

**SOCIAL MEDIA ADDICTION ANALYSIS BASED ON MACHINE
LEARNING**

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

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APPROVAL

This Project/internship titled “**Social media addiction analysis based on machine learning**”, submitted by Minjun Nahar Mim, Tahrima Tazim and Shama Saha, ID No: 191-15-12974, 191-15-12998, 191-15-12973 to the Department of Computer Science and Engineering, Daffodil International University has been accepted as satisfactory for the partial fulfilment of the requirements for the degree of B.Sc. in Computer Science and Engineering and approved as to its style and contents. The presentation has been held on 02/02/2023.

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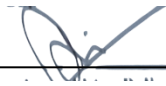
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DECLARATION

We hereby declare that this project has been done by us under the supervision of Johora Akter Polin, Lecturer, 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.

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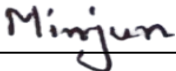
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ABSTRACT

Social media is a necessary component of modern living. Although social media has many advantages and applications, over-usage of it has already led to immediate societal and private problems. It has become clear that social media addiction is a brand-new phenomenon and addiction. A lot of issues in our society and in our daily lives are brought on by excessive usage of social media and online resources. Some people spend a significant amount of their day on social media and ignore or forget about their crucial tasks. Massive social media use contributes to physical and mental disorders. Today, depression affects a large portion of the population worldwide. The internet and social media have the power to affect and alter our emotions, cognitive processes, complete ways of thinking, and regular behavioural attitudes and traits. The major melancholy, anxiety, and dissatisfaction are social networking sites like Twitter, Facebook, Snapchat, and other chat tools that allow us to vent our sentiments. Most of the people are addicted to social media. Our main objective is to find out the number of social media-addicted people. To find out the number of addictions, we collected the data by doing a survey and learned the data in machine learning algorithm and tried to find the number of social addictions through sentimental analysis from that collected data set. Different machine learning algorithms: Decision Tree Classifier, Random Forest Classifier, SVC, and K-Nearest Neighbours have been used.

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CHAPTER 1

Introduction

1.1 Introduction

Nowadays, Social Media has been considered a popular means of spending time. After spending so much time on Social Media, people experience frustration, depression, and other illnesses. It's too challenging to recognize humans who are not represented among the many who are frustrated through Social Media. These individuals' mindsets will be progressive and contingent. Online posting, social interactions, feedback, and outreach will all speak about their state of mind. Traditional word-of-mouth networks are expanding and becoming more prevalent thanks to social media. After spending so much time on Social Media, people experience frustration, depression, and other illnesses [1]. The best and most reliable method of spreading knowledge has always been word of mouth. Anyone with internet access and an opinion may participate in social media thanks to technology. For businesses, this cultural transformation is a force to be considered. There has been a dramatic increase in research on social media addiction. Social media addiction was specifically noticeable among school, college, and university students. In addition to social media addiction, social media are closely associated with the terms social media dependency, problematic network use, compulsive network use, effective social media addiction, ineffective social media use, emotional uses of social media, etc. Messenger, WhatsApp, Telegram, etc. are the most popular messaging sites in social media. In today's Digital World, young people are surrounded by the Internet, smartphone, computer, video game, TV, etc. these become habits for people[2]. Today's young people think that it's normal for them to use all social media platforms. Social media can be dangerous for young people. It can be a source of great frustration for them and at the same time, it can increase their addiction. The only way to avoid that is to reduce Social Media usage and focus on the practical side.

I will first go through the historical and current situation of the Theory of Uses and Gratifications, looking at its theoretical foundations as well as the numerous classifications and groups of Uses and Rewards discussed in the study on this subject.

I will next go over the analysis approach, the data analysis's findings, and my interpretation in that order. The spread of the internet worldwide. It is possible to communicate across the globe via social media and social media is attracting people to communicate from one end of their internet domain to the other. Twitter, Facebook, WhatsApp, Messenger, and Instagram are the utmost popular social media platforms in many developed nations. It will be excessively more widespread in the next or future. Gradually, it will expand people's emotions, thoughts, feelings, and aspirations more widely and these social media mediums will be the only means of expressing or sharing people's emotions, feelings, aspirations, desires, thoughts, etc. The world has come a long way in utilizing social media so that people can be very open and free about any problem they want and can take the solutions. Currently, social media is working as an addiction. Eventually, this addiction leads people to the stage of suicide and it helps sensitive persons in society to commit suicide [1]. It is very important to analyze the classification or categorization of all posts or pictures shared on social media to save the life of any sensitive people or to keep them alive. It should be essential before being affected by a psychological disorder.

In this thesis, we will use social media addiction mainly for research work. Machine learning techniques are commonly used to potential features as instructions. Sadness, happiness, depression, frustration, emotion, anxiety, pain, depending on these things, we have used machine learning to find out the amount of depression by sentinel analysis from the opinion given by people. Sadness, happiness, depression, frustration, emotion, anxiety, pain, etc., and the mental state is involved with all this in all networks. Being more than active on social media leads to depression, frustration, and withal symptoms are anxiety. After the severity of depression and advanced parameters can be recognized as a chance of suicide with cardiovascular illness. Online posting, social interactions, feedback, and outreach will all speak about their state of mind [3].

1.2 Motivation

Social media is a repository of bad addictions, as well as good addictions. Social media has advanced those who have used it for good, but its bad use has led people to destruction. Social media is data produced by individuals with the intention of being shared online, typically on a platform unique like Facebook. It can take the shape of

text, videos, or photographs. A person who can't go more than an hour without the use of social media is thought to have a social media addiction. Dopamine signals in your brain grow whenever you use your favorite apps. The neurotransmitters in question are linked to pleasure. Your brain recognizes social media use as a pleasant activity that you should continue when you feel more dopamine after utilizing it [3].

However, in actuality, social media can be advantageous for society. People may connect and their relationships may become deeper as a result. Student learning and development are also encouraged by social media. Additionally, it can help businesses grow their clientele and increase their revenue. The advantages of social media are numerous [2],[9].

Following are some positive aspects of social media:

- New relationships building and keeping connected.
- Good Communications.
- Getting new news and spreading new news to everyone.
- Building a new business.
- Usually creates motivation for young people.
- Increases creativity.
- For any kind of product offering support.
- Expose any type of sympathy and grace.

1.3 Rationale of the Study

Addiction to social media has been connected to psychological interactions including shyness, despair, and a difficulty to form intimate relationships with others. Additionally, it has been discovered that social media addiction affects conversation quality, which is a part of interpersonal skills [4]. The network of relationships people have and which expand via the application of interpersonal skills can be impacted by social capital, which is the ability to generate social capital, according to research by Bian and Leung (2015). The misuse of social media has also been associated negatively with social connectivity and self-esteem [7].

The cognitive explanation hypothesis contends that social media addiction results through flawed cognition and that individuals use social media to distract themselves

from both internal and external issues. Addiction to social media is usually categorized as a type of addiction to online relationships. The addiction to the internet and social networks is the subject of a wide variety of hypotheses [6]. The social control hypothesis, behavioral explanation, biological explanation, and cognitive explanation are some of the most significant hypotheses [7]. According to the dynamic psychology theory, personality features, psychosocial status, and childhood psychological shocks or emotional deficits are the underlying causes of social networking addiction. The social control hypothesis contends that because addiction differs by age, sex, socioeconomic level, and nationality, it is more likely to affect certain social groups than others [9]. According to the behavioral explanation hypothesis, people use social media to get benefits like amusement and an escape from reality. According to the biological explanation view, addiction is caused by the presence of specific chromosomes or hormones, or the absence of specific substances that control brain function [1].

Social media addiction is the term used to describe the mental preoccupation with using social media networks and devoting enough time to them that it interferes with an individual's other social activities, such as work and other professional pursuits, personal relationships, and health, disrupting their life. Using social networking on a smartphone might have disastrous results as well. It has been shown that those who use their cellphones for social media are more prone to develop smartphone addiction. Smartphone addiction can have the same detrimental repercussions as social media addiction, such as despair, anxiety, sleep loss, and other signs of mental illness [2]. It has been discovered that criteria such as gender, personality type, and the age of initial usage have an impact on social media and smartphone addiction.

1.4 Research Questions

We may increase our vocabulary and communication abilities by reading books. Reading helps us develop our imagination and creativity. Reading various novels inspires us to think about fresh ideas [5]. Books aid in the growth of our cognitive powers and capacities for logical reasoning. Word recognition, comprehension, fluency, and motivation are all important components of the complicated process of reading. Despite the many benefits of reading books, in this age of social media reading

books is loved by many people and disliked by many. So in the age of social media, we asked the question on how many people like to read books out of 100% of people. We can see in the answer in the graph that out of 100% people, 52% people said they like reading books and 48% dislike reading books in this age of social media.

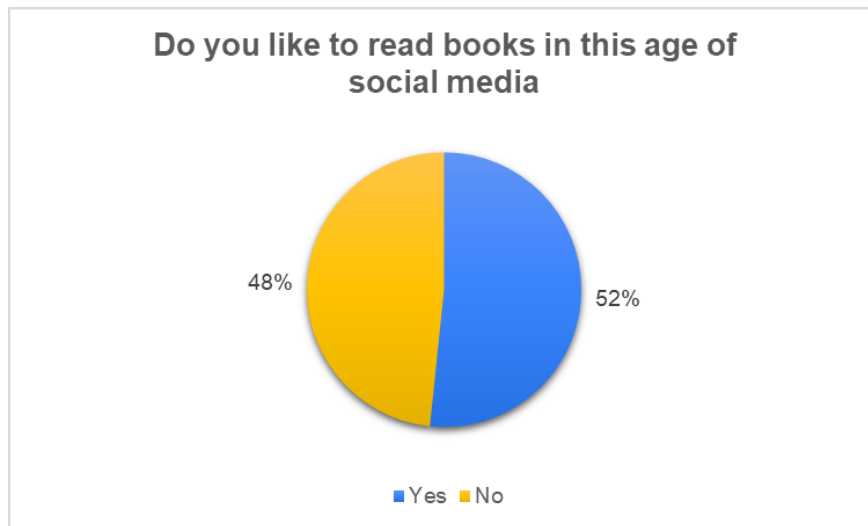


Figure 1.4.1: Pie chart of Survey Question one.

It is almost impossible to live without the internet in the digital age. Without the Internet, your life would be monotonous, boring -Do you think that is so, the answer to this question is 100% of the peoples, 55% people said that without the Internet, your life would be monotonous, boring.

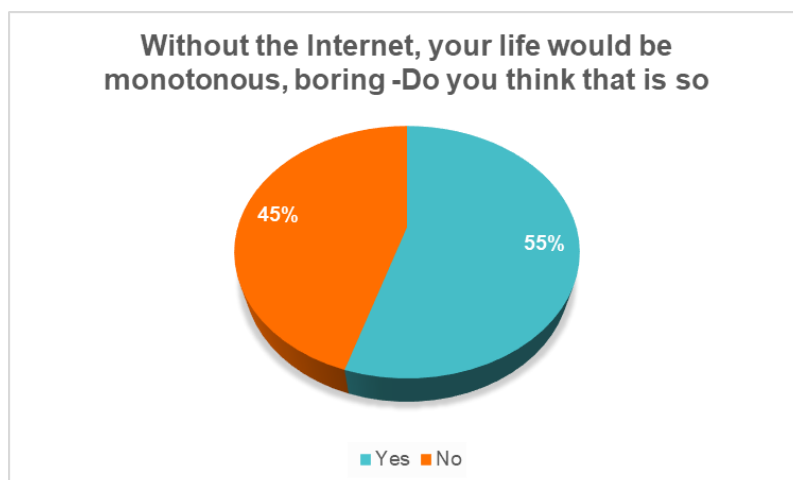


Figure 1.4. 2: Pie chart of Survey Question Two.

Over the past ten years, checking and browsing through social media has grown in popularity. Despite the fact that the majority of people's use of social media is not harmful, a small minority of users develop an addiction to social networking sites and use them compulsively or excessively. The symptoms of social media addiction include excessive worry about social media, an insatiable want to access or use social media, and spending so much time and energy on social media that it interferes with other crucial aspects of one's life. Do you decide to spend time on the Internet rather than hanging out with others, in the answer of this Question we find that 64% people are addicted to social media trend.

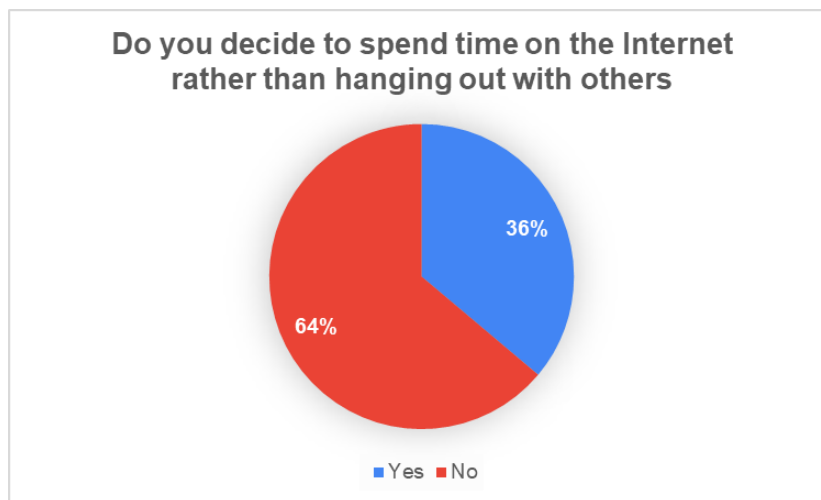


Figure 1.4.3: Survey Question Three.

Similar to any other substance use illness, addiction to social media may present with less social interaction, mood modulation, salience, tolerance, withdrawal symptoms, conflict, and relapse.

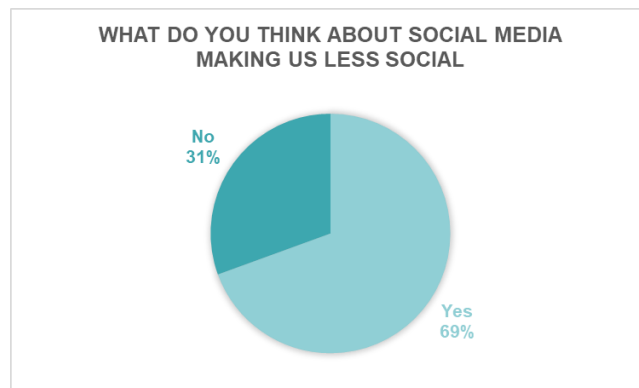


Figure 1.4.4: Survey Question Four.

People use the Internet irregularly for excessive Internet addiction. The user may experience physical and mental health issues like depression, OCD, poor family connections, and anxiety as a result of excessive Internet use, which can lead to little sleep, prolonged periods of not eating, and little physical activity.

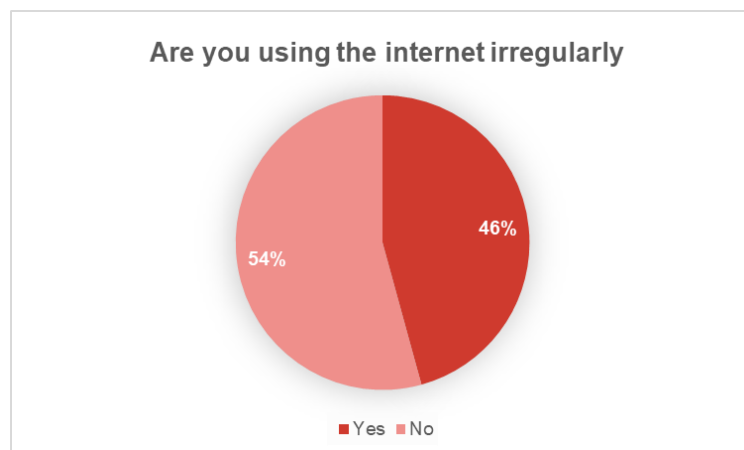


Figure 1.4.5: Survey Question Five.

Many people become addicted to the Internet or involve themselves in some other vices for which they hide what they do on the Internet. Our survey Question is ‘When someone wants to know what you do on the Internet, do you try to hide it’ the answer to this question is 100% of the peoples, 64% people said that they are not hide that but 36% people replied that they are hide what they do on the internet.

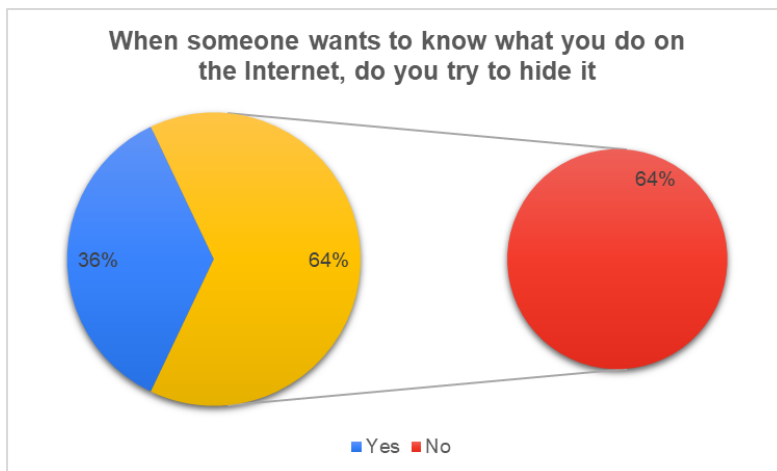


Figure 1.4.6: Survey Question Six.

Many times people get so much addicted to internet that they forget their daily work. We can see through the survey 782 people reply not neglect their daily work to spend more time online. 782 people are not addicted on the internet but 635 people are reply yes, neglect daily work to spend more time online. So, 635 people are addicted on the internet.

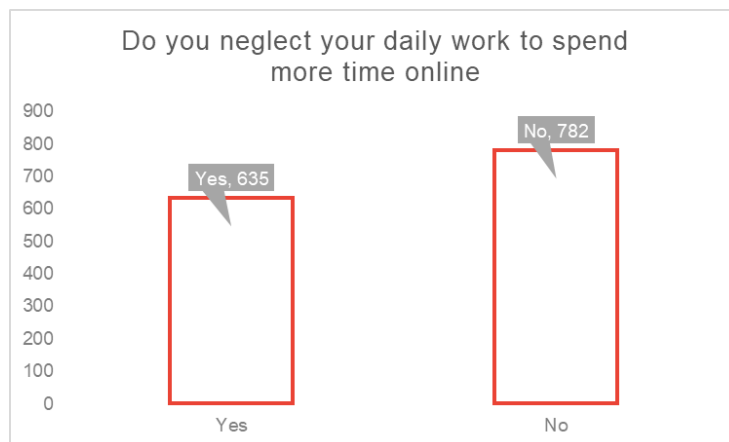


Figure 1.4.7: Survey Question Seven.

Due to internet addiction, people use the internet late into the night. Many times people become so addicted to the internet that they forget how late at night it is while using the internet. 'Are you busy using the internet till late at night' the answer to this question is 100% of the peoples, 61% people said that 'Yes' but 39% people replied that 'No'. We understand their answer 61% people are addicted on internet within 100% people.

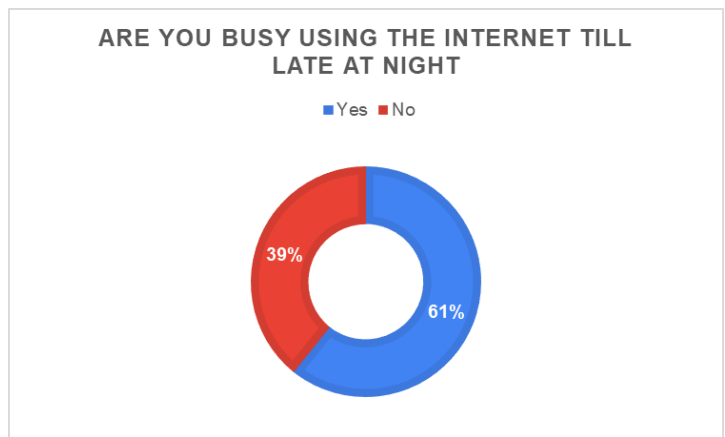


Figure 1.4.8: Survey Question Eight.

People get involved in new relationships on social media and become addicted to it ‘Do you build new relationships with people in the virtual world’ the answer to this question is 100% of the peoples, 55% people said that ‘Yes’ but 45% people replied that ‘No’. We understand their answer 55% people are addicted on internet within 100% people.

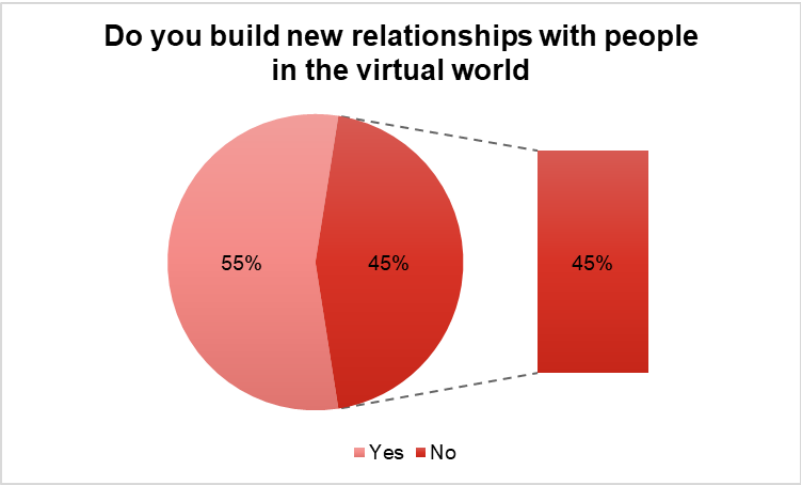


Figure 1.4.9: Survey Question Nine.

Social media-addicted people give more priority to social media than real life. They start thinking about social media leaving aside all the thoughts of real life, when who sends an SMS, whether any notification came, these thoughts are always running in their head. Then real life thinking are so boring to social media addicted people. In our survey answer, 61% people said they are not addicted to social media and remaining 39% people are so much addicted to social media.

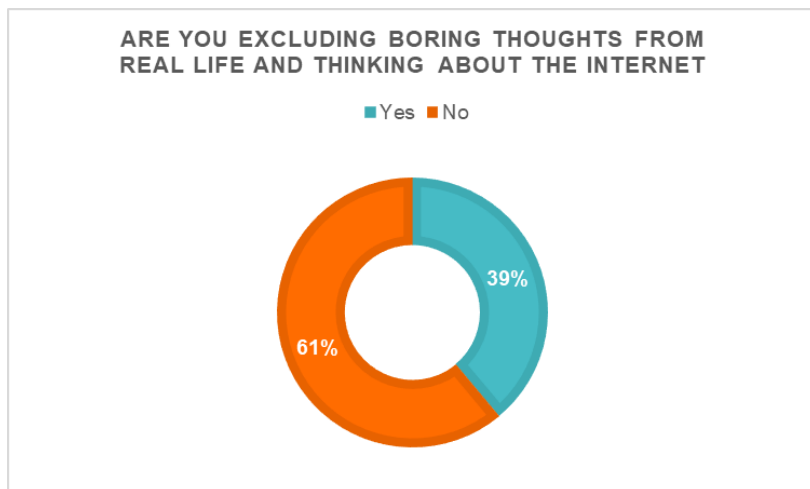


Figure 1.4.10: Survey Question Ten.

People who are addicted to social media are constantly making new friends and it also works like an addiction. Social Media Addicted people are so immersed in social media that they don't attention to what is happening in real life.65% people said that no, means they are not attracted of the Internet. But 35% people are addicted to Internet.

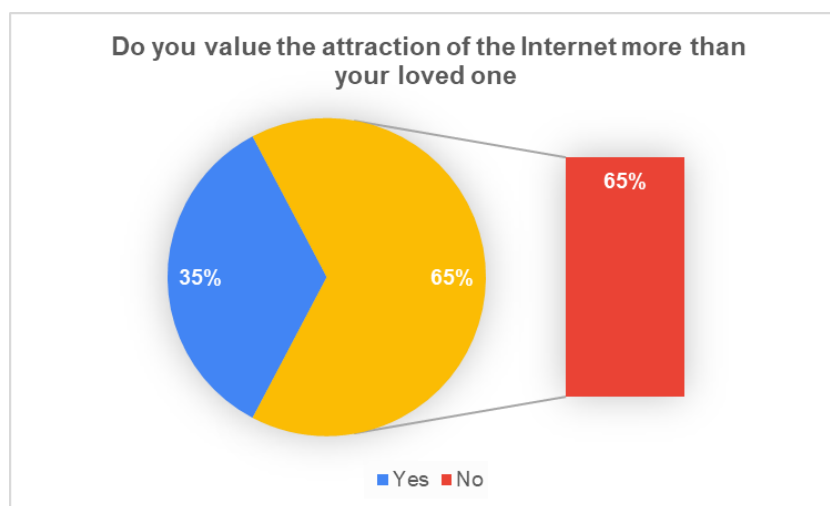


Figure 1.4.11: Survey Question Eleven.

Many people think that social media has a negative impact on their personal relationships and many people think that social media has no negative impact on their personal relationships. 'Do you feel that using social media sites has a negative effect on your personal relationships?' The results we got from the survey on this question are

that most of the people think that social media has a negative impact on their personal life. A few people said that social media does not have any negative effect on them which means they are not addicted to the internet.

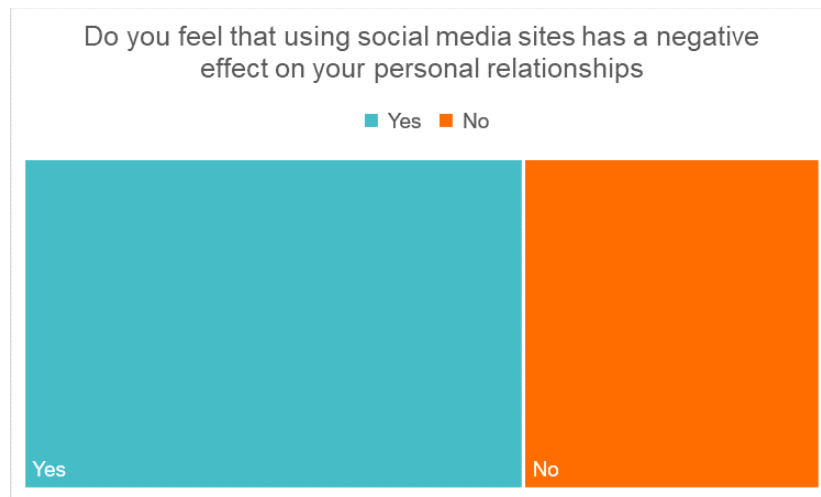


Figure 1.4.12: Survey Question Twelve.

Social media is a platform where it's natural to be addicted. It is natural to forget to get out of the Internet once you enter it. Everything can be done with the help of the internet. Most people are addicted to the internet. Where it is possible to do everything as you like, it is natural that people are most interested there. We got a similar response through the survey. Most people use the internet a lot and the number of internet addictions is also high. There are very few people who are not addicted to the internet [8].

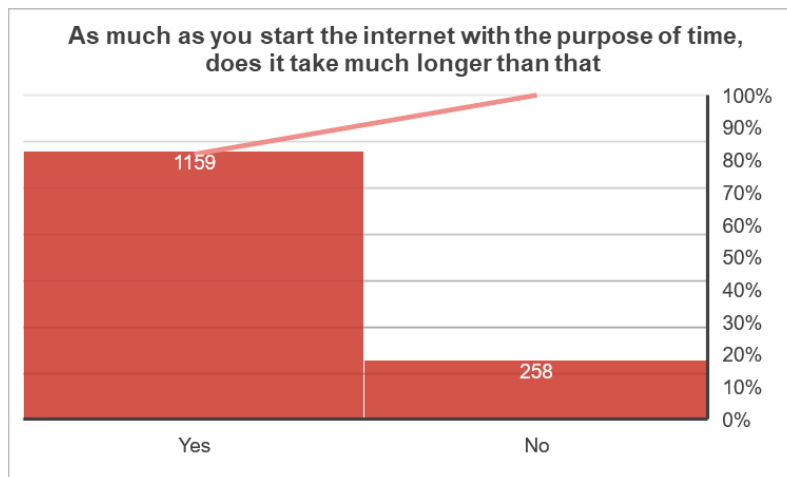


Figure 1.4.13: Survey Question Thirteen.

Once people become addicted to the internet, they keep thinking about it all the time. Most people answered 'no' to our survey. It means they don't make them addicted to the internet after being off the internet. A few said that even when they are not online, the Internet keeps them addicted all the time. Although there are more answers 'NO' to the survey, the number of people who are addicted to the internet is very high and they think about the internet even if they are not online all the time. Because in this age, it is not possible to stay without the internet.

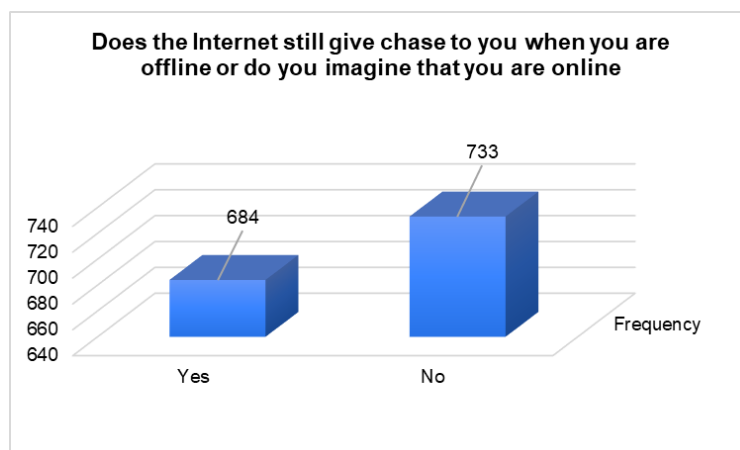


Figure 1.4.14: Graph of survey question fourteen.

Once you become addicted to the Internet, it is very difficult to get out of it. Internet addicts want to spend a few more minutes on the Internet after doing some work, need,

or answering someone else's call. Most of the time people say 'Yes' to our survey question. That means once they start using the internet, tries to spend a few more minutes on the Internet after doing some work, needing or answering someone else's call. The number of internet addictions is increasing day by day. Increase is normal because there is nothing that cannot be done on the Internet.

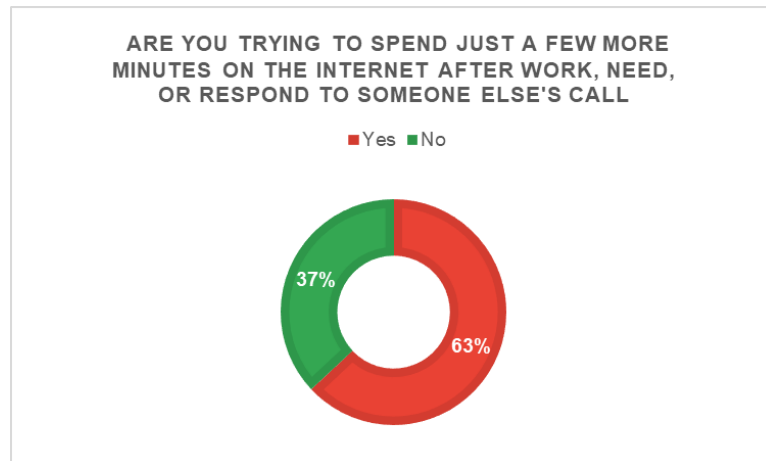


Figure 1.4.15: Pie Chart of survey question fifteen.

Internet-addicted people are immersed in the Internet all the time. For this, internet addicts come in for various criticisms or many suggest to stay away from internet that they don't like. Because of this, Internet addicts try to keep the amount of time they spend on the Internet a secret from others. So that, no one can say anything about internet addiction.

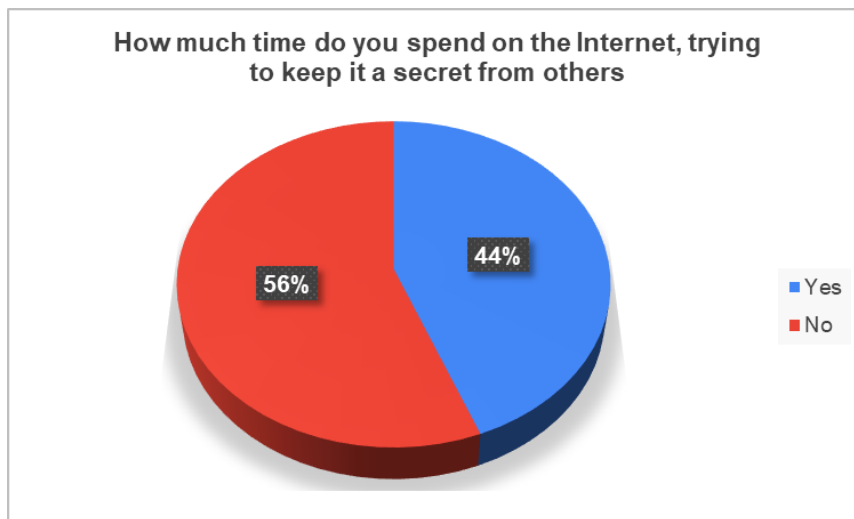


Figure 1.4.16: pie chart of survey question sixteen.

When one realizes that more time is being spent on the Internet, people try to reduce the time they spend on the Internet. Because once people get addicted to the internet, people don't want to do anything else and the internet is a platform where you can spend a lot of time without wanting to spend time there. 66% people out of 100% of respondents to our survey say they decide to cut down on internet time, but either can't or fail to do so.

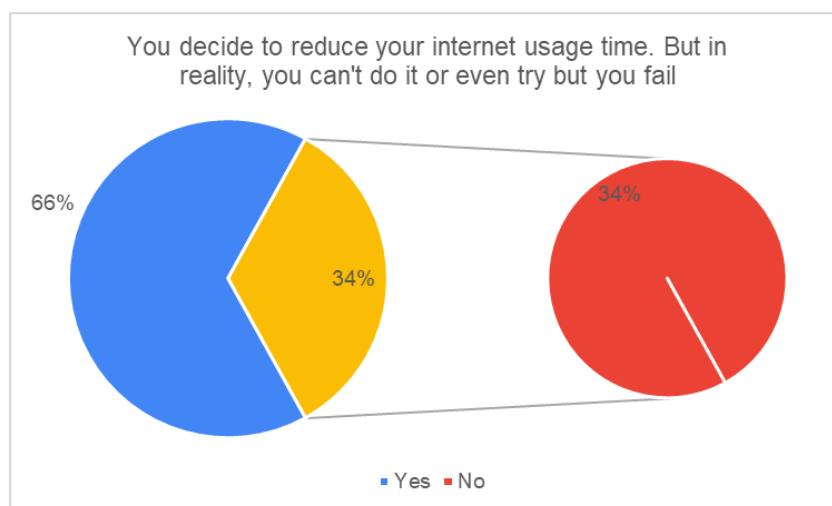


Figure 1.4.17: Pie chart of survey question seventeen.

People who are very much addicted to the internet can't live even a minute without the internet. They become depressed, upset without the internet. These problems are no

more as soon as they are connected to the internet. In the answer to the survey, I found that most of the people face this problem. Most people become depressed, upset without the internet but this problem is no longer when connected to the internet. This means that most people are addicted to the internet. 43% of people answered 'No' while 57% of people answered 'Yes'.

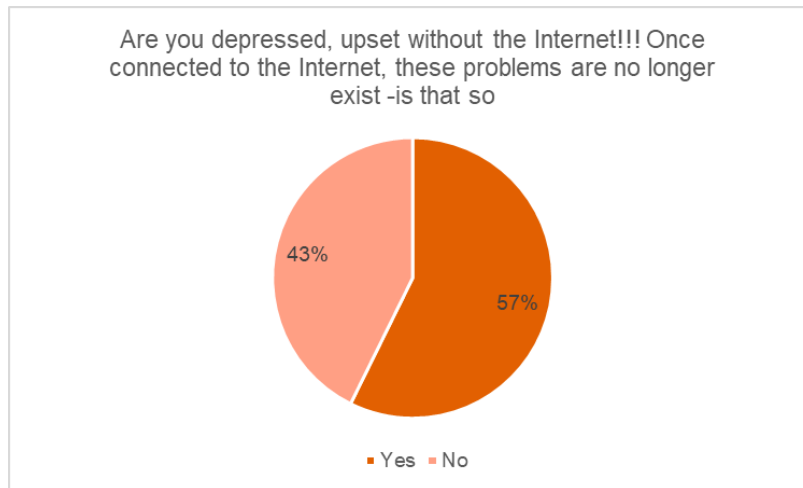


Figure 1.4.18: Pie chart of survey question eighteen.

The Internet is a platform where once connected there is no way to know when the time will pass. As internet addiction is increasing, misuse of the internet is also increasing day by day. So it is normal to see it is bad if you spend more time on the internet. Since there is a lot of bad use on the Internet, it is normal for family members to complain about it if they spend more time on the Internet. In response to the survey, most people say that their family members complain about their internet usage.

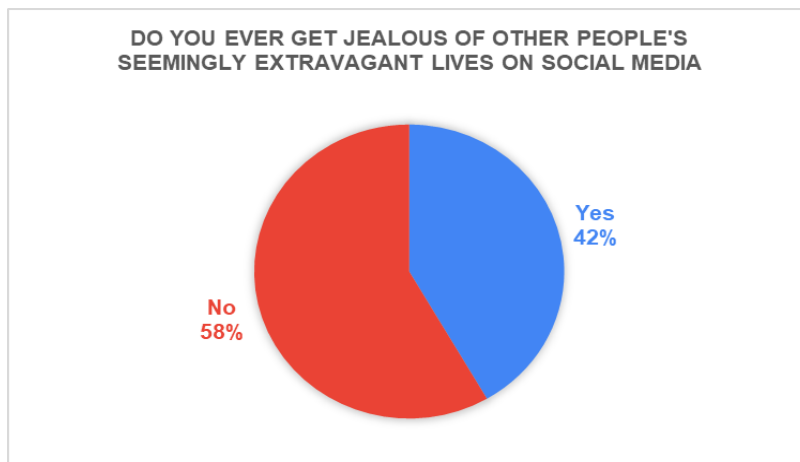


Figure 1.4.19: Pie chart of survey question-19.

‘Do you ever get jealous of other people's seemingly extravagant lives on social media?’ In response to this question, those who are internet addicts answered yes, while those who are addicted mothers answered no. In the graph below we can see that 58% of people say they do not feel that way. The remaining 42% say they feel it works. So it can be understood that these 42% people are very much addicted to the Internet.

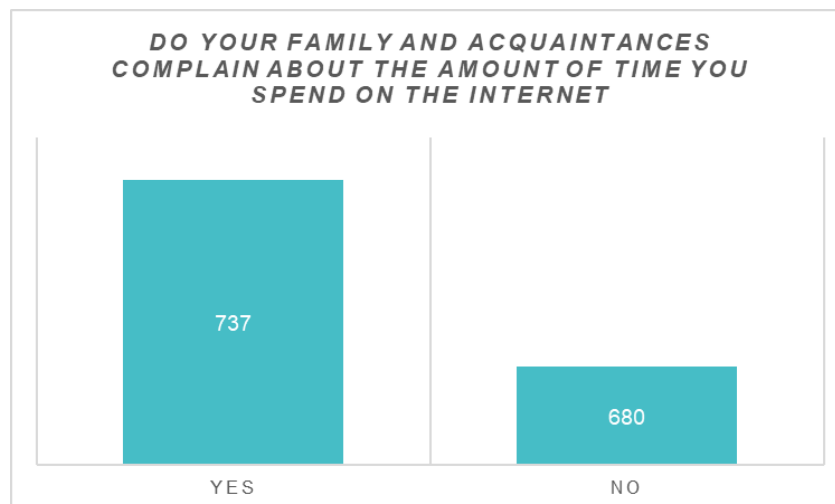


Figure 1.4.20: Pie chart of survey question twenty.

If you are more addicted to the internet, it is natural to get excited about anyone talking about the internet. People involve themselves in many bad and good things on the internet. But there are many misuses on the internet. No one can accept any embarrassing comments about anyone and if that's the case, Internet addiction people

are embarrassed about using the Internet then the addicted person will be angry and that is normal.

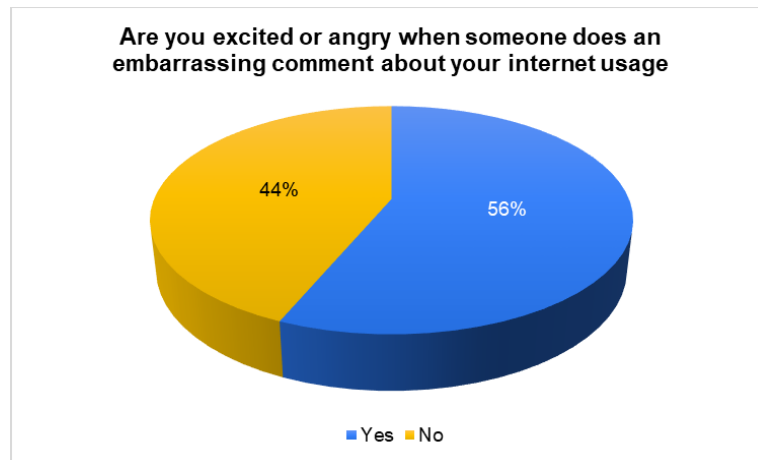


Figure 1.4.21: Pie chart of survey question 21.

‘Have you ever experienced feelings of isolation as a result of using social media?’ In answer to this question, someone said ‘Yes’ and someone said ‘No’. But social media often leads to isolation. People are so addicted to the internet that people don't have time to talk to their people and that good relationship gets alienated. Internet addiction is a very dangerous thing for people.

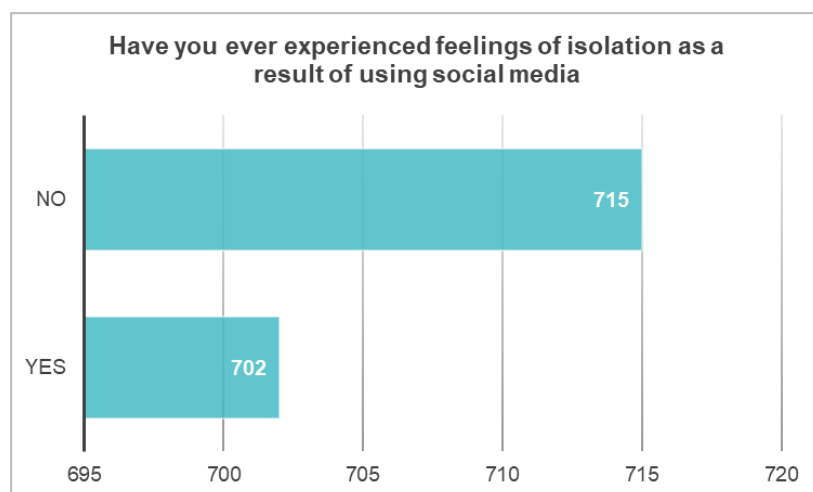


Figure 1.4.22: Graph of survey question 22.

Yes, social media can change people's personality. Sometimes many things are unknown to people which may be known through social media. Sometimes social media

helps to increase people's personality and sometimes it reduces people's personality and all this depends on people's internet usage. If people use the internet with good intentions then the internet helps them a lot and if someone uses the internet with bad intentions then the internet will have a very bad effect on them. However, people who are more addicted to the Internet often use it. Addiction to the internet is pushing people to a bad side day by day.

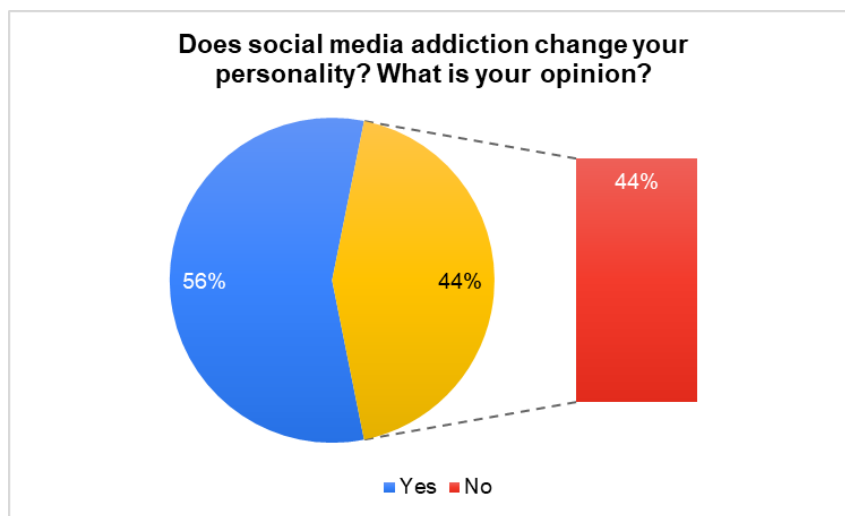


Figure 1.4.23: Pie chart of survey question 23.

1.5 Expected Output

We use sentiment analysis based on survey answers for analysis results, then apply five machine learning algorithms. Sentiment analysis, often known as opinion mining, is a technique used in natural language processing (NLP) to determine the survey answer. This is a common method used by organizations to identify and group ideas regarding a certain good, service, or concept. We collected a total of 1417 pieces of data using the survey form. I developed a result column for each student based on their response after categorizing and analyzing all the data, and we found that 63% of respondents agreed with my questions. The proportion of yes and no replies is then calculated. Finally, it is predicted that 63% of persons experience mental stress. The number of people addicted to social media addiction is increasing day by day. We were collected a total of 1417 data through the survey form. By analyzing these 1417 data, we found that out of the 100%, 63% of people are social media addicted while 37% of people are

not addicted. Hopefully, we will get better results by using machine learning algorithms implementation.

1.6 Project Management and Finance

We conducted a survey to find out the number of social media addictions. To do this I had to print some forms to increase the data collection. Some money was spent and nothing else has been spent so far. But in the future, we may have to spend a little more to develop our project. We have always wanted to work on social media addiction. Because its use is increasing day by day in the present.

1.7 Report Layout

This report consists of 6 chapters. These are:

- Introduction:
 - Introduction
 - Motivation
 - Rationale of the Study
 - Research Questions
 - Expected Output
 - Project Management and Finance
 - Report Layout
- Background:
 - Preliminaries/Terminologies
 - Related Works
 - Comparative Analysis and Summary
 - Scope of the Problem
 - Challenges
- Research Methodology:
 - Research Subject and Instrumentation
 - Data Collection Procedure/Dataset Utilized
 - Statistical Analysis
 - Proposed Methodology/Applied Mechanism

- Implementation Requirements
- Experimental Results and Discussion:
 - Experimental Setup
 - Experimental Results & Analysis
 - Discussion
- Impact on Society, Environment and Sustainability
 - Impact on Society
 - Impact on Environment
 - Ethical Aspects
 - Sustainability Plan
- Summary, Conclusion, Recommendation and Implication for Future Research
 - Summary of the Study
 - Conclusions
 - Implication for Further Study

CHAPTER 2

Background

2.1 Preliminaries/Terminologies

The use of the internet is increasing day by day along with the number of internet addictions. When people log on to the Internet, they forget all their work and spend time behind the internet. Not only is the addiction on the internet but also the abuse of the internet increasing day by day. In the future, its use will increase so much that people will lose their sociality. Taking everything, we have taken the initiative to work on social media addiction [5]. By collecting data from everyone's responses through survey form, we have tried to understand what people's addiction to the Internet is still at what level. To do this now some money has been spent on printing the form for data collection and no other money expenditure has been incurred [4]. We use the machine learning algorithm to determine the number of internet-addicted people after the data connection through the survey, then data pre-processing, and leveling. This has fully completed our work in the process.

2.2 Related Works

In an article on Social Media Addiction, Springer Link (2022) discusses a Social media addiction paper named Coronavirus Anxiety and Psychological Adjustment in College Students: Exploring the Role of College Belongingness and Social Media Addiction. Researchers were capable of confirming that sustained Internet addiction will lead to anatomical changes in the brain. Education system is a beneficial setting where pupils may develop a feeling of community [2],[5]. According to a recent longitudinal cohort study conducted in China, the prevalence of psychological issues among students increased significantly during the pandemic compared to that of the pre-pandemic period for the following indicators: depressive symptoms (24.9 vs. 18.5%), non-suicidal self-injury (42.0 vs. 31.8%), suicide ideation (29.7 vs. 22.5%), suicide plan (14.6 vs. 8.7%), and suicide attempt (6.4 vs. (Zhang et al. 2020) [8]. Young people are more likely to use social media, and they do so for a variety of purposes, including interacting with others and expressing their identity (Mahmood et al. 2018) [11]. Smartphone

ownership and affordable, practical Internet access are two more reasons that encourage young people to utilize social networking sites (Poushter 2016). Due to the use of various assessment methodologies and the lack of a widely accepted conceptualization of problematic social media use, it is difficult to determine the rates of social media consumption (Bányai et al. 2017) [12]. While some studies suggested that university students used social media at a prevalence rate of 2.8% (Olowu and Seri 2012), others showed that young people used social media at a prevalence rate of 47%. (Al Mamun and Griffiths 2019) [11].

Irep.ntu.ac.uk (2022) discussed Italian validation of the Instagram Addiction Scale and association with psychological distress, social media addiction, smartphone addiction, and internet use disorder. According to studies (Baumer, 2013; Garrett & Cutting, 2012; Baumöl et al., 2016; Schultz, 2016; Hutter et al., 2013), moderate usage of social media can have a variety of positive effects, such as enhancing psychological health and the quality of interpersonal relationships. However, an increasing number of research (e.g., Griffiths, Kuss & Demetrovics, 2014; Kuss & Griffiths, 2017; Mäntymäki & Islam, 2016) have shown the more detrimental effects of social media use [17].

Instagram is solely an image-based social network. In addition to instant messaging, features added following the app's introduction include Instagram Stories, which lets users post photographs and videos online for just 24 hours, and Instagram Live, which enables live video streaming in addition to live chat. According to Statista Research Department (2022b), there are already more than one billion active Instagram users, which indicates that Instagram receives more average interactions per post than Facebook and Twitter (Cucu, 2022; Casalo, Flavian, and Ibanez-Sanchez, 2017) [13][14]. With almost 59% of its users being between the ages of 18 and 29 (Statista Research Department, 2022a; Cucu, 2022; Alhabash & Ma, 2017), Instagram is one of the fastest-growing and most popular SNSs among young adults [11].

According to Bhimani (2015), an increasing number of businesses take advantage of everyday people's desire to be online and their willingness to post copious amounts of private information online, which adds to the Big Data. They do this only for financial gain and to increase their own worth. What makes data so appealing are its sheer bulk as well as the numerous applications and uses for which it may be put? The absence of appropriate rules is a further issue. The general public is either unaware of big data or

has a limited understanding of it, as well as the terms and conditions one agrees while using the internet, which enables businesses to utilize the data in a variety of ways. The amount of data grows as more and more individuals get access to the Internet. One example of how the data has been used is in the tailored adverts we see every time we go online. The basic goal of data mining is information extraction since knowledge is a powerful tool that can be used to open up a wide range of opportunities. This is made possible by procedures like profiling and approaches like web mining. Software and digitalization advancements are additional elements that give firms new opportunities [13],[14],[16].

2.3 Comparative Analysis and Summary

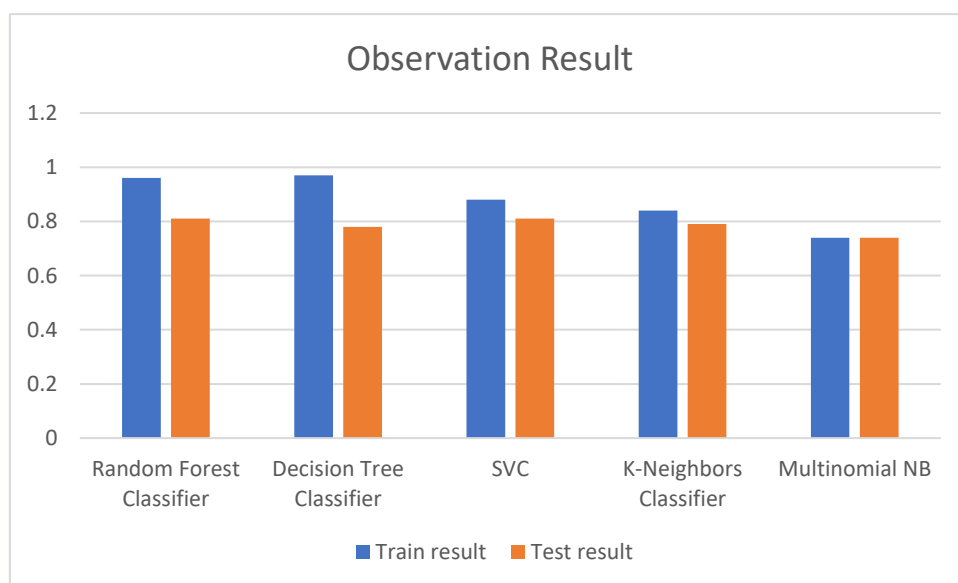


Figure 2.3.1: Graph of comparative algorithm analysis.

In recent years, social media have had a significant impact on people's performance, including students. For people working in a variety of industries, these networks present both possibilities and challenges. The researcher created and carried out this study due to social media addiction and its effects on students' academic performance. This study set out to look at the connection between social networking addictions.

The findings on the connection between social media use and subjective well-being are still contradictory today. We attempt to explain these discrepancies from the standpoint of various social media use and addictions. In order to do this, our study investigated the relationships between social media addiction and subjective well-being as well as the impacts of various social media usage types on these variables. According to other studies, which found that addicted users spend more time on social media, addicted persons score higher on social usage and entertainment use compared to non-addicted people. Comparatively speaking, non-addicts score higher on subjective well-being than addicts, suggesting that non-addicts may frequently experience better subjective well-being. Both correlation analysis and path analysis have supported this finding. The link between social usage, entertainment use, and subjective well-being is not significant among those who are addicted. Even while there is no significant association between entertainment usage and subjective well-being for non-addicts, there is a strong and favorable correlation between social use and subjective well-being. In other words, if everyone is able to utilize social media responsibly, it can improve their subjective well-being.

2.4 Scope of the Problem

Nowadays, social media addiction appears to be a frequent issue among children and young people. Young people spend around more times each day looking through digital news feeds, photographs, and videos on social networking sites because they find them so visually engaging. It appears difficult for them to put down all of their digital gadgets since they strive to stay in touch with their buddies mostly online [14].

Some problems of this scope are given below:

- Lack of satisfaction with your life or appearance.
- Depression, frustration, anxiety, loneliness.
- Self-harm for more deportation.
- Cyberbullying.
- Isolation or separation, communication lost.
- Self-absorption.
- Hacking.

- Late at night, using the internet.

2.5 Challenges

- Topic Discovery
- Data Collection
- Data Preparation
- Data Analysis

CHAPTER 3

Research Methodology

3.1 Research Subject and Instrumentation

Our research topic is ‘**Social Media Addiction analysis based on machine learning**’. In this research, our main objective is to find out the addiction analysis for social media. We all know that social media refers to the means of interaction among people in which they create, share, and exchange information and ideas in virtual communities and networks. Basically, we use social media to create ourselves and to get the easiest way to communicate with each other. But nowadays social media is getting worse and people use it more and more [2]. They cannot relate real life to any other things in social media because this is becoming a cancer in our social life and we definitely know that cancer has no answer!!! Social media is definitely good for our social environment, but we have to know how to use it in a productive way. People do not understand the benefits of social media. That's why they are falling behind the worst zone of social media. As human beings, we are getting addicted to social media badly, we cannot find what is wrong and what is right [9].

Mainly our target is to detect addiction. Although not formally recognized as a diagnosis, addiction shares many similarities with those of other addictions, including tolerance, withdrawal, conflict, and salience, relapse, and mood modification. Several screening instruments to identify SNS addicts have been developed—approaching the phenomenon in various ways, disclosing a conceptual and empirical obscurity in this field. So, by analyzing addiction levels we can come to a result that people are actually how much addicted they are and that's the subject of our research.

Instrumentations:

- Google form for survey
- MS-Word
- Excel for data collection
- Coding for Google Colaboratory

After data collection (use survey form) we used 5 machine learning algorithms as an instrument for addicted people detection. Five machine learning algorithm is given below:

- Decision Tree Classifier
- Random Forest Classifier
- SVC
- K-Neighbors Classifier
- Multinomial NB

3.2 Data Collection Procedure/Dataset Utilized

Data collection is the processing of gathering data or measuring data of interest in various ways. Besides which is data that gives us information about our research. So, this data collection is the main path to start any research work field. If data collection is not going perfectly then research will not start. In many ways you have to collect data for the work such as surveys, from online collected data, any historical data or previous recorded data etc. In our project we collect data by the surveys on the online and offlines. Mainly our main target is to collect data from people who use electrical devices more and more.

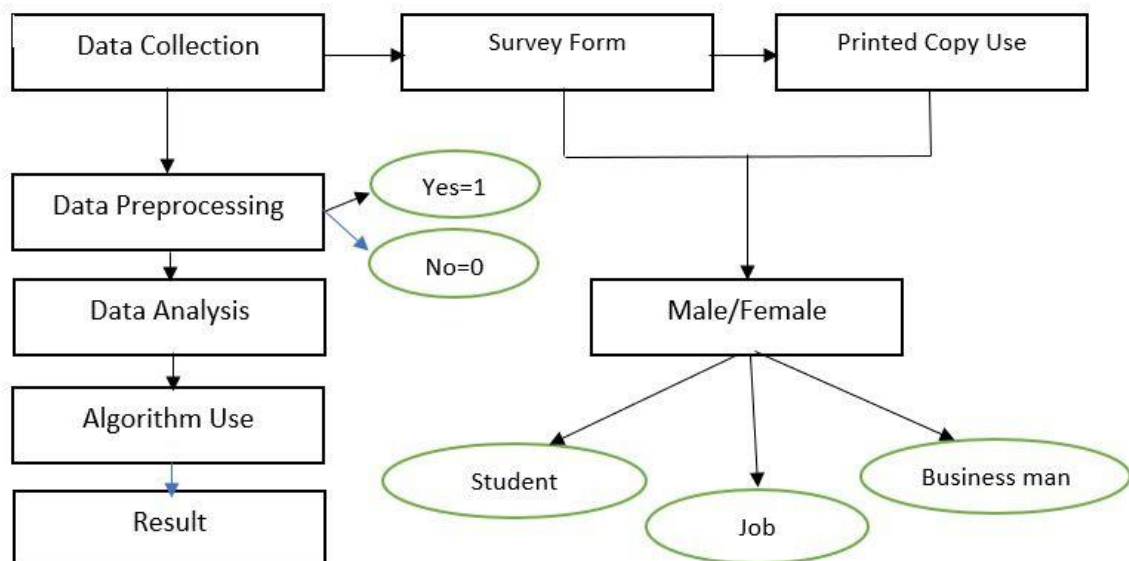


Figure 3.2.1: Flowchart of data collection procedure.

By data collection, we can build up a fine dataset that is defined as yes=1 and no=0. In dataset utilization we fixed some questions for our target resources and they gave us the answers. They give their answer is yes and no for any question and finally for our investigation we convert it to zero and one by manually. After data post processing, we use 5 algorithms for data analysis and from there we get final output.

3.3 Statistical Analysis

Table 3.3.1: Table of statistical analysis of survey questions.

Survey Questions	Responses		Compare	Result
	Yes	No		
Do you like to read books in this age of social media?	52%	48%	Yes>No	Addicted
Without the Internet, your life would be monotonous, boring -Do you think that is so?	55%	45%	Yes>No	Addicted
Do you decide to spend time on the Internet rather than hanging out with others?	36%	64%	Yes<No	Not Addicted
What do you think about social media making us less social?	69%	31%	Yes>No	Addicted
Are you using the internet irregularly?	46%	54%	Yes<No	Not Addicted
When someone wants to know what you do on the Internet, do you try to hide it?	36%	64%	Yes<No	Not Addicted
Do you neglect your daily work to spend more time online?	45%	55%	Yes<No	Not Addicted
Are you busy using the internet till late at night?	61%	39%	Yes>No	Addicted
Do you build new relationships with people in the virtual world?	55%	45%	Yes>No	Addicted
Are you excluding boring thoughts from real life and thinking about the Internet?	39%	61%	Yes<No	Not Addicted

Do you value the attraction of the Internet more than your loved one?	35%	65%	Yes<No	Not Addicted
Do you feel that using social media sites has a negative effect on your personal relationship?	63%	37%	Yes>No	Addicted
As much as you start the internet with the purpose of time, does it take much longer than that?	82%	18%	Yes>No	Addicted
Does the Internet still give chase to you when you are offline or do you imagine that you are online?	48%	52%	Yes<No	Not Addicted
Are you trying to spend just a few more minutes on the Internet after work, need, or respond to someone else's call?	63%	37%	Yes>No	Addicted
How much time do you spend on the Internet, trying to keep it a secret from others?	44%	56%	Yes<No	Not Addicted
You decide to reduce your internet usage time. But in reality, you can't do it or even try but you fail?	66%	34%	Yes>No	Addicted
Are you depressed, upset without the Internet!!! Once connected to the Internet, these problems no longer exist -is that so?	57%	43%	Yes>No	Addicted
Do your family and acquaintances complain about the amount of time you spend on the internet?	52%	48%	Yes>No	Addicted
Do you ever get jealous of other people's seemingly extravagant lives on social media?	42%	58%	Yes<No	Not Addicted
Are you excited or angry when someone makes an embarrassing comment about your internet usage?	56%	44%	Yes>No	Addicted
Have you ever experienced feelings of isolation as a result of using social media?	49%	51%	Yes<No	Not Addicted
Does social media addiction change your personality? What is your opinion?	56%	44%	Yes>No	Addicted

Statistical analysis shows that most people are addicted to social media. We can see that in the survey replies of very few people that they are not addicted to social media.

3.4 Proposed Methodology/Applied Mechanism

Getting information in person during an interview is one of the most intimate and efficient ways to win over a respondent’s confidence and cooperation while collecting data via a survey. Basically, one of the most popular types of survey methods is an online survey method. That's why we choose this method because on social media-related topics people can more easily connect themselves with online methods and we get faster responses.

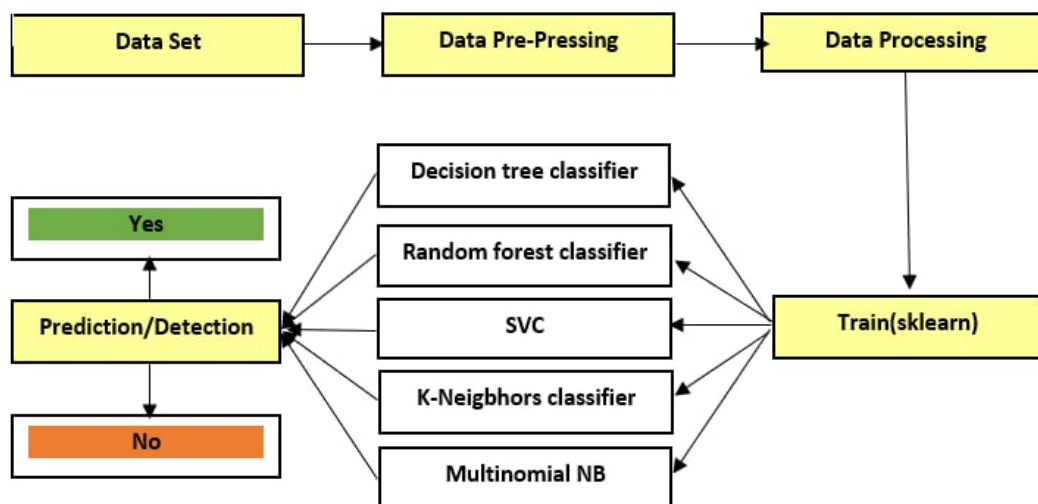


Figure 3.4.1: Flowchart of data processing.

While we almost got 1418 people who showed interest in our survey and shared a lot of information that helped our work. And finally, the six most popular algorithms are Decision Tree Classifier, Random Forest Classifier, SVC, K-Nearest Neighbours Classifier, Multinomial NB, and K-Neighbours Regressor are used in our dataset. The primary goal of this study is to identify Social Media Addiction.

3.5 Implementation Requirements

We have tried to understand using five algorithms that can detect more addicted people. Using Six algorithms are given below: Decision Tree Classifier, Random Forest Classifier, SVC, K-Nearest Neighbors Classifier, and Multinomial NB.

i) Decision Tree Classifier- A decision tree is a structure resembling a flowchart in which each internal node considers a feature, each leaf node provides a label for a class or category, and branches signify the conjunctions of characteristics that give rise to those classes. A decision tree may be a graphical illustration of all doable solutions to a choice-supported sure condition. On every step or node of a choice tree, used for classification, we tend to try and type a condition on the options to separate all the labels or classes contained within the dataset to the fullest purity.

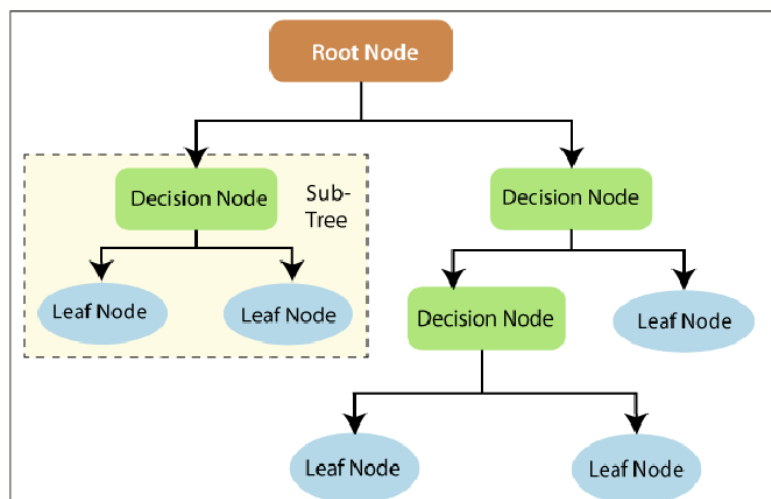


Figure 3.5.1: Decision tree classifier.

ii) Random Forest Classifier- A machine-learning method called a random forest is frequently used to address classification and regression problems. It makes use of ensemble learning, a method that combines several classifiers to provide answers to challenging problems. The formula for a random forest consists of several "trees." Simple to use a machine learning algorithm that, even without hyper-parameter calibration, typically yields decent results. It is also one of the most often used algorithms because of its versatility (it is frequently used for both classification and regression tasks).

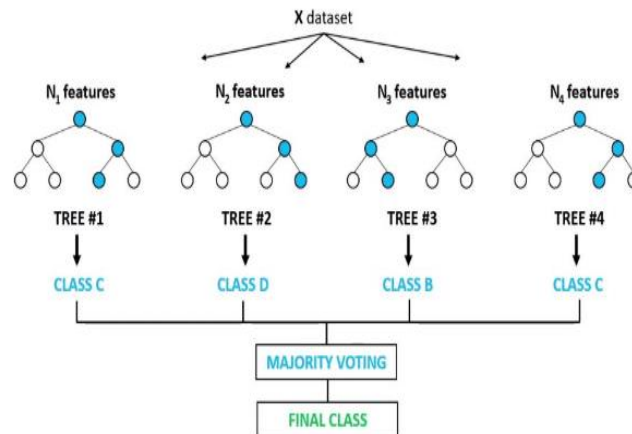


Figure 3.5.2: Random Forest Classifier.

iii) SVC- SVC is a statistical clustering method that makes no assumptions about the number or kind of clusters present in the data. According to our experience, it works best for knowledge that is low-dimensional thus, if your knowledge is high-dimensional, a preprocessing step, such as using principal part analysis incorrectly, is frequently required. The SVC is used in transmission applications to control grid voltage. Using thyristor-controlled reactors that consume VARs from the system can decrease system voltage if the algorithm is capacitive and the SVC.

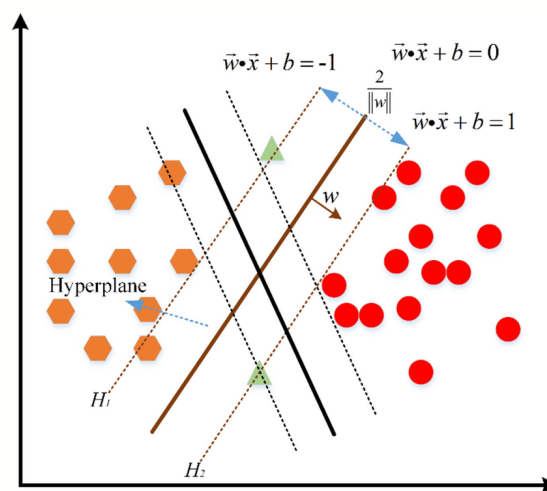


Figure 3.5.3: SVC.

iv) K-Neighbors Classifier- The K-Neighbors Classifier appears for the five nearest neighbors. We tend to expressly tell the classifier to use geometrician distance for determining the proximity between neighboring points. KNN works by calculating the

distances between a question and each sample in the knowledge base, selecting the appropriate range examples (K) closest to the query, and then selecting the label that is most frequently used or averaging the labels.

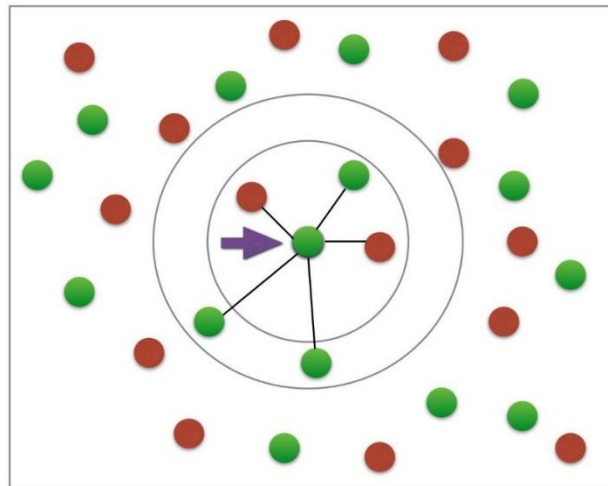


Figure 3.5.4: K-Neighbors Classifier.

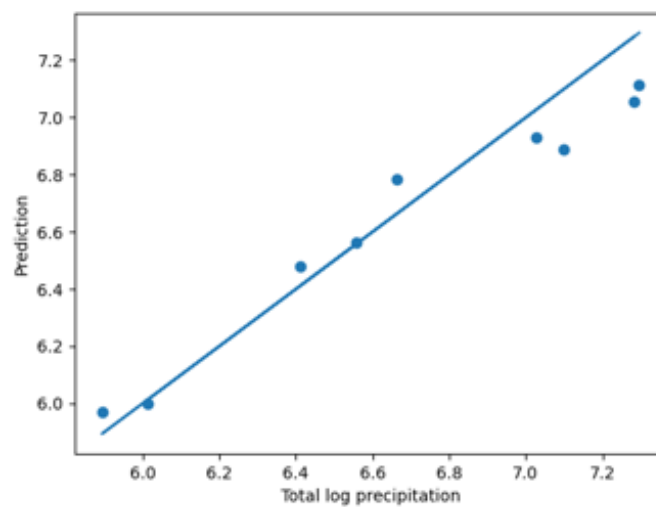


Figure 3.5.4.1: K-Neighbors Classifier.

v) Multinomial NB-

$$P\left(\frac{B}{A}\right) = \left(\frac{P(A \cap B)}{P(A)}\right)$$

The multinomial Naive Bayes classifier is appropriate with distinct options. The multinomial distribution ordinarily needs number feature counts. The following, however, may work with partial counts like tf-idf. Alpha float parameters, the default value is 1.

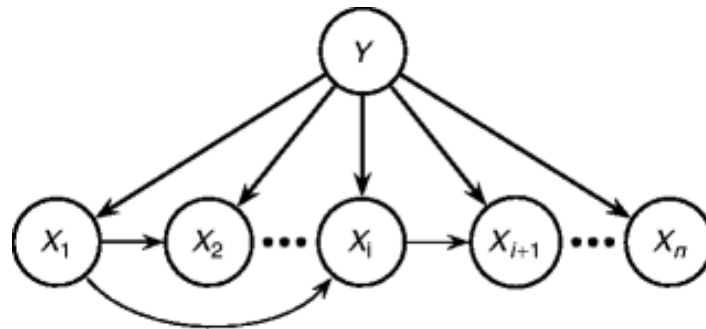


Figure 3.5.5: Multinomial NB.

CHAPTER 4

Experimental Results and Discussion

4.1 Experimental Setup

In this experiment first of all we have to choose the subject. Recently, I have become sure which side is very familiar with my computer science background. Before searching, we can decide that social media is one of the most used elements of our daily life. So, why not work on it? Then we find the weakest part of the user is addicted to social media. Then we design a prototype of the research work and how to implement this project. After planning the project we must make a real-life related survey questionnaire for our target users.

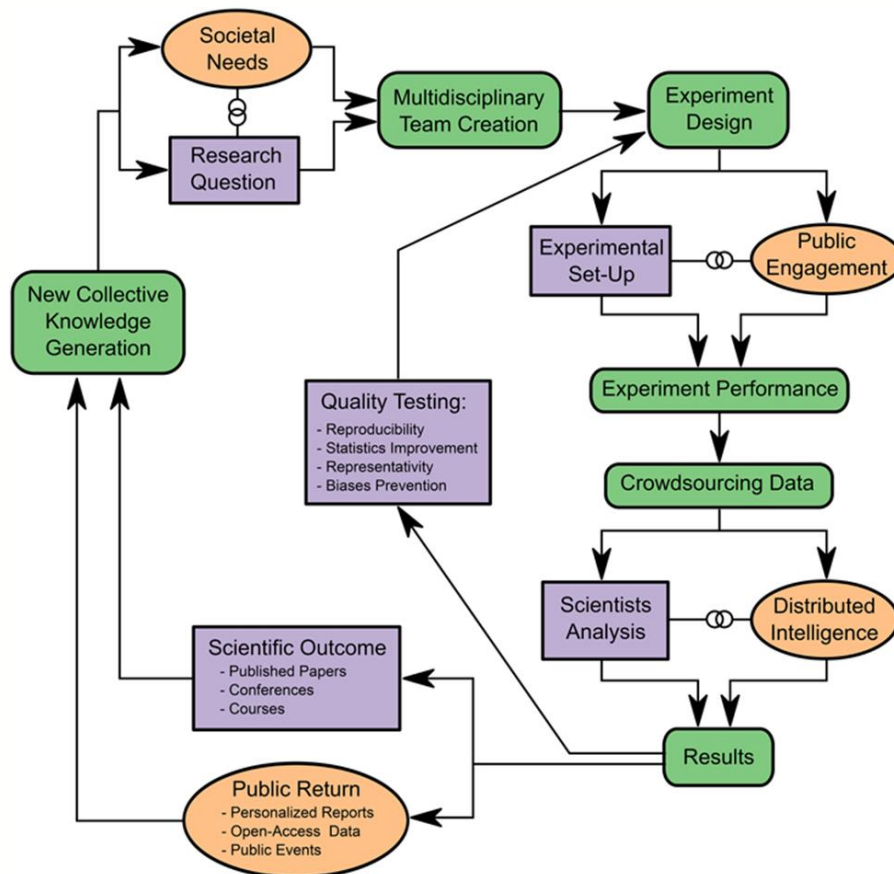


Figure 4.1.1: Flowchart of experimental setup.

4.2 Experimental Results & Analysis

Making questionnaire surveys we go out to collect our expected data. Firstly we fixed the paper based surveys, because if we want to collect university students and college going students then old people are what to think about this social media addiction. Collect some data then we start to manually input data on the dataset. And also we provide the online questions for our target user to data collection on google form and surprisingly we get more responses on google from then papers. In this way we overall 1200+ data can be collected. After analyzing the dataset, we can see that mostly students are more addicted than other occasions. In covid-19 time people are getting more addicted to their increasing dependency to social media. We are often through 22 questions for the data collection. We want to justify their thinking about their life and also use their social sites. One of the questions was “Without the Internet, your life would be monotonous, boring -Do you think that is so?” The people's answers are really surprising. Almost 70% of people cannot think about their life without social media. From the total response we have analyzed, we have gathered a total of 1417 data using a survey form. We discovered through the analysis of these 1417 data points that 63% of people are addicted to social media, compared to 37% who are not. According to our survey, the majority of those who are hooked are students and young adults, which is highly concerning for our society.

```

✓ [189] y = df["Results"]
0s      x = df.drop("Results", axis=1)

✓ [190] from sklearn.model_selection import train_test_split

✓ [191] x_train, x_test, y_train, y_test = train_test_split(x,y,test_size=0.30,stratify=y)

✓ [192] from sklearn.ensemble import RandomForestClassifier
0s      from sklearn.tree import DecisionTreeClassifier
      from sklearn.svm import SVC
      from sklearn.neighbors import KNeighborsClassifier
      from sklearn.naive_bayes import MultinomialNB

✓ [193] clf = RandomForestClassifier()
0s      clf.fit(x_train,y_train)
      print("Train Score:", clf.score(x_train, y_train))
      print("Test Score:", clf.score(x_test, y_test))

      Train Score: 0.967304625199362
      Test Score: 0.8104089219330854

✓ [194] clf = DecisionTreeClassifier()
0s      clf.fit(x_train,y_train)
      print("Train Score:", clf.score(x_train, y_train))
      print("Test Score:", clf.score(x_test, y_test))

      Train Score: 0.967304625199362
      Test Score: 0.7769516728624535

✓ [195] clf = SVC()
0s      clf.fit(x_train,y_train)
      print("Train Score:", clf.score(x_train, y_train))
      print("Test Score:", clf.score(x_test, y_test))

      Train Score: 0.8708133971291866
      Test Score: 0.8197026022304833

✓ [196] clf = KNeighborsClassifier()
0s      clf.fit(x_train,y_train)
      print("Train Score:", clf.score(x_train, y_train))
      print("Test Score:", clf.score(x_test, y_test))

      Train Score: 0.8341307814992025
      Test Score: 0.8011152416356877

✓ [197] clf = MultinomialNB()
0s      clf.fit(x_train,y_train)
      print("Train Score:", clf.score(x_train, y_train))
      print("Test Score:", clf.score(x_test, y_test))

      Train Score: 0.7655502392344498
      Test Score: 0.7230483271375465

```

Figure 4.2.1: Algorithm implementation

Table 4.2.1: Table of Experimental Results & Analysis.

Algorithms	Train	Test
Decision Tree Classifier	0.96	0.96
Random Forest Classifier	0.81	0.81
SVC	0.97	0.97
K-Neighbors Classifier	0.78	0.78
Multinomial NB	0.88	0.88

We used 5 algorithms for collated data analysis, the algorithms are: Decision Tree Classifier, Random Forest Classifier, SVC, K-Neighbors Classifier, Multinomial NB.

4.3 Discussion

In our research work we find some key just like people are getting addicted to social media very rapidly then they become victims of depression, frustration anxiety and many other mental diseases. And mostly finds out them cannot think about their life without social media. We also analyze some previous research work on this same topic and there are also found that people are becoming victims of dangerous behaviors. Children are not getting proper lessons from their parents for this crisis; they are becoming an unethical behavior crisis. After doing this research we understand that if any changes have never come in our life, we are no one to be left out of this unusual situation. And for this reason, in future this subject will be more highlighted in the world as a critical problem for our human beings.

CHAPTER 5

Impact on Society, Environment and Sustainability

5.1 Impact on Society

Social media is a big reason for stress, anxiety, depression and other mental health issues. Excessive use of any social media increases the lack of academic performances in students also all over the society. This addiction has a very negative impact on interpersonal relationships in our society. For persons between the ages of 16 and 64, the typical amount of time spent on social media is currently 2 hours and 24 minutes. This indicates that the typical user of social media logs in for 144 minutes daily. When you extend that over a month. We learn that the typical user uses social media for 72 hours each month [12].

That much time is a commitment to anything, much less a social networking platform. Social media scrolling has an environmental impact like any other technology, and it's far larger than most people realize. According to Mifsuds remark, utilizing each of the 10 platforms for five minutes per day would produce 20 kg of carbon per year, which is equivalent to driving a car 52.5 miles. Addiction to social media is undoubtedly a reality, and it may strike without warning. Nowadays the whole world is addicted to social media. In the world over 210 million people worldwide suffer from addiction to social media. The most vulnerable population to social media addiction is typically young adults in our society. Young single women have a much greater rate. 90% of persons between the ages of 18 and 29 use social media. In our county 15% of persons between the ages of 23 and 38 admit to having a social media addiction. These are the people who are prepared to acknowledge it. 40.6% of young people claim that social media alone has had a substantial negative impact on their ability to sleep. Thus our society is becoming inactive day by day. The main factor was that the lack of social media use made 34% of young adults feel as though they were missing out on something. Social networking is incredibly compulsive. Social media apps may appear entertaining, but they actually have a profound impact on our brains [10],[17]. When we use our preferred social networking apps, dopamine signals are in fact sent to our brain. These neurotransmitters and signals are linked to pleasure (like drugs). The most

addicted group of people to social media and the internet is teenagers in our society. According to studies, 15 to 16-year-old teenagers are the ones most likely to become addicted to the internet. People between the ages of 8 to 11 years old spend an average of 13.5 hours weekly online and the ages 8 to 11 years old people spend their 18% of time by using social media. Ages between 12 to 15 years old spend their average 20.5 hours online activity. Teenagers and children are the largest group of internet users. Most of them don't know how to secure their personal information on the internet or on the web and that's how most of the cyber crime occurs which is very harmful for our society [7],[16].

5.2 Impact on our life

Social media has a substantial impact on the brain, a mechanism also seen in substance use disorders, it is addictive. Social media influences human psychology by turning on the brain's reward centers [1].

When someone checks social media, this process produces happy feelings that can improve their mood. For instance, receiving likes or comments when uploading stuff on Instagram can make someone with an addiction feel good. People run the danger of developing compulsive behaviors related to social media because of this reward system. A person is more inclined to engage in addictive behavior when they come across the trigger again since they can't help but worry about missing out on something crucial online. Users evaluate and process everything, from one's physical appearance to their situations in life to their perceived triumphs. Teens who want to increase their social media following may change how they look and make other undesirable decisions, such as taking on risky social media challenges and indulging in bad habits [20].

People with social media addiction frequently feel ashamed about how much time they spend on the platforms. People who are addicted to social media will therefore lie to loved ones about the amount of time they spend scrolling through various sites. Social media may be increasingly used by people to deal with issues or unfavorable emotions including boredom, social anxiety, tension, or loneliness. As social media continues to take up a significant portion of a person's time and attention, obligations to school or the workplace may be neglected. Because a social media junkie wants to spend more time online, personal relationships may suffer. As one's complete attention is focused

on social media, they may retreat from friends and family and find it difficult to live in the moment. On the other side, social media platforms can display strong indicators of potential and dedication. In the modern world, partners who are separated by distance frequently maintain their relationship. Due to social connections, their romantic relationships, and feeling connected.

Relationships are a great bonding which gets developed day by day with communication. But nowadays we spend more time on social media. There are a lot of social sites. Facebook, messenger, Instagram, tiktok, snapchat, discord and so on. We spend our free time using this rather than talk to our family members or our partners. That is how we get detached from our close personal relationships. We lost our bindings. These days it is also a very common scenario that parents and children also don't have any bonding and connection with their parents [13],[17]. Excessive use of social media is also a big reason of divorce and separation. There are a lot of options, people cheat easily nowadays. People give online friends more priority than the real ones. When one of the partners departs from the partnership changing one's website status to "In a relationship" is a significant step in a connection. Additionally, it was said that people who It's an indication that they're in love when they post about it on social media. Spouses consider these daring romantic acts as expressions of love.

5.3 Ethical Aspects

Marketing ethics can determine how customers see a business. Marketing ethics in social media challenge both consumers and marketers as platforms continue to grow. Ethical issues such as transparency, bias, data privacy are important to consider. When crafting social media marketing campaigns.

The use of social media and the data gathered from its users have both skyrocketed recently. Social networking can be useful for individuals in both their personal and professional lives. The information gathered on social media users can be used professionally for a variety of purposes, including marketing, customer feedback, politics, law enforcement operations, user preferences, and much more. The possibilities for using and consuming this technology appear to be limitless. Many ethical and moral issues regarding the usage, sharing, and even protection of the data are raised by its gathering and use. It also raises issues related to privacy ethics, notably

the appropriateness of sharing some information publicly on these sites. We will examine the moral, social, and ethical challenges that come from both the sharing and use of this data in this research paper. The unethical use of social media a breach resulted as a result of people's privacy and impact both information security and physical.

5.4 Sustainability Plan

Social media is a self-sustaining force which is generated by like-minded, employees, investors, passionate consumers, and members of traditional media who know how to influence others with their collective voice. In their Facebook, Twitter, Instagram they know how to influence others with their collective voice and gain a more powerful base and inspire change.

Sustainability is badly needed for becoming the increase embedded into everyday business, but it uses few to utilize for innovation. The most significant opportunity for companies is to aggressively incorporate stakeholder feedback from social media back into business operations, goods, and services in order to nimbly meet customer needs and so produce true commercial value. Digital disruption is our reality today [19]. Even in the new field of corporate responsibility, digital sustainability and social media are forcing many companies to make a 360 degree turn and revamp their marketing, communications, basically all the parts of the business, operations of supply chain. Facebook and LinkedIn are the most popular social media platforms today, and they are increasingly accepted avenues for CSR communications. Digital is making the distinction between personal and business use hazier.

CHAPTER 6

Summary, Conclusion, Recommendation and Implication for Future

6.1 Summary of the Study

Nowadays we use social media which is a web based platform that we use to make social relationships and networks among the people of similar groups, similar activities, interests, connections, backgrounds. Facebook, WhatsApp, snapchat, Myspace, twitter, Instagram etc. The penetration of social media is led by the rise in the number of possible accessible devices like tablets, laptops, and smartphones. In our life everything has a positive and negative side, as well as this social media. If we use social media for a good purpose we will be benefited. Besides, there are a lot of negative sides of social media. It can ruin someone's life, especially excessive use of social media is very harmful to children, students. We get distracted easily by using this [5]. Social media is also a blessing for our life. We can communicate with our friends and family easily from one country to another country. For any small or new business, it is a perfect way to advertise. Whatever we do on social media, we must ensure the right use of social media. It's helpful for our own betterment. If we use this in the right way it will also be a great source of recreation and entertainment.

6.2 Conclusions

In this age of modern technology, the internet is very important and has become a part of our daily life. We cannot think of our life without the internet and social media. But excess of anything is bad. If we use social media for so long it will be harmful for ourselves. Excessive use of social and internet may cause physical and mental problems. Social media addiction of adolescents is very alarming now. They invest more time on social media for nothing than their studies or other skill development activities. They get depressed and frustrated easily. Addiction is a brain disorder reward system which is characterized by a strong compulsion or yearning, regardless of the negative effects, the person will do anything to indulge in the behavior. When specific actions are taken that the brain interprets as vital for survival, the reward system in the brain releases dopamine to reward the person with pleasure. Dopamine is a potent neurotransmitter that affects the brain's decision-making center and contributes to this pleasurable response.

Any pleasurable activity can cause the brain's reward system to become active. The neuronal network of the brain becomes more imprinted with repetition as an essential function. The individual is compelled to seek out the action as one is compelled to eat as a result of

the reward system. No matter what, the executive center of the brain is wired to seek out the action [2],[18].

6.3 Implication for Further Study

Using self-esteem and work-technology conflict as mediating factors, this study looked at how social media addiction affected employee stress and job performance. Social media addiction has resulted in additional issues including social media invasion and weariness that are not covered in this study. Future studies could look at some additional detrimental effects of social media addiction, such as social media fatigue. The current study also advances our knowledge of how social media addiction influences workers' mental health and task performance. However, depending on individual positions or differences in personality traits (such extroversion), employees' responses to the negative effects of technology addiction may differ (such as sales). Future studies may broaden their focus and employ the social media addiction -influencing elements as determinants or buffering factors [4]. Workers in mainland China provided the research team with their data. Interpersonal contact and social interactions may be further impacted by high collectivism, wide power gaps, and guanxi culture traits, particularly at the organizational level. Future research can examine different cultures to improve the generalizability of this study's findings due to cultural differences.

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