

Design of a Mobile Application for the Monitoring and Control Exercised by Children on their Smartphones

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Abstract: This research work will cover the creation of a mobile application to help parents with the monitoring and control that they will exercise over their children on their smartphones. Many times, children use the phone excessively, and parents cannot control it. There are many mobile apps that help with parental control and that way parents can have a control over their children, but all those parental control apps have a paid amount. What we want to do in this research work is to create a parental control application that helps parents by giving them benefits in its use for free and thus users would not have to pay any amount of money to have access to all their functions.

Keywords: Smartphone, mobile application, parental control, children, parents, emotional damage

1. Introduction

Among children and adolescents from four countries in the Kids Online study in Latin America, the vast majority of them have a cell phone where they access the internet between 83% and 91%. The 2015 Casen Survey revealed that 11% of five-year-old boys and girls have a working and in-use cell phone. This increases with advancing age, 30% at eight years, 50% at 10, 71% at 12 years and 90% at 15 years [1].

About 10 percent of young people between the ages of 12 and 13 have been in contact, through the smartphone, with sexual or violent content. In 2016, in the KIM study (German acronym for "Children, Internet, Media") carried out by the media monitoring institutions of Baden-Württemberg and Rhineland-Palatinate, 6 percent of respondents with between 6 and 13 years old stated that in their circle of friends there had been problems with inappropriate messages spread over the Internet or through a mobile application. In the age group of 12 to 13 years, the percentage increased to 10 percent [2].

Technology has been advancing in a great way, spreading more throughout the world, without taking into account the neuronal damage it causes to minor children, giving

discriminated and indiscriminate use of cell phones without knowing the effect it has on them [3].

Today a child from birth already begins to live with technology which harms their mental development such as televisions, computers, tablets, video games and much more. These devices accompany the child in his daily life and that causes a very strong attachment that it is difficult for them to be able to deprive them of this technology.

Lately there has been an excessive increase that there are many children using cell phones continuously within their homes, so parents allow them to get rid of them because of the noise they can cause, when they are busy in a meeting or any other activity. that they carry out and this causes a great problem within the home that is the carelessness on the part of the parents who allow such action.

31% of the girls and boys in the form stated that they used social media communication apps with tablets. Among them is the use or expectation of use, it is said that due to age they have restricted the use of the social network of the Spanish data protection law: WhatsApp (it is not really a social network that is a messaging service, but it is included in the consider their consumption in this category), TikTok, Facebook and Instagram. Degraded more than services like Snapchat [4].

Excessive use of the cell phone accelerates growth in the brain of infants, which causes attention deficit, learning problems, problems in mental retention, anxiety or childhood depression. Children using these technologies have difficulty being sociable with others around them. In

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addition, he has trouble sleeping. Parents in this situation have no interest in controlling this, they do not provide adequate supervision as it should be [5].

2. Literature Review

The exponential increase in the use of digital devices and new applications is changing the conditions of children's access to the Internet, which poses new cybersecurity challenges. Nowadays, smartphones accompany minors anytime, anywhere without parental supervision, and online life becomes a more private experience. For the review of the literature, the following databases were consulted: Web of Science (Wos), Scopus, Academic Search Premier and Google Scholar. Articles published in selected academic journals and technical reports and terms: smartphone, mobile, tablet, miner, risk, vulnerability used as a search descriptor, and the Boolean operator. Another key criterion of the research is that the studies target adolescents between the ages of 10 and 17, the age at which they start using it. Therefore, the growing use of smartphones and other devices such as tablets among adolescents is confirmed. But the increase in the use of this type of mobile device is also related to the need for them to always feel connected and know almost instantly the information and news that is generated within their surname online circle. Depending on age and sex, the problem of using this type of mobile phone is more serious among young people and women; In this sense, various surveys conclude that women tend to use it to gain more affection and recognition in their online circles, while men basically use it as a search engine [6].

The continuous use of cell phones is causing a great change in the conditions that children have access to the Internet, which is showing the new challenges that have to be faced for network security. Through the search carried out in the Web of Science (Wos), Scopus, Academic Search Premier and Google Scholar databases, much relevant information has been found. The investigations that have been carried out had as object of study children between 10 and 17 years old since one begins to use it, where the different risks of using cell phones could be discussed. In this way, their social circle of the child who has been on the mobile device can be reinforced, where they will soon consider reviewing more bibliographical references on this topic [7].

Developing children are in danger of using these devices as most of them become more attached to this device and thus slowly drift away from the society. It is thought to restrict a child by giving him a set schedule, not blocking the idea that a cell phone can also give us many advantages knowing how to use it correctly and parents should know the consequences that this device causes. Parents were interviewed detailing the harm caused by the use of these

phones. On the other hand, it was investigated that the cell phone is damaging the emotional aspect of the child due to the excessive use of tablets. Due to the extensive use of devices, it has been seen that children are more attached to the virtual world and far from reality [8].

Technology has been evolving and they helped us to be able to communicate over long distances, be it through chat, publications without being interrupted by someone external. Determine how the mobile device influences within the family, how they manage to communicate with others and how the behavior of family members is when they use these devices. Printed bibliographic cards allowed the observation of very important aspects. The use given to these technologies influences the relationship between family members, since they do not use it to strengthen trust and transmit good habits, but the trust of parents and children is lost [9].

Families develop different interests that guide their access and use of different technologies related to the consumption process or the dynamics of their family relationships. Given this, the question can be raised: ¿how do boys and girls use mobile devices differently? ¿Do they contradict or coincide with the parents' expectations? Just as there are new forms of social relationships mediated by cell phones and other technologies, there may be new rules of family life to regulate and control the use of mobile phones. If so, what are the main transitions in family relationships related to cell phone use? The intention is to be able to work with parents and children, so from the beginning it was agreed with the school management and the teachers of the subject to work with the 4th grade students, the selection of the ages of the children is appropriate based on to the research mentioned above. (GSM and NTTDokomo, 2012), indicating that it is at this stage that boys and girls are in the process of bonding. Mothers and fathers seek to guide children according to their interests and in many cases make regulations and try to regulate the use of technology, but many times those with lower technological capabilities than their children; It is not always possible to achieve the desired behavior [10].

A study carried out indicates that children who use cell phones for more than two hours obtained a decline in scores on language tests, brain thinning. Advice given to parents in putting on educational programs would help to keep mobile devices away from children and thus cultivate good social skills. Lack of sleep can affect the field of education within the classroom [11].

Create an application that can help parents have control over their child's phone, where they can filter access to inappropriate content for children. Mobile phone services may be used where parents can provide permissions to send or receive messages, internet access or downloads. There

are cell phones especially for children that are easy to use. Provide information to parents on how mobile phones influence the lives of their children so that they know how to control this problem by limiting their children to a certain time of use.

Today there are various Apps that help us monitor, supervise the mobile of our minor children in order to spy and exercise control over it, reality changes when you are inside the best Apps and you realize that 90% are not free to be able to enjoy their attributes you have to make a payment, that is why the prototype to be presented is free and reliable so that everyone can enjoy its use [12].

3. Methodology

It is very important to monitor our children's devices to have control of what they are doing.

Of the best-known Parental control applications in the world, it has been noted that most are not free, since they all have a cost to be able to use it and get the most out of it. In the table we can see the prices that they cost to be able to use the parental control applications, each one with its respective price that is paid on a monthly basis. According to the top of the parental control applications that we have shown in the table 1.

TABLE I. Price per month

App	Price
Norton	39.99 USD
McAfee	39.99 USD y 49.9 USD
TOTALAV	39.99 USD
Kaspersky	39.99 USD
Iolo	79.95 USD
Trendmicro	49.95 USD y 59.95 USD
Panda	17.49 USD, 23.49 USD, 29.49 USD y 35.49 USD
Bitdefender	19.99 USD

For the development of the App, we will work with the technologies that are related to Hardware and Software, which makes it easier for us to implement a highly reliable application that can monitor another cellular device. In addition, the app aims to be created for free so that users feel comfortable not paying and thus benefit users who have low economic resources, knowing that some have little income and their income would not be enough. that have. There are times when paid applications are not used very much, since users do not want to spend on applications. The development of the App is made up of stages that will be shown in figure 1.

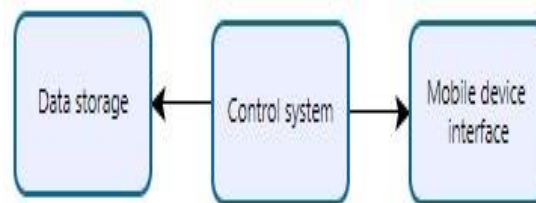


Fig 1: Blocks diagram

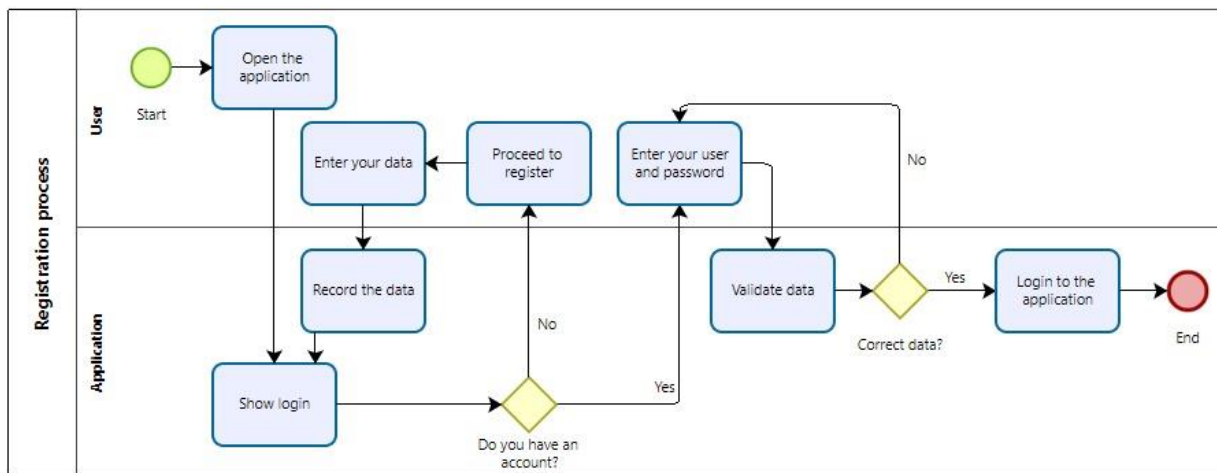


Fig 2: User Process Diagram

Control system: It is responsible for carrying out all system functions.

Data Storage: The information of date, time and all the movements that are made in said device, is stored and transferred to the application that is carrying out the monitoring.

Cellular device interface: It is an application developed for mobile devices, it is in charge of numerous features and functionalities to protect and monitor daily activities, it allows the user and the system to communicate.

A. User Process

This process seeks to capture the user's attention in order to use the App, this will be achieved for marketing, publication and social media purposes. Be the possibility that you want to carry out is derived from the process that can be seen in figure 2.

B. Application Procees

The purpose of the application is to serve as a visual and configuration interface between the device and the one that performs the monitoring, in this process the relationship or control that the father will have when monitoring the device of his minor is shown.

It should be noted that there are currently software with the same methodology and they are a success, then the operation of the application will be shown in the flowchart of figure 3

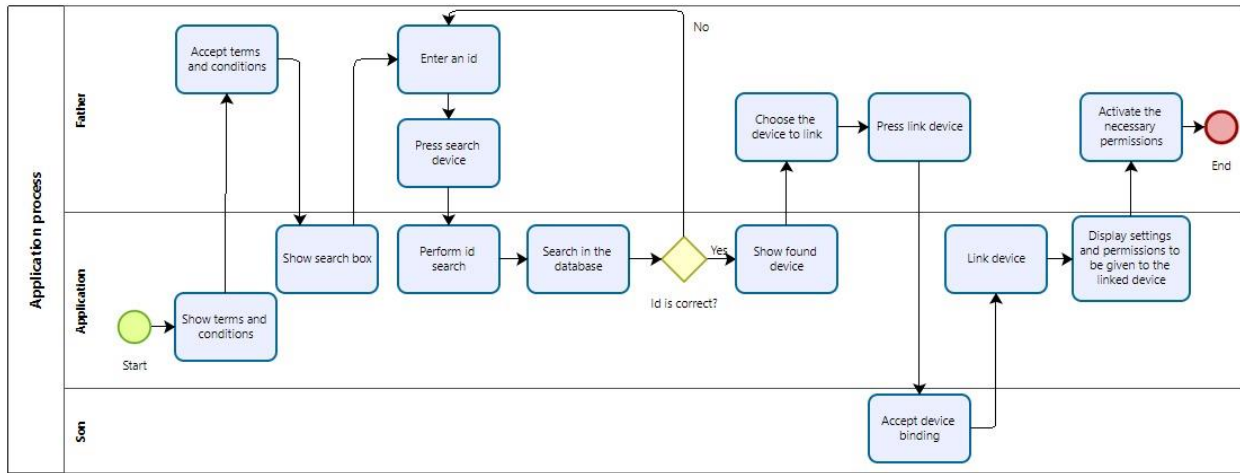


Fig 3: Application Process Diagram

C. BALSAMIQ MOCKUP

Balsamiq is used to develop the prototype of the proposed solution, since it is a fast and low-fidelity user interface tool that reproduces the experience of drawing on a notebook or whiteboard [13], making it possible to sketch the prototype of the application, this will help us to have a reference of the application that will be used.

D. ELABORATION OF THE SKETCH

In this part, the design of the application processing system will be carried out so that parents or guardians can exercise control over their minor children, thus achieving a quick sketch, so that programming was not necessary. The objective is to have a better reference of what was already structured, considering and confirming certain errors, we can improve the sketch.

E. DESIGN APPLICATION

Application of a more reliable and interactive design aspect that helps to facilitate its presentation with the user who is going to monitor the other device, reaching a presentable prototype.

F. Application prototype development

At this stage, all the screens of the application will be presented, the purpose of which is to facilitate use. On the screen Fig. 4. In this part the father can enter a code which the son will give him from his mobile device, in order to enter it and the box will perform the search based on the entered code, where

F.A. Prototype development

Android Studio is a development interface. In fact, it is a kind of work desk for a developer. Conveniently, Android Studio has been created by Google, it is a current and modern instrument or tool, which has been created by the same creators of the operating system [14].

F.B. Elaboration of the Sketch

This mobile application was created with the purpose that parents can have a monitoring of the activities that their minor children have been carrying out on their mobile devices.

The logo of the mobile application "SeControl" will be displayed on the cell phone screen, the user will be able to log in, which will take us to all the information of said user and will be able to make restrictions to his minor child, Creation of a user account, in If you do not have an account, it will proceed to create it. In the terms and conditions part, the father will be able to accept the mobile application, since there will be many points where it will be taken into account before being able to start it.

F.C. Function of the mobile application (Design application)

it will verify if it exists or not. Finally, on the screen Fig. 5 is where the parent will make the selection of an application which they want to monitor and at the same time be able to restrict.



Fig. 4: Find Device

Google Chrome application: limiting the time of use, the restricted links, the speed of the internet that will be used.

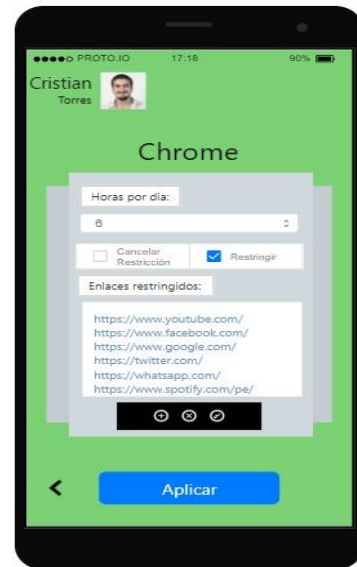


Fig. 6: Restrictions



Fig. 5: Monitor

In Fig. 7 it is seen how the father will be able to access the part of the location of the minor where he will be able to see where his son is, in order to know if he is near or far.

4. Results And Discussions



Fig. 7: Location

In Fig. 6 it is seen how the parent will be able to make the respective restrictions according to each application that they choose, for example, the

The prototype developed on the monitoring and control that parents exercise over their minor

children has been proposed to obtain satisfactory results. This will happen when the father sees or suspects that the son is making or accessing improper tools, that is when he will be able to block access and fix the movements that he is making. The objective of this prototype is to create a mobile application to have better control, so it can also deny access and fix the movements that are being made. The mobile application will serve as a solution, since its use is reliable, and what makes it different from other Apps is that the model we are proposing is free and available to everyone. For this, a questionnaire was carried out, in which 6 questions were raised that will help us determine the opinions of the parents if the proposed prototype is acceptable to be able to create the application that would benefit themselves, since it is necessary to provide each user what they want. The questionnaire was presented to 30 parents to determine acceptance of the proposed prototype, where the following results were obtained

A. Quantitative Analysis

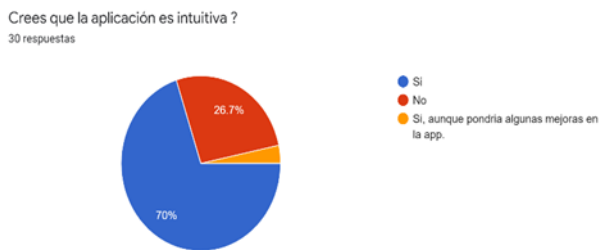


Fig. 8: Quiz Question 1

Esta bien que la App este al alcance de todos ?
30 respuestas

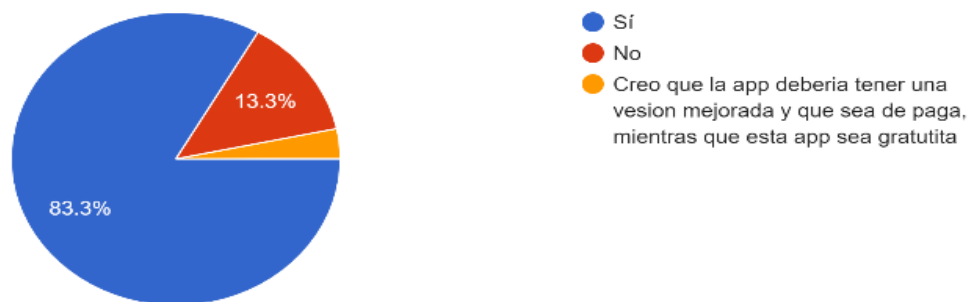


Fig 10: Quiz Question 3

Analysis: According to Fig. 8, the percentages shown are the answers to the first question, most of the answers obtained agree with 70%, while 26.7% disagreed, on the other hand, in the alternative others argued that, if it is intuitive, although they would put some improvements in the App.



Fig. 9: Quiz Question 2

Analysis: According to Fig. 9, the percentages shown are the answers to the second question, the majority of the answers obtained agree with 76.7%, on the other hand, 23.3% disagreed.

Analysis: According to Fig. 10, the percentages shown are the answers to the third question, the majority of the answers obtained agree with 83.3%,

while 13.3% disagreed, on the other hand, in the alternative other They argued that the App should have an improved version and have a monthly plan.

Fueron de gran ayuda las herramientas de la App ?

29 respuestas

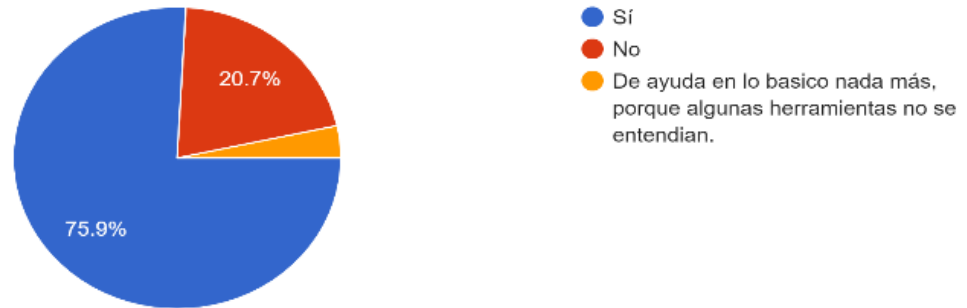


Fig. 11: Quiz Question 4

Analysis: According to Fig. 11, the percentages shown are the answers to the fourth question, the majority of the answers obtained agree with 75.9%,

while 20.7% disagreed, on the other hand, in the alternative other They argued that the help it shows is basic, as it was also of great help to supervise their children who spend a lot of time on the Internet.

¿Qué sugieres que se debería de agregar a la aplicación?

26 respuestas

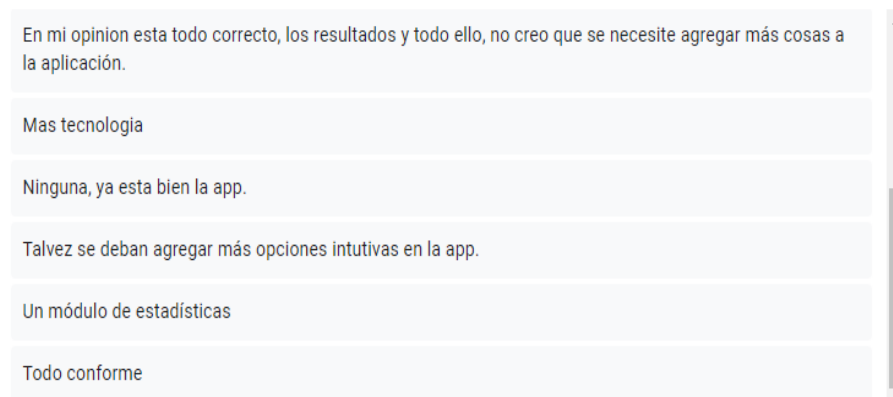


Fig.12: Quiz Question 5

Analysis: According to Fig. 12, the data shown are the answers to the fifth question, in this the paragraph option was used to listen and implement

improvements to the App, the suggestions we obtained were that everything is correct, no more things need to be added, requires more technology, more options must be added, among others.

Al momento de mostrar los resultados. ¿Tiene todo lo necesario?
20 respuestas

si
Casi todo
Si, aunque me gustaria que mostrara distintos resultados en distintos casos.
Si todo esta bien y en orden.
Si, aunque estaria mejor si mostrara los resultado de otra manera.
Si, me parecio todos los resultados correctamente.

Fig. 13: Quiz Question 6

Analysis: According to Fig. 13, the data shown are the answers to the sixth question, in this the paragraph option was used to listen and implement improvements to the App, the answers we obtained regarding whether it complies with everything necessary were yes, almost everything, which should show results for different cases, everything in good order, among others.

A. Result Analysis

To obtain the result analysis, 30 parents had to be surveyed, where it was possible to verify that the prototype was accepted by most of them, while the minority thinks that, if it is interesting, that improvements should be made or simply lack of interest. Thanks to the survey carried out, it was possible to determine that many of the people do not access these applications since most of them are profitable, contrary to the model that is being proposed, which is easy to use and available to everyone since it is free. It also helped us to realize that it complies with the basic tools and that it would not be bad to make an improved version. In short, these results indicate that the proposed model is accepted, complies with standards, has a user-friendly design and, above all, is of great help so that they can supervise and be closer to their children.

B. DISCUSSIONS

The advantage of developing the prototype of the App was of great help to get closer and in the same way to see the advantages, such as keeping the problematic content away from improper people on the internet, keeping a 24/7 surveillance, taking care of their minor children, etc. [fifteen]. The disadvantage is that we do not show enough confidence to our youngest children that we know they can make the right decisions, something that can create disgust and make them feel a little bad.

And the difference according to the background and the investigations that were carried out, it was possible to verify that there are various parental control applications, most of them effective, the constant is when it is in execution plan, to see that use is not free and is not available to everyone is not to the liking of the people. The prototype that has been proposed in this research work is prioritizing that it be free so that it is well received and that it can show the services provided by any of these parental control applications.

5. Conclusions

In this research work, it was proposed to create a reliable and simple mobile application for parental control. The prototype of the mobile application proposes a monitoring mechanism that supports parent-child communications by providing detailed information, available at anytime, anywhere, in a very short time. The prototype offers to make available to the parent or guardian clear, detailed, short-term and accessible information about what their minor children have been doing on their mobile devices. The mobile application makes available to the father the database where information related to the actions, views, all the content of the device is stored, so that it will allow him to supervise and control. In order to achieve this implementation of said mobile application for control, Android Studio was used, since it provides us with facilities for the possible creation of the mobile application prototype and thus gives us a vision of the tools and functions that the prototype will provide. we're offering.

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