Home-habits, app for monitoring the progress of the HabitFun video game to generate hygiene habits

Home-habits, app para monitoreo del progreso del videojuego HabitFun para generación de hábitos de higiene

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Abstract

The Home-Habits app allows you to monitor the progress of the HabitFun video game, which was developed as a support tool for the generation of good hygiene habits in elementary school children, in the range of 6 to 8 years. Home-Habits allows parents or guardians to monitor their children, which essentially consists of the analysis of recovered data such as the times of the day when the video game was opened, mini-games played, playing time, scores obtained, and with all the data to make a progress history, in addition to having the ability to provide feedback to each report generated, this with the intention of being able to track the child's daily behavior and relate it to the progress within the game.

App, Monitoring, Hygiene habits

Resumen

La app Home-Habits permite el monitoreo del progreso del videojuego HabitFun que fue desarrollado como herramienta de apoyo a la generación de buenos hábitos de higiene en niños de primaria, en el rango de 6 a 8 años. Home-Habits permite a los padres o tutores el monitoreo de sus hijos, que consiste esencialmente en el análisis de datos recuperados como los momentos del día en que se abrió el videojuego, minijuegos jugados, tiempo de juego, puntajes obtenidos, y con todos los datos hacer un historial del progreso, además de tener la capacidad de poder brindar una retroalimentación a cada reporte generado, esto con la intención de poder hacer un seguimiento del comportamiento en el día a día del niño y relacionarlo con el progreso dentro del juego.

App, Monitoreo, Hábitos de Higiene

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Introduction

According to UNICEF, health, as a necessity and fundamental right of citizens, is closely linked to school performance, quality of life and economic productivity. In this sense, one of the aspects that must be attended to, encouraged and promoted from home, school, health establishments and other organizations, is the development of hygiene habits in the personal, social and environmental order, which lead to the health care, maintenance and prevention. (Unicef, 2005).

Therefore, it is necessary to develop knowledge and skills on this important topic in the family, at school and in the community, to promote attitudes for compliance and promotion of hygiene habits, with the participation of all actors in society in dissemination and promotion campaigns to promote positive change in all areas of life.

Unicef also believes that good hygiene is essential to prevent the spread of infectious diseases and help children lead a long and healthy life. It also prevents them from missing school, which leads to improved learning outcomes (Unicef, 2017).

For a family, having good hygiene habits also means avoiding illnesses and thus being able to spend less on medical care. In some cases, it can also reinforce the family's social status and help people maintain self-confidence. The practice of personal hygiene in childhood is a matter of individual responsibility that is acquired through an educational process and is essential to prevent diseases and promote an adequate state of health. From the school environment, children should be encouraged to achieve certain objectives (Pinto Yépez, 2014).

One of the situations to face is that children tend to give little importance to personal hygiene activities, and for them they tend to be repetitive and tedious activities, and parents tend to approach this learning in a rigid way and this in many of the Sometimes it causes rejection.

The main strategies aimed at creating better health conditions include interventions aimed at the school-age children's population, since in childhood the attitudes and behavioral patterns that regulate life in adulthood are acquired (Piaget, 1977).

Unicef focuses on key behaviors that help children and their families maintain adequate hygiene, washing hands with soap, daily showers or baths, safe handling and storage of drinking water, safe disposal of faeces, etc (Unicef, 2017).

Good personal hygiene habits are directly related to less illness and better health. However, poor personal hygiene habits can lead to some minor side effects, such as body odor and oily skin. They can also lead to more serious or even severe problems (Holland, 2018).

In addition to the above, poor hygiene habits can lead to self-esteem problems, looking good and feeling presentable can give a boost of confidence and a sense of pride in one's appearance.

Hygiene is about measures to prevent and maintain good health. The practice of hygiene rules, over time, becomes a habit. Hence the inseparable relationship of Hygiene Habits. It is convenient for the learning, practice and assessment of hygiene habits that adults set an example for children and young people with the daily practice of adequate hygiene habits, so that conceptual, attitudinal and procedural knowledge about hygiene is consolidated. Issue (Unicef, 2005).

In 2018, Unicef México launched a program called Water, Hygiene and Sanitation, which highlights that children and adolescents have the right to live in a clean environment and with access to drinking water (Unicef México, 2018).

In this program, solutions are presented to the aforementioned problems, emphasizing drinking water, but also complementing these actions, various teaching materials were developed that allow people to have information to create healthy environments, with access to drinking water and good hygiene practices. Among the materials presented, there is an activity booklet, guides for teachers, guides for healthy environments committees, etc (Unicef México, 2018).

Technology plays a leading role in society today, which is why it is intended to be used as a support tool to make the acquisition of good habits more fun. Video games are great learning motivators, through them, children, they can develop good habits with a less routine and, above all, less authoritarian environment, which allows the psychosocial development of the student, that is, by living their own experiences, they build their own knowledge, articulate the cognitive, with the affective and emotional, to achieve development. integral in an attractive and different way, all this within a child's own innate social expressions, thus seeing play as a learning tool that generates interest, motivation, desire to learn and to put into practice what has been learned, since only that the child is interested in is significant and continues in his desire to know much more, in addition to making it clear that activities such as leaving the room clean not only have to do with one's own hygiene but with environmental hygiene, which also benefits , to the people who live with the child (Pinto Yépez, 2014).

In addition, we must teach children to take care of themselves, not to depend on someone to clean the space they have just used.

Nowadays, technology becomes relevant, especially after the pandemic experienced in recent years, and that is why the HabitFun video game was developed as a support tool for the generation of hygiene habits focused on primary school children, in the range of 6 to 8 year old. However, if we only have a child play a video game, how do we know, especially when we are not present, how long he plays, what levels he has reached, etc.

Multiple studies have been carried out on the benefits and harms of video games in people's lives, and there are still detractors of them even when their main focus is educational use, since they consider, among other things, that they can generate violence in the community. personality of the player, confusion of reality, etc (Estela, Yeray, Rafael, 2020).

Due to the above, and considering that this can provide some relief or peace of mind to parents who are not yet convinced of the benefits of video games in their children's education, Home-Habits was developed, an application for mobile devices. which allows monitoring the progress of the HabitFun video game, and in this way parents can not only be attentive to the time their little ones spend playing the video game, but they can also verify or analyze if the video game is having a positive impact on hygiene habits. of their children.

Analysis

Below, some of the products made in some of the developed stages will be described.

Among other things, at this stage the functional and non-functional requirements for the development of the Home-Habits App were established.

In Table 1, the functional requirements are listed, while in Table 2, the non-functional requirements are shown.

CLUE	NAME	DESCRIPTION
ReqF01	Create Account	The guardian user of the infant may create a new account.
ReqF02	Login	The tutor user will be able to log in.
ReqF03	Sign off	The tutor user will be able to close a session started.
ReqF04	See information	The tutor user will be able to see their registered information.
ReqF05	List of player users	The tutor user will be able to see the list of player users he/she supervises.
ReqF06	List reports for each session	The tutor user will be able to see the reports of each game that the player user registers.
ReqF07	Report information	The tutor user, once a session report has been selected, will be able to see a complete description of the session that the player user registered.
ReqF08	Change Password	The tutor user may change his or her password.
ReqF09	Account Sync Token	The tutor user will be able to see the account synchronization token to register player users.
ReqF10	Clipboard	The tutor user will be able to access the account synchronization token through the clipboard.

Table 1 Functional requirements
Source: Own elaboration

CLUE	NAME	DESCRIPTION
ReqNF01	Design	The interface design must be using material design.
ReqNF02	View Centralization	All views will focus on a main menu.
ReqNF03	Loading view	Have a loading screen.

Table 2 Non-functional Requirements
Source: Own elaboration

Development

Once all the interfaces had been designed, the project and the architecture that it would follow were structured, creating the necessary data layers.

The Home-Habits App was created organized under the concept of "Clean Architecture" which consists of structuring all content in four main layers, these layers are: Core, Data, Domain and UI.

General-purpose elements were placed in the Core layer (figure 1). The Data layer contains the classes necessary to obtain data (figure 2).

Within the Data layer we find the Model package that contains the data models that correspond to the backend responses, the entities of the Home-Habits App and the data transfer objects or Dto (figure 3).

At the same level as Model, we find the Network folder, in which the necessary logic is carried out to connect the app to the API and link each of the endpoints (figure 4).
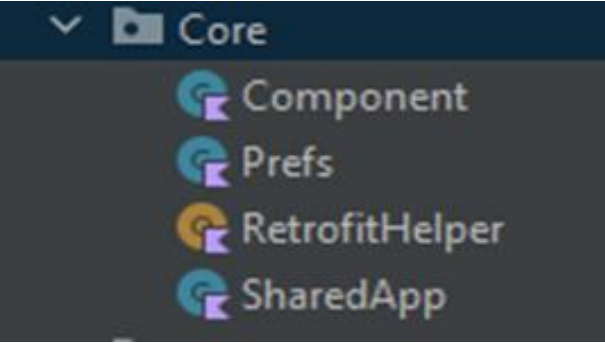
Figure 1 Structure of the Core layer
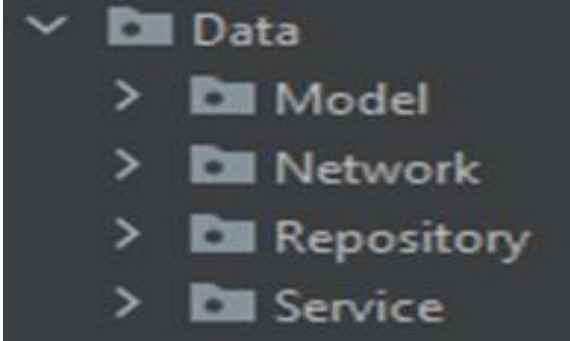*Source: Own elaboration*

Figure 2 Structure of the Data layer
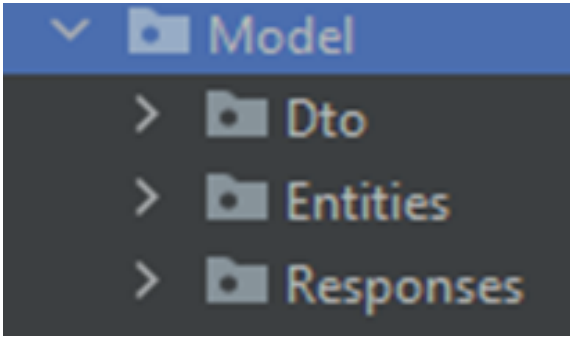*Source: Own elaboration*

Figure 3 Model Structure
Source: Own elaboration

In the same way as Model and Network there are the service and repository layers (Service and Repository), the first will make the corresponding calls to the network layer according to the information requested and the second will call the functions established in the service and it will process the information to provide clean data and not the answers that the backend gives in response (figure 2).
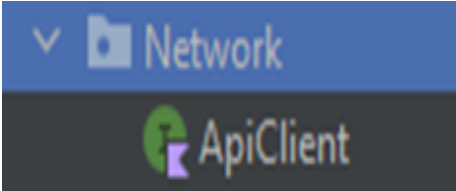
Figure 4 Network Structure
Source: Own elaboration

At the height of the Data layer is the Domain layer, and in it the functions of all the use cases that correspond to the functional requirements are stored (figure 5).

The last layer is the UI, in which the folders are separated by views, which are organized according to the number of activities they have, as shown in figure 6.

Implementation

The implementation stage encompasses the entire process of taking the previously made design to code. As a first instance, the views are laid out within the UI layer, separating and designing each element, fragments, activities and dialog windows. Within this first implementation stage, the own design pattern is implemented to link the data between the interface and what is obtained from the domain layer. For this software, the MVVM pattern will be implemented.
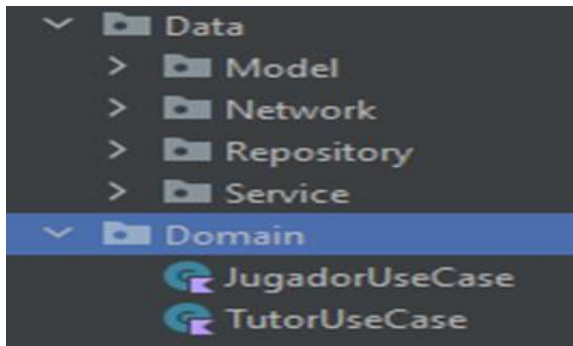

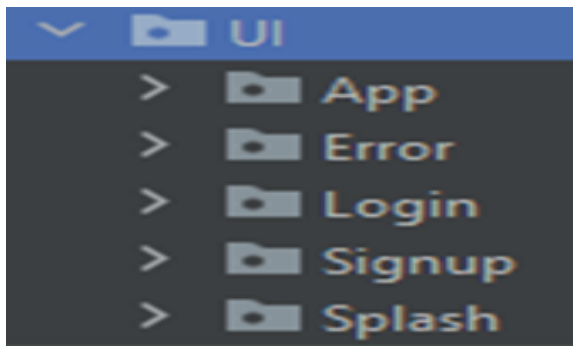**Figure 5** Domain Structure
Source: Own elaboration

Figure 6 UI structure
Source: Own elaboration

We can see in Figure 7, an example of the general structure of the UI layer showing the login activity. The objective of using MVVM is to be able to bind the view to the data automatically and to be able to observe whenever a change is made, update the data within the ViewModel, but without having any type of business logic within the interface.

Within the view file, only two actions are performed, the call to the ViewModel function to authenticate the user and the observable that is waiting for the response whether it is registered or not (figure 8).
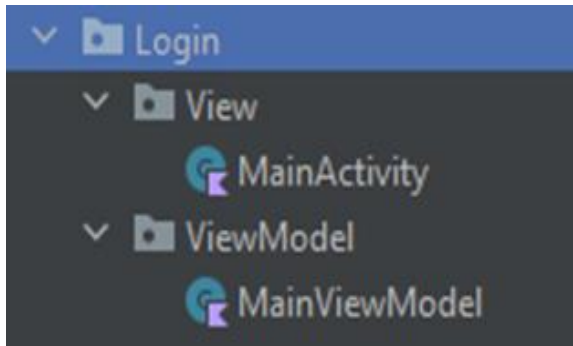

Figure 7 Login Structure
Source: Own elaboration

Now, within the ViewModel the call is made to the domain layer to be able to assign a value to the observable that needs to know if it is registered (figure 9).
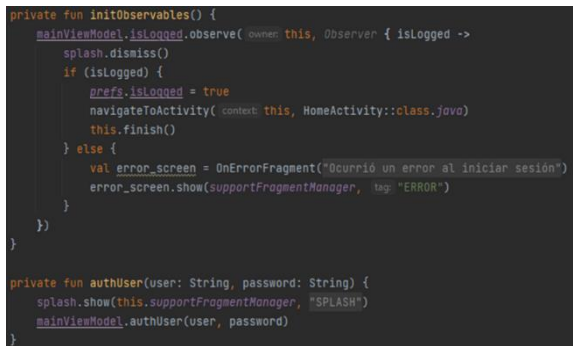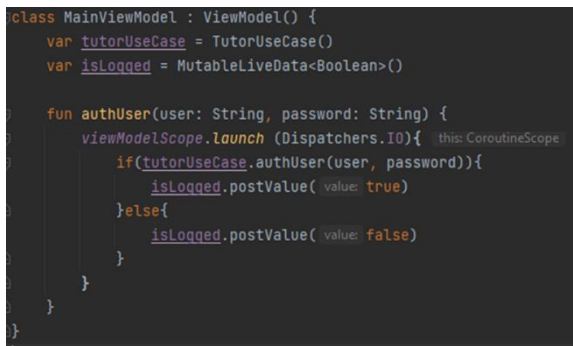

Figure 8 View File
Source: Own elaboration

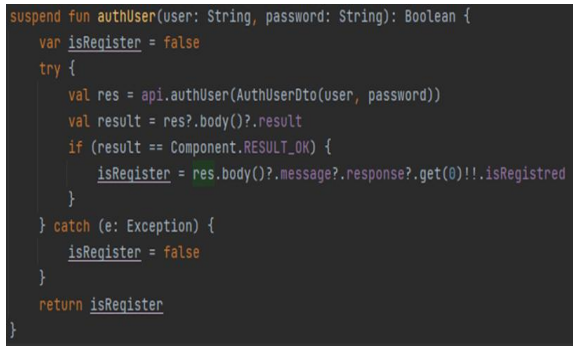**Figure 9** ViewModel
Source: Own elaboration

Figure 10 Repository
Source: Own elaboration

The domain layer in this project performs the role of intermediary, requesting data from the repository and delivering data to the ViewModel. The repository in turn works with the data that the service provides, which is to receive the responses from the backend and process them to deliver only the requested data to the domain layer (figure 10).

In the service layer, functions that qualify as intermediaries are performed, calls are made to each endpoint of the backend and responses are obtained directly from the server to send them to the repository (Figure 11).


```
suspend fun authUser(body:AuthUserDto): Response<AuthResponse>? {
    return withContext(Dispatchers.IO){ this: CoroutineScope
        var response:Response<AuthResponse>?
        try{
            response = api.authUser(body)
            val response_info = api.getTutorId(body).body()?.message?.response
            prefs.tutorId=response_info?.get(0)?.idTutor
            prefs.tutorToken=response_info?.get(0)?.authTokenTutor
            response     ^withContext
        }catch(e:Exception){
            response= null
            response     ^withContext
        }     ^withContext
    }
}
```

Figure 11 ViewModel
Source: Own elaboration

At this point we reach the point where the data transfer leaves our project in Android Studio and the calls are made to the backend using, in this case, retrofit, and we describe the type of response that is expected from the backend (figure 12).

This is the entire flow of the data journey and is the same path that all use cases follow to be implemented. This is the entire flow of the data journey and is the same path that all use cases follow to be implemented.


```
@POST("auth/tutor")
suspend fun authUser(@Body authUserDto:
```

Figure 12 API
Source: Own elaboration

Methodology to be developed

Home-Habits is an application for monitoring the progress of a child in the HabitFun video game, and it was decided to use the Android Studio platform for its development.

For the planning and development of the Home-Habits application, it was decided to use the agile Scrum software development methodology, considering the general stages of the software life cycle, this because the size of the software is not extensive (Schwaber, Sutherland, 2020).

Results

Once all the development shown in the previous sections has been completed, part of the Home-Habits App is presented below.

In the first instance, and as established in the functional requirements, there is a login interface shown in Figure 13, but also, if a user is not registered, they can register through the interface shown. in figure 14.

Once the account is created, the Home-Habits App redirects you to the login interface (figure 13), and this allows you to log in to enjoy all the functionality. Once authentication is completed, if there is still no synchronized player to monitor their progress, a synchronization token will be displayed (figure 15) so that a tutor user does not review the progress of any player user. The sync token must be used in the HabitFun video game and this will complete the sync.
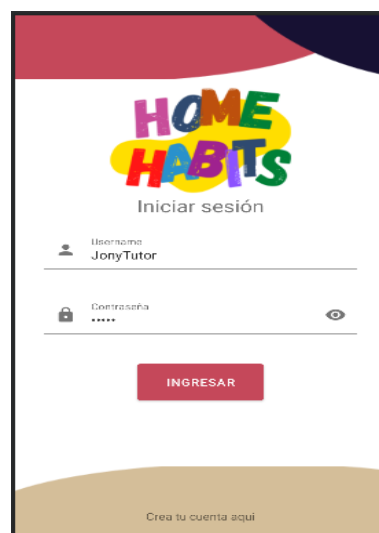

Figure 13 Login interface
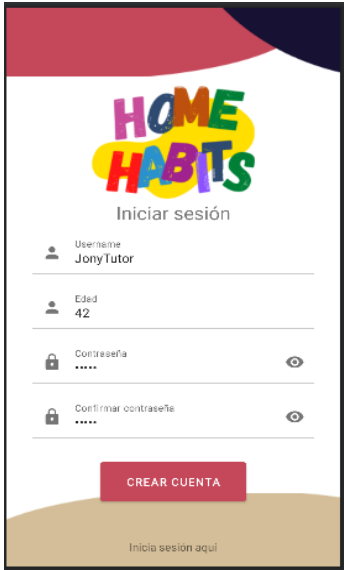*Source: Own elaboration*

Figure 14 Account creation interface
Source: Own elaboration

Figure 15 Interface with sync token
Source: Own elaboration

If you already have synchronized player users, a list of them will be displayed, as shown in figure 16. If a player is selected to monitor, the navigation system of the Home-Habits App is based on a tab-style menu, since at the top the information from the reports, sessions and personal information of the player are separated into different fragments. profile.

In the reports section (figure 17), a summary of data is displayed for each report generated by each minigame completed by the synchronized player, and if one of them in particular is selected, the complete information of the player is displayed along with statistics of advance of the corresponding level (figure 18).

In the sessions section (figure 19), a list of the sessions created by the player is displayed and a list of reports generated in that session can also be displayed along with the score obtained with reference to the maximum total possible points. reach.

Finally, in the My Information section (figure 20), in addition to viewing general profile information, you can access the synchronization token to monitor more than one player, along with the possibility of changing the password if you wish.

Figure 16 Interface with list of synchronized players
Source: Own elaboration

LUNA-CARRASCO, Claudia Yadira, LUNA-TREJO, Cupertino and VARGAS-FERRER, Juan. Home-habits, app for monitoring the progress of the HabitFun video game to generate hygiene habits. ECORFAN Journal-Republic of Peru. 2023

Figure 17 Reporting interface
Source: Own elaboration

Figure 18 Report detail interface
Source: Own elaboration

Figure 19 Interfaz sesiones
Source: Own elaboration

Figure 20 My information interface
Source: Own elaboration

Gratitude

Conclusions

An app called Home-Habits was developed to monitor the progress of the HabitFun video game to generate hygiene habits, specifically children between 6 and 8 years old, with an intuitive, minimalist and appropriate interface for guardians or parents.

The information presented is clear, concise and in simple language so that parents or guardians can understand it.

The Home-Habits App is visually pleasant and simple so that the parent or guardian can use it without so many complications.

Home-Habits is an innovative application that integrates with the HabitFun video game to effectively promote and monitor hygiene habits. Both tools combined mix fun and gamification with personalized monitoring and this allows them to be effective tools for developing and maintaining healthy hygiene habits in your daily life.

Home-Habits allows while children enjoy the playful experience of the HabitFun video game and work on improving their personal hygiene, Home-Habits offers an interactive approach to behavior change progress, encouraging consistency.

Additionally, progress monitoring through the Home-Habits app allows guardian or parent users to have a clear view of children's achievement as well as areas for improvement, encouraging greater awareness in parents or parents. tutors on hygiene habits. By receiving feedback, users, parents or guardians, feel encouraged to stay committed to the children's long-term goals.

Home-Habits is an innovative and effective app that harnesses the power of gamification and personalized tracking to help children develop and maintain healthy hygiene habits in a fun and sustainable way and parents or guardians to monitor progress. By promoting hygiene as an interactive game, Home-Habits and the HabitsFun video game have proven to be promising tools in improving the quality of life and general well-being of elementary school children aged 6 to 8 years.

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