

Proposal of a Counseling Application on Care of Children Admitted to the Pediatric Emergency Room and Discharged

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Abstract - In this research article we focus on children because they are very prone to contracting diseases due to hereditary disease as well as contracting a virus among others, that is why we seek to design a mobile application for counseling or care in children admitted to emergency and have been discharged, The problem encountered is due to the fact that when the patients are discharged, many times they are not given the constant follow-up that they should have since they were hospitalized in emergency rooms, that is why the proposed solution is the development of the mobile application where each patient is monitored and also providing advice on their care for their speedy recovery, which is the primary function of the creation of the mobile application. In this work the research objective is to help many children to have a speedy recovery with the required care advised by their assigned doctor through the application. The methodology used is Design Thinking since each of its phases is perfectly coupled for the development of the application where as a first phase empathizes with the user so that then it is defined, as a third step the solution to the problem is devised so that then the prototype is created and finally the evaluative test where it will observe its correct operation, The result obtained is the prototype of the mobile application for the care and recommendations of each patient who has been discharged from the hospital where many children will benefit since an older adult will monitor their progress together with the doctor through the mobile application.

Index Terms - Application Mobil, Careful, Design Thinking, Children's, Pediatric.

INTRODUCTION

Diseases in young children are very frequent since they are more susceptible to contracting various pathologies Children under 5 years of age have a greater risk of suffering from foodborne pathologies and other related health complications, because their immune systems they are still

developing. Young children with developing immune systems don't have the ability to fight off infections like adults do. Also, boys generate less stomach acid, which kills harmful bacteria, making them sick more easily.

The pathologies of food origin, can occur in different ways such as food poisoning that have the potential to be especially dangerous for young children in such a way generate vomiting and diarrhea, because the infant's human body immediately loses a huge proportion of body fluid can cause dehydration which if not treated in time could cause high risks such as death. The nutritional stability of young children is dependent on the feeding habits of their parents, which is why it is important to wash hands before each meal to prevent future intoxication by harmful bacteria [1].

It is worth mentioning that the Peruvian report mentions that the most common pediatric pathologies are those of respiratory origin such as respiratory infections, pneumonia or asthma, due to the fact that these two conditions remain among the first reasons for morbidity and mortality in young children during their growth process, Likewise, with respect to acute respiratory pathologies, the ones that remain the most are the common cold as well as acute pharyngitis. The analysis showed that these 3 respiratory diseases had a prevalence of more than 20% each, out of the 4050 histories that were taken in the investigation. However, regarding the pathologies of the digestive tract, it is predominant to evaluate the acute diarrheal pathology, of which it is common to see at least 3 episodes per year in children. However, its transcendence in the disorders of liquids, electrolytes and the deprivation of nutrients that this pathology creates; in the Peruvian territory, an analysis carried out in the Regional Nosocomio of Lambayeque shows the etiology of this infection, finding that much more than half of the acute diarrheas show an unknown etiology,

followed in order of frequency by those of parasitic and bacterial origin [2].

Child health in Peru has been in constant progress in the last decade, however, there are problems that require much attention such as infant diarrhea because if it is not treated in time it can cause severe damage to children. The vaccination coverage and the progress of the problem of infant morbidity in children whose mothers have less education, as well as low economic capacity and live in rural areas or in the highlands and jungle areas of the nation.

Infant morbimortality is closely related to living conditions and environmental contamination related to cultural patterns that determine how the life of a child is valued in the territory. That is why the research is referred to the results of issues such as, for example, birth weight and size, vaccination and the prevalence and procedure of certain pathologies in children, especially diarrhea and respiratory tract infections. The primary purpose is to detect the most vulnerable teams and thus contribute to the organization of child health programs so that they can be treated in time [3].

The National Hospital "Edgardo Rebagliati Martins", a level IV hospital of high complexity and resolution of the Social Security in Health (ESSALUD), is located in the district of Jesús María, province of Lima, Department of Lima. The central geographic location of the district of Jesús María within the Lima metropolitan area makes the hospital easily accessible from the four cones of the capital due to the large number of public transportation lines that circulate along its borders 24 hours a day [4].

Therefore, the hospital has 1,580 census beds, of which 37 beds are in the Pediatric Emergency Department. Compared to the other National Hospitals at the head of the Health Care Network in Metropolitan Lima and Callao, the Hospital has 4 and 8 times more beds for Pediatric Emergency. The Pediatric Emergency Department is the first door of admission for pediatric patients with clinical or surgical pathologies. During the years 2000 and 2003, the Pediatric Emergency Department provided a total of 255,479 care services, approximately one third of which corresponded to priority I and priority II (N) services, which are those provided to patients with sudden alterations in their state of health that lead to imminent danger of death or to those patients who present a risk of death or with severe complications that require attention within the first 10 minutes of their arrival at the Emergency Department.

The objective of the research is to help patients admitted to the pediatric area to be able to monitor and control their recovery through the mobile application.

The research is structured as follows: Section II shows the methodology, Section III shows the case study, Section IV shows the results and discussion and finally, Section V presents the conclusion and future work.

The Design Thinkin methodology is a procedure focused on creating innovative ideas that meets its effectiveness in understanding and providing solutions to real problems of users, born from the way product designers work, the methodology consists of 5 phases in which each one focuses on a specified function to develop a project correctly [5].

- *Empathize*: Find out the needs of your users, i.e. we are talking about empathically understanding the problem you are trying to solve, therefore this stage usually starts with the inquiry of the customer or user [6].

- *Define*: Detect the needs and drawbacks of its users, then collect information collected in detail throughout the first phase, analyze each of the visualizations and synthesize them to conceptualize the central drawbacks that the accessories have recognized [7].

- *Idear*: In this phase, we talk about creating as many ideas as possible, that is to say, we talk about thinking and looking for creative ideas in order to find alternative ways of looking at the problem and to detect innovative solutions for the solution of the problem that has arisen [8].

- *Prototyping*: In this phase we build the solution proposed in the previous phase, i.e. at the beginning we identify the best solution for each problem encountered, then we build the prototype to have a better perspective on the project [9].

- *Test*: In this phase the prototypes are tested, it is the last stage of the Design Thinking process, the main function of this phase is to rigorously test the prototypes and they are implemented correctly, although this is the final stage, the Design Thinking methodology is based on an iterative work model, therefore the groups constantly use that as a starting point, therefore it is likely to return to previous periods to make more iterations, alterations and refinements if required [10].

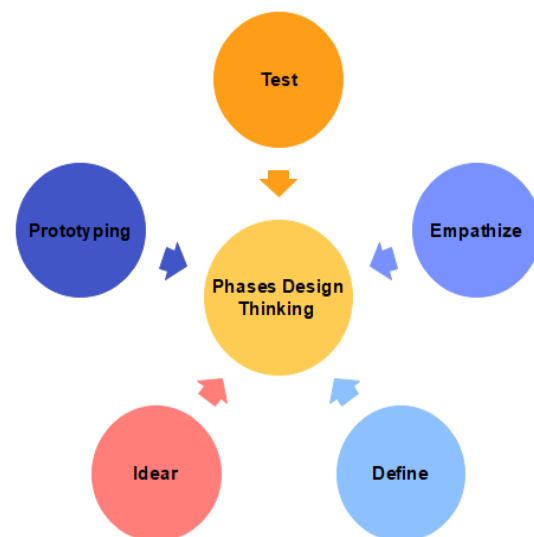


Fig. 1 Phases Design Thinking

METHODOLOGY

Fig. 1 shows the phases used in this research, starting with empathy, definition, design, prototyping and, finally, testing, all of these phases will complement each other in order to obtain favorable results such as the creation of the child care and assistance application.

CASE OF STUDY

For the case study we will apply the above steps detailed in the methodology:

- *Empathize*: In the first phase we identify the different diseases that seriously affect young children as they are very vulnerable.
- *Define*: In the second phase we define the problem being faced in this case regarding the care required by patients discharged from the emergency room.
- *Ideate*: In the third phase we create ideas for the best solution to the problem in this case we chose the most innovative idea in order to have a better performance or strategy of what is required in the project.
- *Prototyping*: In the fourth phase, after having the best idea for the solution of the problem, we move on to the creation of the prototype to have a strategic idea of how the mobile application will work in detail.
- *Test*: In the fifth phase, the operation of all the previously applied phases will be determined, where it will be carefully observed if the correct application to the solution of the problem was achieved, where it will be verified if there is an error that can be immediately solved for its final delivery.

RESULTS

a) About the Case Study:

As a result of the proposal for the application of counseling on the care of children admitted to the pediatric emergency department and discharged, a sequence of steps for its execution was carried out, which will be shown in detail. In Fig. 2 shows the flowchart where the operation of the application will go through the registration to then go to the logging of the application where once entered the application will show different interfaces where the patient will be evaluated daily because they are just out of the emergency area and need constant monitoring in case any complication may occur likewise the application shows a number of options such as the return of the results according to the evaluated where these data will be sent to the doctor where he will determine how each patient is doing. Therefore, the application also shows recommendations, follow up of their medication intake and the care that should be taken to each one of them for a speedy recovery, in addition there is also the option of emergency where you can contact directly either the hospital or doctor [11].

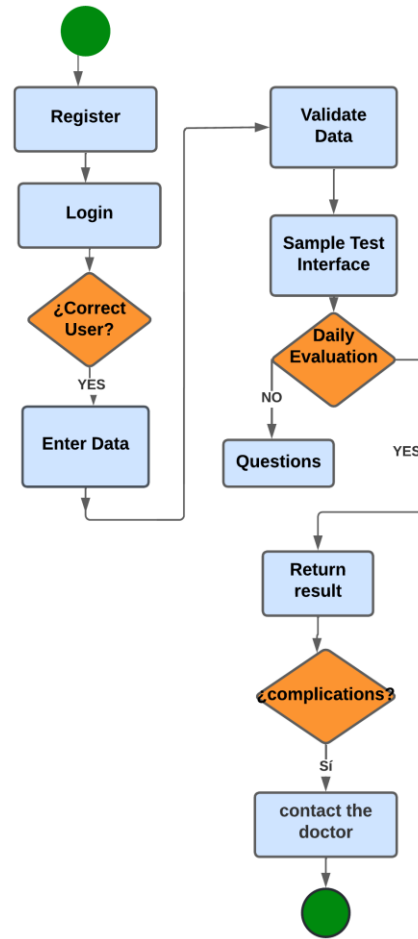


Fig. 2 Application Flowchart

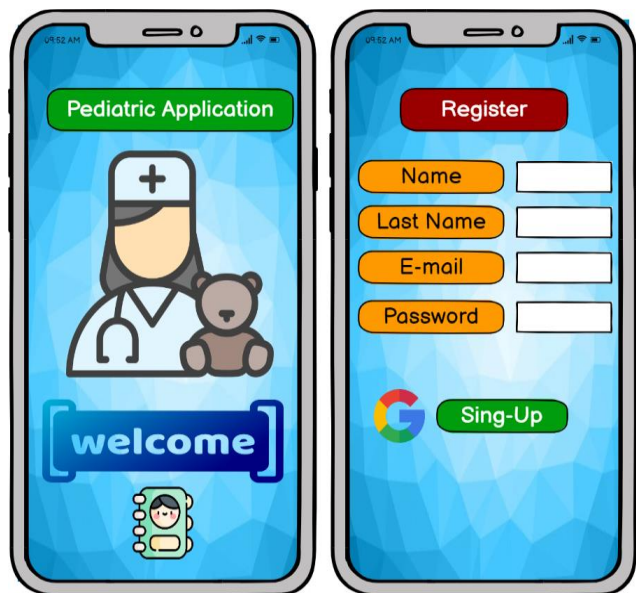


Fig 3. Welcome and Registration Interface

Fig. 3 shows the welcome interface and patient registration where the focus is on the pediatrics area. As can be seen, the registration will contain the names, surnames, Gmail and the corresponding password for greater security for each child that requires control and recommendations that are required, where the application will provide assistance to children discharged from the emergency area and discharged from the hospital.



Fig. 4 Daily Logging and Evaluation Interface

In Fig. 4 shows the logging interface where once the patient has been registered, he/she goes to the interface where he/she enters his/her user name and password and then goes to the daily evaluation interface where each patient who has left the emergency room and is discharged can be monitored from home through the application where he/she will have to complete a daily questionnaire where, according to the result, an evaluation is identified and sent to the corresponding doctor in case the patient is again in a critical condition. From the same application there is the option to contact the doctor and hospital to be taken to be able to perform a more detailed evaluation and be attended immediately for the prompt improvement of the child, because the creation of the application has the function to help many patients and take their process safer for the benefit of each of them [12].



Fig. 5 Care and recommendation interface in addition to the emergency interface.

In Fig. 5 shows the interface of care and recommendations that will be given according to each patient because they will present different symptoms, that is why each patient will be specified in detail their recommendations for their early improvement since that is the purpose of the application to help others, also as seen in the interface will see the symptoms, food that has to be taken, as well as taking medication that has to be daily that varies according to the diagnosis given by their respective doctor. As you can see in the interface you will see the symptoms, the diet that you have to take, as well as the medication that has to be taken daily that varies according to the diagnosis that your respective doctor gave you, therefore in the following interface you will see the emergency option that means that in case the patient presents complications, you will have the option to call your doctor, hospital or require an ambulance to the nearest hospital possible, also in case the complication is not so serious you can use the option of message or video call that depends on what is returned in your daily evaluation [13].

b) About the Methodology

The Design Thinking methodology was used because it was very beneficial and easily adapted to the research project.

It should also be noted that it is a technique that focuses on the development of innovative products that meet the needs of users and therefore includes a sequence of logic and creativity to explore the ways in which it can be done in order to design results that benefit users in solving problems. The advantage of using the agile methodology is to empathize with the problem as well as to create a good working environment [14].

• Comparison

As shown in Table 1, the Design Thinking, Cascade and Scrum methodologies were compared, where it was identified that the most beneficial for our project is the design thinking methodology because it proposes innovative solutions, the scrum methodology requires working with a small group because if it is implemented in a large group it could fail and the cascade methodology does not adapt to changes as the Design Thinking methodology does [15].

Table 1.
Comparison Methodologies

Design Thinking	Cascade	Scrum
The agile methodology contains a lot of visual material, working both the creative and analytical mind to obtain as a result innovative and feasible solutions [16].	It is not available to changes that may be required.	Scrum Master: manages the scrum process and helps to remove impediments.
The agile methodology empathizes to understand the problems and needs in order to satisfy them successfully and generate a good working environment.	The waterfall methodology excludes the end user.	It is composed of a small team of members, since assigning a large team could ruin the project [17].
The Design Thinking methodology is easily adaptable to changes if required.	The cascade methodology maintains a very clear structure [18].	The scrum team makes decisions on their own according to each task.

CONCLUSIONS

In conclusion, we obtained the design and proposal of the mobile application for counseling and care in care for children in the pediatric area admitted to the emergency room and have been discharged thus helping many children to have a constant evaluation and care for their early improvement hand in hand with a doctor and an older person who is caring for the younger child, it was also essential the application of the agile methodology called Design Thinking thanks to the use of it, it was possible to perform in an agile way each of the steps to obtain favorable results in the

development of the mobile application this is because the methodology is focused on the users so that the problems that may arise will have a creative solution for implementation, with this very innovative proposal is intended to a future implementation of the application in Peru in that way can provide a better quality of care to each patient that the main function is that they can be fully recovered from the diseases encountered.

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