issues using these mobile apps continuously for a long time-	27.3	42.8	19.9	8.4	1.6
You have experienced any type of mental breakdown (such as anger, sadness, hypertension) caused by these apps-	12.3	25.6	35.9	22.1	4.1
Most of the app we use is social media related app:	24.6	36.1	30.1	7.8	1.4

- I. We asked for user opinion on various attributes. Firstly, we presented this question that is “We prefer using mobile apps to control our home appliances (E.g.: AC, TV etc.)”. In response we get 26% of the respondents strongly agree, 37.3% of the respondents agree, 20.3% of the respondents remained neutral. 11.7% of the respondents disagree and 4.7% of the respondents strongly disagree.
- II. We presented another question that is “Are you aware that you are wasting a valuable time of your day on mobile applications-”. In response we get 27% of the respondents strongly agree, 40.8% of the respondents agree, 18.2% of the respondents remained neutral. 10.9% of the respondents disagree and 3.1% of the respondents strongly disagree.
- III. Again, another question presented that is “You ever experienced neck pain, eyestrain or any other health issues using these mobile apps continuously for a long time-”. In response we get 27.3% of the respondents strongly agree, 42.8% of the respondents agree, 19.9% of the respondents remained neutral. 8.4% of the respondents disagree and 1.6% of the respondents strongly disagree.
- IV. Another question presented that is “You have experienced any type of mental breakdown (such as anger, sadness, hypertension)[7] caused by these apps-”. In response we get 12.3% of the respondents strongly agree, 25.6% of the respondents agree, 35.9% of the respondents remained neutral. 22.1% of the respondents disagree and 4.1% of the respondents strongly disagree.
- V. Last question presented that is “Most of the app we use is social media related app:”. In response we get 24.6% of the respondents strongly agree, 36.1% of the respondents agree, 30.1% of the respondents remained neutral. 7.8% of the respondents disagree and 1.4% of the respondents strongly disagree.

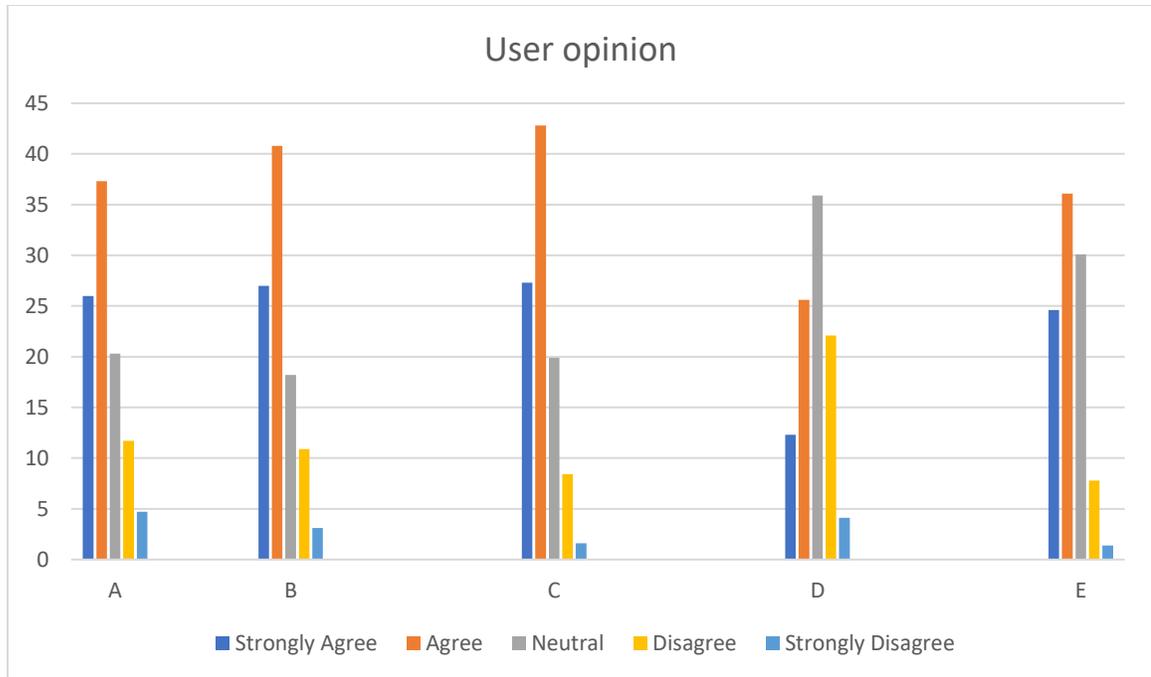


Figure 3.3.6: User opinion related data chart

In Figure 3.3.6, For better adjustment in the chart, we introduced A, B, C, D, E instead of the questions. Here are the questions according to alphabets:

A= We prefer using mobile apps to control our home appliances (E.g.: AC, TV etc.)

B= Are you aware that you are wasting a valuable time of your day on mobile applications-

C= You ever experienced neck pain, eyestrain or any other health issues using these mobile apps continuously for a long time-

D= You have experienced any type of mental breakdown (such as anger, sadness, hypertension) caused by these apps-

E= Most of the app we use is social media related app:

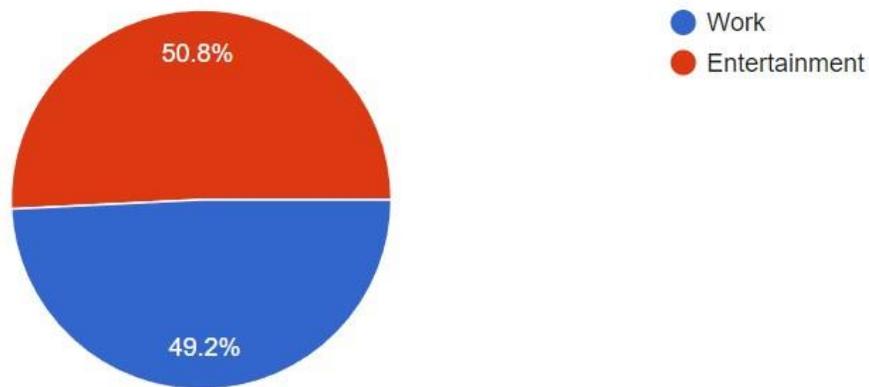


Figure 3.3.7: Reason of using mobile app related data

A question was asked that is “Why do you spend the time mobile apps mostly for?”. In response we can see in Figure3.3.7 50.8% of the respondents use mobile app for entertainment and 49.2% of the respondents use mobile app for work.

3.4 Proposed Methodology

In this session various steps are considered, initial of all, Data pre-processed, and covert string data to integer, Follow appropriate format to train. After training step then take a look at validate data testing. And we show the test image that use randomly.

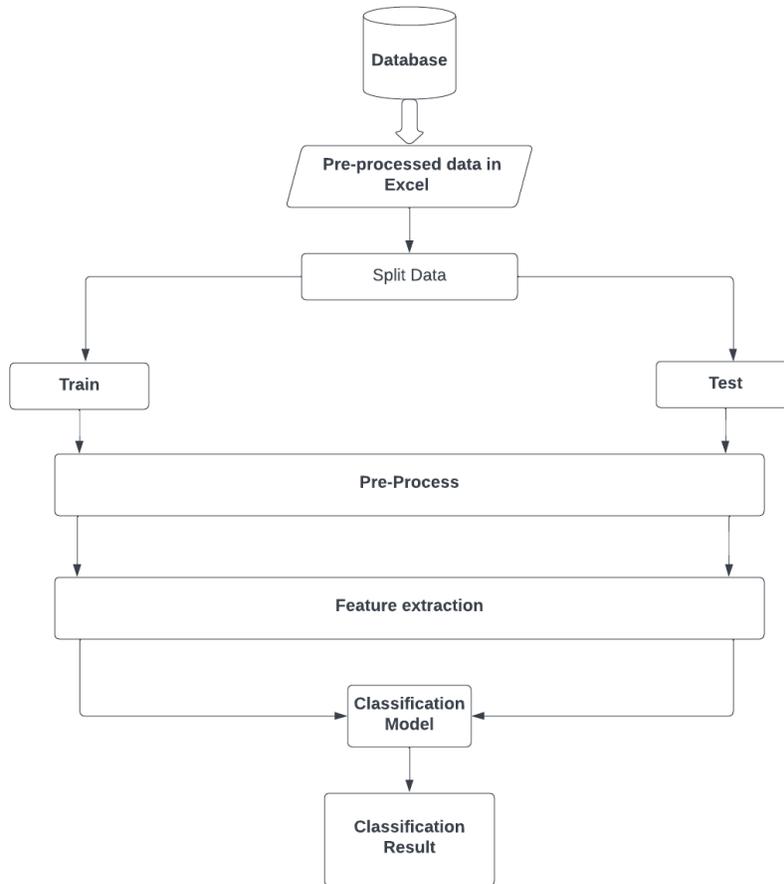


Figure 3.4.1: System design

We have collected our data via questionnaire and transferred all data to Excel sheet. Total respondents are 512. Almost all of our data was in string so we had to convert them in integer. It was easy for us to convert the data in Excel sheet rather than in Machine learning coding. So, we convert the string into individual integers. Conversion is given below:

TABLE 3.4.1: Data preprocess table

Before Conversion	After Conversion
0 to 30 minutes	30
31 to 60 minutes	60
61 to 120 minutes	120
121 to 180 minutes	180
More than 180 minutes	200
Strongly Agree	20
Agree	40
Neutral	60
Disagree	80
Strongly Disagree	100

3.5 Split the data & pre-process

The dataset consists the opinion of the participants and the awareness of the usage of mobile application. We have divided the data set into 75% Training and 25% Testing.

We dropped the data that we do not require and find out the null values and then got rid of the null values so that er can run the models correctly without error. Before uploading the data set to machine learning we converted the values in order to run the models.

3.6 Model Implementation

We did not convert the values of awareness data and execute one hot encoding in coding part so that we can run classification on ‘Strongly Agree’ or ‘Strongly disagree’ for ‘Are you aware that you are wasting a valuable time of your day on mobile applications’. We selected these models for the research:

- I. Random forests: This is an ensemble model that consists of multiple decision trees and makes predictions based on the majority vote of the individual trees.
- II. Decision trees: This is a tree-like model that makes a prediction by traversing a decision tree from the root to a leaf node, where the class label is determined.
- III. Gradient Boosting Classifier: Machine learning method for classification and regression that involves training weak prediction models sequentially, with each model attempting to correct the mistakes of the previous model.
- IV. GaussianNB: This is a simple probabilistic classifier based on applying Bayes' theorem with strong (naive) independence assumptions between the features.
- V. K-nearest neighbors (KNN): This is a non-parametric method that stores all available cases and classifies new cases based on a similarity measure.

CHAPTER 4

EXPERIMENTAL RESULTS AND DISCUSSION

4.1 Experimental Setup

From our data set we have achieved the statistical data of physical and mental effect on the respondents and dependency on hardware and software devices. In machine learning experiment we achieved the test result of awareness of wasting time in mobile applications.

4.2 Experimental Results and Analysis

If we consider ‘Strongly agree’ and ‘Agree’ as positive then we get a result that total 70.1% of respondents feels physical pain such as neck pain, eye strain. On the other hand, in same perimeter total 37.9% of respondents has faced mental breakdown using mobile applications for a long time. Total 63.3% of respondents consider mobile application to control electronic device rather than manual control or remote control.

Now, In the machine learning section we are presenting the prediction result of ‘Strongly agree’ and ‘Strongly disagree’ on ‘Are you aware that you are wasting a valuable time of your day on mobile applications’ using multiple models.

Accuracy: The proportion of correct predictions made by the model. This is the most intuitive metric, and is calculated as the number of correct predictions divided by the total number of predictions.

Results for “Strongly Agree”:

TABLE 4.2.1: Model accuracy, precision, recall table on ‘Strongly Agree’

Model	Accuracy	Precision	Recall
Random forests	0.90	0.86	0.83
Gradient Boosting Classifier	0.86	0.83	0.86
GaussianNB	0.88	0.71	1.0
Decision trees	0.89	0.83	0.78
K-nearest neighbors (KNN)	0.71	0.48	0.23

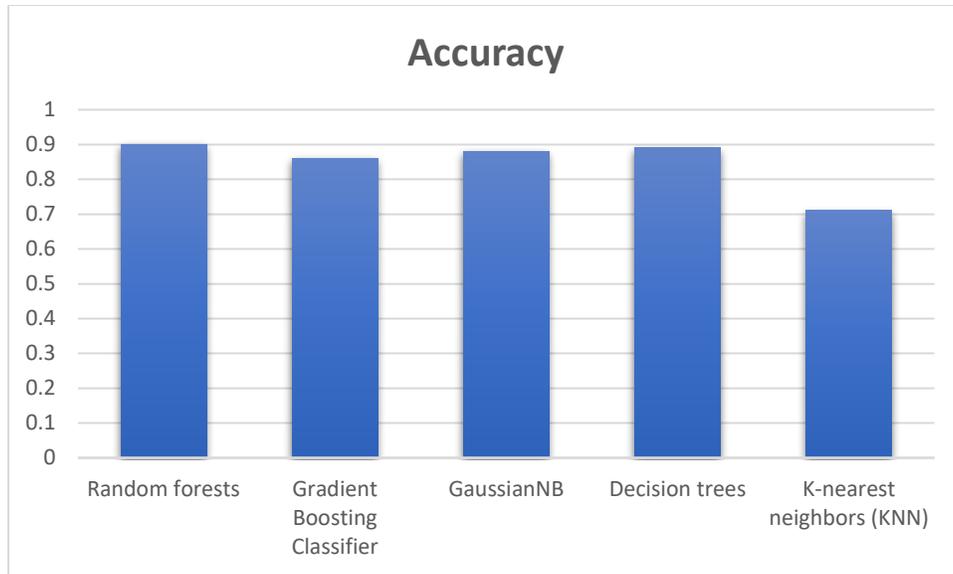


Figure 4.2.1: Model accuracy on 'Strongly agree'

From Figure 4.2.1, we can see the most accuracy score is in Random forests model and lowest score is in K-nearest neighbors.

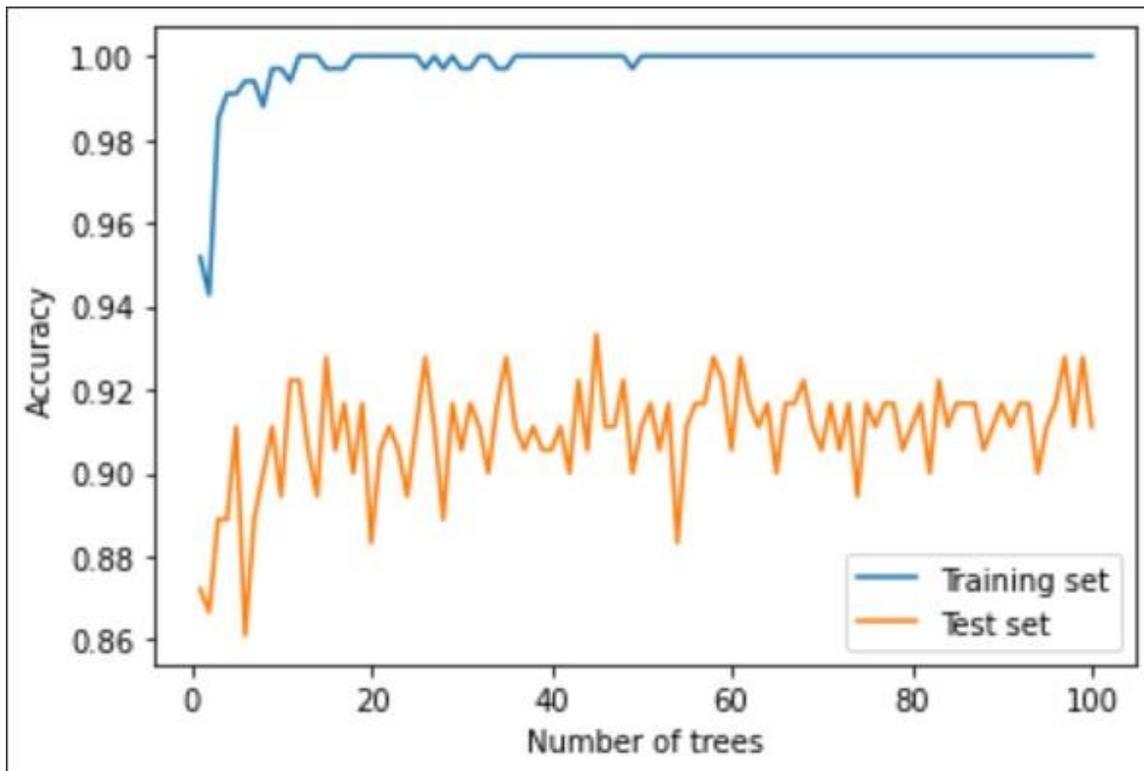


Figure 4.2.2: Model's performance on the training and test sets of "Random forests"

Precision: The proportion of positive predictions that are actually correct. This is calculated as the number of true positives divided by the sum of the true positives and false positives.

Recall: The proportion of actual positive cases that are correctly predicted by the model. This is calculated as the number of true positives divided by the sum of the true positives and false negatives.

The precision and recall result of the random forest results is as bellow:

Precision=86%

Recall = 83%

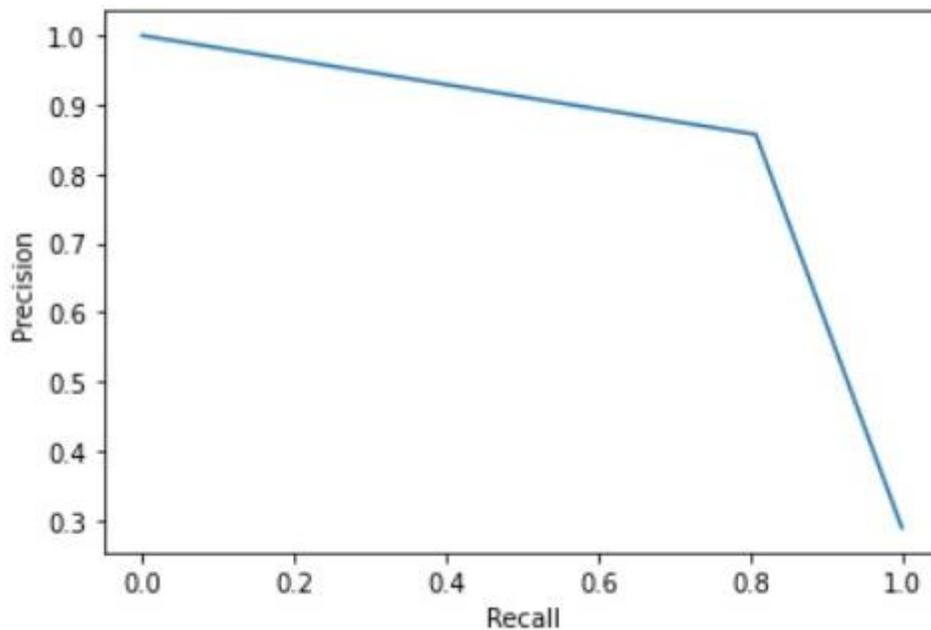


Figure 4.2.3: Precision-recall curve of “Random forests” for “Strongly Agree”

Results for “Strongly Disagree”:

TABLE 4.2.2: Model accuracy,precision,recall table on ‘Strongly disagree’

Model	Accuracy	Precision	Recall
Random forests	0.92	0.86	0.85
Gradient Boosting Classifier	0.86	0.83	0.88
GaussianNB	0.88	0.71	1.0
Decision trees	0.89	0.82	0.80
K-nearest neighbors (KNN)	0.71	0.48	0.23

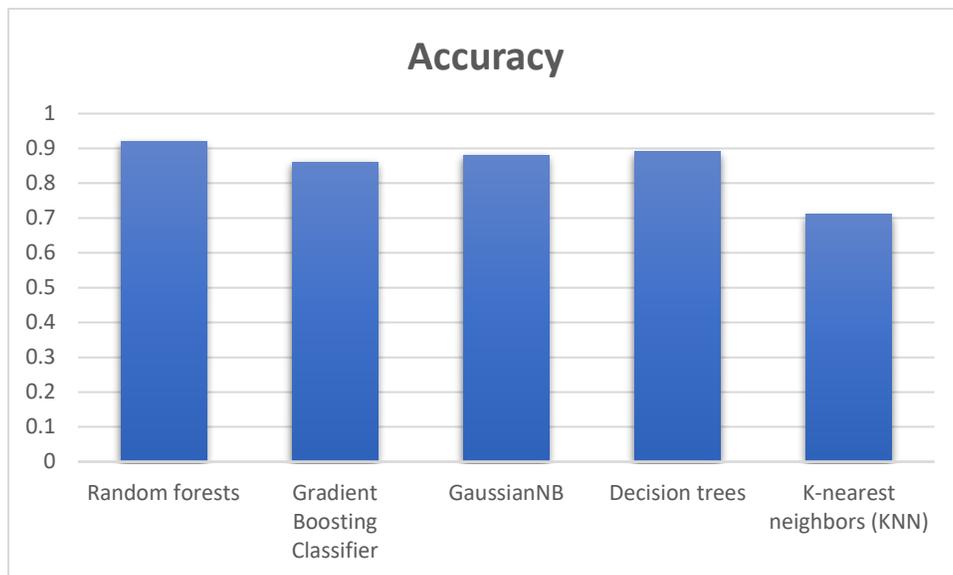


Figure 4.2.4: Model accuracy on 'Strongly disagree'

From Figure 4.2.4, we can see the most accuracy score is in Random forests model and lowest score is in K-nearest neighbors.

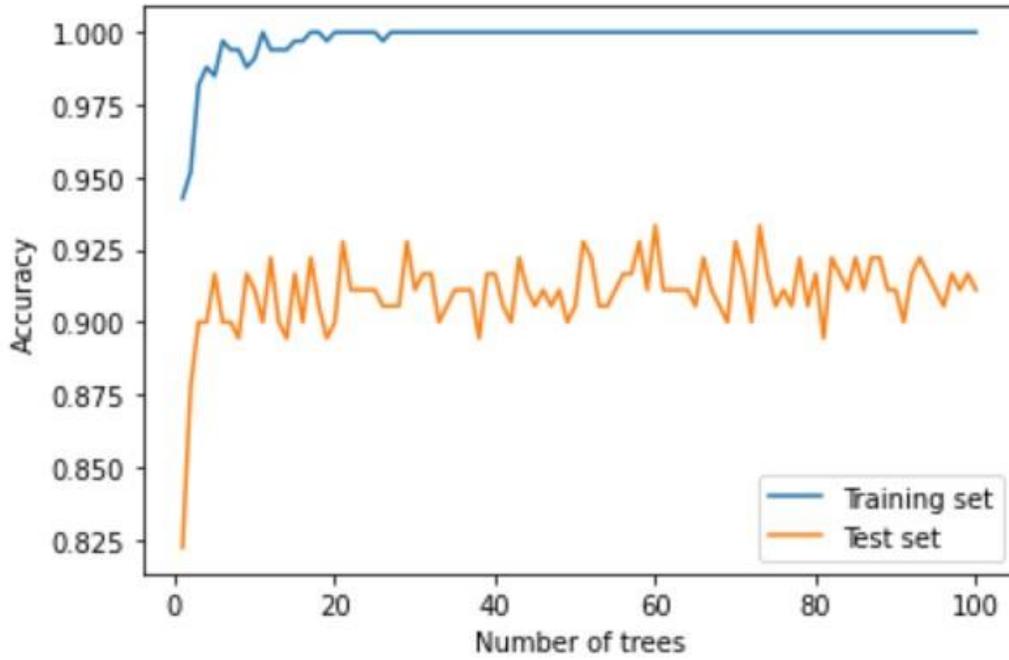


Figure 4.2.5: Model's performance on the training and test sets of "Random forests"

The precision and recall result of the random forest results is as bellow:

Precision=86%

Recall = 85%

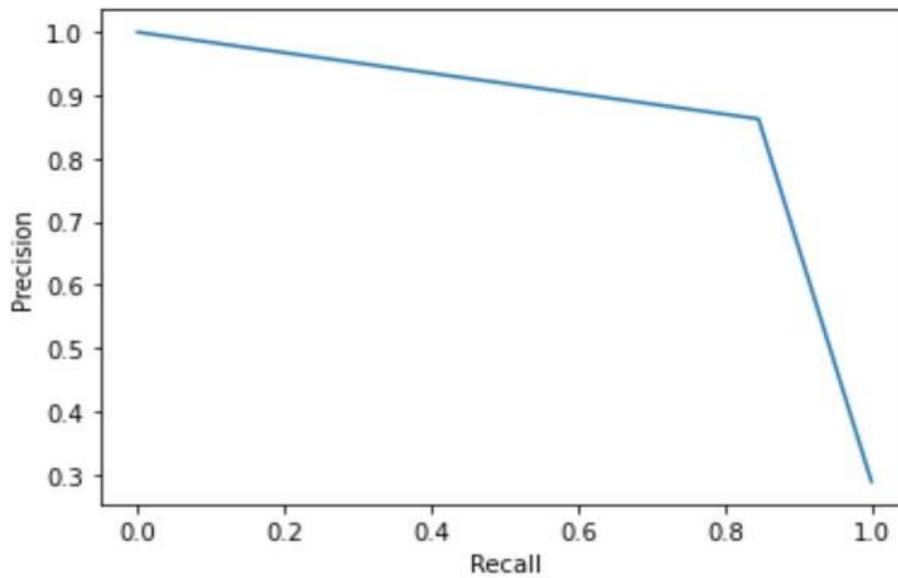


Figure 4.2.6: Precision-recall curve of "Random forests" for "Strongly Disagree"

4.3 Discussion

Results shows the model implantation and their accuracy, precision, recall. These are all classification model to predict result from given data. Research also shows the statistical analysis of the data.

CHAPTER 5

IMPACT ON SOCIETY, ENVIRONMENT AND SUSTAINABILITY

5.1 Impact on Society

Our main concern of the study is to raise awareness among the users which in return will impact our society. Modern society have changed a lot after the revolution of technology. So, if we can raise awareness among the people of society we can see a positive impact on the socialization. People will spend more time on talking to each other rather than using mobile apps and harming themselves.

5.2 Impact on Environment

As our research is based on technology we see no impact on environment so far. But it can affect environment passively in long run.

5.3 Ethical Aspects

People are getting detached socially because of the negative impacts of using mobile apps. So, this research will raise awareness among all and hopefully get a positive impact on the society.

5.4 Sustainability Plan

Further study and implementation to the real world will affect the society. Our research will open doors for further research to study further and bring more sustainable plans to work.

CHAPTER 6

SUMMARY, CONCLUSION, RECOMMENDATION AND IMPLICATION FOR FUTURE RESEARCH

6.1 Summary of the study

We are trying to represent a Machine learning approach for the prediction of awareness on usage of mobile applications from dataset using classifiers. Reading the previous studies, we came to a decision to research on a unique topic. So, data collection was done according to research plan and from the data five different classifier model is used to bring out the expected outcome. Also, research show statistical data analysis.

6.2 Conclusion

In our research we have achieved highest 90% and 92% accuracy on both experiments. We have also shown the precision and recall of the models. We are hopeful that if we can collect more relatable data and huge amount of participant this accuracy can go higher. Besides we have achieved the result that how mobile applications is having an effect on both mental and physical health and also dependency.

6.3 Recommendation and further study

This experiment can be used to make an software that will remind the user that he or she is using mobile applications for a long time and if or she is aware that it a waste of time then a notification can be shown. By doing that the user will be aware and stop further usage of mobile applications.

REFERENCES

- [1] Ine Beyens, J. Loes Pouwels, Irene I. van Driel, Loes Keijsers 2& Patti M.Valkenburg, “The effect of social media on well-being differs from adolescent to adolescent”, *Scientific Reports*, Volume: 10, P: 1-11, 01 Jul 2020.
- [2] Ghulam Shabir, Yousef Mahmood Yousef Hameed, Ghulam Safdar, Syed Muhammad Farouq Shah Gilani, “The Impact of Social Media on Youth: A Case Study of Bahawalpur City”, *Asian Journal of Social Sciences & Humanities*, Vol. 3(4), November 2014
- [3] Shabnoor Siddiqui Mats University Raipur (C.G.), India, Tajinder Singh Mats University Raipur (C.G.), India, “Social Media its Impact with Positive and Negative Aspects”, *International Journal of Computer Applications Technology and Research*, Volume 5– Issue 2, 71 - 75, 2016, ISSN: - 2319–8656)
- [4] Muhammad Sarwar,Tariq RahimSoomro, “Impact of Smartphone’s on Society”, *European Journal of Scientific Research* ISSN 1450-216X / 1450-202X Vol. 98 No 2, pp.216-226 , March, 2013
- [5] Md. Rashedul Islam, Md. Rofiqul Islam, Tohidul Arafhin Mazumder, “Mobile Application and Its Global Impact”, *International Journal of Engineering & Technology IJET-IJENS* Vol: 10 No: 06, 14 August 2017.
- [6] Somaya Ben Allouch,Judith Boonstra, “The development and implementation of a mobile application in human services”, *Journal of Technology in Human Services* 37(2):1-25, June 2019
- [7] Ma. Regina Hechanova-Alampay,Patrick Louis Angeles,Antover Tuliao,Edgar Hilario,Amadeus Fernando Pagente,Carol Villegas Narra, “The development and pilot evaluation of a mental health mobile app in the Philippines”, *Mental Health and Social Inclusion*, DOI:10.1108/MHSI-04-2022-0024
- [8] Lucky Mwiinga, Prof. Solomon Ogara, & Dr. Nchimunya Chaamwe, “The Influence of Mobile App and Media, Towards Entomophagy Awareness and Acceptability”, *International Journal of Advanced Research*, ijar.eanso.org Volume 5, Issue 1, 2022
- [9]Alin Zamfiroiu,Emanuel Herteliu,Bogdan Vintila, “HUMAN INTERACTION WITH MOBILE APPLICATIONS”, *JOURNAL OF INFORMATION SYSTEMS & OPERATIONS MANAGEMENT*, December 2012
- [10] Md. Rashedul Islam, Md. Rofiqul Islam, Tohidul Arafhin Mazumder, “Mobile Application and Its Global Impact”, *International Journal of Engineering & Technology*, *IJET-IJENS* Vol: 10 No: 06,December,2010

APPENDIX

Collecting Dataset for Research Purpose

Your two minutes will help us to improve our research!

* Required

What is your age? *

- 14 to 18
- 19 to 23
- 24 to 28
- 29 or more

Select your gender. *

- Male
- Female

What is your occupation? *

- Student
- Serviceholder
- Housewife
- Businessman
- Other: _____

How much time do you spend on FACEBOOK? *

- 0 to 30 mintues
- 31 to 60 minutes
- 61 to 120 minutes
- 121 to 180 minutes
- More than 180 minutes

How much time do you spend on INSTAGRAM? *

- 0 to 30 minutes
- 31 to 60 minutes
- 61 to 120 minutes
- 121 to 180 minutes
- More than 180 minutes

How much time do you spend on YOUTUBE? *

- 0 to 30 minutes
- 31 to 60 minutes
- 61 to 120 minutes
- 121 to 180 minutes
- More than 180 minutes

How much time do you spend on TIKTOK? *

- 0 to 30 mintues
- 31 to 60 minutes
- 61 to 120 minutes
- 121 to 180 minutes
- More than 180 minutes

Which one do you prefer most searching any solution? *

- Google
- Youtube
- Other Application

We prefer using mobile apps to control our home appliances (Eg: AC, TV etc.) *

- Strongly agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

Are you aware that you are wasting a valuable time of your day on mobile applications- *

- Strongly agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

You ever experienced neck pain, eyestrain or any other health issues using these mobile apps continuously for a long time- *

- Strongly agree
- Agree
- Neutral
- Disagree
- Strongly disagree

You have experienced any type of mental breakdown (such as anger, sadness, hypertension) caused by these apps- *

- Strongly agree
- Agree
- Neutral
- Disagree
- Strongly disagree

Why do you spend the time mobile apps mostly for? *

- Work
- Entertainment

Most of the app we use is social media related app: *

- Strongly agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

Turnitin Originality Report

Processed on: 02-Jan-2023 20:39 +06
ID: 1987970088
Word Count: 4076
Submitted: 1

takimul By Hasna Hena

Similarity Index	Similarity by Source
18%	Internet Sources: 15%
	Publications: 1%
	Student Papers: 13%

3% match (Internet from 20-Sep-2022)

<https://aiou.edu.pk/SAB/gm/GM3%20Spring%202018/01.pdf>

2% match (student papers from 06-Feb-2017)

Submitted to Higher Education Commission Pakistan on 2017-02-06

2% match (student papers from 31-Mar-2018)

Submitted to Daffodil International University on 2018-03-31

2% match ()

[Rather, Mudasir Khazer, RATHER, Shabir Ahmad. "Impact of Smartphones on Young Generation", DigitalCommons@University of Nebraska - Lincoln, 2019](#)

1% match (student papers from 28-Mar-2016)

Submitted to Higher Education Commission Pakistan on 2016-03-28

1% match (Internet from 27-Dec-2022)

http://dspace.daffodilvarsity.edu.bd:8080/bitstream/handle/123456789/3965/P14342%20%289_%29.pdf?isAllowed=y&sequence=1

1% match (student papers from 11-May-2021)

Submitted to Brandeis High School on 2021-05-11

1% match (student papers from 19-Jun-2022)

Submitted to The University of the South Pacific on 2022-06-19

1% match (Internet from 13-Jan-2020)

<https://www.jabfm.org/content/17/6/443.long>

< 1% match (Internet from 24-Dec-2022)

http://dspace.daffodilvarsity.edu.bd:8080/bitstream/handle/123456789/2509/P11882%20%2824_%20%29.pdf?isAllowed=y&sequence=1

< 1% match (Internet from 30-Dec-2022)

<http://dspace.daffodilvarsity.edu.bd:8080/bitstream/handle/123456789/4405/161-15-726.161-15-723.161-15-691.pdf?isAllowed=y&sequence=1>

< 1% match (Internet from 20-Nov-2022)

http://dspace.daffodilvarsity.edu.bd:8080/bitstream/handle/123456789/5207/162-15-7914%20%2825_%29.pdf?isAllowed=y&sequence=1

< 1% match (Internet from 20-Nov-2022)

http://dspace.daffodilvarsity.edu.bd:8080/bitstream/handle/123456789/3931/P15491%20%2823_%29_.pdf?isAllowed=y&sequence=1

< 1% match (Internet from 26-Oct-2022)

<http://dspace.daffodilvarsity.edu.bd:8080/bitstream/handle/123456789/8350/191-25-751%20%2818%25%29.pdf?isAllowed=y&sequence=1>

< 1% match (Internet from 20-Nov-2022)

Activate Windows
Go to Settings to activate Windows.