Tutor Adaptativo

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Abstract

The smartphone became very prominent in the day-to-day life of billions of people arround the world, each day with more and more funcionalities.

They also became the main tool for personal organization most persons nowadays but not everything is perfect.

Every user is different and they have different needs and taste in terms of organization of their lifes.

The main objective of this work is to create a personal organization smartphone application adaptable to each use. This application should able to satisfy both basic users that just want a simple organization tool and more advanced users that want a more powerful tool with many options.

Keywords: Personal Organization, Adaptability, smartphone

1. Introduction

During the day, our day is divided between different activities and tasks, both professional and personal. Like a problem to resolve problems in work or a lunch with family.

In a world more and more frenetic and competitive, the levels of stress and work pressure that people are under are increasing quickly. The people are always expected to perform better and more efficiently, the personal time is scarce.

Many studies show that both Generation X and Millenials, that currently represent the biggest percentage of the working population, they care a lot more for the work-life balance then previous generations[4].

To reach this important balance between professional and work life, a good personal organization and time management are indispensable. In that fields, many studies and techinques have been developed during the last decades, like *Getting Things Done*[5] or *Get Everything Done: And Still Have Time to Play*[7], for example.

Besides the generational changes described before there was another big change, a big technology revolution with introduction and success of the smartphones, that became omnipresent[2].

People in general are becoming more and more dependent of this type of mobile devices as their main tool for managing their life, not only on the rich world but all around the world [3]. This kind of features on smartphones started with simple applications, like remainders and calendars but are evolving for full personal assistants.

The main problem with this type of applications is that they don't adapt to the user and they don't give an incentive to the user to improve his organizational skills. Either the user install a simple application and just keep it simple or install a very complete app that can be too complicated for him at that moment and make him forfeit.

In order to address this problem, this work porposes the creation of a new application for personal organization. This application will adapt to the user based on different metrics, like usage rate of a certain feature or if some feature that are only active if another feature needs it.

2. Related Work

In this section the most important works carried out in the following areas will be investigated: productivity and time management techniques, and personal assistants. This analysis will be important to understand the state of the art in these areas, the results obtained and the limitations presented, as only based on this information will it be possible to develop a good solution.

2.1. Maslow Pyramid

On a psychological level, humans are very complex beings , having different needs to be satisfied in order to feel fulfilled and happy. These needs are not all of the same importance, they can be grouped and ranked as Abraham Maslow did in 1943 [10]. Maslow divided human needs into 5 large groups, which are usually presented in a pyramid-shaped

hierarchy. Maslow's hierarchy of needs are, starting at the base of the pyramid:

- Physiological needs

- Safety needs

- Love and belonging needs

- Self-esteem needs

- Self-actualization needs

This hierarchy of needs demonstrates that not all of them have the same importance. Without the physiological needs (basis) a person can not even survive, so the following matter little if that basis does not exist. This logic remains throughout the pyramid, without a level being sated a person does not care about the next level. If someone doesn't have food, they won't care about whether or not they have a rich social life... if one does not have financial security one won't be looking for new experiences...

In the case of the Tutor Adaptativo application, it is important to understand the hierarchy of the user's needs. If you are not able to meet your most basic needs, including completing the tasks you have set out to do, it will make no sense, for example, to suggest that you spend time learning a new skill.

2.2. Getting Things Done

Your mind is for having ideas, not holding them (David Allen). This is the basic idea of *Getting Things Done* (GTD), a system to better manage the dichotomies work - personal life, which helps bring order to chaos, through 5 simple steps:

1. *Capture*: gather everything that captures attention. You can use a notebook or recorder to draw up to-do lists, things to solve or finish

2. *Clarify*: process what it means. Ask yourself: is it actionable? In case of a negative response, forget or archive to serve as a reference. In case of a positive response, define the next step. If it requires less than 2 minutes, do it in the moment; otherwise, delegate or put in a to-do list;

3. *Organize* : place it where it should be. Create reminders that involve actions, such as sending emails to;

4. *Reflect*: review frequently. Review frequently the to-do lists to determine upcoming actions. Do a weekly review to eliminate complete tasks, update the list, or just clear your mind;

5. *Engage*: Just do it! Use a system to act with confidence

This system provides an improvement of the user's performance by pouring everything that occupies their head into the notes, whether it's tasks, scraps, projects or future ideas. Thus, the user can focus completely on the task he/she is performing at that moment, relieving the feeling of oppression and "suffocation" caused by the multiple tasks in his/her head that cannot be forgotten, providing greater clarity and focus on the task at hand. TIME magazine describes it as *"The defining self-help business book of its time."* In the Tutor Adaptativo application, the user will be encouraged to create to-do lists, review the tasks to complete and be reminded if all tasks are not complete.

2.3. Get Everything Done: And Still Have Time to Play

Get Everything Done - and still have time to play is a time/life duality management system proposed by Mark Foster. According to the author, everyone should remove from life things that cannot be done in the right way as there is no time, and focus on the essential that has to be done. One should create to-do lists to ensure that nothing is forgotten and a system that should be looked at critically in case it doesn't work, but also ensure to take time for oneself on a day-to-day basis to simply "disconnect" from work/personal life.

According to this model there are 3 types of tasks:

1. Tasks with a deadline, such as meetings, appointments...

2. Tasks that should have a deadline. Tasks that require "depth/concentration", need to have a deadline, otherwise they are not performed, for example studying, meditating or exercising...

3. Tasks that do not have a deadline

In the Tutor Adaptativo application, the user can create categories to organize tasks and thus separate, for example, personal tasks and work tasks.

2.4. Pomodoro Technique

In 1992, Francesco Cirillo developed a productivity-boosting technique called *Pomodoro Technique*[6]. The name *Pomodoro Technique* comes from a tomato-shaped (*Pomodoro*) kitchen timer, that the author used during his university student days to manage his work.

This technique is based on a working methodology in short-time *sprints* (25 minutes), according to which any larger or more complex task can be divided into smaller sub-tasks. The aim of this technique is to increase the focus on the task that is currently being carried out, and thus be more productive. Each of these *sprints* is called *Pomodoro*.

The *Pomodoro Technique* works as follows:

1. Pick the task to accomplish in this *Pomodoro*;

2. Set a 25-minute timer;

3. Work on the task until the time is up;

4. When the *Pomodoro* ends, mark the task as complete;

5. Take a short break.

This technique is itative. The steps should be repeated for all tasks to be performed. Every 4 *Pomodoros* a longer breakperiod between 20 and 30 minutes should be made.

The *Pomodoro Technique* allows to minimize two problems: the human being's difficulty to concentrate for longer periods [8, 9] and also the ease with which we are distracted by small interruptions in the work environment, especially in *open space* environments.

The Tutor Adaptativo application will have the integrated Pomodoro feature, in which the *smartphone Do not disturb* mode will be activated to avoid distractions such as social network notifications and messages. It will be possible to define how restricted the *Do not disturb* mode is and thus cancel even calls and alarms. It will also be possible to set the *Pomodoro's* time.

3. *Tutor Adaptativo*

3.1. Objectives

The goal is to create an app capable of adapting to the needs and capabilities of personal organization of each user.

In order not to drive away basic users who want an app only to list ocasional to do tasks, but also sufficiently complete for those with higher organizational requirements, due to a life with more responsibilities and a busier schedule.

3.2. Architecture

The main differentiating factor of this solution is, as the name indicates, its user adaptability. The most common scenario in an app is all features being available from the beginning. This can cause confusion for the user and a basic user will eventually give up using the app because he/she will find it too much for their needs.

Therefore, the proposed solution will make available its features depending on the use of the app.

3.3. Functional Requirements

The main differentiating factor of this solution is its user adaptability based on its previous use. That is, unlike in other apps, the features will be made available to the user as he/she uses the app.

Adaptability is important to allow any user to feel that the app adapts to his/her requirements, regardless of the level of organization.

3.4. App Features

Prior to the development of the app, a survey was conducted to understand people's relationship with personal organization apps and also to question what they thought was missing in the apps they are currently using.

Considering the state of the art presented in the 2 section and also the information taken from the above mentioned survey, 3 main features were chosen for the *Tutor Adaptativo* app: a to-do list with categories, reminders and integration with the calendar, a Pomodoro feature and a list of new skills that the user wants to develop.

To-dos List *Tutor Adaptativo*'s base functionality is a to-do list as they are the basis for personal or professional organization. You can't be productive and organize the tasks you have to do without setting them first.

Skills A feature that can appear with the app's use is a section to register some skill(s) the user would like to acquire, for example: learning a new language, how to play a musical instrument, etc.

Pomodoro If on one hand the smartphone has become an important tool to improve personal and professional organization, on the other notifications being constantly received are a major obstacle for concentration these days.

The smartphone became the center of all our personal and professional communications, thus we receive a huge amount of notifications throughout the day, be it messages, emails or social networks, among others.

To fight the distraction generated by the notifications, the *Tutor Adaptativo* has a feature called Pomodoro, based on the concepts of the *Pomodoro Technique*[6]. Because in the *Pomodoro Technique* the user must ignore all distractions and focus 100

It is well known that it is not easy to ignore the smartphone notifications. Thus this feature allows the user to disable notifications from the smartphone, during the duration of a Pomodoro period, typically 25 minutes.

3.5. Features activation and deactivation metrics

To fulfill the adaptability requirement to different users, metrics for activating and deactivating features have been defined in the *Tutor Adaptativo* app.

All users start only with the To-Do list active, no categories or reminders, just a simple to-do list. Depending on the user's use of the app, new features will be activated.

For example, if the user creates multiple tasks, the Categories feature will be unlocked, which may be useful for organizing the high number of tasks. Additionally, if the user has already created multiple tasks and has tasks to complete, the Pomodoro feature is suggested and enabled, so that the user can focus on and terminate incomplete tasks.

Likewise, when all tasks have been completed, the Pomodoro feature will be inactive because it is no longer needed.

The concrete values of the used metrics shown in the figure 1, were planned for the initial test with a short period of use and could easily be modified in the future.
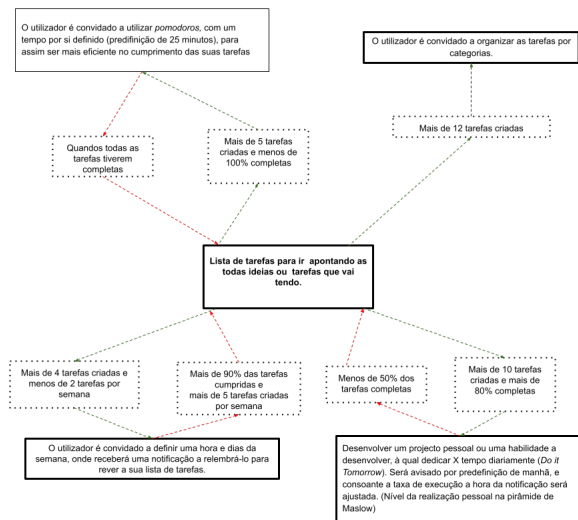
Figure 1: Metrics of how to unlock and lock features in *Tutor Adaptativo*

4. Evaluation
4.1. Metodology
To evaluate the Tutor Adaptativo application it was decided to ask several users to test the application for a period of two weeks, in order to understand if the application meets the proposed objectives. In particular, if users feel that this application improves their use experience in relation to the applications they usually use and also if with its adaptability the application satisfies different users. At the end of that two-week period, a log of the application use for a quantitative evaluation was collected and a survey was conducted for a more qualitative assessment.

This log contains all relevant user interactions with the application such as tasks creation, *Pomodoros* or skills, activation and deactivation of features... However it does not keep private data of the user, such as titles or tasks content. This is a very important issue these days and was a concern raised in the survey done before the development of the application.

An efford was made to try to find a universe of users as diverse as possible at different levels: age, gender, profession, educational qualifications... Which turned out to be quite difficult, as it was not possible to convince unknown people to test the application, since it is an application that requires a use over 2 weeks and not just the typical test of an application or game for 10 minutes. We tried to raise other students without success as well. Therefore, the users are within my circle of friends and acquaintances.

Another difficulty was the fact that the application only works on Android and many of the people contacted use iOS. Even within the Android, a problem was raised regarding the supported Android versions, as the application only works with version 8 or newer, and some people still use devices with older versions. This reflects a major development problem in Android, the fragmentation of the market [1], where many devices take too long or don't even update to newer versions of Android.

The total number of users raised were 12, aged between 24 and 34 years, 7 females and 5 males. Of the 12 users, 11 had higher education.

As a starting point, an email explaining the trial period was sent, asking them to confirm their participation in the trial and their data, such as age, profession and educational qualifications. In addition, the application binary was also sent in order to be installed on the mobile phones, a manual with instructions for installing the application and some basic instructions on how to create notes, trying to influence the use as little as possible.

After a week (half the trial period) an email was sent with the sole purpose to remind users to use the application and ask if they had detected any problems during the use.

At the end of the two weeks trial, an email was sent containing a link to complete the survey and send the usage log by pressing the button in the application for this purpose (figure 2).

Of the 12 initial users, only 7 completed the trial, submitted the log and completed the survey. One user was unable to install the application on their device (with Android 8) due to an installation error probably derived from some operating system variation made by the device manufacturer.

The other 4 users simply forgot to use the application, didn't send the logs or didn't respond to the survey.

4.2. Qualitative evaluation
The qualitative evaluation was carried out using a survey to gather the users feedback on the experience of using the application. This survey was
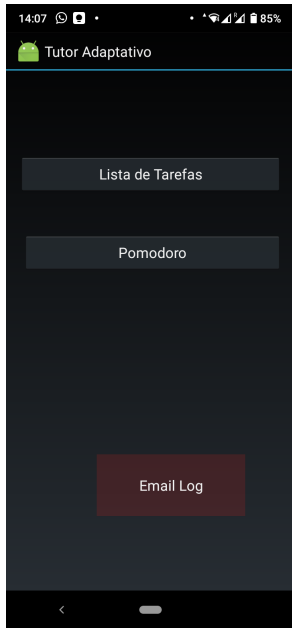
Figure 2: Button to send the Log

completed at the end of the two weeks of application use.

The survey's questions were restricted to data impossible to collect through the usage log as they are more subjective questions.

The main positive aspects of the application highlighted by the users were its simplicity and also integration with the calendar application, where one can create an event in the calendar from a task. Other aspects highlighted were the fact that, in addition to the title, it was also possible to add a description to the task and also the possibility of dividing the tasks by categories.

The main defect pointed out by users was the fact that the motivation notification to try the Pomodoro feature (sent every 3 days after unlocking the feature) was too intrusive, appearing too often. Other problems pointed out were the difficulty in marking the tasks, the color of some fonts and also the lack of notification /reminder per task in the application itself. There were also users who were frustrated that they couldn't unlock all the features.

The points where users considered Tutor Adaptativo better than the application they currently use are the integration with the calendar, the integrated Pomodoro feature and the tasks' coloring depending on the categories.

Overall, the Tutor Adaptativo application was considered useful by users. On an utility scale of 1 to 5, it obtained an average of 3.71.

Nevertheless, when questioned about the possibility of switching the application currently used for the Tutor Adaptativo application, users considered it unlikely. On a scale of 1 to 5, being 1 unlikely and 5 very likely, the average of responses was 3.

4.3. Quantitative evaluation

For the quantitative evaluation of this work, a usage log was collected, which was sent by the users at the end of the trial. This log was being written as the user was using the application.

All interactions relevant to the experiment were being recorded in the log, namely the time of task creation, the beginning and end of the Pomodoros, the timing of activation or deactivation of features, the user's reaction to the notifications of the application...

Of the 3 main features of the Tutor Adaptativo, the most used feature was the To-do List, followed at a distance by the Pomodoro, as clearly visible in the graphic in the figure 3, no skills were created by any of the users.

This data can be explained because the Skills feature was only unlocked by one user and only on the last day of the trial. The Pomodoro has been unlocked by all users.
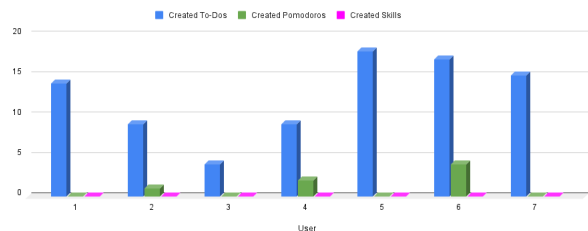

Figure 3: Usage chart of Tutor Adaptativo's main features

In the To-do List functionality, the most used, a total of 86 tasks were created, of which 61 were compared, that is, 71% of the tasks were completed. On average, each user created 12.3 tasks and completed 8.7 of the tasks.

Only 3 users have unlocked the possibility to create categories for their tasks and no one has unlocked the task reminder.
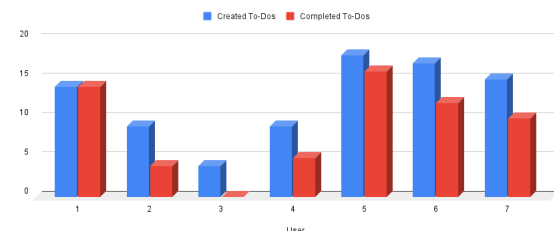

Figure 4: To-do List's usage chart

As for the Pomodoro, this feature was unlocked by all users but only 3 users, 43% of users, used the

feature and created Pomodoros, as can be seen in the graphic in the figure 5.

Of the Pomodoros created only 43% were completed, the others being stopped before completion.

This little use of the Pomodoro feature is not a result of lack of time to try the feature, as 86% of users unlocked the Pomodoro feature for the first time in the week of the trial, ie before halfway through the trial.
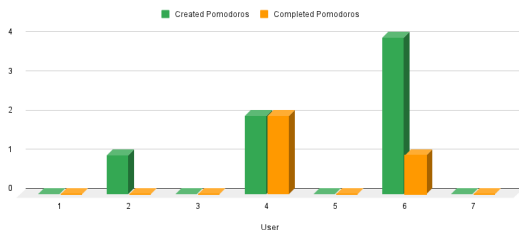

Figure 5: Pomodoro's usage chart

The logs corroborate the answers given by the users in survey, in which the users found the useful. The most useful feature was clearly the To-do List, which was by far the most used feature.

5. Conclusion

The main objective of this work was to create a personal organization application that adapts to the user. The application created would have to adapt to the needs and personal organization capabilities of each user, in order not to alienate the most basic users, but also to be complete enough for those users with more demands at the organization level.

This goal seems to have been achieved, at least in part, as there were as many responses from users highlighting the simplicity of the application as users highlighting more advanced features such as categories or the *Pomodoro*, the advanced features were unlocked based on the metrics of the figure 1.

The results also prove the different level of use of the application, translated in the fact that not all the functionalities were activated by all the users, with some having only used the To-do list functionality.

Nevertheless, to have more certainty of the trial results, some improvements were needed:

- The user group should be larger and more diverse, which was not possible due to the difficulty in finding available people to participate in a two-week trial.

- Another point to improve would be the duration of the trial. It should have been longer, to enable the activation of more features and also to further test the metrics. However this would make the first point even more difficult,

as the longer the trial would be, the less people would be interested in participating and the more they drop out.

- If the trial was longer, another interesting variation would be for the same users to do the same test at different times of the year, for example a test during working time and another during holidays.

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