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# Self Discipline Time-Restricted Smartphone Addiction Management System Using (Andoid) Mobile Technology

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## ABSTRACT

Invention of technology has been one of best   things that has happened to mankind. It has been an integral part of our society. It is part of everything we do including how we learn and teach. Smart phones have become an essential part of human life. They are integrated with multiple and different features that allow us to communicate with the world, organize our lives and document events. One of the most important features is location-based services. Smart phones use different features to get the location of the phone. One of these features is the GPS. The GPS uses satellites to get the exact location of the phone in terms of longitude and latitude.  In this work, a self discipline time-restricted smartphone addiction management system was developed using andoid mobile technology.

**Keywords**: Mobile Phones, Self-discipline, Android Technology, Addiction and GPS.

## 1. INTRODUCTION

The smart phone utilizes this coordination and uses them to show the phone's location in a map application. In addition, special mobile applications have been developed with various abilities of navigating. Implementing a collaborative disciplinary system using mobile devices requires technical and cognitive knowledge. Developers have to consider the usability of the mobile application and the collaborative environment to ensure effective learning activities. Use of mobile devices has steadily grown in popularity to become one of the most common consumer devices. Mobile devices are cheaper in comparison to laptop computers so that we can carry and use them anywhere in the world. Although the technologies have also been changing rapidly the educational environment and the programs of colleges/universities since new technologies propose different learning skill. Mobile applications are more flexible and can integrate the existing services by employing web-based interfaces. Addiction is a condition that results when a person engages in an activity (for example, gambling, sex, shopping, and smartphone application usage) that can be pleasurable but the continuation of which becomes compulsive and interferes with ordinary responsibilities and concerns, such as work, relationships, or health. People who have developed an addiction may not be aware that their behavior is out of control, thereby causing problems for themselves and others [4].

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According to study conducted by Flurry, it shows that consumers spend over five hours a day on mobile devices! About 86% of that time was taken up by smartphones that is, meaning we spend about 4 hours, 15 minutes is spent on mobile phones every day.

On a recent report published by Twinepine , it states that on a daily basis, an average smartphone user in Nigeria spends about 193 minutes on the device either browsing, texting or making calls. It also informed that Nigeria has 74.7 million unique mobile users and 30% smartphone penetration rate.

## 1.1 Statement of Problem

It is targeted that this project will serve as good indication of how important a smart phone could be to assist in self-discipline.

The major problem of using Smartphone applications is that most of them are very addictive and there is little or no controlling measures to prevent usage of these applications. The current systems available do not actually prevent Smartphone Addiction

## 1.2 Aim and Objectives

The aim of this project work is to design and implement a self-discipline time-restricted smartphone addiction management system using (android) mobile technology. The objectives of the project are as follows:

- To Design and implement a logical and practical system that enables one to curb his or her addictions to smartphone and to be more productive.
- To develop a very secure application that enables the user to **just lock his or her apps** so that others don't get to use the app or read private messages.
- To develop a simple and structured application that shows application usage statistics for the user to know how addicted he or she is to an application.
- To develop a mobile application that would enable a user to lock his or her mobile application at a desired time, for a specific duration.
- To develop an application that enables one to set alarm

## 2. REVIEW OF RELATED WORK

In many other countries, Information and Communication Technologies are being synchronized into efficient, sustainable and reliable solutions for Smartphone Addiction Management Systems (SAMS). In this study, efforts were made to study closely related systems (SAMS) developed around the world to help smartphone addicts to discipline and manage their time. The only problem with these systems or applications is that they are not time-based and they still give users the opportunity to go back to their applications which defeats the whole idea of self-discipline. Other related works were reviewed to study and examine their design techniques, limitations and ways it could have been done better.

## 2.1 Academic Achievement

Someone cannot get his or her achievement without any effort. Djamarah (1994) Achievement is the thing that we get through a great work with a pleasure willingness to do so. Based on the dictionary entitles  Kamus Besar Bahasa Indonesia, the word "academik" is derived from "akademis" which means as a high educational institute that already organizes the students at least in 3 years. The academic achievement is inseparable with the learning process. Academic achievement is as the result of the activity that we already done, do the work with full of effort in the high academic institute field (Alfani, 2007).

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In this research, the academic achievement refers to GPA (Grade Point Average) of the students of Information Technology Information Department. The factors that influence the academic achievement can be classified into two, namely internal factor and external factor. Slameto (2003) One of the internal factors is time management and the external factor is the use of the learning facilities that influence the students academic achievement.

## 2.2 Time Management

Peter f. Ducker argues that time is most precious thing that the people should manage well and the good time management reflects his or ability to manage the other thing (Setiawati, 2015). Time is the consideration for a good work potency that should be managed well. That is why a schedule is very important to help someone to manage the time to be efficient. According to Atkinson (1994), time management is one of a skill that has close relation with all of effort and activities which are arranged well to help individual to manage their time wisely. Macan (1994) time management would be more efficient if individual classifies and distinguishes between the needs and the wants and try to view that the assignment is the most priority. The ability to use the time in effective, efficient, and productive is as the result of the good habit in managing the time well. Gea (2014) The basic concept of time management is the use of time effectively in order to some activities such as a task.

## 2.3 Current Method In Use

The traditional clinical approach for screening and assess- ment in behavior addictions has been surveys and interviews. However, there are a massively large number of subjects in smartphone addiction. Furthermore, continuing intervention would be essential for daily-life treatment of addicted people. This paper presents the SAMS (Smartphone Addiction Man- agement System), a comprehensive ICT system for objective assessment-based diagnosis and intervention for smartphone addiction. We describe the system requirements, architectures, and typical use scenarios of the smartphone addiction man- agement system. Then, we describe the system verification methods: operation checking by manual records, and through a comparison study with a pilot test. The correlation between the usage measure and paper-based addiction scale is also examined. Finally, we discuss the future improvement of the SAMS, together with comparison with related ICT systems.

## 3. METHODOLOGY

A hybrid of waterfall model and Incremental Development approach would be adopted in developing the proposed system. Interview with stakeholders to get requirement document. Design and Implementation of Self-Disciplinary Time-Restricted Smartphone Addiction Management System using java (android) mobile technology

## 3.1 Research Model

Drawing conclusions from the theoretical background of this research, a research model was developed to explicate the determinants of smartphone addiction. [17] applied four category motivation framework and identified a total of six smartphone motives. In specific, enhancement motives include information seeking and perceived enjoyment. Social motive refers to social relationship. Coping motives include mood regulation and pastime, and conformity motive refers to conformity. In total, it was proposed that these motives are key determinants of smartphone addiction. Figure 1 depicts the research model of this study.

**Information Seeking:** Research shows that many individuals use the Internet for information purpose and self-education [18]. Internet addiction is likely to be positively reinforced if the need for information seeking is gratified immediately. [19] confirmed that the reinforcing effect from the gratification of information seeking may lead to users' maladaptive dependence on the Internet. In this context, it is obvious that information seeking may be

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an important smartphone motive because users go online to get information. In Figure 1, H1 depicts that Information seeking is positively associated with smartphone addiction. Perceived enjoyment of interacting with information technology has been shown as a key factor that affects smartphone addiction. [20] pointed out the dark sides of enjoyment in the context of social networking websites.

They found that if users perceive the websites to be enjoyable, then they are likely to become addicted to using the websites. Similarly, prior research contends that enjoyment is closely related to substance abuse.

## 3.2 System requirements

The key goals of the SAMS are to provide a comprehensive framework for an objective data-driven study for addiction study and treatment, specifically, to itemize the assessment metrics, analysis algorithm, and treatment strategies. We developed the system requirements starting from Young's clinical guideline of Internet addiction [8] and Gustafon et al's relapse prevention model in A-CHESS [9]. Then the unique properties and capabilities of smartphones, such as their mobility and 24-h-companionship, are included for system requirements. The system requirements are reviewed by the co- working national project team from St. Mary Hospital, Ulji Hospital, and Seoul National University Hospital, South Korea. Table 1 summarizes the key functionality for each stage of the SAMS. The first function is to effectively monitor and store the key usage data for usage patterns. The second function is to provide analysis tools for evaluation of usage data to diagnose symptoms. The last is to deliver intervention and provide a self-control mechanism.

## 3.2 System architecture

The overall system architecture and workflow of the SAMS framework. On the client side, the SAMS application continuously monitors applications in use, and stores the usage records locally. Users may view the locally stored records for self-recognition and control. Periodically, the new records are transmitted to the SAMS server via the Internet. The usage records are archived in the SAMS server's database, and statistical and data mining analysis are performed on the data for the diagnosis and treatment to be conducted by clinicians. Clinicians can determine feedback actions, such as requesting current condition check survey or updating the usage limit time table for a specific application. While in the early stage of studying smartphone addiction, most studies focus on assessment and evaluation of the extent of addictive use of smartphone. We also aimed to develop treatment techniques and study the outcome of their efficiency.

Young [7] suggested possible treatment techniques for Internet addicts:
(a) Practice the opposite time in Internet use (for example, to shift the Internet use time from evening to morning, or reverse)
(b) Employ external stoppers
(c) Set goals
(d) Abstain from a particular application
(e) Use reminder cards
(f) Develop a personal inventory
(g) Enter individual therapy or a support group.

The usage-abstaining function and individual therapy are included in the SAMS application. For example, when a user is playing a special game application for more than the designed usage time, the SAMS client will pop up a warning message and block the user from the game application. The usage restriction function is especially designed for elementary to high-school students for preventing overuse in classrooms, and will only be used for the contracted users.

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### 3.4 Client system design

The SAMS client application is developed on Google Android based smartphones. In the Android system, a component of an application has to be one of our Java classes [10]:'Activity is for user interaction and output display, 'Service' is for a long running background service, 'Content Provider' is for persistent data storage, and 'Broadcast Receiver' is for waiting for system wide events. The proposed SAMS client application is composed of eight activities, two services, one content provider, and three broadcast receivers. Due to space limitations, we describe only the operation of the usage monitoring mechanism, which is the key function for our study. First, the foreground application in the Google Android system can be obtained from the system service 'android.app. Activity Manager'. The monitoring service periodically checks the changes in the foreground application and records its start time, end time, GPS location, and URL if the application is a browser.

The GPS location can be obtained from the Android service, 'android. location. Location Manager', and the current URL can be obtained from the Android browser history content provider, 'android. provider. Browser'. Then the usage data is first stored in local 'SQLite' database, and then transmitted to the server whenever Internet access, either WiFi or cellular data, is available. Taking into account the LCD display device's status, the SAMS client does not include the duration of the time the LCD display is off. Special consideration has been taken to maintain the periodic checking process in the Android system without interruption due to its memory limitation and process kill mechanism. In the current implementation, the system sets up the Android system alarm service to send 'Pending Intent' periodically every 3 s. We compared this 'Alarm service plus Pending Intent' method with an alternative, 'Service with Timer Task' method, and finally chose the proposed one be-cause of its reliability (not unintentionally terminated)and low power-consumption.

### 3.5 Server system design

This illustrates the architecture of the SAMS server sys- tem. The server receives and stores the data (user profile and client system information) from SAMS clients, performs data analysis/mining, and finally provides graphical and numerical information for the clinicians for analysis, diagnosis and treatment.

### 3.6 Output Design

The application is design to accomplish addiction of all users on a smart phone. The following are the output result generated

**Conformity:** The conformity motive emphasizes individuals' needs of avoiding peer disapproval. According to Stewart's work, conformity mediates the relationship between fear of negative evaluation and problematic drinking behave or. In the context of this study, research has shown that individuals use smartphone to gain identification and avoid disapproval among their friends. This is what is popularly known as peer-pressure. Therefore, if a smartphone user has a high level of conformity, then it is likely that he or she will keep using the device and become addicted. In as much as the popularity of smartphones has given enormous convenience to our lives, their pathological use has created a new mental health concern among the community. The excessive usage of smartphones has been the major reason or agent behind academic failure, lack of productivity, laziness and the rest. To cope with this limitation, Self-Disciplinary Time Management System was developed to help the user reduce the number of hours spent on the phone.

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**Mood Regulation:** Mood regulation is defined as mood changes due to thrill or relief created using information technologies. found that some users may have problematic Internet use issues because of trying to reduce negative feelings, such as loneliness, anxiety, stress, and depression. Therefore, in this study, it is proposed that if a user often experiences mood regulation when he/she uses a smartphone, then he/she is likely to have a high level of smartphone addiction. Hypothesis H4 is proposed (Figure 1).H4 depicts that Mood regulation is positively associated with smartphone addiction.

**Pastime:** Pastime refers to occupying free time with no productive interest. This is a primary motive for adolescents to play video games. Boredom has been found to significantly influence game addiction. Players who have boredom inclination may result in negative consequences (for example addiction). Based on these concerns, this study proposes that if a user has a strong motive of using a smartphone to pastime, then he or she is more likely to be addicted to using the device.
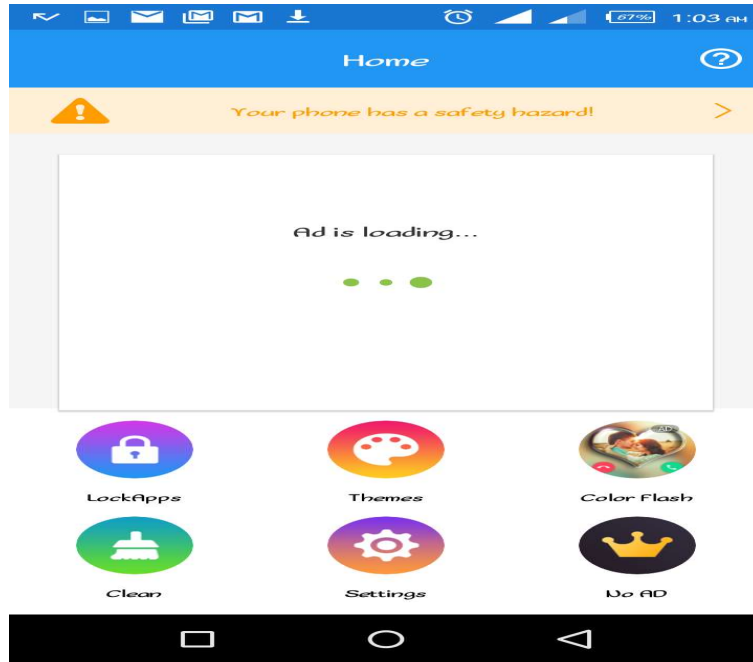
### INPUT DESIGN

For the self discipline time-restricted smartphone addiction management system some input data are required into the smart devise: those input data include:

i.      user's name
ii.     Set alarm Method
iii.    Locking of some application for some specific period of time
iv.    Select Discipline Test Method
v.     Input specific date or time to activate smart phone discipline.
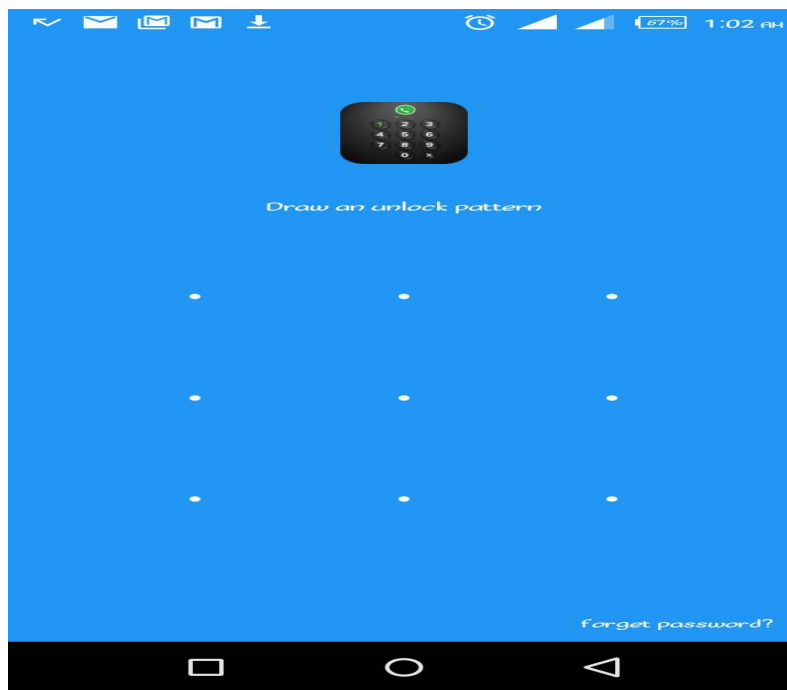


**Fig 1: Pattern Draw:** This is the first interface of the application, where disciplined setup is been made. The pattern is drawn to secure the app and cannot be bypassed

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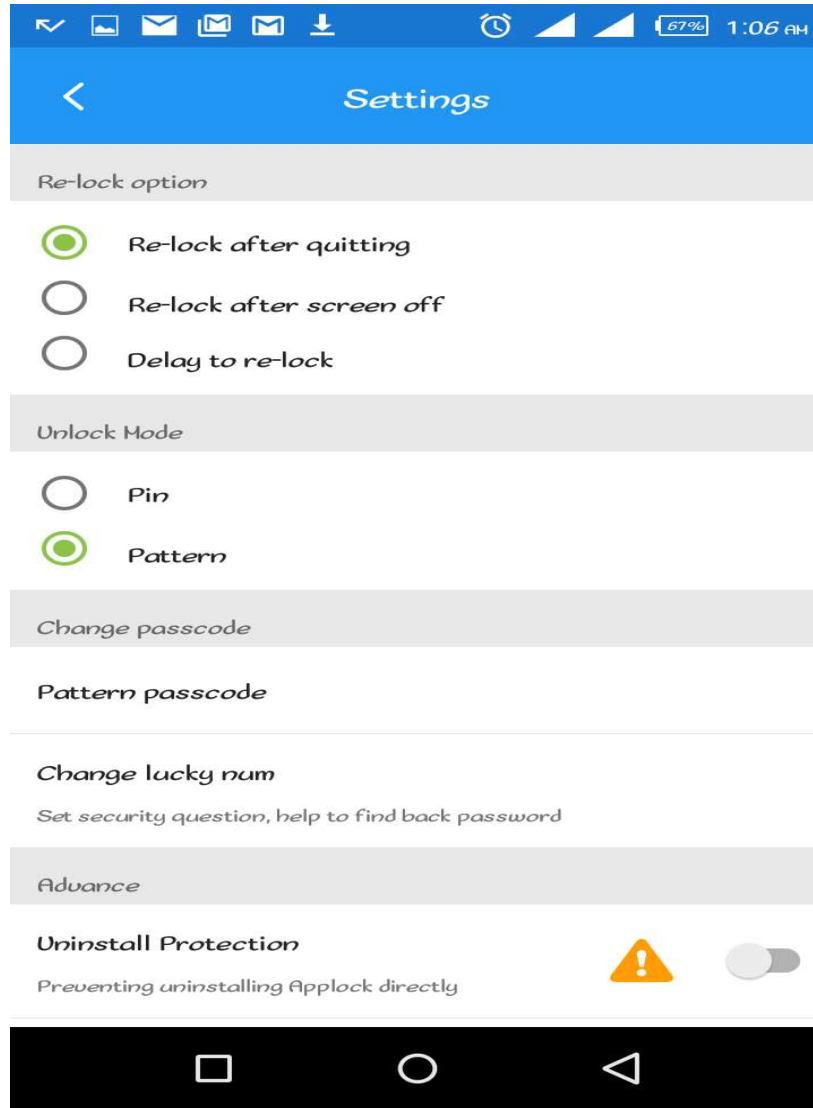KEAN University, New Jersey, USA - www.isteams.net/usa2019

**Fig 2: APP HOME INTERFACE:** this is the home interface of the application. This linkup all of the application menu: Settings, Lock Apps e.t.c
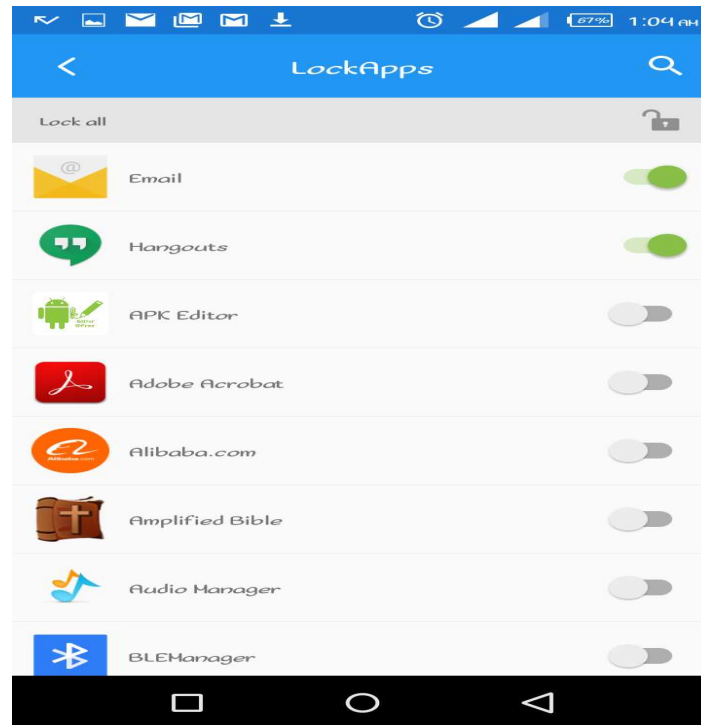


**Fig 3: LOCK APP:** This interface lock all the app that causes distraction to the user and it disable its direct use.

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**Fig 4: SETTINGS:** this interface is design for proper settings of the user where user can change lock patterns and also change lock num and also set some relock patterns.
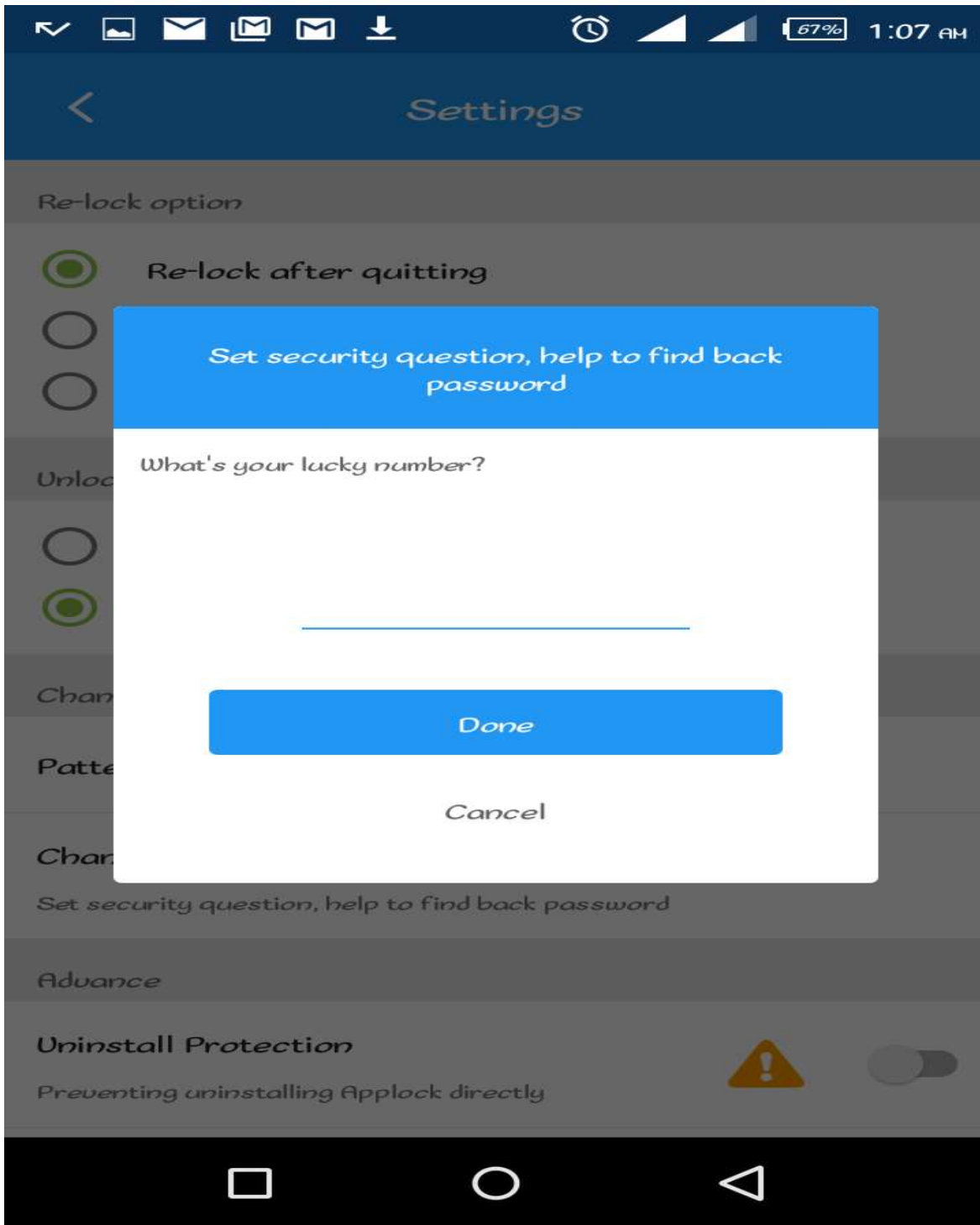
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**Fig 5: Security question to help restore or find password**

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## 4. FILING AND PROCESS DESIGN

### 4.1 File Inputs
For the development of this smart phone discipline system, some input record or data is needed to be stored in a container or a body (Database). This enables easy retrieval of any needed data when ever or in any module of the application. The database use for this application is called Sqli Database system, which is best use in the development of any android Applications.

**Table 4.1 Entries of Documents**

| FIELD NUMBER | FIELD NAME | FIELD TYPE | LENGTH |
|:---:|:---:|:---:|:---:|
| 1 | Fname | VARCHAR | 15 |
| 2 | Mname | VARCHAR | 15 |
| 3 | Lname | VARCHAR | 15 |

**Table 2:  Table Records Of Users Login**

| FIELD NUMBER | Field Name | Field Type | Length |
|:---:|:---:|:---:|:---:|
| 1 | User name | Text | 10 |
| 2 | Password | Text | 15 |

**Table 3: Table of Requirement**

| FIELD NUMBER | Field Name | Field Type | Length |
|:---:|:---:|:---:|:---:|
| 1 | req_id | INT | 20 |
| 2 | req_content | VARCHAR | 18 |
| 3 | admin_id | INT | 15 |

### 4.2 Process Design

**Programming Activities Necessary**
This application is designed with Extended Markup Language (XML) which happens to be the appropriate and best tool for it as at the time the study was conducted.  The system has a page or activity that is shown when a user launches the application. It contains a list of all the installed applications on the user's phone with two buttons to either lock or block applications. Once the user clicks on "LOCK", it automatically locks the selected applications but if the user clicks on "BLOCK", a time selector popsup for the user to select the range button.
- Some other application is also use to develop this app, application such as
    - i.        Android Studio
    - ii.        Java Development Kits

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## 5. SUMMARY CONCLUSION AND RECOMMENDATION

### 5.1 Summary
Addiction is a condition that results when a person engages in an activity (for example, gambling, sex, shopping, and smartphone application usage) that can be pleasurable but the continuation of which becomes compulsive and interferes with ordinary responsibilities and concerns, such as work, relationships, or health. People who have developed an addiction may not be aware that their behaviour is out of control, thereby causing problems for themselves and others. According to study conducted by Flurry, it shows that consumers spend over five hours a day on mobile devices! About 86% of that time was taken up by smartphones, that is, meaning we spend about 4 hours, 15 minutes is spent on mobile phones every day.

### 5.2 Conclusion
The system is built for anyone who wants to be more productive by reducing the amount of time spent on using his/her smartphone. The major limitation of the system is the ability of the user to uninstall the application when an application has been locked out for a particular period of time in order to get access to the application he/she wants to use. The only way to combat this limitation is to make the application a system application which means the user would not be able to uninstall the application. Since many people get addicted to their smartphones which majorly leads to failure in academics and other negative results, therefore, this system aims to curb addictions and attachments to smartphones and mobile applications. It is hoped that this study would be an inspiration for further research in the field of Smartphone Addiction Management Systems. This system would help in curbing addictions to smartphones.

### 5.3 Recommendation
Due to attachments to smartphones and mobile applications, there is a major need for technologies that would help curb addictions and attachments to smartphones. The Smartphone Addiction Time-based Management System has implemented a basic part of Smartphone Addiction Management Systems (SAMS) which is locking applications within a particular time frame. However, a whole lot of features can be added to this system to make it more robust.

For further expansions, the following features are recommended:
 i. Addition of URL blockage of some sites. This feature will prevent users from going to certain sites (i.e. pornography sites) they always find themselves going to.
 ii. Incorporation of a feature that automatically locksan application if the user has spent countless hours on the application.

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