Eagle Eye

FYP-1

Supervisor

Usman Ahmed Raza

Submitted by

Syed Qasim Ali

{F16-1413}

M. Ali Raza

{F16-1335}

Danish Imran

{F16-1120}

Laiqa Anwar

{F16-1405}

Department of Computer Science

Lahore Leads University

Date of Submission: 4-2-2020

Abstract

We are working on android application for parents who want to monitor their kids' activities on phones and tablets, customizing control features and how devices are used. Our application will help the parents in a lot of ways

Contents

Chapter 1: Project Overview

1. Introduction

Monitoring and controlling electronic devices and systems have been developed as technology changes over the years. Under the security sciences, the concepts of monitoring and controlling devices focus on possible threats and defining polices. This part of the survey discusses the different methodologies and terminologies used in controlling and monitoring mobile devices. Applications for the Android operating system are programmed using the SDK Android software development kit and Java programming language that also may be used with C or C++. The SDK is a rich programming platform with a variety of development tools that includes libraries, debugger, documentation, sample code, and Tutorials.

2. Objective

We are working on android application for parents who want to monitor their kids' activities on phones and tablets, customizing control features and how devices are used. Our application will help the parents in a lot of ways.

With Eagle Eye application, parents will decide which app and tool can be accessed by your children, so they can have fun online in the safest and most convenient way. Monitoring and controlling methodologies and approaches have been developed as the technologies are started or developed. As human being, there are some concerns when using emerging technology. These concerns push developers to innovate ways to test, control, and manage new technologies. One of the most known approaches is based on the use of distributed architecture for the monitoring and controlling connected devices. This distributed design allows for central controlling component over the connected devices either using client server approach, or mobile data management approach which will be the focus on this survey to monitor mobile devices.

This survey is the base to help building up the proposed project, which will research the different methods available for technology usage surveillance. The project will focus more on the parental control over children's mobile devices. Furthermore, the project will develop a controlling application for parental use on children's mobile devices. The proposed application may help guardians to not only control, but also evaluate the way their children handle and utilize the technologies available at their tablet devices. This survey is the base part of the project that includes the background for researching and developing the proposed application.

3. Problem Statement

On the digital century where technology reaches kids hands, guardians may worry about the effect of this very open world on their kids' development. They may worry about the detrimental effect of this

technology on their educational, emotional and social developments. As mobile devices are one of the most used technologies by children on our society, guardians will need to have some automated technologies to observe and supervise the time and quality of their children's usage for these mobile phones.

4. Problem Solution for Proposed System

The problem Solution is that to develop a system/application for parents they can keep eye on their child. We develop a parent monitoring mobile application Eagle Eye for parents they can monitor their child and their activities on mobile. Parent can access the child mobile to keep eye on their activities of child on mobile

5. Benefits of Proposed System

Obviously every parent wants to save their kids from the evils of the world but all parents don't perceive the evils in same way. Some are over protective and make quick decisions while others give full freedom. Evidently we know both extremes cannot be acceptable, so therefore parent monitoring application are best options to tackle these problems. Parent monitoring application is a safety guard for busy parents. It helps parents to control and protect kids without checking their smartphones manually on a daily basis. With the help of parent monitoring application one can easily checkout their kids mobile contacts, messages, location, install app restriction and further unique features for parents to keep eye on their kids

6. Scope

Scope of this application is to help the parents to monitor their child's activities. Application will help to monitor the child apps, SMS, call logs and installed apps. Application will minimize the human effort and have the ability to monitor child in a good

7. Modules:

7.1 Child Side

Module 1: Name

Enter the name of child in string

Module 2: QR Code

App generate QR Code for the parent access to scan and create relation between parent and child

Module 3: Change Dial Pad Pin

By Default pin is set but user change the pin in int type

Module 4: Restrict To Uninstall
Restrict to uninstall the application whenever child user want to uninstall a app but they don't uninstall

Module 5: Remove Restrict To Uninstall
User have also an option to remove a uninstall restriction

Module 6: Hide App Icon
User hide an app icon from child user

Module 7: Show App Icon
User have also an option to show app icon in child mobile

7.2 Parent Side

Module 1: Sign Up
User install application on mobile and register to fill the short form username, email, password and sign up and submit

Module 2: Login
When user successfully sign up than login on the application by the register username or password

Module 3: Scan QR Code
Parent side user scan the QR Code from the child side user and create relation between parent and child to access data this relation is one to Many Relation One parent can access many children's

Module 4: Childs list
After the QR Code scan the list of child display

Module 5: Menu
To click on the child Menu display with the attracted UI for the user with features buttons. Easily access the parent side user just press a button and access the child side user

Module 6: Messages
Parent side user access the sim message of child side with contact number or conversation

Module 7: Call Logs
Parent side user access call logs from child side user call history

Module 8: Contacts
Parent side user access the mobile Contacts from child side with Contacts name

Module 9: Application
Parent side user access the all mobile install applications from child side user and also lock each and every application

Module 10: Location
Parent side user access the current location from the child side user

8. System Limitations/Constraints

1. Parent cannot check install apps history
2. API 16 Android Version 4.1 Jelly Bean
3. Must Internet Access
4. 1 GB RAM

9. Software Process Methodology

The main three difficulties that would face researchers in this area include the balance between security and the ease of use, the uncertainty of testes data used through mobile context, and violating personal privacy boundaries [3].

Most of the monitoring and controlling approaches require adding more system layers or components. Examples for added layers or components would be presented as permissions, passwords, policy, or verifications [2]. The more the system use these security activities the more is difficult to maintain flexibility and ease of use. Balancing security and smooth usage is hard to maintain especially with using other layers such as networking or mobile devices [4].

The research challenge associated with the mobile context elements on the mobile devices, such as mobile phone and tablets, is based on the changing circumstance of using such portable devices. The unexpected and unstable background environment may cause the lack of pure and correct data gathering (noisy data) that would affect the effectiveness of the data analysis and the persuasion stage [5].

The most difficult challenge to overcome is the handling personal data when monitoring and controlling systems. Users may hastate to share their personal information or may provide incorrect data, especially most systems only ask for permission to access data without explaining how the data is going to be used. Providing personal data for longtime using mobile devices for examination purposes is a hard task to maintain, so that researchers may do such experiments using labs with few devices. Yet such setting would not provide the research with data used in normal circumstances [7].

Design:

The Design Phase of the project started in early July, and we will continue working on the following aspects:

Analyze Play Store:

We will carefully study Parent Monitoring Applications on Play Store, how they work which features they have and check UI.

Design Techniques:

We will design algorithm for contacting two different mobile application over the internet.

Design the database:

We will design an entity-relationship schema (ER diagram) for our Eagle Eyes Parent Monitoring App database. The ER diagram will help us design a stable and efficient database.

Design the user interface:

Design the UI (User Interface) for our Eagle Eyes Parent Monitoring App that is use to you and display features of our application in Adobe XD.

Implementation:

The Implementation Phase will include the following aspects:

Develop the Application:

Based on our design, we will use java to write the program of our application.

Build the database:
Based on our ER diagram, we will use SQLITE to build our application database.
Build the user interface:
Based on our design, we will use XML and Android Studio Drag and drop platform to develop the user interface.
Testing:
During the development process, unit testing will be done to ensure all modules are built correctly. System integration testing will be done after we have built all the components and combined them into the application. We will test the database, the algorithms and the user interface.
Test the connectivity:
Test the connectivity between parent and child Application.
Test the Database:
Test the database to ensure that all child history storing in database or not.
Test the User Interface:
Test the user interface to ensure that all button working properly.
Evaluation:
After we have finished all the testing, we will evaluate the system to check whether it fulfills our objectives or not.

10. Tools and Technologies
Hardware:

Development on Laptop or PC:	MS windows o 10
Testing on Android Mobile:	Android OS version Jelly Bean and above

Software:

JAVA and PHP	Language
XML and android Studio	for develop UI
SQLI, Shared Preference, SQLite	for our Database
Android SDK	Compiler
Adobe Photoshop, Illustrator	for graphic design
Adobe XD	for UI design
Genymotion (Emulator)	for testing program.

11. Project Stakeholders and Roles

Our projects stakeholders:

Parent can monitor the activity of child

Admin can manage the overall performance of application

Developer play a role to the maintenance of application

12. Team Members Individual Tasks/Work Division

Task	Ali	Qasim	Danish	Laiqa
Do the Literature Survey	○	○	●	○
Analyze Play Store Parent Monitoring App	○	○	○	●
Design Features	○	●	○	○
Design the Database	○	●	○	○
Design Data Algorithms	●	○	○	○
Design the User Interface in Adobe XD	○	○	●	○
Develop the application	●	○	○	○
Build the Database	○	●	○	○
Develop the Algorithms	●	○	○	○
Build the User Interface	○	○	●	○
Test the Application programs	●	○	○	○
Test the Database	○	●	○	○
Test the connectivity Algorithms	●	○	○	○
Test the User Interface	○	○	○	●
Perform Integration Testing	○	●	○	○
Write the Proposal	●	○	○	○
Write the Monthly Reports	○	●	○	○
Write the Progress Report	○	○	●	○
Write the Final Report	●	○	○	○
Prepare for the Presentation	○	○	○	●
Design the Project Poster	○	○	●	○

13. Gantt chart

Tasks	Start – End Date	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
Finalize the group members	Aug 20 – Aug 25								
Discussion about different problem and different technologies	Aug 26 -- Sept 5								
Finalize the technology and FYP topic	Sept 6 -- Sept 10								
Research about FYP	Sept 11- Sept 20								
Working on FYP proposal	Sept 21 -- Sept 30								
Learn about android	Oct 1 -- Nov 15								
Making design and algorithm	Nov 16 -- Nov 30								
Development of database and android application	Dec 1 -- Feb 1								
Application testing	Feb 2 -- Feb 15								
Working on documentation and final report about FYP	Feb 16 -- Feb 29								
Preparation for FYP presentation	Mar 1 -- Mar 8								
Design the project poster	March 9--March 16								

.

Chapter 2: Requirements Analysis

2.1Literature review / Existing system study

There are many available applications on play store like kids' zone, MM Guardian, Family Time but in all applications, there are many missing features which we realized we need to create one app in which we add all necessary features [8].

Many of Apps like Abeona, Spyzie is a fast and free parental control app which helps you monitor your kid's activities and save them from internet dangers. It is a parental control software for Android devices lets you easily connect with your children and access their smart phone usage and block if needed [12]. Eagle Eye monitoring refers to parental awareness, watchfulness and supervision of adolescent activities in multiple domains (i.e., friends, school and behavior at home), and communication to the adolescent that the parent is concerned about, and aware of, those activities (Dishion and McMahon, 1998). Poor parental monitoring and supervision of child and adolescent activities has been demonstrated to predict adolescent alcohol use in numerous longitudinal studies [1]. For example, Guo et al. (2001) conducted a longitudinal study of 755 adolescents aged 10–21 years. Results indicated that high parental monitoring, in addition to clearly defined rules at the age of 10 years, predicted lower alcohol use and dependence at 21 years. In this study, higher monitoring was associated with lower rates of alcohol abuse after controlling for both externalizing and internalizing behavior at 10 years of age. In another study, Barnes et al. (2000) conducted a six-wave longitudinal analysis based on interviews with 506 adolescents in a general community sample in the United States. Results indicated that higher parental monitoring directly predicted lower initial drinking levels in adolescents, and lower levels of adolescent alcohol misuse across time. Monitoring was also found to mediate other family effects; low levels of parental support were indirectly related to increasing adolescent alcohol abuse through poor parental monitoring. The authors therefore suggested that children who are reared in a supportive, nurturing environment are likely to be more receptive to parental monitoring. In turn, these adolescents are less likely to engage in alcohol misuse during adolescence [3].

In other longitudinal work by Ary and colleagues (Ary et al., 1999a, 1999b), parental monitoring was shown to have a direct effect on alcohol use and other problem behavior, and an indirect effect through deviant peer associations. In a study by Duncan et al. (1998), high levels of parent-child conflict and low levels of parental monitoring were associated with a greater likelihood of adolescent substance use and deviant peer friendships. In other studies, poor monitoring has been associated with family dysfunction, parent-adolescent relationship difficulties and social disadvantage (Dishion and McMahon, 1998). In sum, poor parental monitoring appears to be an important risk factor for the development of youth alcohol problems. Monitoring also appears to interplay with other family, peer and socio-demographic risks in the development of youth alcohol use problems.

One study measured ethnicity and parental monitoring to determine if different groups, such as White, African-American, Hispanic and Asian, exhibited varied strategies. The researchers found that Asian parents limited the time their children spent with TV and video games the most. In addition, Hispanic families limited their children the least (Connell et al., 2015).

Culture can deeply affect a variety of attitudes and behaviors (Greenfield, 2009), and researchers have begun to examine how parental mediation of digital media differs across cultures [12]. A 2013 study queried 1238 adolescents between the ages of 14 to 19 and their parents in eight different cultural contexts (i.e., Spain—three cities, Ireland, Mexico, Dominican Republic, Bolivia, and Chile). The findings showed that parents reported three different parenting styles: co-viewing, instructive, and restrictive [13]. Teens, however, reported an additional parenting style called inhibitive (which refers to not doing anything), which teens reported as the most frequent form of parental mediation (Martínez de Morentin et al., 2014) [8]. Few differences were found in parental report of mediation by country, with both teens and adults reporting that the restrictive style was the most frequent. Teens in Bolivia, however, reported that their parents used the instructive style most frequently. Parents in Ireland were most often reported to use inhibited mediation with nearly 63% of teens reporting this parental style. In Aragon, Spain, parents reported using the restrictive style more than other cities, and the Dominican Republic parents reported they used co-viewing the most. Interestingly enough, the researchers found that the greater the level of parental mediation, the more adolescents reported using the Internet to search for information. The researchers also examined how teens in these different contexts used the Internet. In six of the cities, teens used the Internet most to communicate and least to shop; in two countries, Bolivia and the Dominican Republic, the Internet was used mostly by adolescents for looking up information [12].

2.2Requirements elicitation

We use Four Techniques of Requirements elicitations in Our FYP Project

Document Analysis

We read different documents and research papers to find problems and their solutions for the present time in the society

Interface Analysis

Interface Analysis is a business analysis elicitation technique that helps to identify interfaces between solutions/applications to determine the requirements for ensuring that the components interact with one another effectively

Interviews

Talk to different peoples and ask different questions to how know their thinking or mentality what they want what they face a problems

Observations

Observe the present problems in society and their possible solutions

2.2.1Functional requirements

Summary of Functions whose primary functions include:

- User Accounts
- System Security
- Connect By Scanning QR Code
- Hide App Icon
- Child's Messages, Contacts, Call Logs
- Parent Can Monitor Child's Installed Apps
- Parent Can Create Lock for Child's Apps
- Dial Pad Code To Visible/Open the Monitoring Application
- Child's Current Location
- Parent Can Monitor More Than One Child at a Time

User Accounts

User accounts are password protected (Utilization of In Common Federation will be considered in future phases of development)
With the exception of system administrators.

System Security

API provides read-only data access
Profile editing requires password-protected user account with manually-assigned rights
Change log records details on data modification (date, username)
Consideration will be given to potentially hiding of email address from public

Connect By Scanning QR Code

The Parent App Relation with child app by the scanning of QR Code
When the parent app develop a relation with child app than parent can keep eye on their child

Hide App Icon

Parent can hide the child app by the set of dial pad code
Child hidden the visibility of app in their mobile

Dial Pad Code To Visible/Open the Monitoring Application

Hide the app and does not visible
Set the dial pad code and when dial the code than app visible in system

Child's Messages, Contacts, Call Logs

Fetch the data of child sim messages (date, time, message, name, mobile number)
All contact number fetch which save in contacts of mobile
Calls logs history of sim calls

Parent Can Monitor Child's Installed Apps

Parent can see all the install apps of child

Parent Can Create Lock for Child's Apps

Parent can lock of any install app of child
Child does not use of lock app by parents

Child's Current Location

Parent can detect the exactly current location of child

Parent Can Monitor More Than One Child at a Time

Parent can monitor multiple child but child monitor by only one parent
This is one to Many Relationships

2.2.2Non-functional requirements

SECURITY REQUIREMENTS

Security systems need database storage just like many other applications. However, the special requirements of the security market

SAFETY REQUIREMENTS

If there is extensive damage to a wide portion of the database due to catastrophic failure, such as a disk crash, the recovery method restores a past copy of the database that was backed up to archival storage

References

[1] Dishion and McMahon, 1998 “Parental Monitoring and the Prevention of Child and Adolescent Problem Behavior”

[2] Lane, Nicholas D., et al. "A survey of mobile phone sensing." *Communications Magazine, IEEE* 48.9 (2010): 140-150.

[3] Enck, William, et al. "TaintDroid: an information-flow tracking system for realtime privacy monitoring on smartphones." *ACM Transactions on Computer Systems (TOCS)* 32.2 (2014): 5.

see, for example, Barnes and Farrell, 1992; Barnes et al., 1992, 2000; Duncan et *al.*, 1998; Ary et al., 1999a, 1999b; Thomas *et al.*, 2000; Guo *et al.*, 2001

[4] Bläsing, Thomas, et al. "An android application sandbox system for suspicious software detection." *Malicious and unwanted software (MALWARE), 2010 5th international conference on*. IEEE, 2010.

[5] Rohr, Matthias, et al. "Kieker: Continuous monitoring and on demand visualization of Java software behavior." (2008): 80-85.

[6] Froehlich, Jon, et al. "MyExperience: a system for in situ tracing and capturing of user feedback on mobile phones." *Proceedings of the 5th international conference on Mobile systems, applications and services*. ACM, 2007.

[7] Robinson, William N. "Monitoring software requirements using instrumented code." *System Sciences, 2002. HICSS. Proceedings of the 35th Annual Hawaii International Conference on*. IEEE, 2002.

[8] Ofcom, October. "Children and Parents: Media Use and Attitudes Report." (2014).

[9] Kuhn, Roland, Philippe Morin, and Brian Hanson. "Method and parental control and monitoring of usage of devices connected to home network." U.S. Patent No. 7,046,139. 16 May 2006.

[10] Corrallo, Charles Shane. "Computer Entertainment Tracker Application for Limiting Use of Specific Computer Applications and Method of Use." U.S. Patent Application 13/031,032.

[11] Gatz, Scott, et al. "Parental control system for use in connection with account-based internet access server." U.S. Patent Application 09/858,855.

[12] Balia, Hinal K. "Systems and methods for managing and monitoring mobile data, content, access, and usage." U.S. Patent No. 8,095,124. 10 Jan. 2012.

[13] Rhee, Keunwoo, et al. "Threat modeling of a mobile device management system for secure smart work." Electronic Commerce Research 13.3 (2013): 243-256.