

**Classification of Ethical and Unethical Social Media Activities using Data Analytics**

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Degree of Bachelor of Science in Computer Science and Engineering

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## APPROVAL

This Project/internship titled “**Classification of Ethical and Unethical Social Media Activities using Data Analytics**”, submitted by Farzana Yesmin, ID No: 191-15-2549 and Shoaib Hossain, ID No: 191-15-2377 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. The presentation has been held on *February 5, 2023*.

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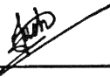
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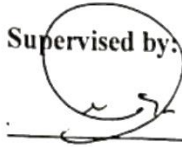
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## DECLARATION

We hereby declare that this project has been done by us under the supervision of Dr. S. M. Aminul Haque, Associate 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.

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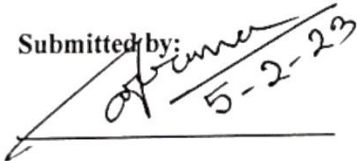
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## **ABSTRACT**

In a society and era when they are prevalent, such as Instagram, Twitter, and Facebook, it could be challenging to identify the shortcomings of each program or website. In 2022, almost every person uses social media to get connected and relate to each other through these platforms. As it is a modern age and a technological revolution has happened already, people need to get connected to social media by their own privileges. Merely, everyone must continue their study and official work. Therefore, it has been found that many people become addicted to using social media in all cases and in all circumstances. It is necessary to find out the exact reasons why people become addicted to social media and maintain social media activities during working or studying time. Researchers all over the world found out that a huge quantity of people become addicted to social media, however they are not their workplace or not. By using machine learning technologies and data analytics, it can be found out the reason to use social media in that environment where it is not allowed. As everyone is concerned about their own workplaces, they must have known it is unethical. In this research, these questions are answered with proper explanation with the help of data analytics and machine learning. Soon, it will be great to understand and find out the reasons for natural language processing or human activities.

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# CHAPTER 1

## INTRODUCTION

### 1.1 Introduction

In 2022, most people will interact with one another and build connections via the use of social media. People are only able to utilize social media because of the benefits they get from doing so because we now live in a period in which a technological revolution has already taken place. To put it more simply, everyone is required to keep working and going to school. As a direct result of this, research has revealed that a considerable number of people get reliant on the regular use of social media. It is essential to continue using social media while working, as well as to investigate the specific factors that contribute to addiction to social media. Social workers who connect with their clients directly on social media encounter a variety of challenging moral conundrums that are unique to their line of work and are sometimes difficult to navigate. To begin, if you share a Facebook friend with another person, you run the risk of receiving both desired and unwelcome sexual overtures from that person. These kinds of interactions might pave the way for a romantic or sexual bond. In addition, getting unwanted sexual advances because of a shared friend on Facebook. Because of this, there is a high incidence of conflicts of interest, which may cause the efficacy of the social worker to decline. In the past, when social workers were producing treatments, they often utilized the client's own personal information as a source of inspiration since it was more relevant to the client's situation. Now that social media is a thing, social professionals like counselors and psychiatrists may be tempted to spy on their patients' social media accounts to obtain information. This is because social media makes it easier to communicate with patients. This is done to facilitate the discovery of information on people via the use of social media. This is an invasion of privacy, which is problematic from both a moral and a legal point of view. Those involved should be held accountable for their actions. For instance, social workers may find themselves in an awkward situation if the client's friends seek them on Facebook and then start communicating with them after doing so. In addition, there is a possibility that customers

who follow social workers may make inappropriate use of the information and images that are shared on those employees' social media sites. The fact that various social media platforms are gaining increased popularity is not in the least bit going to change the reality that the social work industry is still mostly unregulated. On the one hand, it may be difficult for regulatory organizations to monitor online social workers since these people may not have a real office or even an address. This makes it more difficult for regulatory agencies to supervise online social workers. In addition to this, it may be challenging for regulatory agencies to validate the individuals' identities. The fact that there is now no established legal framework for social work that is carried out online makes the current situation far more precarious. Consumers may not be able to check the licensing and regulatory status of their social workers, particularly if the social workers are from a foreign nation. This is especially likely to be the case if the customers are in a different country. This is especially important to keep in mind in situations when the social worker and the client are from different countries. This is particularly the case when both the individuals receiving social services and the individuals providing them come from other nations. Dealing with unsupervised social workers puts one at risk for a variety of negative outcomes, including the possibility of being subjected to sexual harassment or being a victim of fraud. The pervasive use of social media has been linked to the emergence of a variety of undesirable side effects. The risks associated with isolating an online experience can be even when there is interaction with other people because there is no direct physical contact are among these dangers. Additionally, the risks associated with the setting of safe boundaries for online interaction with children, youth, and other vulnerable populations are included in this category. The field of social work must evolve with social media and technological standards to accommodate the ever-shifting requirements and behaviors of people who interact with one another online. This is necessary for the field to remain relevant and responsive to clients. Applying machine learning techniques from the perspective of unethical social media practices and finding the appropriate outcomes from those models are the main theme and motivations of this research work. Basic Machine learning techniques such as Logistic Regression, K-Nearest Neighbor, Random Forest, Decision Tree etc. can be used throughout this research and researchers tried their best to find out the hypothetical outcomes from this technique.

## **1.2 Motivation**

The most important aspect of today's society is the proliferation of social media. At this point, it is impossible to imagine living before social media. Use this social networking platform for a variety of different purposes. Someone uses it for their own amusement, someone uses it for their own education, someone utilizes it for work purposes, and many other reasons use social media. Every site has two components: a good site and a bad site. Numerous research papers have discovered that spending a significant amount of time on social media faces many problems. When examining the job sector, researchers discovered that employees utilize social media throughout their working hours. The employee is unable to concentrate on their task. As a result, they waste their valuable working time. If any worker uses social media during work hours for reasons unrelated to their job, its impact can be felt by organizations, because they cannot find the proper work from their worker. If any worker utilizes social media during work hours for reasons unrelated to their job, that worker's productivity will suffer. A considerable number of students are glued to social media sites. They spend their entire day on social media. Students with social media addictions are also less likely to read academic lectures on time or complete class assignments. They are distracted by social media throughout their study time. Many students use social media for meaningless purposes. They are unable to concentrate on their academic work because of this. They were unable to function in the academic world. And if they do not do well in academic life, it will affect their future opportunities. Students who try to balance their social media use with their study time often end up frustrated.

## **1.3 Rationale of the Study**

These days, many cannot function without their social media accounts. Which have some positive and bad aspects. While it may be tempting to check Facebook or Twitter while at the office or in class, doing so can have a negative impact on both productivity and efficiency. This research is mostly focused on social media usage which might affect their job performance. This paper comes up regarding some subjects for which they are utilizing unethical social media activity and what are the motives for that. Which will aid individuals

in understanding why they engage in unethical social media behavior and can lead to greater efficiency.

#### **1.4 Research Questions**

In this study, there are many questions that can be asked. A set of questions from various individuals has been taken out of this study to make it more manageable.

##### **Using social media during working hours is it ethical or unethical?**

When using social media led to the discovery of numerous questions. If an employee utilizes social media during working hours for no cause and for non-work-related activities. That is an unethical approach to utilize social media while at work. It is ethical for him or her to utilize social media during working hours for that organization. It has gone wrong because workers do not work at that time since there is no need for them to utilize social media at work. and they wasted useful time on social media.

##### **How to find the use of social media during working hours ethical and unethical?**

If anyone employee is happy psychological state remarks goes above 3 (3 means the psychological state is good), spend too much time on social media for more than 2 hours, and use social media for professional purpose. the use reason to use social media belongs to Professionals then it is ethical or without having personal issues, enough time to rest, and does not feel hesitant to share their problems; only for these cases using social media will be Ethical. Unless it will be Unethical

##### **How does the impact of landing a dream job affect your professional life?**

if employees are dissatisfied with their jobs. or any employee was unable to locate their ideal employment. They are unable to concentrate on their current employment. As a result, they did not like their jobs. Is it the problem of not focusing on their job life .One of the most important things about an employee's job is how they feel about it. if he or she does not feel that they cannot enjoy that job.

##### **How does affect employees' unethical use of social media during working hours?**

Using social media for personal reasons during job hours. It shortens the working day. use of social media during working hours reduces both decrease employee productivity and quality of life at work. if any much time an employee spends on social media for personal issues or personal work. During the working period, they distracted the office work. For that they also lose their productivity.

**Is there a link between mental health and a lack of employment? What is the reason for utilizing social media while at work?**

The lack of attention paid to mental health in the workplace has a significant negative impact on the work. When an employee's mental health was poor, it showed in their work performance since they were not as conscientious. in addition, if they are not concentrating on the task at hand, they will not be able to complete it. And last, it is possible that he utilizes social media as a kind of enjoyment that has a direct impact on the job. And besides employees when find lacking the job then the employee, is curious about some of the fundamental issues associated with their current employment, causing them to lose job interest. Then he or she figured out what to do. But if they spend their time doing something else, they lose their working hours. Most of the time, employees use social media to find the solution. When they do that, they use it all the time and waste their time at work. because of that dangerous health and not having a job also affect the time on the job. There are several good reasons to use social media at work. The first reason is that you can use it to work or take some time to find something to drink. But it was not okay when an employee did that for fun or for other reasons. When an employee is overworked and exhausted, when an employee's mental health is suffering, or when the employee's personal life is falling apart, then the employee needs some refreshment. Then, they turn to other social media sites. However, most of the time it does not turn out well. mainly since they utilize it nonstop for more than 2 hours. When people use it frequently, it starts to influence their job careers and the amount of work they get done. can also influence the expansion of the organization.

## 1.5 Expected Outcome

The primary objective is to provide a clean and productive workplace during working hours, and provide staff with solutions to their challenges, for concentrating on their job and enhancing employee productivity at work. Social media provides us with numerous options but also distractions. If it is utilized properly, the organization will get the best results. Use social media to develop tight rules and regulations for the organization. It is continually following that. If they can do so, they may get the finest performance from their employees. When employees use social media at work for no reason, it wastes their time and slows down the growth of the organization. So, the company needs to train its employees on how to use social media in an effective way. Build some indoor activities for employees to do when they get tired, and talk about which ways of using social media are right and which are wrong, and rising with some rules for that. If any employee is dissatisfied with their job, need to create some operculate to come back their focus on their job, for that, they find interest to do that job, and they give their best effort to that organization, and if any employee's mental health is not okay need to find out about that. If any employee's mental health is okay, then the organization finds the best output for their company, and if any employee has a lack in their job life give them the best resource and give them the training to remove that lack. If a company did not need social media, like Facebook, TikTok, Instagram, Twitter, and LinkedIn, they could block that IP for their employees while they were at work, for that reason, workers also built their work, and that employee whose job is to market their business on social media, just allow them to use social media. The company needs to keep track of what the employee is doing and how much time he or she spends on social media for personal business or work. Because if an employee uses social media for things that are not related to their job while they are at work, it could affect their job. Using social media while at work is against company policy, so they need to do something about employees who break the rules by using social media for personal matters. To proceed with this, locate the finest possible outcome for both the employees and the organization, as well as strengthen created the bond between employees and their respective organizations.

## 1.6 Report Layout

This study report is divided into six separate chapters with the purpose of making it more consumable and informative for anyone who is perusing it, be they researchers or readers.

**Chapter 1** gives an important introduction about this research work. An overview of unethical social media use at work is given in this article. This chapter explains the study's objective, pertinent research questions, anticipated results, and general management information.

**Chapter 2** gives a detailed report about the background of this study. An overview of unethical social media usage at work is given in this article. This chapter explains the study's objective, essential research questions, anticipated results, general management information, and budgetary issues.

**Chapter 3** provides a description of the research study's methodology, suggested system, and system design. From the very beginning of mathematics through the discussion of the present state, each employed algorithm's algorithmic specifics are given.

**Chapter 4** gives a detailed evaluation of the outcomes of each phase. It is concluded using the best algorithm, Jaccard score, cross-validated score, confusion matrix, and classification report. The ROC-AUC curve for each method is also described. The definitions of Misclassification, Mean Absolute Error, and Mean Squared Error are provided in the chapter's last section.

**Chapter 5** discusses the ethical factors that are crucial for any study that will have a significant influence on society. The last section of this chapter addresses the sustainability of this research project.

**Chapter 6** briefly characterizes as the continuation of this research investigation, exemplifies the potential reach of this line of inquiry. This chapter concludes the full study report with a useful summary that briefly addresses the key results.



## **CHAPTER 2**

### **BACKGROUND**

#### **2.1 Preliminaries**

In anticipation for this chapter, the work in question goes through several stages, including paper gathering, paper sorting, paper evaluation, and a great deal more besides. In the process of collecting papers, first think about the topic at hand, and then begin looking for relevant papers or articles, which was a challenge in and of itself. The next step is to begin looking for further examples of the same type of challenge. However, work that is comparable has been located, and you may then begin to download that thesis and journal paper so that you can begin reading them. Although the exact same problem cannot be identified, comparable work has been found.

#### **2.2 Related Works**

Mățã et al. (2020) intend to investigate unethical forms of social networking in the academic community. All these repercussions highlight the need to increase awareness of the significance of the ethical use of these technologies in academic settings, which is particularly crucial given the current climate. This has highlighted the importance of our society shouldering a portion of the responsibility for raising awareness, in addition to the education provided in the classroom. [1].

Zivnuska et al. (2019) investigate the effects that becoming addicted to social media can have on an individual's life. Used a research model that was established on the concept of resource conservation as its foundation. The gathering of sample data and the conclusion, founded on COR theory, that SM addiction and reactions were associated with significant workplace characteristics were both presented. In a roundabout way, compulsive mobile-phone use and SM reactions are linked to one's performance at work. There was a significant correlation between having a healthy working-family balance and addiction to social media. [2].

Amin et al. (2016) investigates the effect that using social media has on the academic performance of students attending college and universities. Ninety-seven percent of students provide feedback in the form of surveys, and the majority of those who do so utilize statistical methods for analyzing the data. Students have completed and unrestricted access to educational resources when they use social networking sites. On this platform, students can easily exchange and collect knowledge on a wide variety of topics. In addition to that, this is enjoyable. The pace at which data is being collected is, regrettably, painfully slow.[3].

Talaus et al. (2018) make the discovery that student performance may be affected by social media use. The good and bad sides of social media are represented by the fishbone graphic. It is important for educational institutions to make students aware of the benefits associated with using social networks. Students have an obligation to be aware that excessive participation in social networking sites may have a detrimental effect on their academic potential and performance. data collection was kept to a minimum. Using extra data from the school to establish the influence that social media has on the academic performance of students.[4].

According to Hajil et al. (2018), to sell things online, an e-commerce website must first earn the trust of its customers. If the product is of excellent quality, customers will tell their friends and family about it. As a result, customers will advocate for the product if it is successful in establishing trust in it. However, the method of data collecting was insufficient. The gathering of more data from a variety of countries led to the discovery of recently discovered information on the seller-customer trust relationship that exists throughout the process of purchasing items via social networking sites. [5].

Chukwuere et al. (2017) state that the usage of social media influences the lives of female college students. Both the good and bad aspects of social media may be found on two different websites. This is because of developments that have been made in modern technology. Students need to develop their self-awareness so that they can recognize harmful movies and avoid watching them. In addition, it is necessary to ignore any harsh comments. The effect of this is how the female students see their regular lives. Their

behavior can be characterized by many things, including interacting, conversing, falling in love, their social life, and a variety of other activities.[6].

According to Habes et al. (2018), the use of social media negatively affects the academic performance of college students attending higher education institutions. Facebook is used by a lot of kids, and research shows that it has a detrimental impact on their academic performance. Many kids are unable to focus on their schoolwork because they spend anywhere from four to twelve hours a day on social media, which has a negative influence on their grade point averages. They have the potential to improve their technical abilities, their knowledge, and their creative output if they utilize social media in the right manner. The capacity for e-learning offered by educational networks is improved by social networking [7].

Cetinkaya et al. (2018) discuss the usage of social media by workers in their job performance and organizational structure, and they conclude that the effect is positive. To do data analysis on employee use of social media, structural equation modeling should be used. Find out whether organizations are encouraging their workers to use it for job-related purposes when they are at work so that these employees may fully get the most out of the platform and benefit possible. to get a deeper understanding and to center attention on other industries [8].

According to Al-Rahmi et al. (2013), student's academic progress is favorably and significantly impacted when they participate in collaborative learning. To get better outcomes, we make use of all three predators. That includes both engagements with other students as well as interaction with the instructor, as well as participation. Students will experience unfavorable consequences as a direct result of their inability to effectively manage their time. To acquire a clearer view of the problem, we need to collect information on a greater number of the variables that affect student performance [9].

By utilizing social media, Aguenza et al. (2012) hope to ascertain the level of productivity of social workers, as well as the significance of the workplace, along with its challenges and limitations. The use of social media makes teamwork and the exchange of information simpler. Productivity may either increase or decrease as a direct result of this factor. The

use of social media on the job should be regulated and overseen by the organizations that employ its users. increase the efficiency of the job performed by their employees If this is not the case, using social media in the workplace to achieve results is not possible [10].

The authors of the study by Wright et al. (1998) want to explain emotional fatigue as being unrelated to job satisfaction but connected to performance and attrition. Emotional exhaustion was also shown to be a predictor of employee turnover as well as performance on the job, according to the findings of a few different regression models. Apply the COR theory framework [11] to your understanding of emotional exhaustion.

Munene et al. (2013) state that the level of productivity exhibited by a company's workforce is directly proportional to the level of success that the company enjoys. A test of variance, also known as an ANOVA, applied to the data. And discover that employees use social media while they are on the job for a wide variety of purposes, both job-related and non-work-related goals. Businesses can increase employee productivity using social media. This can be accomplished by monitoring employee participation in social media to prevent its misuse while also protecting employees' right to privacy [12].

Awolusi et al. (2012) are conducting research to find out whether using social media in the workplace can increase the amount of work done by employees. Benefits and drawbacks can be brought into the workplace from using either personal or professional social media sites, and it all depends on how well an organization manages its internal structures. Platforms for social networking could have an impact on an organization's productivity, particularly in the areas of geographical collaboration and hierarchical coordination. If during working hours, access to other social networking sites should be restricted, and workplaces should be equipped with devices that boost employee productivity. After that, the company made the discovery regarding employee productivity [13].

Cao et al. (2016) have the goal of determining whether and how the use of social media in the workplace might increase the productivity of employees. The results of an analysis of 379 Chinese professionals as well as by employing a structural model. Knowledge transfer and shared vision are included as a portion of its outcomes at 24.2% each. Because of the ways in which it enables employees to share their visions and communicate information,

social media is an extremely useful tool for use in the workplace more effectively. but with the goal of achieving a better result. Sample data capture factor dynamics. Find out more information about the country's personnel. Find websites that are either positive or negative by using social media.

Bhanot et al. (2017) focuses their attention on the marketing strategies that Indian businesses implement using social media. Currently, social media platforms are the most important promotional channels for businesses. using the information provided by twenty-five different companies. The conclusion that social networking is a game changer was reached by applying a conceptual framework in which social media is an independent variable alongside other variables, such as increasing consumer reach and sales. Many businesses communicate with their clientele by utilizing a mix of traditional and social media communication channels. After giving the social media industry a boost, several companies have decided to invest [15].

### **2.3 Comparative Analysis**

The purpose of Trimurni et al.'s (2021) study is to investigate the impact that information technology has on the performance of village workplaces. It has been demonstrated that improved performance can result from both the application of information technology in the workplace and the expertise of workers. A total of two hundred data samples are going to be collected and analyzed with SEM AMOS. This is a factor that contributes to overall job satisfaction [16].

Comparing online and offline networks, Rajae Harandi et al. (2018) describe how information technology strategies influence job performance. Within the context of the Baseline model, both direct and indirect relationships had an impact on occupational performance. According to the model that was proposed for the research, job performance was affected by offline direct ties, offline indirect ties, online direct ties, and online indirect ties. The findings of the field study indicate that there is a significant correlation between the use of offline and online information and the level of job performance [17].

Cao et al. (2019) explain that the purpose of this study is to investigate the influence of social media on employee job performance as well as the underlying mechanism. There are three aspects to the growing use of social media in the workplace. These factors relate to conflict between technology and work and stress, both of which lower employee job performance. The information for this study was gathered by way of an online poll. Employees who participate in social networking experience less stress, which in turn boosts their performance. And are required to pay attention to a variety of negative impacts, such as overload, and consider how these impacts affect the performance of their work [18].

Pavithra et al. (2021) present evidence that there is a correlation between the use of social media and the performance of workers in their jobs. The findings of the SEM indicate that there is a correlation between the use of social media and one's overall performance at work. And top management should develop policies, procedures, regulations, and laws governing the usage of social media, and they should encourage people to use it for business purposes to make the most of the opportunities it presents. It is not sufficient to investigate just one location if one wishes to have a more comprehensive understanding of the IT industry; rather, it is necessary to investigate a variety of regions and industries (19).

Herlle et al In this paper, we evaluate the research on social media and its consequences for the workplace and offer some recommendations using Adams' concept of equity as our framework. This concept places an emphasis on the input and outcome points of view within a relationship. In romantic partnerships, it is common for people to strive for a positive input-to-output ratio. Understanding equity theory also requires an awareness of the employment process and its significance. In addition to using social media in the workplace, make use of training programs and other instructional materials. The Adams equity concept was the subject of comparison in several papers [20].

The objective of the research carried out by Qiu et al. (2009) is to provide an explanation because the power of members in a social network is expressed by organizational structure. Community Tree is a representation of the hierarchical structure of the network. Using a combination of PageRank and random graph walks, a community tree for a social network can be constructed. Social networks are in a constant state of flux. The social network's

organizational structure is always going through a process of change. Create an adaptable community tree to illustrate the structure of social networks by using a tree learning approach, which you propose here. The ever-evolving community tree exemplifies how an organizational structure can develop within a living social network and makes it possible for a smooth transition between the two [21].

Ibrahim et al. Establish that there is an inverse relationship between the amount of time spent on social media and the amount of effort put into one's job. Self-efficacy would act as a beneficial moderator of the correlation between work engagement and output at one's place of employment. Develop a conceptual framework in which addiction to social media, self-efficacy, and work engagement all have direct effects on job performance, with the additional criterion that using social media during work hours is a waste of time and resources [22].

Cheng et al. (2017) focused their attention on the research that had been done before on various aspects of trust in social media. In addition to it, a cognitive onion model was constructed. A college in China is now doing research to determine the gender distribution of its 115 undergraduate students. In addition, the use of this tactic illustrates three different methods of communicating through online chat. A layered building known as "onion architecture" has a structure that is circular in shape. Utilize this strategy to get a better perspective, discover seven several types of results, and collect data face-to-face. gather more information from sources other than students at the institution [23].

Barker et al. (2009) found that women utilize SMPs for a bigger number of significant activities and a lesser number of risky activities than men do. This contrasts with the findings of their study on men. In addition, research has indicated that demographic factors such as an individual's age, gender, and level of education all have a role in determining how they interact with social media. It is possible for online social networks to function as vast and all-encompassing marketing tools, with the ability to have both good and negative effects on the behavior of users [24].

Ewing et al. (2019) discuss the effects that it has on a company's employees to discover that employees have been using internal social media. To get this comprehension, they

conducted interviews with a total of twenty-seven members of higher authority. The research led to the discovery of successful methods for integrating social media platforms into an organization to improve employee communication and collaboration with management. In addition, the personnel may be able to focus their attention more intently on the job at hand. Employees put out their best efforts, and businesses achieve success as a result [25].

Considering the recent changes that have taken place in Malaysia, the purpose of this article is to investigate the structural connections that exist between work, the well-being of employees, and job performance. It was established, with the use of data collected from 208 workers working on-site, that 41.8% of an employee's well-being contributed to their effectiveness at work. It is vital to focus on better outcomes and seek feedback from public sector managers on employee satisfaction to enhance work performance [26]. Doing so will allow you to improve work performance.

Zhang et al. (2018) show how factors such as professional identity, job happiness, and work engagement all play a role in determining whether Chinese township health inspectors want to quit their jobs. The data was collected by 2426 health inspectors working in Sichuan townships. The structural equation model (SEM) investigates the hypothesized relationship between the variables. There was a substantial relationship between work satisfaction, professional identity, and level of job engagement, and the intention to leave a job. The provision of pleasant facilities in the workplace, reasonable pay, and opportunities for advancement all contribute to greater levels of job satisfaction for workers. The rate of employees leaving their positions as health inspectors. Those in charge of monitoring public health preferred a work engagement and job satisfaction rate of 45.3%. Job satisfaction and engagement were shown to have a direct effect on turnover, while professional identity was found to have an indirect influence [27].

Zhang et al. (2019) investigate the impact that using different social media platforms has on Chinese workers' organizational commitment, job happiness, and willingness to quit their current positions. collecting 298 responses that are suitable for further examination. The use of social networking at work has been shown to increase both job happiness and



loyalty to the business. It increases organizational commitment as well as job happiness, while at the same time reducing the urge to quit the firm. When employees are happy in their jobs, they are less likely to quit. The information came from a sole source, which was businesses in China that dealt in e-commerce and software. requiring further data on the various work sectors is necessary to get more accurate results. [28]

Ali-Hassan et al. (2015) concentrates their research on three distinct forms of social media. The utilization of social media for social, hedonistic, and cognitive purposes influences job performance through the utilization of three varied factors of social capital. to accomplish the goal at hand Indirectly, improvements in regular and creative work performance can be attributed to social and cognitive technologies. Hedonic devices had a negative impact on normal performance but had a positive impact on social bonds, creativity, and overall well-being. Construct a model that illustrates the connection between time spent on social media platforms and levels of productivity at work. When it comes to questions regarding job performance and the hedonistic use of social media while at work, there is a possibility of social desirability bias. The hedonistic aspect pays extraordinarily little attention to this fact. and there is a need for enhancements to the sampling frame [29].

According to Schmidt et al. (2016), the number and frequency of social media exchanges between coworkers' influence work support and spontaneity. Relationships formed via the use of social media were shown to be positively connected with organizational support and spontaneity among a sample of 106 workers who belonged to a variety of organizations. Self-reported data, which are prone to being biased, serve as the foundation for hypotheses. The collection of data is inadequate. When trying to generalize these findings, it may be helpful to consider a variety of sectors and locations. The results might be different in workplaces where there are people using social media. [30]

This study by Bala et al. (2019) highlighted the significance of individual adaptability by examining how workers' usage of enterprise social media changes and how they work, with an emphasis on individual adaptability in First period uses on employment outcomes. The findings of this research highlighted the significance of individual adaptability by examining how workers' usage of enterprise social media changes and how they work.

Despite its extensive use, there is no obvious connection between ESM and the results of job searches. Burton-Jones and Straub provide two reliable system utilization metrics in their research. Every one of the suggested structures makes use of five hundred survey hypotheses. However, job agility does not have a negative impact on innovative behavior at all. Communication agility, on the other hand, does. In addition, the engagement of workers in ESM is necessary for the enhancement of their job agility. Nevertheless, the collection of data by itself is not adequate. [31]

Gunnalaugsdottir et al (2015) pointed out many topics about “Cyberloafing”. Also mention in related work that up to more than 2.5 hours per day in cyberspace with consequence that between 20% and 30% of companies have terminated the employment as a result. Also heighthed that who are engaged with cyberloafing, 40% found it not acceptable,22% found it acceptable to spend less than an hour, 23% found it acceptable to spend less than two hours, 16% found it acceptable more than, 5% of their working time per week using SM for personal use. During working hours, two-thirds of organizations (66%) allowed public access to SM. In 2000, 62% of Californians reported Internet restrictions.[32]

Baltaci et al(2019) explained there found a negative association between student satisfaction and social media addiction. The social anxiety and pleasure variables greatly predicted the social media addiction variable; however the loneliness variable did not predict it significantly. Considering important literature, the findings are evaluated, and comments are provided. [33]

Hunt et al(2019) Several studies have linked social networking sites to depression. Other evidence suggests social media causes depression. "No More FOMO: Limiting Social Media Decreases Loneliness and Depression" was published in 2018 by the Journal of Social and Clinical Psychology.Reduced social media use meant less loneliness and unhappiness, according to the study. This ties social media use to mental wellbeing. According to experts, this is the first-time scientific study has linked these traits.[34]

## **2.4 Scope of the Problem**

Social networking helps the company grow. Social networking improves job performance and organizational production. If firms encourage employees to use social media for work, they may maximize its benefits. Employees utilize social media for work and non-work purposes. Senior management should implement policies, processes, norms, and laws regulating social media use and encourage workers to use it for work to maximize its advantages and effective methods. Internal social media will boost staff-management communication and collaboration. They may thus attain optimal staff performance. Otherwise, social media in the workplace won't provide. Monitoring social media helps firms enhance worker productivity. Three aspects of workplace social media use These variables cause technology-work conflict, stress, and emotional fatigue, which decreases employee job performance. Better employee-supervisor interactions are also needed. Social media addiction was connected to work-family balance. Organizations must prevent misuse without infringing employee privacy. It boosts productivity. Employee Mental health affects job focus. Creating Indore activities to relieve worker fatigue. Positive-minded employees will provide their all to the company. Social media affects college students' grades. Most kids spend 4-12 hours a day on social media, which affects their GPA.

## **2.5 Challenges**

During the process of conducting this research effort, the researchers were confronted with a wide variety of challenges. Authentic data collection was the one that presented the most challenge of all. No company is ready to provide any personal information about its staff members. In this scenario, the data has been gathered both online and offline in a different manner, ensuring that everyone's privacy has been preserved. Because there is no comparable dataset to be found in any online medium, the researchers are forced to acquire the data in a natural setting using laborious methods.

## **CHAPTER 3**

### **RESEARCH METHODOLOGY**

#### **3.1 Introduction**

It is necessary to have a research approach in place before beginning any kind of investigation. The first step in solving any problem is to recognize that there is a problem, which is then followed by the steps necessary to solve that problem. The focus of the investigation is revealed in this part of the report. After providing an overview of the approaches that were used to address the issue, a diagram was then employed to illustrate the process to further promote understanding. In addition, this investigation incorporates work on machine learning, which will be discussed in subsequent parts.

#### **3.2 Research Subject**

Social networking is vital nowadays. Social media has changed everything. Many people use this social network. Social media is for fun, learning, and work. Each website has pros and cons. Too much time on social media is bad, according to studies. Workplace social media usage was identified. Unfocused. Waste of time. Organizations may not obtain a worker's work if they use social media at work. Unrelated social media usage at work reduces productivity. Students use social media. They just socialize. Social media junkies read less and complete less. Social media distracts students. Students misuse social media. Their academics suffer. Academically, they failed. Academic accomplishment influences careers. Social media and studies students typically fail.

#### **3.3 Machine Learning Techniques**

Both categorization and supervised machine learning may be used to categorize objects. A machine learning system for decision-making is defined as one that is self-contained and capable of continually acquiring and integrating data. It is feasible to develop an ever-improving system by learning from previous events, conducting analytical observations, and using other strategies. There are several types and sizes of machine learning methods.

### **3.3.1 Supervised Learning**

Guided machine learning methods play a crucial part in this work. Supervised machine learning approaches employ labeled samples of previous occurrences to predict the future. The learning technique produces an inferred function from a well-known training dataset to predict output values. After then, there are no restrictions on the amount of training the system may endure. If the algorithm for learning compares its output to the predicted result, it may find flaws and update the model accordingly. Using numerous supervised learning methodologies, this thesis classifies unethical and ethical social media practices in the workplace.

### **3.4 Classification Techniques**

Classification is an approach to data analysis that generates models that reflect fundamental data classes. It is the most prevalent and well-known machine learning technology. These models, known as classifiers, may predict categorical class labels through supervised learning. The predictions are inconsistent and disorganized. The classifier has no intermediate values that may be retrieved. A classifier is meant, for instance, to detect whether a picture contains a dog or a cat. The weather will be either "dog" or "cat." The classifier has no intermediate values that may be retrieved. Classification learning techniques may be used to label data. There are two types of data for categorization learning. One is known as training data and the other as test data. Training data is used to build the model, while test data is utilized to validate it. The technique for categorizing consists of two components.

#### **3.4.1 Learning**

During the learning phase, a suitable algorithm and training data are used to create a classifier, which is then evaluated in the real world. The result of combining a classification algorithm with training data is a classifier, which is just a set of rules that can be applied to a variety of events and conditions.

### 3.4.2 Classification

As a result of the learning phase, it is possible to anticipate which category of unknown data will be predicted by the classifier or model created during the prediction phase. This section evaluates the accuracy of a model's predictions using the test data.

### 3.5 Algorithmic Details

Six of the finest Supervised Machine Learning methods are used to conduct this study. A general definition of an algorithm is a collection of ordered instructions that instructs computer software on how to turn an input set of data into useable data. Statistics are facts, and any information that is beneficial to people, machines, or algorithms is valued. Similarly, machine learning algorithms operate in a flow and with some mathematics. In general, not all Machine Learning Algorithms use the same mathematical modifications.

#### 3.5.1 Decision Tree

Decision trees may be used to solve classification and regression issues in supervised learning. However, they are mostly employed to resolve difficulties over categorization. The central nodes of this tree-structured classifier contain the dataset's characteristics, while the branches represent decision rules, and the leaf nodes provide conclusions. To do this, the Decision Tree must be utilized to construct a training model that predicts the class or value of the input variables based on the training dataset using simple decision rules.

$$E(S) = \sum_{i=1}^c -p_i - p_i \dots \dots (i)$$

In equation(i) S represents the current state and  $p_i$  denotes the likelihood that event I will occur in state S or the fraction of nodes belonging to class i in state S.

#### 3.5.2 Random Forest

Random forests or random decision-making forests are a method of ensemble learning for classifying, regressing, and performing other tasks by constructing many decision-making trees. For classification tasks, the output of a random forest is the class picked by most

trees. The mean or average prediction of the individual trees is provided for regression tasks.

$$\sigma = \sqrt{\frac{\sum_{b=1}^B (f_b(x') - f)^2}{B - 1}} \dots \dots \dots (ii)$$

The sample number, B, is a free parameter in equation (ii). Depending on the size and purpose of the workshop, hundreds to thousands of trees are often used. Cross validation or observation of the out-of-bag error may aid in establishing the ideal number of B trees: the average prediction error for each training sample X', which includes only the trees without X' in their bootstrap sample. After a certain number of trees are healthy, training and assessment errors begin to deteriorate.

### 3.5.3 Logistic Regression

Logistic Regression is a classification method that can predict a 0 or 1 binary outcome. Since this approach predicts a binary form of ethical and unethical action, this algorithm may be utilized to easily interpret and predict the outcome. By combining many attributes rather than one, these models may be able to tackle far more complicated problems. The curve grows steeper as the Y-axis climbs from 0 to 1. This is because the sigmoid function always uses the maximum and lowest values, which are ideal for splitting data into two distinct groups. This system provides the probability (obviously between 0 and 1) that an observation fits into one of the two categories by computing the sigmoid function of X. This expression depicts the sigmoid function. The formula for the sigmoid function is as follows:

$$Sigmoid(x) = \frac{1}{1 + e^{-x}} \dots \dots \dots (iii)$$

Therefore, for Logistic Regression the equation becomes equation (iv).

$$P = \frac{1}{1 + e^{-(b' + b''x)}} \dots \dots \dots (iv)$$

### 3.5.4 K-Nearest Neighbors

The k-nearest neighbors' approach (KNN) is a fundamental supervised machine learning technique that may be used to address classification and regression problems. The understanding and implementation of KNN are simple. The basic theorem of KNN is based on Euclidean distance. Since the dataset is separated into two categories, KNN is used for this classification. Actual K-Nearest Neighbor technique formula is generated by equation (v).

$$D(x_i, x_j) = \sqrt{(x_i - x_j)^2 + (y_i - y_j)^2} \dots \dots \dots (v)$$

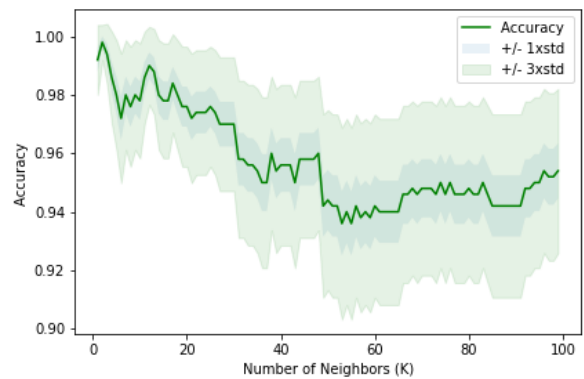


Figure 3.1: K's Best Value

### 3.5.5 Gaussian Naive Bayes

Gaussian Naive Bayes is a version of Naive Bayes that permits Gaussian normal distribution and continuous data. Naive Bayes is a set of supervised classification methods based on the Bayes theorem. The categorizing method is fundamental but beneficial. Frequently, while working with continuous data, it is assumed that the values associated with each class follow a normal (or Gaussian) distribution. In the equation (vi), a comprehensive formulation approach for the Gaussian Nave Bayes algorithm is developed.

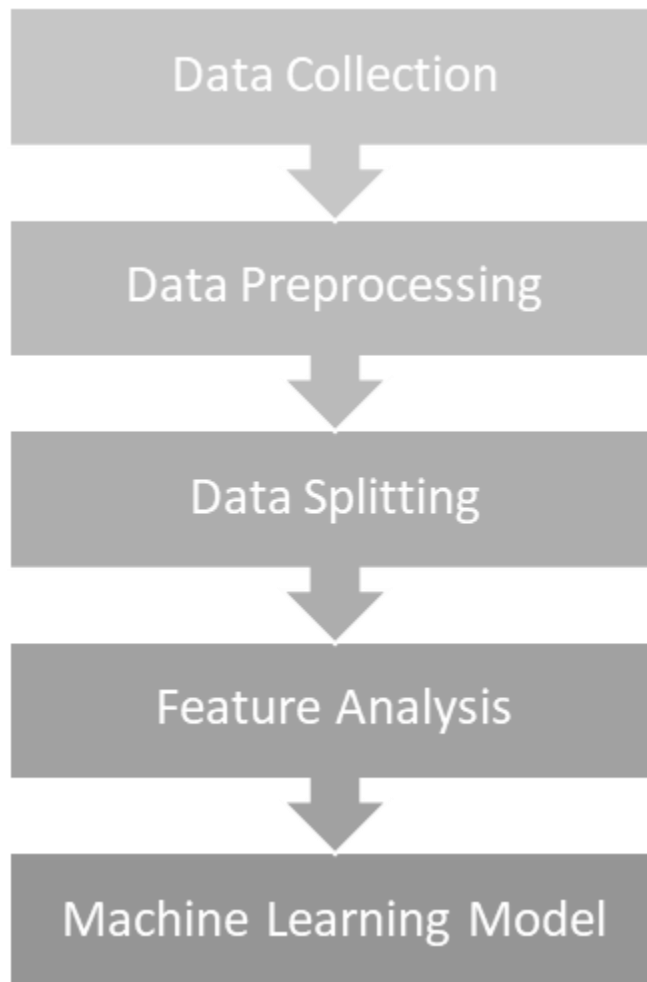
$$P(x_i|y) = \frac{1}{\sqrt{2\pi\sigma_y^2}} \exp\left(-\frac{(x_i - \mu_y)^2}{2\sigma_y^2}\right) \dots \dots \dots (vi)$$



### 3.5.6 Support Vector Machine

Since Support Vector Machine (SVM) is a machine learning technique, its performance must be regularly checked. It is applicable to classification and regression issues, respectively. Although it serves several purposes, classification is its primary function. The designers of this technology unsuccessfully tried to plot data points in n-dimensional space using a graphing calculator. In this study, researchers choose between the Ethical and Unethical methods for the examination of two-dimensional data charting.

### 3.6 Proposed System



**Figure 3.2:** Proposed System

### 3.6.1 Data Collection

The first step of data collection for this research has begun. The data was compiled using both online and in-person sources. A survey was conducted and sent to the working population to collect information. The survey question was then answered by the participants based on their own subjective experiences. This query includes:

- About people's Gender, Age, Occupation.
- Are you in depression?
- What is your opinion about your current job?
- Is there any lacking in your job?
- Some of the basic questions about their problem.
- Which social media do you use?
- How much time do you spend on social media during Working Time?
- Do you think "using social media while working in the office is against the policy"?

Since it was a real-time data collection exercise, participants were asked questions about their own subjective experiences. A study was conducted on people's addiction to social media, as well as its effects on people's mental health and how people perform in the job. Considering this overarching theoretical structure, it also formulated the queries.

### 3.6.2 Data Preprocessing

This research moved on to the following stage, which was preparing the data, once the phase in which it collected the data was finished. The problem was presented in the form of nominal values, which allows most individuals to comprehend its essence with relative ease. It is imperative that it operates at its nominal value currently. That all the processing and the transformation from notional to numerical values were carried out by hand. After being collected using Google Form, the information was then exported to an Excel spreadsheet for further analysis. Excel is required to be used to create a CSV file from the data set that is now open in Excel. The values of the strings were converted into their integer equivalents. Take, for example:

- In gender, "Male" and "Female" were converted into "1" and "0".

- Ages of “18-20”, “20-25”, “25-30”, “30-35”, “ 35-40”, “ 40+” were converted into 1, 2, 3, 4, 5, 6.
- Occupations “Teacher,” “Student,” “Information Technology,” “Engineering,” “Banking,” “Business,” “Medical,” “Civil Defense,” “Government Job” were converted into 1, 2, 3, 4, 5, 6, 7, 8, 9.
- The question about if they are having issues in their job field which was given “Yes” and “No’ converted to 1 and 0.
- Also, they get rest at work or not. The answers were “Yes” and “No” also converted into “1” and “0”.
- Social Media using in working hour was answered by “Yes” and “No” also converted into “1” and “0”
- Understanding unethical Practice had three answers “Yes,” “Maybe” and “No” . These were converted into 2, 1, 0.
- The last one was about why they use social media, and the answers were “Entertainment,” “Professional ”, “Passing Time,” “Chatting,” “I Do not Use.” These were converted into 1, 2, 3, 4, 5.

These are the values that were converted before further processing. The final question in our unit on "Understanding Unethical Practice" concerned either the Targeted Variable or the Dependent Variable. It was discarded to proceed with the processing.

### **3.6.3 Data Splitting**

After that, the data goes through a pre-processing step before moving on to the splitting part, where it is categorized into five separate segments. That five-part segment was:

- Basic Questions
- Job Opinion
- Lacking
- Type of social media
- Final Decision

Each segment has five related questions, which are as follows: “Gender,” “Age,” “Occupation,” “Psychological State,” “Understanding Unethical Practice.” Besides these

queries it also has more questions based on their segments. In the “Basic Question” segment, different questions are:

- Having personal issues
- Rest at work
- Social Media Use in Working Hours

In the Job Opinion part, the questions are addressed:

- Fitted with skill
- Comfortable
- Dream Job
- Having Issues
- Challenging
- Perfect
- Anxiety
- Searching for better
- Ready to learn new skills
- Work pressure is more than salary
- More work than Capability

A component of "Lacking's" that a variety of queries are:

- Appreciation
- Inspiration
- Challenges
- Entertainment

“Type of Social Media” has many more question, such as:

- Facebook
- Instagram
- LinkedIn
- YouTube
- TikTok

- Likee
- WhatsApp
- Messenger
- IMO
- Telegram

The last stage of this splitting is “Final Sole Decisions” where the only questions is:

- Spent Time on social media

To find out the Ethical and Unethical practice on social media some features were extracted before splitting. These are:

- Depression
- Spent Time on social media
- Reason to Use social media
- Having personal issues
- Rest at work
- Anxiety

After extracting these features a Logic was developed due to find out the Ethical and Unethical classification. Logic to build dataset for Machine Learning. By means, we have recombined this logic with interviewed candidates states and reason to use social media. This logic is only explainable by writing. If anyone is happy (psychological state remarks goes above 3), spend too much time on social media (more than 2 hours), use social media for professional purpose (reason to use social media belongs to Professional) or without having personal issues, enough time to have rest and doesn't feel hesitate to share their problem; only for these cases using social media will be Ethical. Unless it will be Unethical. After completing the section that is responsible for the splitting, it will then proceed to the phase that is responsible for the data training and testing to find out the Ethical and Unethical practice on social media based on selected features. This training and testing data had a ratio of 75 and 25, respectively.

### **3.6.4 Feature Analysis**

In this part of the research, researchers use RFECV (Recursive Feature Elimination, Cross Validated) method to analyze the features of the dataset and make it fit for the machine learning model. One method for picking features is known as the recursive feature elimination method (RFE for short). To facilitate the use of machine learning in classification and regression tasks, datasets are often arranged in a tabular fashion, very much like an Excel spreadsheet. This makes it easier to use machine learning. In most cases, rows are examples or samples, while columns are thought of as denoting characteristics such as an observation's properties. The term "feature selection" refers to a group of methods that are used to choose the characteristics within a dataset that are the most important (columns). According to the findings of several pieces of research, decreasing the total number of input characteristics may help improve the efficiency of machine learning algorithms (with less complexity in terms of space or time). Certain machine learning algorithms are susceptible to being fooled by irrelevant input properties, which may lead to erroneous performance forecasts consequently. RFE is an example of a wrapper-type feature selection algorithm. This implies that a different machine learning algorithm is given and used in the method's core, that it is wrapped by RFE, and that it is utilized to aid in picking features. In contrast, filter-based feature choices provide a score to each feature before choosing those with the greatest (or lowest) score. RFE is a filter-based feature selection technique that is formally a wrapper-style feature selection algorithm. RFE also implements filter-based feature selection internally. RFE finds a subset of features by starting with all features in the training dataset and subsequently eliminating features until the required number of features remains. This approach hunts for a subset of qualities.

### **3.6.5 Machine Learning Model**

After completing the feature analysis segment, researchers found that it is possible to apply machine learning approaches to find out the possibilities of understanding unethical social media practices. Therefore, multiple algorithms are applied to find out the possibilities, and more.

## CHAPTER 4

### EXPERIMENTAL RESULTS & DISCUSSION

#### 4.1 Introduction

For all types of study and endeavors, the outcome is of the highest significance. As the result represents the consequence of any endeavor. All findings are shown using the tables in this chapter. This chapter describes the data gathering, data use, and feature significance for the dataset utilized for this inquiry. The confusion matrix table was then constructed to present the findings in many ways. The F1-Score, precision, and recall are shown in a table inside a classification report. Several graphs demonstrate the precision, cross-validated score, area under the curve (AUC), and receiver operating characteristic (ROC) curve. A table is also provided to help comprehension of the data. Sometimes, the standard deviation is given as a table. In addition to being shown in tabular format, misclassification and inaccuracy were also presented in tabular format.

#### 4.2 Experimental Results

Following the successful execution of Machine Learning Model Creation, each algorithm displayed its unique accuracy and scores, which are necessary for identifying the ideal algorithm for predicting ethical and immoral conduct on social media. Experiment findings are therefore an analytic segment in which each conceivable score for each algorithmic application and process may be examined.

##### 4.2.1 Data Acquisition

The data necessary to train the model is collected via random interviews with people from a variety of occupations, such as the medical, academic, military, and industrial sectors, among others. This study used around two thousand sample data points. Except for the objective variable, which is also nominal, each sample in this dataset has thirty-five noteworthy features, of which three are numerical variables and thirty-two are nominal or category variables. Table 4.1 depicts the value generation of the data set.

**Table 4.1:** Data Acquisition

<b>Attribute</b>	<b>Scale</b>	<b>Data Type</b>
Gender	Male or Female	Nominal
Age	Age in years	Numerical
Occupation	Occupation	Nominal
Depression	(1, 2, 3, 4, 5)	Numerical
Having Personal Issues	(Yes, No)	Nominal
Rest at Work	(Yes, No)	Nominal
Social Media Use in Working Hour	(Yes, No)	Nominal
Spent Time on social media	Time in Hours	Numerical
Reason to Use social media	(Professional, Non-professional)	Nominal
Facebook	Reason for Use	Nominal
Instagram	Reason for Use	Nominal
LinkedIn	Reason for Use	Nominal
YouTube	Reason for Use	Nominal
TikTok	Reason for Use	Nominal
Likee	Reason for Use	Nominal
WhatsApp	Reason for Use	Nominal
Messenger	Reason for Use	Nominal
IMO	Reason for Use	Nominal
Telegram	Reason for Use	Nominal
Appreciation	(Yes, No)	Nominal
Inspiration	(Yes, No)	Nominal
Challenges	(Yes, No)	Nominal
Entertainment	(Yes, No)	Nominal
Fitted with skill	(Yes, No)	Nominal
Comfortable	(Yes, No)	Nominal
Dream Job	(Yes, No)	Nominal
Having Issues	(Yes, No)	Nominal
Challenging	(Yes, No)	Nominal
Perfect	(Yes, No)	Nominal
Anxiety	(Yes, No)	Nominal
Searching for better	(Yes, No)	Nominal
Ready to learn new skills	(Yes, No)	Nominal
Work pressure is more than salary	(Yes, No)	Nominal
More work than Capability	(Yes, No)	Nominal
Understanding Unethical Practice	(Yes, no, Maybe)	Nominal



## 4.2.2 Data Utilization

By encoding each category variable (nominal variable) individually, a computer system's data became easier to manage. The results for male and female Gender were recorded as 1 and 0, respectively. The age groups 18-20, 20-25, 30-35, 35-40, and 40+ were categorized as 1, 2, 3, 4, 5, and 6 accordingly. The responses to the yes/no question were encoded as 1 and 0, with one representing "yes" and zero representing "no." For this characteristic, Professional is one and Non-professional is a zero. The value 1 was allocated to the teacher, the value 2 to the student, the value 3 to information technology, the value 4 to banking, the value 5 to business, the value 6 to medical, the value 7 to civil defense, and the value 9 to government employees to determine occupation value. Comparable categories were applied to the reasons for using social media, including one for entertainment, two for professional use, three for passing the time, four for discussion, and five for those who do not use social media at work. The data descriptions for the thirty-four characteristics were subsequently removed to improve the readability of the dataset. The gathered dataset's data description is shown in Table 4.2.

**Table 4.2:** Data Utilization

	count	mean	std	min	25%	50%	75%	max
Gender	2000	0.569	0.5	0	0	1	1	1
Age	2000	3.76	1.8	1	2	4	6	6
Occupation	2000	5.268	2.9	1	2	6	8	9
Depression	2000	3.166	1.4	1	2	3	4	5
Having personal issues	2000	0.666	0.5	0	0	1	1	1
Rest at work	2000	0.445	0.5	0	0	0	1	1
Social Media Use in Working Hour	2000	0.543	0.5	0	0	1	1	1
Fitted with skill	2000	0.602	0.5	0	0	1	1	1
Comfortable	2000	0.538	0.5	0	0	1	1	1
Dream Job	2000	0.532	0.5	0	0	1	1	1
Having Issues	2000	0.551	0.5	0	0	1	1	1
Challenging	2000	0.595	0.5	0	0	1	1	1
Perfect	2000	0.46	0.5	0	0	0	1	1
Anxiety	2000	0.457	0.5	0	0	0	1	1
Searching for better	2000	0.482	0.5	0	0	0	1	1
Ready to learn new skills	2000	0.545	0.5	0	0	1	1	1
Work pressure is more than salary	2000	0.546	0.5	0	0	1	1	1

	count	mean	std	min	25%	50%	75%	max
More work than Capability	2000	0.526	0.5	0	0	1	1	1
Appreciation	2000	0.626	0.5	0	0	1	1	1
Inspiration	2000	0.521	0.5	0	0	1	1	1
Challenges	2000	0.468	0.5	0	0	0	1	1
Entertainment	2000	0.521	0.5	0	0	1	1	1
Reason to Use social media	2000	0.299	0.5	0	0	0	1	1
Facebook	2000	2.378	1.4	1	1	2	3	5
Instagram	2000	2.892	1.4	1	2	3	4	5
LinkedIn	2000	3.12	1.3	1	2	3	4	5
YouTube	2000	2.752	1.4	1	2	3	4	5
TikTok	2000	3.246	1.5	1	2	4	5	5
Likee	2000	3.234	1.5	1	2	4	5	5
WhatsApp	2000	3.161	1.1	1	3	3	4	5
Messenger	2000	3.187	1.1	1	2	3	4	5
IMO	2000	3.361	1.3	1	2	3	5	5
Telegram	2000	3.315	1.3	1	2	3	5	5
Spent Time on social media	2000	3.018	1	1	3	3	4	4
Understanding Unethical Practice	2000	0.973	0.8	0	0	1	2	2

### 4.2.3 Feature Importance

The term "feature significance" refers to techniques that weight input attributes based on their ability to predict the target variable. Item significance refers to a collection of ways for assigning weights to the input characteristics of a predictive model, with each weight indicating the relative importance of each item for generating a forecast. The score of feature importance may be used to strengthen a prediction model and provide insight into the dataset and the model. Table 4.3 shows the feature relevance of different attributes for various methods. In the same table, Facebook has the highest value for the Decision Tree algorithm and Psychological State has the highest value for the Random Forest method. Therefore, Facebook and Psychological State are much more important than other factors. And these are the actual opportunities for social media use in the workplace.

**Table 4.3: Feature Importance**

	<b>Decision Tree</b>	<b>Random Forest</b>
Gender	0	0.00329
Age	0	0.01073
Occupation	0	0.00702
Depression	0.05457	0.06066
Having Personal Issues	0	0.00351
Rest at Work	0	0.00285
Social Media Use in Working Hour	0	0.00304
Spent Time on social media	0.08235	0.05928
Reason to Use social media	0.0827	0.06124
Facebook	0.09533	0.0521
Instagram	0.07012	0.05381
LinkedIn	0.03152	0.04751
YouTube	0.06933	0.04799
TikTok	0.05474	0.05058
Likee	0.07268	0.05545
WhatsApp	0.04219	0.04135
Messenger	0.0477	0.06034
IMO	0.03438	0.05665
Telegram	0.0796	0.04966
Appreciation	0.00904	0.02264
Inspiration	0.01181	0.02017
Challenges	0.02252	0.02198
Entertainment	0.0245	0.02613
Fitted with skill	0.02145	0.02643
Comfortable	0.00247	0.0217
Dream Job	0.01395	0.02035
Having Issues	0	0.02529
Challenging	0.03289	0.02623
Perfect	0.0272	0.02245
Anxiety	0.02342	0.02088
Searching for better	0.00671	0.02133
Ready to learn new skills	0.02144	0.02026
Work pressure is more than salary	0.02788	0.01974
More work than Capability	0.02024	0.01858

### 4.3 Result & Discussion

In this research, Ethical was assigned a positive value while Unethical was assigned a negative score. The confusion matrix has been used to show certain results and assess the effectiveness of machine learning algorithms.

#### 4.3.1 Basic Questions

When it is must to conduct research with person-based interview over various occupational sources and genders, this portion of research gives us definite idea on these features. From the figure 4.1, it is shown that from the collected dataset it contains 1137 of male gender and 863 of female gender. All of them were interviewed to conduct this research. These people are from various occupations. From figure 4.2, it is found that most of the interviewed candidates were from Government Job, Civil Defense, and medical sector.

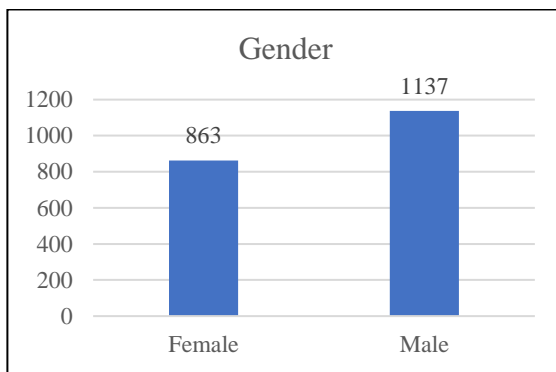


Figure 4.1: Gender

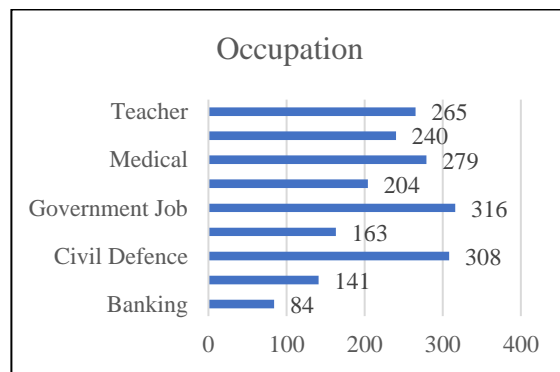
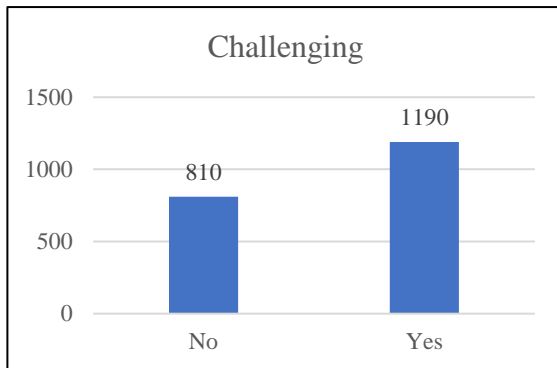


Figure 4.2: Occupation

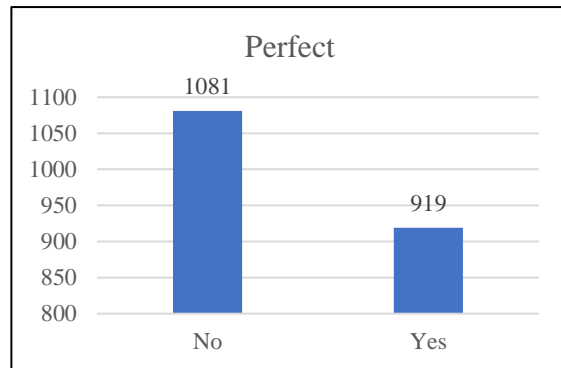
#### 4.3.2 Job Opinion

In this part of research, researchers interviewed the candidates with their job opinion. It was going through some important questions about their job. From figure 4.3, most of the candidates found their job challenging one. On the other hand, 1190 candidates found their job was not perfect for them to continue, it is shown at Figure 4.4. The interesting findings are, though most of the candidates believe that their job was not perfect for them, yet they thought their job was fitted with their skillset, in Figure 4.5 it is visualized. As well as most of the candidates believe that their job is comfortable for them (Figure 4.6). From Figure 4.7 and 4.8, it is found that though most of the candidates votes for their dream job it is but

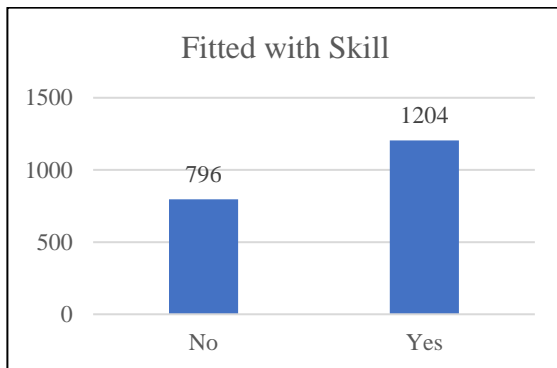
though they are having issues with it. It means, they are having some other blockings from their job.



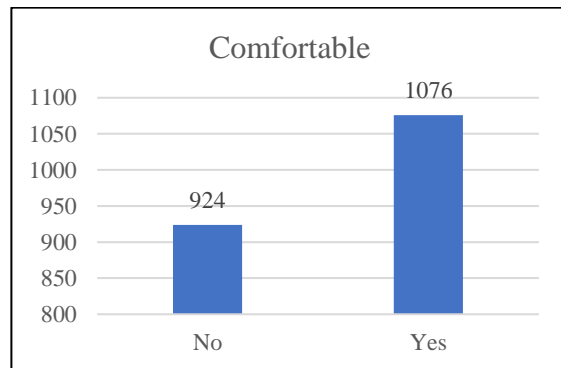
**Figure 4.3:** Challenging



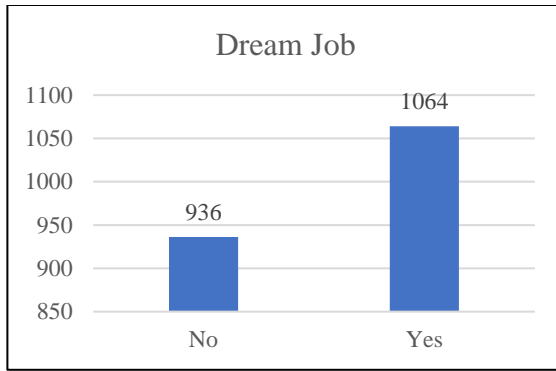
**Figure 4.4:** Perfect



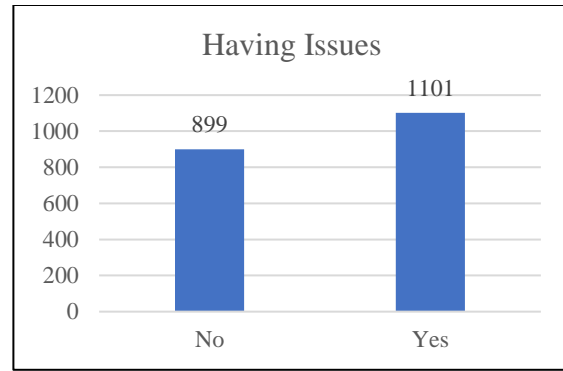
**Figure 4.5:** Fitted with Skill



**Figure 4.6:** Comfortable



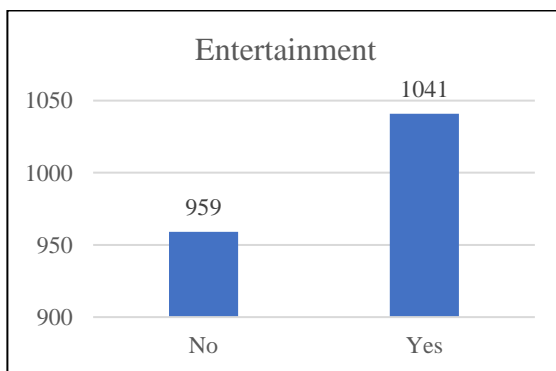
**Figure 4.7:** Dream Job



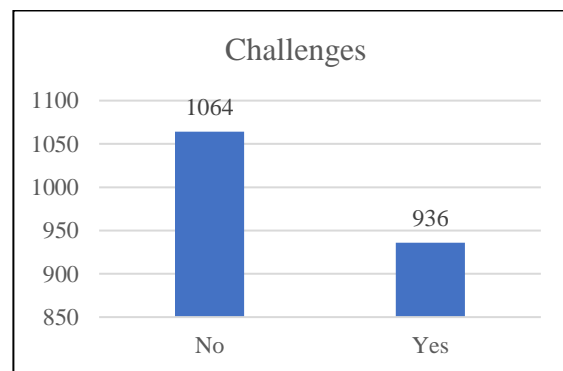
**Figure 4.8:** Having Issues

### 4.3.3 Lacking

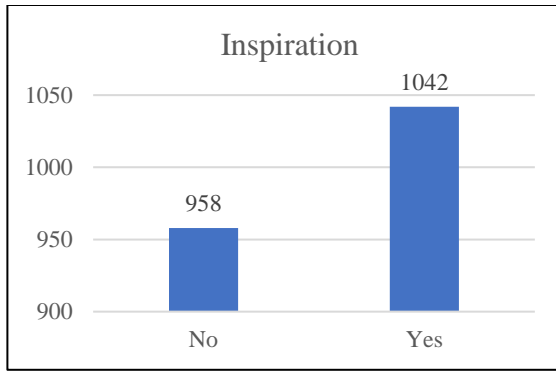
In this part of research, researchers were trying to find the lacking from their employers. This is the most confidential segment of this research. From Figure 4.9, the interviewed candidates mentioned they are lacking entertainment in their workplace. But it is ideal to have entertainment zones in every working place to make the employee’s mind relax and increase productivity. From Figure 4.10, they also mentioned they were finding enough challenge in their job, which may cause extra pressure during worktime. On the other hand, the interviewed candidates mentioned also they are having less inspiration from their job (Figure 4.11) and less appreciation also (Figure 4.12).



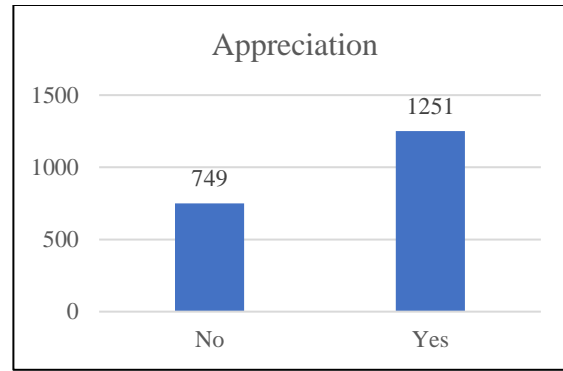
**Figure 4.9:** Entertainment



**Figure 4.10:** Challenges



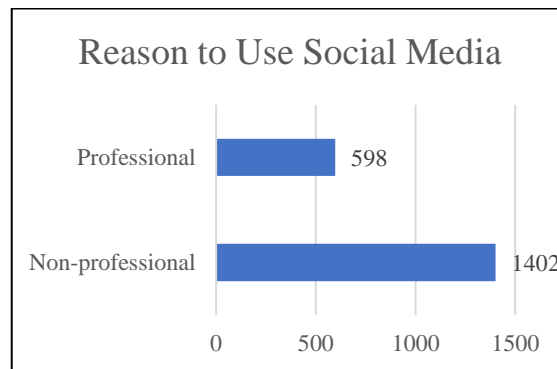
**Figure 4.11:** Inspiration



**Figure 4.12:** Appreciation

#### 4.3.4 Reason to Use social media

It is important to know why the interviewed candidates used social media during their working hours. Therefore, this query has been made and produced the following result mentioned in Figure 4.13.

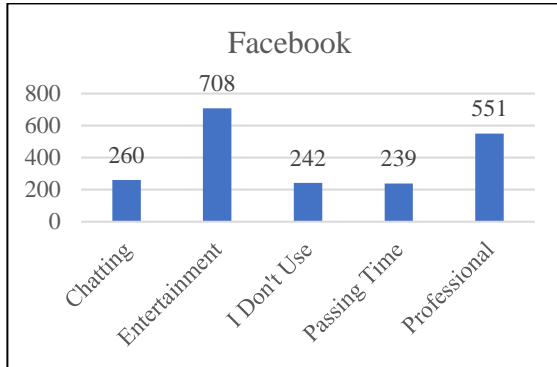


**Figure 4.13:** Reason to Use social media

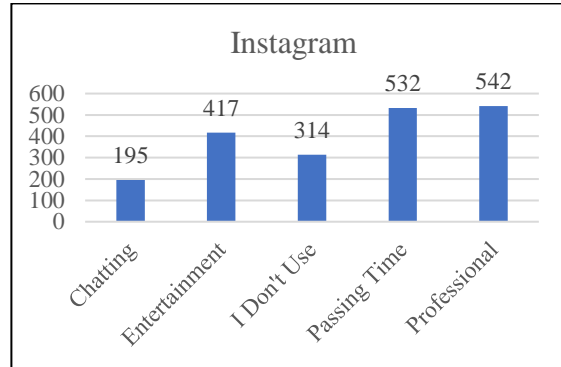
#### 4.3.5 Social media

After completing two important analyses on Job Opinion and Lacking, researchers were looking forward to conducting research which social media affects more than any other media to people. From Figure 4.14, most of the people have addiction to Facebook just for entertainment, as they were having a lacking on entertainment at their workspace. On the other hand, Figure 4.15 says, most of the people use Instagram for passing their leisure time while they are having lack of inspiration and appreciation. Though, LinkedIn was used for only professional purposes for most of the people (Figure 4.16). People occasionally find their entertainment on YouTube; it is shown in Figure 4.17. Now, the most interesting part is, most people mentioned they do not use TikTok and Likee on their

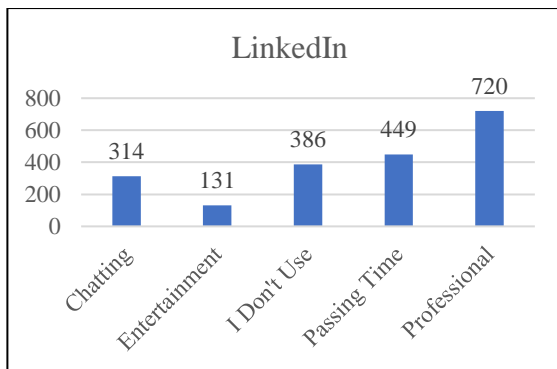
professional workspace (Figure 4.18, 4.19). From the chatting option, Figure 4.20 to 4.23 shows Telegram, IMO, Messenger, and WhatsApp usage among interviewed candidates while they were working on their working hour. Precious findings were discovered from the following figures.



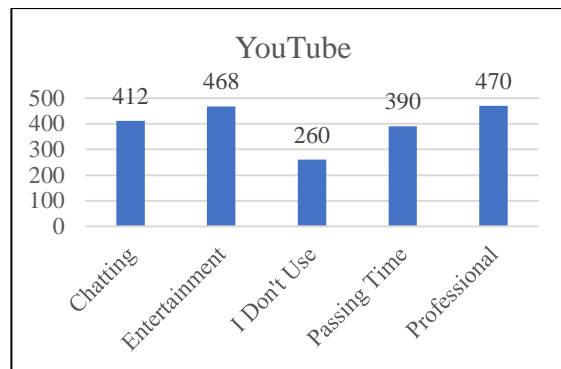
**Figure 4.14:** Facebook



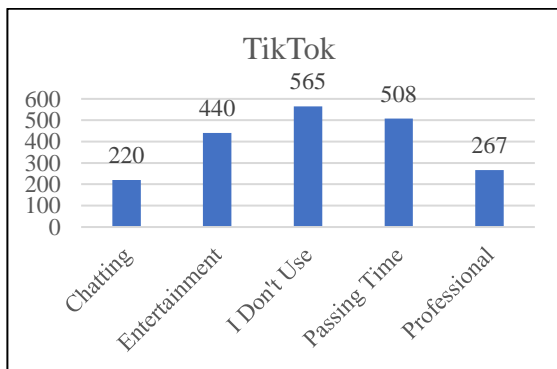
**Figure 4.15:** Instagram



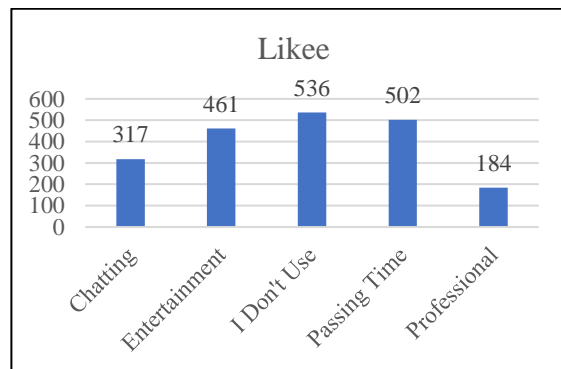
**Figure 4.16:** LinkedIn



**Figure 4.17:** YouTube

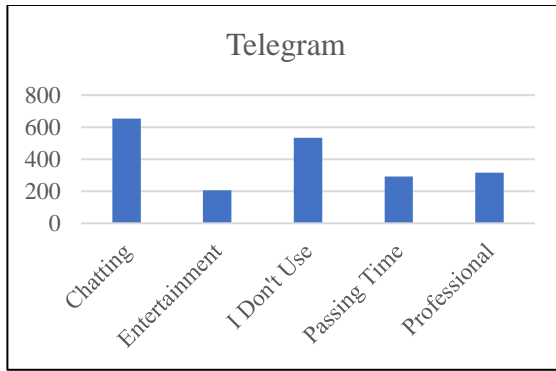


**Figure 4.18:** TikTok

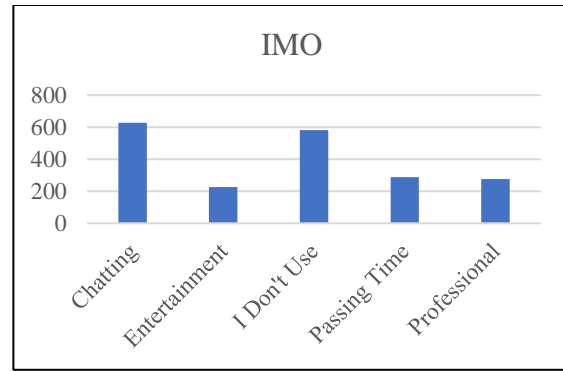


**Figure 4.19:** Likee

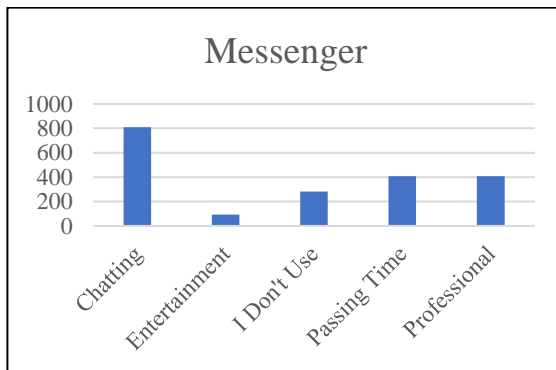




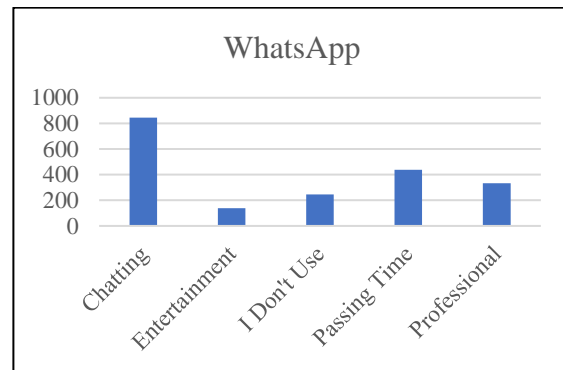
**Figure 4.20:** Telegram



**Figure 4.21:** IMO



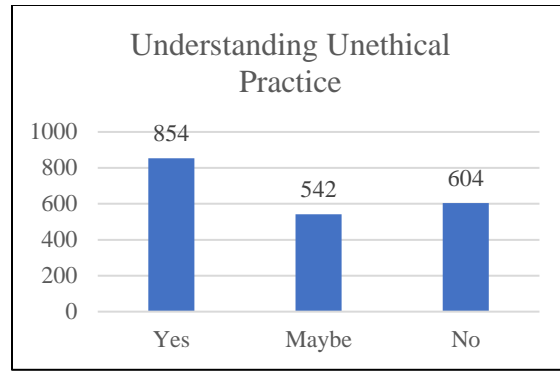
**Figure 4.22:** Messenger



**Figure 4.23:** WhatsApp

### 4.3.6 Understanding Unethical Practice

As researchers previously found their all-important information from previous analysis, now they can ask interviewed candidates if they think their activities during the working is ethical or not. From Figure 4.24, most of the people responded, they are aware of this. They think using social media in the workspace is not ethical and 604 participants believe they do not think the same as the others. But the researchers have received mixed reactions from 542 candidates, who think it is unethical practice to use social media during working time or workspace.



**Figure 4.24:** Understanding Unethical Practice

### 4.3.7 Confusion Matrix

Table 4.4 shows the template for the confusion matrix for various algorithm types. Table 4.5 contains the confusion matrix for each algorithm.

**Table 4.4:** Confusion Matrix

Confusion Matrix		
	Predicted Class	
Actual Class	True Positive (TP)	False Positive (FP)
	False Negative (FN)	True Negative (TN)

**Table 4.5:** Confusion Matrix for Algorithms

Algorithm	Confusion Matrix			Confusion Matrix Percentage	
		Ethical	Unethical	Ethical	Unethical
Decision Tree	<b>Ethical</b>	356	0	71.2	0
	<b>Unethical</b>	0	144	0	28.8
Random Forest	<b>Ethical</b>	356	0	71.2	0
	<b>Unethical</b>	0	144	0	28.8
Logistic Regression	<b>Ethical</b>	328	28	65.6	5.6
	<b>Unethical</b>	28	106	5.6	21.2
KNN	<b>Ethical</b>	355	1	71	0.2
	<b>Unethical</b>	0	144	0	28.8
Gaussian Naïve Bayes	<b>Ethical</b>	309	47	61.8	9.4
	<b>Unethical</b>	31	113	6.2	22.6
SVM	<b>Ethical</b>	356	0	71.2	0
	<b>Unethical</b>	0	144	0	28.8

### **A. True Positive**

Positive tuples are those that the classifier successfully classified. In the acronym, it is represented by the letter TP. The highest True Positive value for SVM in Decision Tree and Random Forest is 71.2 percent; therefore, the highest True Positive value for KNN is also 71%.

### **B. True Negative**

Negative tuples are positive tuples that were misclassified by the classifier. These instances may be denoted with the letter TN. Here, in both Decision Tree and Random Forest, SVM has the highest True Negative value of 28.8%; therefore, KNN has the highest True Negative value of 28.8%.

### **C. False Positive**

Today's focus is on these incorrectly identified as positive negative tuples by the classifier. This kind of relationship may be represented using FP. In this phase of the investigation, False Positive (FP) scores were 0% for Decision Tree, Random Forest, and SVM. Logistic Regression with 5.6% and Gaussian Naive Bayes with 9.0% follow KNN with 0.2% of FP values.

### **D. False Negative**

These positive tuples were misclassified as negative by the classifier. It is denoted with the letter FN. All algorithms using False Negative (FN) values got a result of 0%. Therefore, Logistic Regression yields 5.6% False Negative (FN) values whereas Gaussian Naive Bayes yields 6.2% False Negative (FN) values.

### **E. Precision**

Precision is a metric for measuring the accuracy of something. In other words, the proportion of recovered instances is what truly matters. The Precision measurement formula is shown in Equation.

$$Precision = \frac{TP}{TP + FP} \dots \dots (vii)$$

## F. Recall

It is a measure of machine learning thoroughness. Relevant instance refers to the ratio of retrieved relevant examples to the total number of relevant instances. Equation (viii) is the formula used to calculate Recall.

$$Recall = Sensitivity = \frac{TP}{TP + FN} \dots \dots \dots (viii)$$

## G. F1-Measure

The F measure is an estimation of a test's precision and recall based on the weighted harmonic mean. Formula for determining F1-Measure is presented in Equation (ix).

$$F = \frac{2 \times Precision \times Recall}{Precision + Recall} \dots \dots \dots (ix)$$

## H. Accuracy

The accuracy of a classifier on a certain test set is the percentage of test set tuples that are properly categorized by the classifier on that test set. From equation (x), measuring precision is straightforward.

$$Accuracy = \frac{TP + TN}{TP + FN + FP + TN} \dots \dots \dots (x)$$

### 4.3.8 Classification Report

In machine learning, a classification report is a statistic used to assess the performance of the system. It is used to illustrate the classification model's training accuracy, recall, F1 Score, and support. It is a performance statistic for classification-based machine learning models. Displays the model's accuracy, recall, F1 score, and support. It offers a more accurate depiction of the overall performance of the model. To interpret categorization reports created by machine learning models, it is necessary to be acquainted with all metrics offered in the research. The percentage values for Precision, Recall, F1-Score, and Accuracy are shown in Table 4.6 for each algorithm's classification report.

**Table 4.6:** Classification Report

Algorithm	Class	Precision	Recall	F1-Score	Accuracy (%)
Decision Tree	Unethical	1	1	1	100%
	Ethical	1	1	1	
	Macro Avg.	1	1	1	
	Weighted Avg.	1	1	1	
Random Forest	Unethical	1	1	1	100%
	Ethical	1	1	1	
	Macro Avg.	1	1	1	
	Weighted Avg.	1	1	1	
Logistic Regression	Unethical	0.9	0.92	0.91	87%
	Ethical	0.79	0.74	0.76	
	Macro Avg.	0.84	0.83	0.84	
	Weighted Avg.	0.87	0.87	0.87	
KNN	Unethical	1	1	1	100%
	Ethical	0.99	1	1	
	Macro Avg.	1	1	1	
	Weighted Avg.	1	1	1	
Gaussian Naïve Bayes	Unethical	0.91	0.87	0.89	84%
	Ethical	0.71	0.78	0.74	
	Macro Avg.	0.81	0.83	0.82	
	Weighted Avg.	0.85	0.84	0.85	
SVM	Unethical	1	1	1	100%
	Ethical	1	1	1	
	Macro Avg.	1	1	1	
	Weighted Avg.	1	1	1	

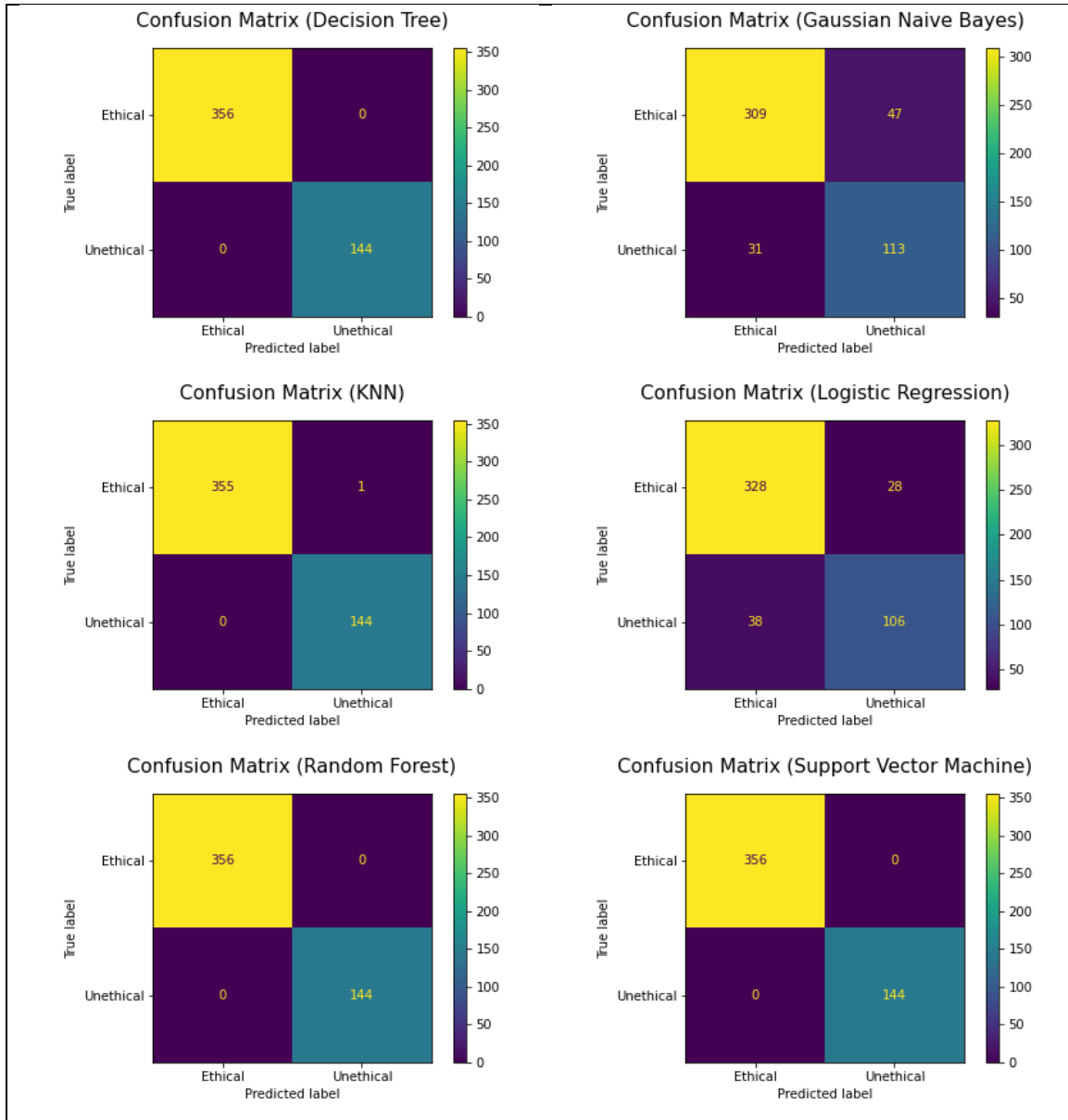
#### 4.4 Result Analysis

Examining the findings is the next stage after the computation of all variables, including Precision, Recall, F1-Measure, and Accuracy. This investigation will determine which algorithm has the greatest and lowest performance.

##### 4.4.1 Confusion Matrix

This thesis has previously explained the Confusion Matrix calculating procedure. In this portion of the investigation, Decision Tree, Random Forest, and SVM all obtained 0% False Positive (FP) scores, which is a significant decrease from their previous results. Following KNN with 0.2% of the False Positive (FP) results were Logistic Regression with 5.6% and Gaussian Naïve Bayes with 9.4%. The highest True Positive value for Decision Tree, Random Forest, and SVM is 71.2%; hence, the maximum True Positive value for KNN is 71%. Decision Tree, Random Forest, and SVM all have the highest True Negative value of 28.8%; thus, KNN likewise has the maximum True Negative value of 28.8%. Then

Logistic Regression yields 5.6% False Negative (FN) values while Gaussian Naive Bayes yields 6.2% False Negative (FN) values. Figure 4.25 shows the confusion matrix for all used algorithms in this thesis.

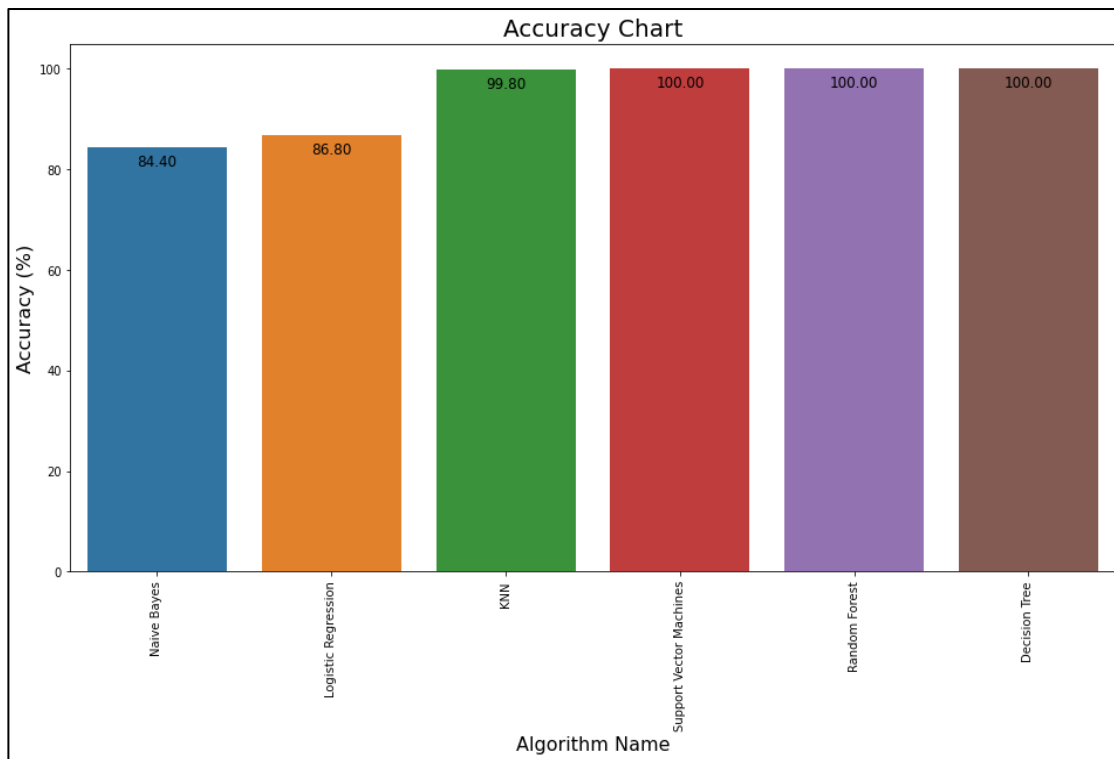


**Figure 4.25:** Confusion Matrices

#### 4.4.2 Accuracy

Accuracy measures an algorithm's optimal performance. The performance is dependent on the given information. To assess the performance's accuracy, a probabilistic technique may

be used. The three most accurate algorithms are Random Forest, Decision Tree, and SVM, whereas Gaussian Nave Bayes is the least accurate. Random Forest, Decision Tree, and SVM algorithms have shown to be very efficient and scalable implementations, capable of surpassing the computing power restrictions for boosted forests techniques. It was created and developed only to improve model performance and accelerate the rate at which computers could assess data. Figure 4.26 and Table 4.7 show the accuracy and proportion of each prediction strategy used by this model.

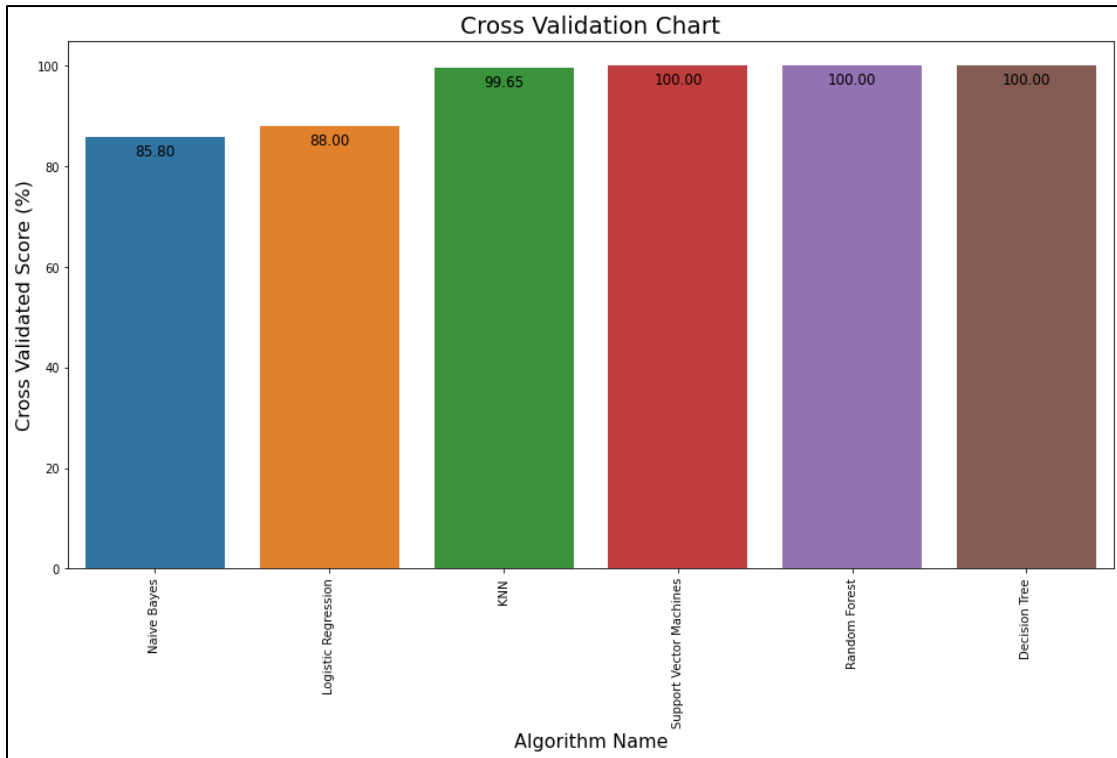


**Figure 4.26:** Accuracy Chart

### 4.4.3 Cross Validated Score

Cross-validation is the statistical method used to evaluate the accuracy of machine learning models. Cross Validation begins with the randomization and distribution of data into  $k$  folds. After fitting  $k$  models to  $\frac{k-1}{k}$  of the data,  $\frac{1}{k}$  of the data is evaluated. The final score is computed by averaging the results of each evaluation, and the resulting model is implemented by fitting it to the whole dataset. The cross-validated score chart and

proportion of each prediction technique used by this model are shown in Figure 4.27 and Table 4.7, respectively.

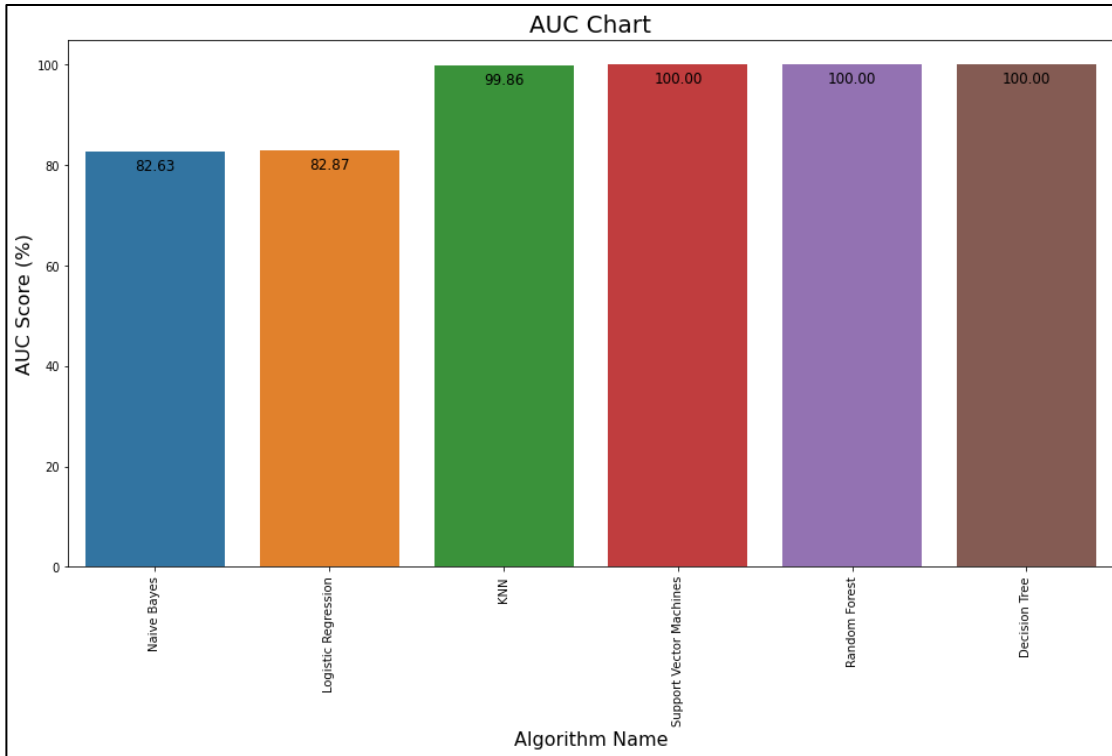


**Figure 4.27:** Cross Validation Score

#### 4.4.4 AUC Score

Using this performance indicator in conjunction with machine learning applications, it is possible to estimate the projected categorization levels of a system, which is advantageous in a variety of situations. The AUC is calculated by comparing a percentile of randomly positive circumstances in which the model performs better to a percentile of randomly negative situations in which it performs significantly worse. This number may take on four distinct values, with one being the most likely. The values range from 0 to 1, with zero being the minimum implementable value. As seen in Figure 4.28 and Table 4.7, models with 100% incorrect predictions have an accuracy of zero, while models with 100% accurate predictions have an accuracy of one.

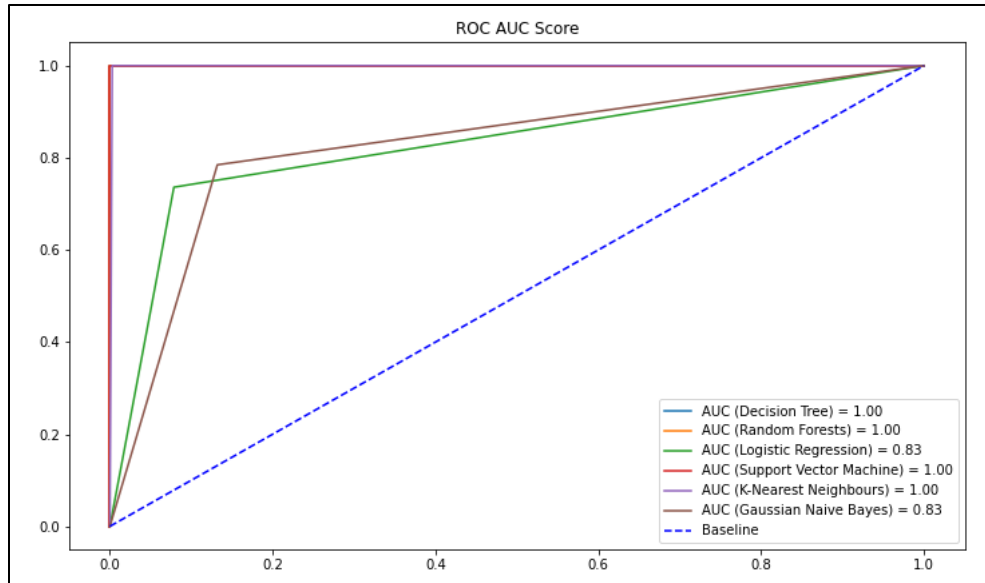




**Figure 4.28:** AUC Score

#### 4.4.5 ROC Curve

ROC analysis is essential for assessing the performance of diagnostic tests and, more generally, the accuracy of a statistical model that classifies individuals into one of two groups: healthy or ill. Unquestionably, one of the most advantageous applications of ROC curve analysis is as a simple graphical tool for presenting the accuracy of a medical diagnostic test. Figure 4.29 depicts this value for the critical curve.



**Figure 4.29:** ROC Curve

The models with the highest accuracy were Random Forest, Decision Tree, and Support Vector Machine, with scores of 100% for accuracy, 100% for cross validation, and 100% for area under the curve. Table 4.7 provides a concise summary of the precision.

**Table 4.7:** Accuracy, Cross Validated and AUC Score

Algorithm Name	Accuracy Score (%)	Cross Validated Score (%)	AUC Score (%)
Naive Bayes	84.4	85.8	82.63
Logistic Regression	86.8	88	82.87
KNN	99.8	99.65	99.86
Support Vector Machines	100	100	100
Random Forest	100	100	100
Decision Tree	100	100	100

#### 4.4.6 Misclassification & Error

When assessing the precision of an algorithm, errors become a concern. Following misclassification, absolute error and mean square error become components of the accuracy of a machine-learning model. If an unsuitable attribute is selected, misclassification may result. When all classes, groups, or categories of a variable have the same error rate, misclassification happens.

Absolute error is the measure of measuring imprecision. MAE represents the average of all absolute measurement errors. This equation reflects the Mean Absolute Error formula.

$$MAE = \frac{1}{n} \sum_{i=1}^n |x_i - x| \dots \dots \dots (xi)$$

MSE represents the distance between a regression line and a set of points. Mean Squared Error is calculated using the formula.

$$MSE = \frac{1}{n} \sum_{i=1}^n |y_i - y|^2 \dots \dots \dots (xii)$$

The misclassification, absolute error, and mean square error for each method are displayed in Table 4.8. Misclassification, Mean Absolute Error, and Mean Squared Error rates for Decision Tree, Random Forest, and SVM were 0%, 0%, and 0%, respectively.

**Table 4.8:** Misclassifications & Errors

Algorithm Name	Misclassification (%)	Mean Absolute Error (%)	Mean Squared Error (%)
Naive Bayes	15.6	15.6	15.6
Logistic Regression	13.2	13.2	13.2
KNN	0.2	0.2	0.2
Support Vector Machines	0	0	0
Random Forest	0	0	0
Decision Tree	0	0	0

## CHAPTER 5

### IMPACT ON SOCIETY & SUSTAINABILITY

#### 5.1 Introduction

If research has been conducted, the societal effect of the study must be examined and assessed. This chapter discusses the influence of the Identifying Unethical Social Media Activities study in three sections, with the impact on society focusing on how this research will positively affect society. There are also ethical considerations. To comprehend how this study would benefit the workers, the ethical considerations have been examined in detail. And last, the sustainability of the study was explored. There, it is addressed how this study might expand in the future and benefit more individuals.

#### 5.2 Impact on Society

This research has a meaningful impact on society. The author predicts a lot of data using machine learning to determine what kinds of behavior are ethical and what kinds are unethical when using social media during work hours. Most employees are unable to differentiate between what is ethical and what is unethical using social media during working time. If workers are made aware of the ways in which it is ethical and in which it is unethical to use social media, then the company can improve their employee productivity. Moreover, if the company establishes some clear policies regarding the matter, employees will be disallowed from using social media in an unethical manner while they are on the job. With that company must create some activity to keep employee mentally health fit and help them to understand about the unethical term.

#### 5.3 Ethical Aspects

People living in the current era engage in activities on social media, but they are unaware that this decreases their levels of productivity. The best way to educate oneself independently or get information about the entire world without leaving the coziness of your own house is via the utilization of social networking. In addition, it may operate as a cautionary note to those people who have allowed themselves to get sidetracked from their

profession. Which might be detrimental to a company. People will have a better understanding of the unethical aspects of social networking thanks to this research. They could find a way to reconcile the ethical considerations of social media with their own personal development. In addition, acquiring information on the organization's staff productivity rate would be of wonderful use. Employees may get assistance from their organizations to boost their productivity.

#### **5.4 Sustainability**

This study has a significant level of sustainability due to its unique approach, which allows people to differentiate between ethical and unethical use of social media while they are on the job. Additionally, data visualization and machine learning were used to ascertain how the ethical implications of this work might be applied. However, in the not-too-distant future, deep learning will be used in a wide range of settings and models. Therefore, if future sustainability can be achieved, this information might potentially be used for a number of other initiatives. Even websites and apps for mobile devices might be built. Even in its current form, this role has the potential to contribute to the collection of data on the mental health of people. After reading all this study, individuals will be able to raise their level of productivity without experiencing increased levels of stress.

## CHAPTER 6

### FUTURE SCOPE & CONCLUSION

#### 6.1 Introduction

This chapter examines the future scope. What strategies could be used to boost employee productivity through the usage of social media by generating a better output? How this initiative may contribute to the company's growth and how employees can increase their productivity in the future. This chapter concludes with a clear and concise conclusion, which is presented at the end of the chapter. At the conclusion of this chapter, a list of references is provided.

#### 6.2 Implication of Further Study

For this study, the authors have built a model to determine if the use of social media during work hours is ethical or unethical. In the future, it is feasible that a website based on the Internet of Things will be created and made accessible to the public via the internet. Thus, the organization may quickly determine whether the social media user is ethical or immoral. Therefore, the organization can obtain optimal performance from its staff. And establishing some Ai-based websites to assess the mental health of employees so that they may express their feelings with them. The website then comprehends the user's concern and provides a solution for it. for that employee, productivity can rise. at the workplace Creating some indoor activities to relieve employee tiredness. designing some indoor activities to help relieve staff tiredness. Create a social networking site dedicated to the group. which organizations did not have a need for social media. so that everyone working on that website may give their whole attention to their tasks at hand.

#### 6.3 Recommendations

Most of the time, employees feel stressed at work if they cannot find a way to relax. So, they move to find something entertaining to do. So, they go to social media to find something entertaining to do. Because of that, they lost time at work and were less

productive. If a company set up some fun sessions or other activities to keep their workers from getting too tired, they could get the most out of them.

Work schedules can be affected by employees' mental health. The emotional well-being of all staff members was not consistently high. If a company is serious about improving its employees' mental health, it should consider implementing a website or implementing an app that, at its core, asks visitors a series of questions designed to help them assess their own state of mind before offering advice on how to improve. or suggest some fun things to do to relieve stress. It will eventually aid the organization. because once the stress is gone, the workers will be able to focus on the job at hand. The company finds 100% effort from each worker. If a secure, one-on-one session can be set up, it will be used to discuss the employees' issues. and offer forth some useful suggestions for how the organization proposes to deal with the problem at hand. Consequently, staff members will be able to release their tensions and feel the company. When a worker feels like he or she is a part of the company, they invest more effort in the company. If the organization holds a monthly meeting in which workers can discuss their contributions to the company, they may see a significant uptick in morale and productivity. and show your gratitude to those workers. employees are more likely to put in extra effort when they feel their efforts are being recognized. for the simple reason that people adore being appreciated.

#### **6.4 Conclusion**

The expansion of social media is a direct result of the rapid pace of technological change in recent years. The purpose of this study was to examine the role of social media in the workplace in terms of productivity. Most workers nowadays often waste work hours on social media. Since most workers use social media for reasons unrelated to their jobs, the results of the studies that have been conducted are negative. Most of their time is devoted to recreational activities. That is why they are wasting time and not getting anything done. There should be concern among all employers about the amount of time their employees waste on social media sites like Facebook and Twitter. To get a good return on their investment, business owners are entitled to that performance from their staff. Based on the findings, it is recommended that businesses craft policies that are flexible, open to input,

and widely accepted by employees to regulate employees' use of social media on the job. The reason for this is that social media can simultaneously pique interest and distract users, making it difficult to focus on other tasks. The inability to regulate employees' use of social media during work hours poses a serious threat to business efficiency. By regulating and monitoring employees' social media use, businesses can boost productivity and morale.



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