

Article Citation Format

Egejuru, S.C., Nosike, P, Nwankwo, B.N., Akindunni, E.F. & Egejuru, N.C. (2022):
Application Software for the Reduction of Communication Gadget Addiction. Journal
of Digital Innovations & Contemporary Research in Science, Engineering &
Technology.

Vol. 10, No. 4. Pp 79-98

DOI: dx.doi.org/10.22624/AIMS/DIGITAL/V10N4P11

Application Software for the Reduction of Communication Gadget Addiction

¹Egejuru, Shama Chidi., ²Nosike, Paul, ³Nwankwo, Benjamin N., ⁴Akindunni, Emmanuel Feyisola &
^{*5}Egejuru, Ngozi Chidozie

^{1,2,3}Department Of Computer Science, Paul University, Awka, Anambra State, Nigeria

^{4,5}Department of Computer Science, Hallmark University, Ijebu Itele, Ogun State, Nigeria

Corresponding Author's *Email: ngoegejuru@yahoo.com

ABSTRACT

Presently, the introduction of recent technological gadgets has caught the global population's attention. People are now so dependent on technical devices and the services they offer that they cannot go in the course of their progress without them. The degree of dependence is causing digital products and services to become addictive. The study was designed to look at how people use tech devices, how much time they spend using it, why they use it, and how it affects their lifestyle and mental health. For data collection in this study, a structured questionnaire, unstructured interviews, and researcher observation were all used. The primary data were collected from 150 respondents from Imo State and Anambra State. The study's findings revealed that the most of the young respondents spent a lot of time utilizing their tech-related devices and services. Once more, it is clear that addiction to technological gadgets has numerous detrimental effects on respondents' mental health and has contributed to the shift in the lifestyles of participants' young. A reminder application system, as an alert, was developed to remind the user of the time spent browsing the internet. The system demands the user specify the time to use for browsing.

Keywords: Gadgets, Mental Health, Lifestyle, Addiction, Technology.

1. INTRODUCTION

Technology is a good thing that has come to make things work faster and ensure interaction with some gadgets. People want to do things more quickly, easier and cheaper, thereby finding Information Technology as a valuable tool to achieve their quest. Unfortunately, the use of Information Communication and Technology (ICT) devices positively and negatively impact people, especially the youth. The addictive nature negatively impacts their mental health. Technology is the application, development, and knowledge of tools, crafts, systems, techniques, or organizational procedures used to handle problems or further a certain goal (Igi-global, 2022). Communication devices or gadgets are able to transfer analog or digital signals, over a communication cable, wire or wireless, or through a telephone network.

Other communication tools include laptops, network interface cards, and modems, which take analog signals and turn them into digital ones so that a computer can analyze them (Google Sites, 2022). Technology has made our children the most vulnerable sector of the population today due to addiction and accessibility to newer technologies that are affordable and easily available. This has resulted in gadget addiction that in the future constitutes a risk to the social infrastructure. Addiction is an unquenchable urge that is followed by a loss of control, which diminishes emotional intellect and, in turn, impacts performance professionally and academically as well as in the home, which can have life-threatening concerns in the future (*Kumar and Sherkhane, 2018*).

The use of a gadget continuously has been associated with a range of health problems, including finger discomfort, eye strain, neck pain, backache, and disturbed sleep. There are negative repercussions like emotional, physiological, social, and psychological ones depending on how much time (length and frequency) is spent using a device. Overusing the internet has been linked to depression, antisocial behaviour, poor emotional intelligence, and loneliness. Youth culture today is dominated by social networking sites, video-sharing websites, online games, and technology like smartphones and iPods (Mizuko et al., 2008; *Kumar and Sherkhane, 2018*). People have grown so reliant on technological devices and services that they cannot imagine moving in the path of their development without them. The degree of dependence has made digital products and services to become addictive. The population's most susceptible age group to technology addiction is young people aged 15 to 24 years old (Surat et al., 2021). Health could be directly impacted by Radio frequency (RF) radiation exposure in two ways: thermal (heating) impacts, which are mostly brought on by holding smartphones close to the body, and perhaps non-thermal effects (*Kumar and Sherkhane, 2018*).

Some of the Communication Gadgets and Services used by people include computers/laptops, Internet Services; Mobile/cell phones; and Smart Phone. Online shopping, news, games, social networking travel information, advertising, business, and many other things can be done on the internet. Search engines like Bing, Google, MSN, and Yahoo are the best frequent ways to find information on the internet. This led to using social networking sites. A mobile phone, often known as a cell phone, is a device that can place and receive phone calls using a radio link as the user travels round a large geographic area. Mobile phones/smartphones allow users to send text messages, make calls, listen to music, play games, watch movies, internet access, infrared, Bluetooth, business applications, photography, and perform other tasks that are typically only available on computers, such as creating and editing documents, and using a wide range of applications (Mohammad et al., 2018).

More than 5.22 billion people use smartphones worldwide, or 66% of the world's population. In 2020, there were 93 million more users, with a 1.8% yearly growth rate. More than six billion people now have mobile subscriptions, and more than a million new smartphones are being used every day (DataReportal, 2021). The number of distinctive mobile phone users has climbed by 1.8% (93 million) since January 2020, while the overall number of mobile connections has increased by 0.9% (72 million), bringing the total to 8.02 billion at the beginning of 2021. In this study, information was elicited using information communication and technology gadgets, the extracted data was analyzed, and a prototype system was designed and developed.

This study created an application to decrease the use of communication devices and improve or encourage today's youth's academic, social, and physical well-being. The study also was able to:

1. Investigate how much time people spend using their communication gadgets.
2. Examine the motivations driving the use of communication tools and services.
3. become aware of how the compulsive use of various devices and services affects physical and mental health.
4. Encourage people to take a closer look at or greater care with their health
5. Encourage people, mainly youngsters, to read more while improving their academic achievement.
6. Foster their social and physical interaction
7. Encourage or motivate people to take initiative

People spend more time accessing the internet through some communication gadgets which affect their productivity and health. In the long run, it will be more beneficial, progressive, and educative for young and older adults, if they can use fewer communication devices or reduce the time spent on gadgets. The study's scope is limited to several processes to help students be more conscious of their environment. The study is taken into consideration because of the lack of concentration in the academic aspect, in both old and young. A communication gadget management system can provide the user access to a time frame plan that will help regulate the usage. The study is also beneficial for young and older adults, especially those who are glued to or addicted to their communication devices. This system will help them cut down on the time they spend using these devices and encourage them to be more active and aware of their surroundings, which will benefit their society rather than becoming screen addicts.

2. LITERATURE REVIEW

Numerous studies demonstrate the advantages of technological devices and services. Other research showed the drawbacks of these technological items. Some studies considered the advantages and disadvantages of these technologies, while others displayed a balanced view of how to use tech products and services. There is a need to develop a reminder communication gadget system to reduce communication gadget addiction, which can provide the user access to a time frame plan to help regulate the usage.

A. The Benefits of Information Technology and Communication Gadgets

Using ICT gadgets and services is beneficial and has a positive impact on the economy. Technology may favor a person's capacity for creativity, strategic thinking, and investigative skills. Youth can learn more effectively through these technological tools and services, and they can also have fun and escape daily life's stresses. Because of their digital behavior, young people spend a lot of time sitting still, maintaining their hand, eye, and mental coordination throughout that time. The ability to play video games and go through the stages step-by-step may help young people develop their engineering skills and positive attitudes toward overcoming challenges. Internet usage is expanding beyond our expectations. The social networking sites like YouTube, Twitter, Blogs, Facebook, LinkedIn, Instagram, Whatsapp, and many others allow people of all ages to quickly communicate their current interests with others anywhere in the world. Consequently, internet usage has caused a significant increase in global interconnection (Cabral, 2011; Tsitsika, and Janikan, 2013).

Gadgets positively impact information technology (IT), as seen in the Nigeria End-SARS Protest and the bloody day of October 20, 2020. Without social media, gadgets, and IT, the world would not have been aware of the Lekki Lagos Toll Gate massacre, proving that IT is beneficial.

B. Related Works

In (Thomé, et al., 2012), the study aimed to determine whether heavy computer use poses a potential risk for young individuals in a population-based sample to have mental health symptoms. The study population consisted of a cohort of young adults (n = 4163) aged 20 to 24 who provided answers to questionnaires at baseline and one year afterward. Among the exposure factors were the amount of time spent using computers (CU), email and chat usage, computer gaming, CU without breaks, and CU at night that interfered with sleep. Results related to mental health included reported stress, sleep disruptions, depressive symptoms, and decreased performance as a result of stress, depression, or exhaustion. Prevalence ratios (PRs) were determined for future relationships between baseline exposure factors and mental health effects (new cases) for the men and women.

It was concluded that the men's performance and sleep disruptions were linked to time spent using the computer. Lack of breaks while using the computer was associated with numerous outcomes related to women's mental health. In interactions with mobile phone use, several correlations were strengthened. Most mental health outcomes were linked to nighttime computer use and subsequent sleep loss in both men and women. The processes relating information and communication technologies (ICTs) to sleep problems should be the subject of future research.

According to (Sandeep, 2016), people are giving their smartphones prime priority and can no longer avoid using the internet, smartphones, or social media in their daily lives. Additionally, 43% of people have some sort of medical or psychological issue as a result of using their gadgets excessively. The constant use of technology, including smartphones and other devices, fosters attachment. According to (Reagan, 2019), the Cutting Edge Writer, technology addiction is described as persistent, obsessive behavior related to technology use, even when it has a negative impact on the person. Although almost everyone uses technology, excessive reliance on it might negatively affect students' lives.

According to (Stevanović, 2020), one of the research topics with the highest growth over the past ten years focuses on the Internet's detrimental effects on mental health. This editorial provides a summary of the research that has been done on harmful online conduct. According to contemporary psychiatric terminology, the only mental disorder connected to Internet use is gaming disorder, which is recognized as a result of gaming or other addictive behaviors. Problematic Internet use (PIU), disordered gaming, and various mental problems characterized mainly by impulsive, obsessive, and addictive behaviors may all be related. Globally, PIU and gaming disorder prevalence showed notable variation, with a wide range of potential causes and/or maintainers of these behaviors. According to research, people who suffer from PIU and gaming disorders may have unique psychological profiles and specific cognitive abnormalities. Brain abnormalities that are functional, structural, and related to neurochemistry may also exist. Last but not least, these illnesses already have therapies. Eleven articles specifically chosen for this special edition and dealt with problematic Internet-related habits were also discussed.

According to (Cemiloglu et al., 2021), the idea of a digital addiction has gained popularity recently. There are more requests for remedies to stop it, particularly among adolescents. There is a need for preventative and intervention strategies that encourage people to have more control over their digital usage, even though there is an ongoing dispute about whether this phenomenon qualifies as a diagnosable mental health problem. The review included 87 studies in total. The results indicate four broad categories into which the principal countermeasures may be divided: psycho-social, software-mediated, pharmaceutical, and combination. Overall, it has been demonstrated that the suggested countermeasures successfully lowered the compulsive use of digital devices. As a result, this assessment sheds light on concerns that require further investigation.

Understanding how we engage with technology is becoming more and more crucial as it permeates our work and personal lives. Scientific research on addiction disorders related to people's use of video games, social media and the internet is becoming increasingly important. The results will impact how we manage evolving technologies in the future, both at work and at home. There is a need to time out the time usage of high technology as solutions are sought to discover a means to stop individuals from using or minimizing the time spent on ICT gadgets.

3. METHODOLOGY

An agile development process was adopted, eliminating the need for extra modeling and documentation, and it also contributed to customer satisfaction by delivering useful products frequently and early. The data were analyzed using both quantitative and qualitative methodologies.

A. Data Collection and Analysis

This study is based on extensive fieldwork done in Avu, Owerri-West (Imo State); Nwachukwu Foundation Medical Mission (two days medical mission), Ogwuama, Mbaise (Imo State); and Paul University, Awka (Anambra State). From December 2020 until March 2021, fieldwork was carried out. Before the start of the fieldwork in October 2020, a pilot research was carried out. Information was gathered from 150 people using a purposive sampling technique, of whom 90 were men and 60 were women. The range of ages is from 15 to 56. The sample as a whole was 21 years old on average. Both the male and female samples have an average age of 21. The sampled population's level of education ranges from secondary to retired.

The structured questionnaire is divided into four pieces after the declaration and participant demographics. The final four sections included close-ended questions about using technological devices and the participant's current health status. The questionnaire's Section A includes tabular-style questions about the usage of the devices. When asked how much time they spent using various devices and services, respondents were given the alternatives of 1–2 hours, 2–4 hours, 4–6 hours, and 6 hours. It was also questioned how much time was spent using the devices and services, and the proportion of respondents was calculated. Respondents to the current survey considered using devices for longer than 6 hours to be an addictive behavior.

The questionnaire's Section B posed some inquiries regarding the respondents' reliance on technological tools and services. Five, eight, and ten were negative statements out of ten questions; hence they were reverse-coded for computation. All the questions used a 5-point Likert scale, with 1 representing a strong disagreement and 5 a strong agreement.

This 5-point scale had scores ranging from 10 to 50. A score of 34 to 50 is considered high, 17 to 33 is considered moderate, and 10 to 16 is considered low dependent. Because reliance determines addictive behavior, the more dependent the respondents, the more addicted they will be. Some questions about the current state of one's health and social behavior were posed in sections C and D, respectively. A percentage of respondents who reported having social or health issues was determined. To determine the effects of the respondents' compulsive use of Information Communication and Technology devices on their mental health and lifestyle, the data from these two parts were compared with those from section A. Unstructured and semi-structured interviews with the students to gain their opinions on how they use technology and how it affects their health and social standing were carried out. These interview formats were chosen for this study since it focuses on young people and includes data on their academic performance and health.

B. System Analysis

Based on the data gathered, the system is examined and analyzed. According to Table 1, for communication gadgets, out of 150 people, 110 utilize personal computers as communication tools, whereas 40 do not. 108 use laptops for communication purposes, and 42 do not. Only 90 out of 150 persons do not use tablets to communicate, whereas 60 do. Out of 150 individuals, 150 utilize phones as a form of communication gadget. It shows that 75 people do not use the smartwatch while 75 use the smartwatch as a communication gadget. Also 145 people use the internet while 5 do not use the internet.

Table 1: Summary of Communication Gadgets Usage

| S/N | Communication Gadgets | Yes | No |
|-----|-----------------------|-----|----|
| 1. | Personal Computer | 110 | 40 |
| 2. | Laptop | 108 | 42 |
| 3. | Tablets | 60 | 90 |
| 4. | Phone | 150 | 0 |
| 5. | Smart watch | 75 | 75 |
| 6. | Internet | 145 | 5 |

Table 2 shows that 35 people do not send mail, while 115 people send mail. The chart shows that 10 people do not use WhatsApp and 140 people use WhatsApp. Also, 63 people do not use Instagram, while 87 use Instagram. This chart tells us that 125 do not use Twitter, and 25 use Twitter. This chart shows that 20 user does not use Facebook then, and 130 use Facebook.

Table 2: Summary of Application Package Usage

| S/N | Application Packages | YES | NO |
|-----|----------------------|-----|-----|
| 1. | Whatsapp | 140 | 10 |
| 2. | Instagram | 87 | 63 |
| 3. | Twitter | 25 | 125 |
| 4. | Email | 115 | 35 |
| 5. | Facebook | 130 | 20 |
| 6. | Internet | 145 | 5 |

Table 3 shows that 145 people use the internet always, 3 use it frequently, 1 uses it rarely, and 1 user does not use the internet at all. This demonstrates that 30 users constantly send mail, 50 send mail regularly, 2 send mail rarely, and 70 do not send mail. The chart shows that 140 people use Whatsapp always, 8 do not, and 2 rarely use Whatsapp. This chart tells us that 57 people use Instagram always, 25 use it frequently, 65 do not use it at all then 5 rarely use it at all. This chart shows us that 53 always use Twitter, 47 frequently use Twitter, 23 do not, and 25 rarely use Twitter. This shows that 65 use Facebook always, 35 use it frequently, 20 person does not use it at all, and 30 use it rarely.

Table 3: Summary of How often Application Packages are Used

| S/N | Application Usage | Always | Frequently | Rarely | No |
|-----|-------------------|--------|------------|--------|----|
| 1 | Internet | 145 | 3 | 1 | 1 |
| 2 | Email | 30 | 50 | 2 | 70 |
| 3 | Whatsapp | 140 | 8 | 2 | 0 |
| 4 | Instagram | 57 | 25 | 5 | 65 |
| 5 | Twitter | 53 | 47 | 25 | 23 |
| 6 | Facebook | 65 | 35 | 30 | 20 |

This shows that 30 users use a laptop, 90 users use a phone, and 30 use a tablet. Therefore all uses at least one gadget and the best is Phone (Fig 1).

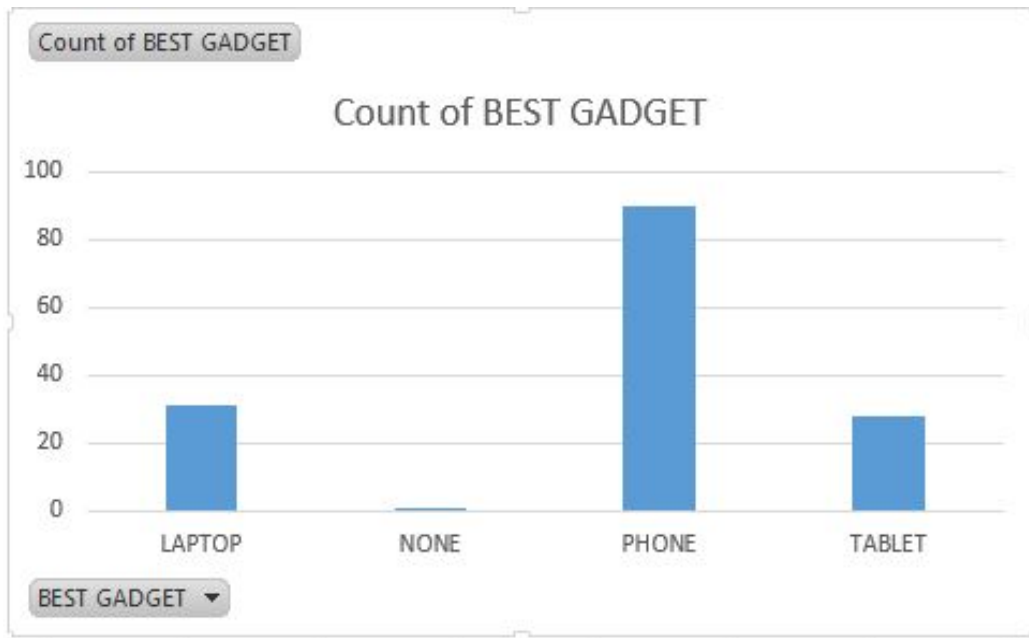


Fig 1: The Best Gadget

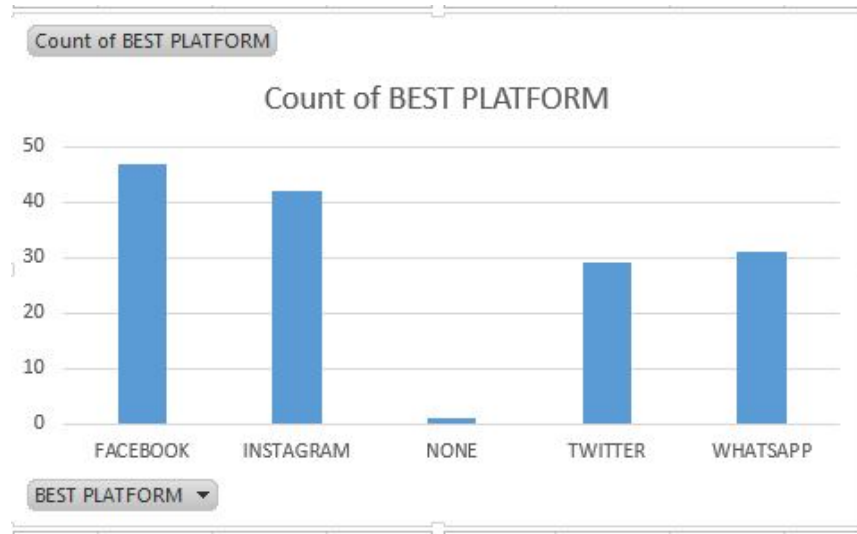


Fig 2: The Best Platform Used

This shows that Facebook is mostly used by people, followed by Instagram, then Whatsapp, and Twitter, and only 1 person does not use any (Fig 2).

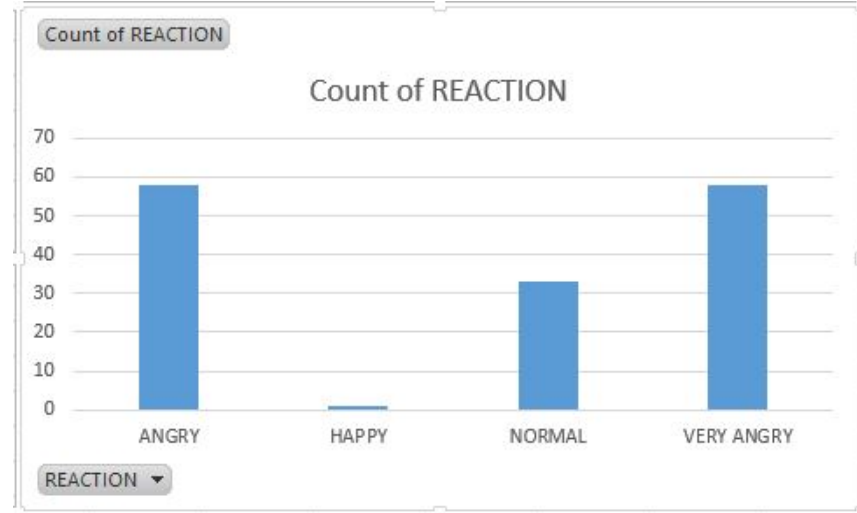


Fig 3: Reaction When Disturbed

Fig 3 shows that 57 users will be angry when disturbed, 1 user will be happy, 35 users will be normal, then 57 will be very angry

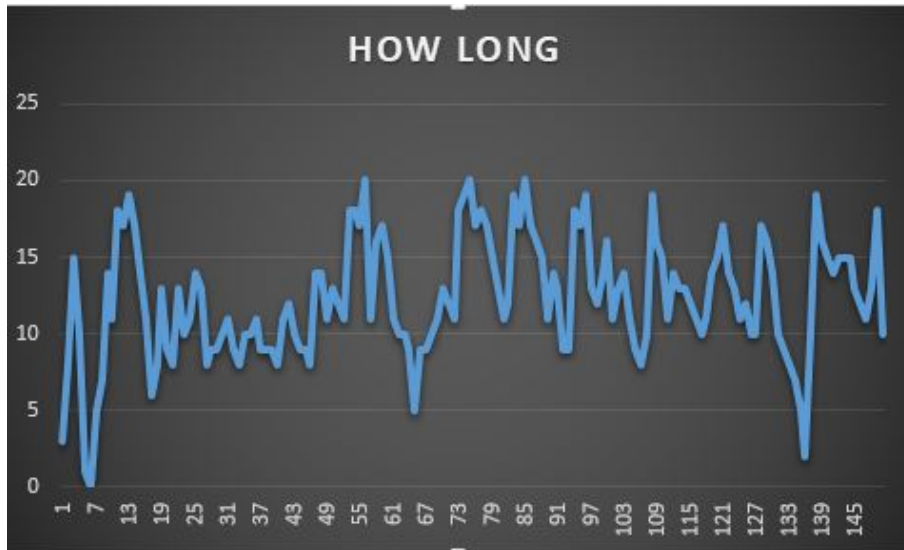


Fig 4: How Long Is the User Online

According to the chart (Fig. 4), people use communication devices for at least 5 hours daily. Additionally, 130 individuals spend no less than 8 hours using communication devices daily.

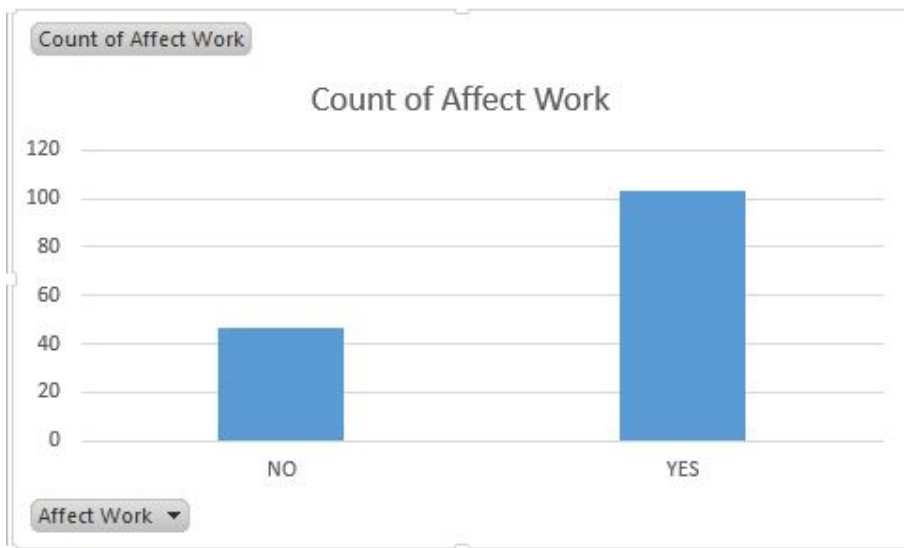


Fig 5: Does it Affect Work

From Fig 5, 105 users agreed that it affects their daily work, and 45 disagreed.

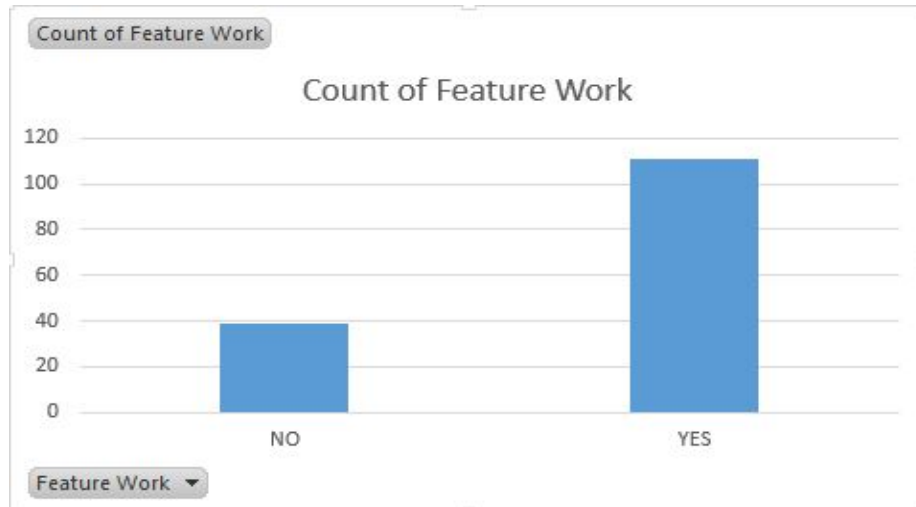


Fig 6: Will the Feature Help

From the chart, 110 users agree there would like a feature to help them regulate their time, and 40 do not agree (Fig 6).

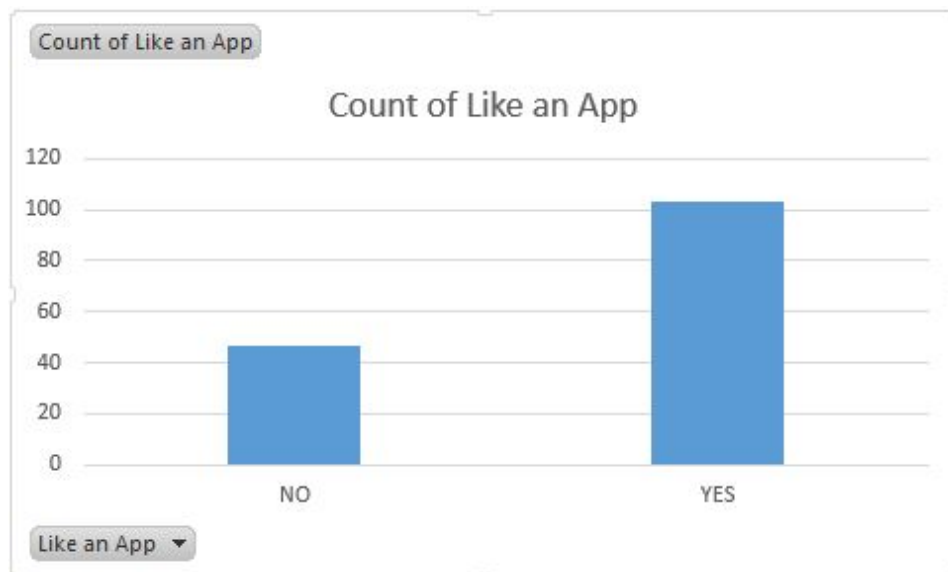


Fig 7: Would Like an App

From the chart, 105 agreed that there would like an app if it was created, and 45 did not agree to it (Fig 7).



Fig. 8: If the App Control your Apps Totally

From the chart, 105 want it to total control their apps, and 45 do not want it (Fig 8).

C. High Level Model of the Application

This model shows the flow of information surrounding the developed application system and is shown in Fig. 9.

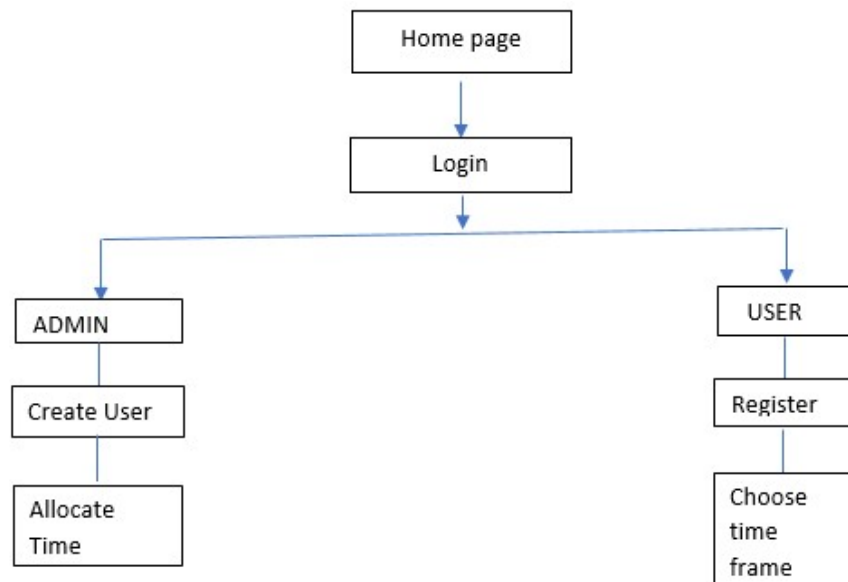


Fig. 9: Flowchart of the Application System (Data Flow Modeling)

4. RESULTS AND DISCUSSIONS

The results were stated and discussed based on collected, analyzed, designed, and implemented data.

A. Results and Discussions of the Application System Developed

The above communication devices are often used, demonstrating their popularity and value. From the analysis, the best communication tool is a phone, and WhatsApp is the most popular platform, followed by Facebook and Twitter. The majority of them are seen to be constantly on Facebook, WhatsApp, and Twitter. All of these point to individuals who are constantly using social media. Students made up the majority of the interview subjects. In addition to being a distraction, communication devices prevent individuals from working by requiring them to use them for at least 8 hours each day, which reduces productivity. This demonstrates how using a communication device can interfere with learning because it takes away time that could be spent studying. This is not encouraging because it would reduce user productivity and hurt the country's economy. People are urged to spend less time on Twitter, Facebook, Instagram, and WhatsApp to be more productive and live healthier lives. Didactics

B. The Application Interface

The developed system was able to handle reminders. It is used to remind the user of the time spent using the internet (Facebook, Instagram, Twitter, Whatsapp, etc.). The first screenshot displayed is Fig. 10.

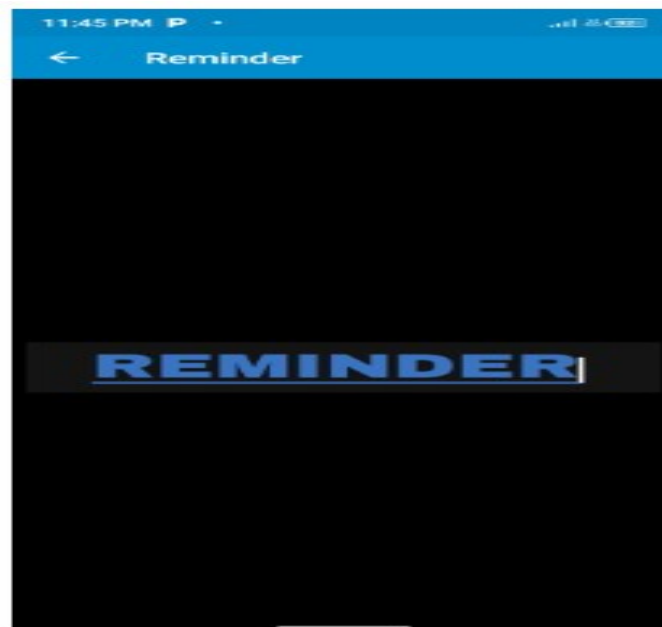


Fig. 10a. Home Page of the Reminder System

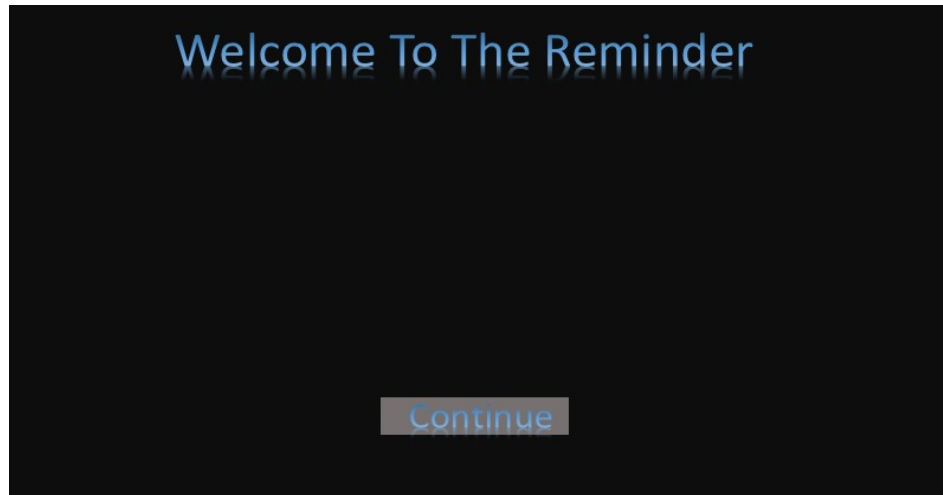


Fig. 10b. Home Page of the Reminder System

C. Admin Login

The Administrator and the User are involved in putting the designed system into use. Each group has a specific task to do. The Homepage menu appears as soon as the system is logged on, as seen in Figure 10. The administrator or director handles the Admin login, which entails the administrator entering the system with their username and password. For security purposes, the administrator is the first user to log into the system. They will be able to add users to the system of the reminder application by using the administrator login. These are shown in Figures 11. and 12. Before gaining access to the system, a user must register to use the application's system, as shown in Fig. 13 and Fig. 14. After entering a username and password, the user will have access to the system; this is known as user login, as shown in Fig. 15.

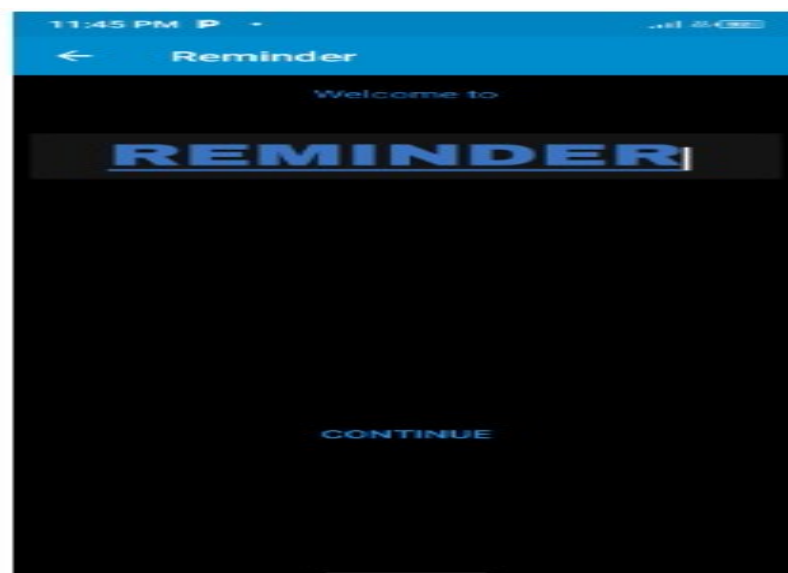


Fig. 11: Admin Page of the Reminder System

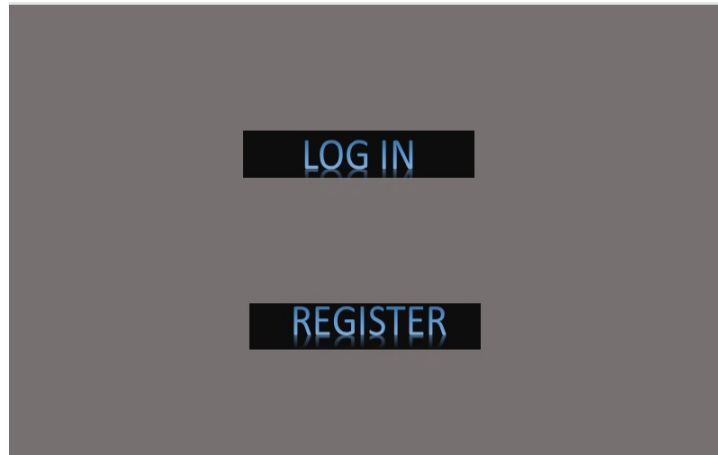


Fig. 12: System User Login Page

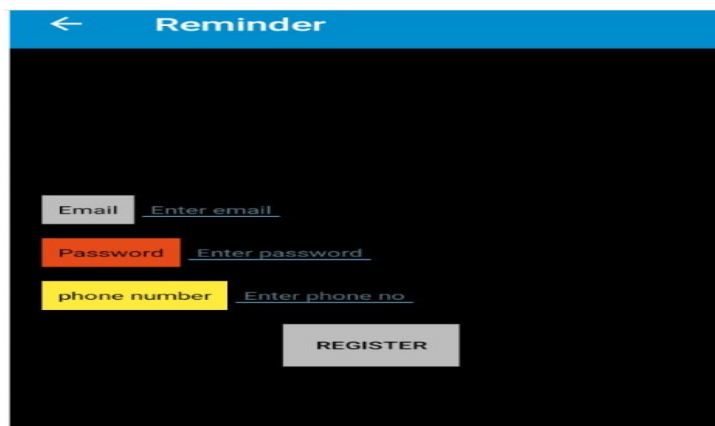


Fig. 13: System User Registration Page



Fig. 14: System User Login Page Contd.

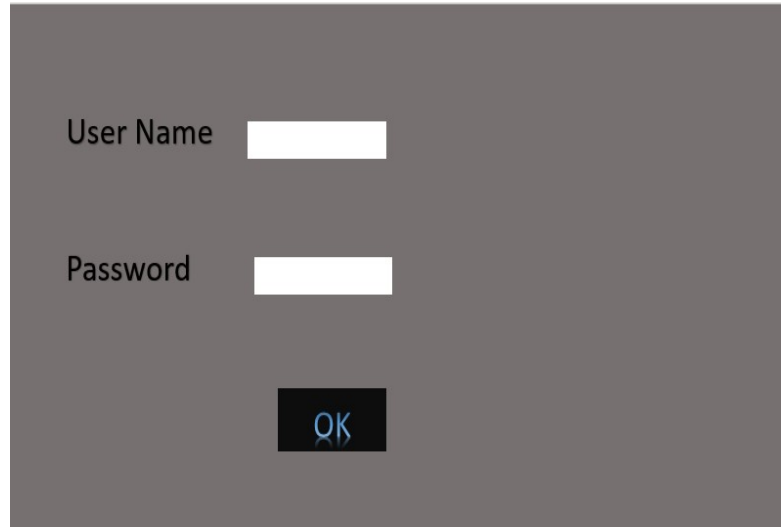


Fig. 15: Login Page of the System

D. Different Applications Considered

This takes care of how the applications are displayed. Figures 16, 17, and 18 displayed screenshots of the various apps under consideration.

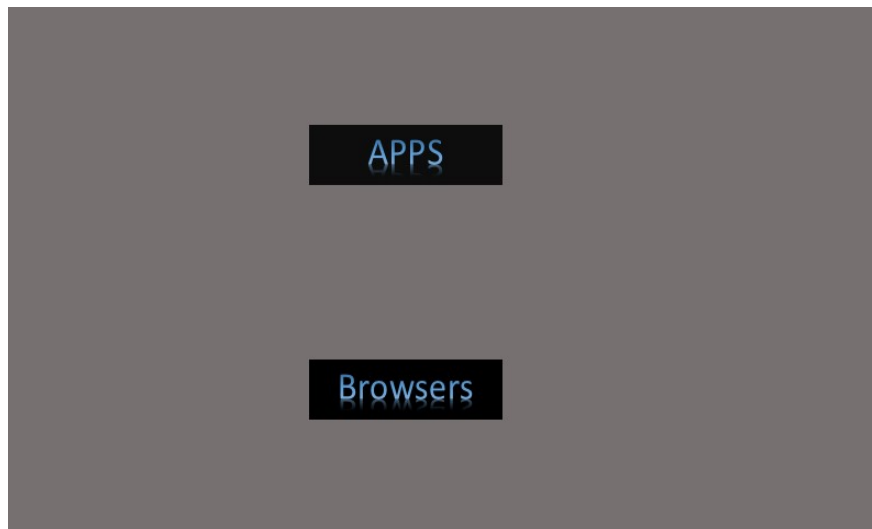


Fig. 16. Application Entry Display Screenshot

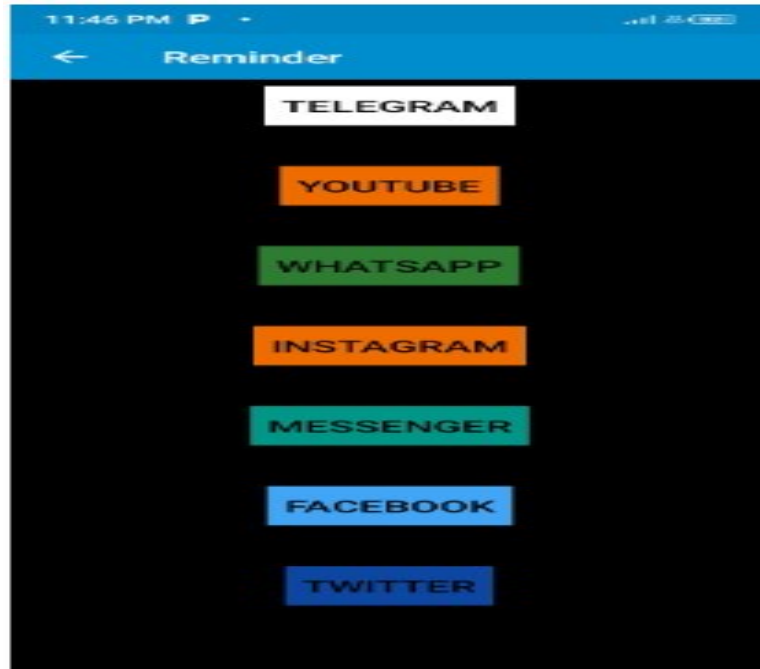


Fig. 17: Screenshots of Social Media page (Application)



Fig. 18.: Screenshots of Browser Page (Applications considered)

E. The Timing System

This shows the screenshot display for recording and presenting the application's usage timing, as seen in Fig 19 and 20. The application termination time up results are shown in Fig 21 and 22.

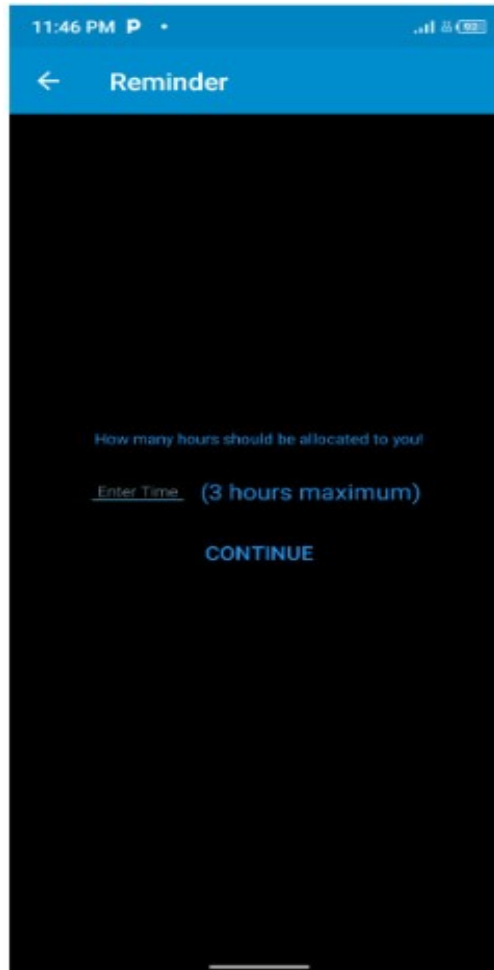


Fig. 19: Screenshot of Time Entry

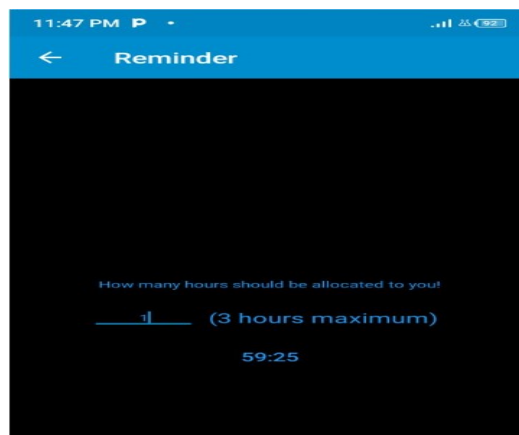


Fig. 20: Clocking system showing time remaining

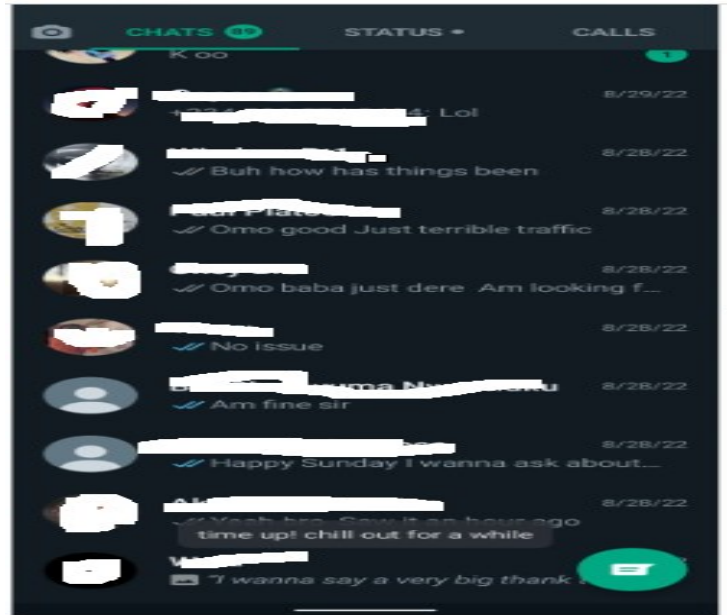


Fig. 21: Application termination reminder



Fig. 22: Application termination reminder
"time up! Chill out for a while"

When the user opens the system, the next thing is to show the homepage for Registration (REGISTER) before the LOGIN page, shown in fig. 10, 11, 12, 13, 14, and 15. So, if you are a first-time user, you create/register with the details required by the system, but if you have an account, you use login with more information you filled in when you registered, then it takes you to the APPS and BROWSER page. On the App and Browser page, choose any of them. Select any option social media app or browser app you want to use (Fig. 16, 17, and 18); then, it takes you to the time page for you to input how long you want to use the application (Fig 19).

It will display the utilized time as it goes on the reminder system (Fig 20). The system will send you a notification time-out when the time elapses (“time up! Chill out for a while”) as shown in Fig 21 and 22.

5. CONCLUSION

The majority of people, mostly students, have been found to use all of the aforementioned communication devices, making them popular and addictive. It has been demonstrated that this is harming their health, academic performance, and productivity. When using social media instead of studying, time spent on communication devices like WhatsApp, Facebook, Instagram, Twitter, and YouTube can have an impact on academic performance. Despite its benefits, it can also have unfavorable effects on the economy of the country. Owing to this need, a system that reminds users how much time they have spent using communication devices was developed. The goal of this project is to create a piece of software that will help people become less dependent on communication devices. To help manage the use of communication devices, the system generates a time limit for internet access. The management system for communication devices is set up to limit the use of devices for communication. In the long run, it will be more beneficial, progressive, and educational for young and older people, especially students, if they choose to use fewer communication gadgets that will help them reduce the number of hours spent.

REFERENCE

1. Cabral, J. (2011). Is Generation Y addicted to Social Media? The Elton Journal of Undergraduate Research in Communications, 2(1). 2011.
2. Cemiloglu, D, Almourad, M. B., McAlaney, J., and Ali R, (2021). Combatting digital addiction: Current approaches and future directions. Technology in Society, Published by Elsevier Ltd; Volume 68, February 2022, 101832; <https://doi.org/10.1016/j.techsoc.2021.101832>Get rights and content
3. DataReportal, (Digital): Global overview report. (2021, February 4). DataReportal. <https://datareportal.com/reports/digital-2021-global-overview-report>;
4. Google Sites (2022). Teaching Computer Networking: Lesson 6 - Communication Devices; Powered By Google Sites. Accessed 22nd August, 2022. <https://sites.google.com/site/pnutpck11/lesson-6--communication-devices>
5. Igi Global (2022). <https://www.igi-global.com/dictionary/business-models-for-digital-economy/29481>. Accessed 22nd August, 2022.
6. Kumar A. K., and Sherkhane M. S., (2018). Assessment of gadgets addiction and its impact on health among undergraduates: *International Journal of Community Medicine and Public Health* | 7th August 2018 | Vol 5 | Issue 8 Page 3624: 5(8):3624-3628 <http://www.ijcmph.com>; DOI: <https://dx.doi.org/10.18203/2394-6040.ijcmph20183109>
7. Mizuko Ito, Heather Horst, Matteo Bittanti, Danah Boyd, Becky Herr-Stephenson, Patricia G. Lange, C.J. Pascoe, and Laura Robinson with Sonja Baumer, Rachel Cody, Dilan Mahendran, Katynka Martínez, Dan Perkel, Christo Sims, and Lisa Tripp (2008). Living and Learning with New Media: Summary of Findings from the Digital Youth Project. The John D. and Catherine T. MacArthur Foundation Reports on Digital Media and Learning; November 2008
8. Mohammad Nabil Almunawar, Muhammad Anshari and Heru Susanto (2018). Adopting Open Source Software in Smartphone Manufacturers' Open Innovation Strategy. Igi-Global

- Publication. Copyright: © 2018 |Pages: 13; DOI: 10.4018/978-1-5225-2255-3.ch641.
<https://www.igi-global.com/chapter/adopting-open-source-software-in-smartphone-manufacturers-open-innovation-strategy/184435>
9. Reagan R. (2019), Technology Addiction. Cutting Edge Writer in The Independent on April 24, 2019. <https://gbsindependent.org/7390/in-depth/technology-addiction-2/>
 10. Sandeep T. K. (2016). A study at the digital gadget addiction of youth in south India. Online International Interdisciplinary Research Journal, {Bi-Monthly}, ISSN 2249-9598, Volume-VI, Sept 2016 Special Issue. <https://www.researchgate.net/publication/350689476>; September 2016
 11. Stevanović, D. (2020). Introduction to the Special Issue on problematic behaviors related to Internet use: Facts, conjectures, and oranges. *Psihologija*, 53(3), 225– 236. doi: <https://doi.org/10.2298/PSI200413015S>
 12. Surat, S., Govindaraj, Y. D., Ramli, S., & Yusop, Y. M. (2021). An Educational Study on Gadget Addiction and Mental Health among Gen Z. *Creative Education*, 12, 1469-1484. <https://doi.org/10.4236/ce.2021.127112>; (2021).
 13. Thomée S, Härenstam A. and Hagberg M. (2012). Computer use and stress, sleep disturbances, and symptoms of depression among young adults – a prospective cohort study. *BMC Psychiatry* 2012, 12:176. Doi:10.1186/1471-244X-12-176; <http://www.biomedcentral.com/1471-244X/12/176>.
 14. Tsitsika, A. and Janikan, M. (2013), Internet use and Internet Addictive Behaviour Among European Adolescents: A cross-sectional study, EU NET ADB.