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OPTIME

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GRADUATION SENIOR PROJECT REPORT

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APPROVAL OF GRADUATION SENIOR PROJECT

The B.S. Graduation Thesis titled “Optime” prepared by Fatma Erkan has been unanimously approved as a Graduation Senior Project at Akdeniz University, Faculty of Engineering, Computer Engineering Department.

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ABSTRACT

Optime

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Optime is a mobile application that is aimed to arrange the time thriftily to achieve success in one's own life. The meaning of the name comes from "Optimize time". It is an intelligence schedule generation application to plan works. The application provides the user to schedule their time and manages a business. There are many features of the application. However, the most important property is the intelligent schedule generation. It can be used both as personal and as teamwork. Thus, users can save time and do their works with a plan. There are many goals of the project that is help users to optimize time with a minimum loss, remind users about task deadlines, offer a simple and clean user interface. There are a lot of applications such as "Asana", "Trello", "WunderList", "To-Do". These applications are used to organize projects or lists to do. However, none of them can organize daily planning according to the time by minimizing the waste of time. The popularity of project management and to-do list applications grows every second. The inadequacy of other applications led to the development of Optime.

The main feature of the application is to plan tasks as well as plan a project. Optime is an application to help to organize time optimally. The application shuffles all the tasks automatically and it plans user's day or week programmatically. Thus, it optimizes the user's time. In addition to this shuffling, it divides big tasks into small tasks to increase the quality of working.

This management app provides users to schedule their works and business projects with two parts. Users can organize their businesses such as project management. Business professionals rely on project management software to help them oversee multiple endeavors. Companies can conveniently mitigate risk by identifying the failing aspects of a project using time tracking that estimated time of completion for each stage of the project. This part is used for project planning, scheduling, and management. It provides managers to control developers, to control project costs and budgeting, to check the quality of development, documentation, resource planning, time tracking, and many more. It is also used for collaboration between team members.

KEYWORDS: intelligence schedule generation, project management, teamwork, time optimization.

FOREWORD

I would like to thank to my supervisor, Asst. Prof. Dr. Murat Ak, for guiding me and giving me feedback to improve my senior project. Mr. Ak always encourages us while developing the project and he provides advice regarding all steps. I would also thank to my employer for leading and supporting me during the development.

Fatma ERKAN.

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SYMBOLS AND ABBREVIATIONS

AI : Artificial Intelligence

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1. INTRODUCTION

Task management software has become wildly popular nowadays, which means there are plenty of options to choose from. Whether looking for a simple way to organize tasks or a powerful enterprise-grade system, there is a task management tool everywhere. However, most of them are just for project management. Optime is an online schedule management application for android and web-based. In more detail, users can create tasks by assigning due time. The application's main features will be planning tasks as well as planning a project. The user will also identify the priority of the task and the plan of the day will be changed depending on it. To detail, a task user can add images that increase visual quality. They also are free to create a repeated task which means it can be located in a plan every day. Briefly, optime is an application to help to organize time optimally. On the other hand, users can organize their business as project management. Business professionals rely on project management software to help them oversee multiple endeavors. Companies can conveniently mitigate risk by identifying the failing aspects of a project using time tracking that estimated time of completion for each stage of the project. This part is used to project planning, scheduling, and management. It provides managers to control developers, to control project costs and budgeting, to check the quality of development, documentation, resource planning, time tracking, and many more. It is also used for collaboration between team members. This management application provides users to schedule their time and manage business projects with two parts which are named "Optime". There are many fundamental properties of the application, but the most important feature is the optimized time in the course of the schedule.

Optime will be a mobile application that is aimed to arrange the time thriftily to achieve success in one's own life. In project management part, the application which is named "optime" supplies some opportunities to reach the information that belongs to the project as documentation which includes reports, provide to create the task and share it with other users or team members, assign the task to anyone else, shuffle tasks depend on their deadline and priority. In daily life, people may forget their plans, works, meets, or some obligations to do once in a while. Optime is an assistant application to prevent some unexpected results that comprised of giving something amiss.

There are different meanings of painting according to the beholder's perspective. Somebody looks at this painting from a distance, and they like it or not. It is missing the small details that given the meaning to the whole than only then. However, the others see it and get closer to it, Thus, they can investigate all parts of the painting, analyze and make it more meaningful. Like that painting, our life has a meaning with small details. Optime helps you to catch the small point of life besides obligations. If we mention about the obligation, an old and high blood pressure patient person has to take his drug neatly, but he may slip his mind, so it can end up badly. Through Optime, when the time of drug comes, users keep informed by notifications and alarms. On the other hand, these small details which make our life more meaningful we mentioned can be reading a book. The user wants to read a book 2000 pages and continue to read regularly. Optime is helpful to organize it, reading is regulated according to the day by day or pages. This choice belongs to users on two types of the user application. Optime allows categorizing as both long-

term and short-term plans like those.

Another feature of Optime that it can be chosen as a personal or business part by the user. The personal part reminds generally of social activity, not so important plans, special dates like birthdays, etc. The business part of it is about work. It can be a meet, a congress, a deadline, an important knowledge to add, etc. Of course, both of them can be arranged according to the user's desire and Optime send the user to notifications and reminds by alarm regularly.

The most effective thing is the color. Because of color, Optime gives users to a facility to remark plans according to the order of significance. For example, an old person's taking the drug is more important and one has to do it first of all. Its color is red, the most important things are remarked red. On the other hand, reading an essay for presentation is important but not so much urgent. So, it is remarked with the color yellow. The other color is white. White is general. It can be a vocabulary's meaning which makes him wonder. The user searches it whenever he wants. If a person has time pressure and he cannot determine which one is the most important, colors chosen by the user helps him. At the same time, encolouring the plans that render the application more attractive and more entertaining.

Optime reminds the habitual progress, which is not done for a long time, like as to make exercise. A fat and reluctant to lose weight person does exercise rarely after some time. Our application sends a notification after a while to him. Optime, which is arranged according to the user request, reminds subjects, plans, habits, etc. in this manner via notification.

In addition to these, users can mark plans by done or not done. It makes it easier the determining the time to end user's daily duties discriminatingly and because of Optime, the user can achieve success in his own life by following his goals step by step carefully.

The most important feature of Optime is that it makes the general productivity analysis of the user and shows it as a table timely. And it causes to increase the application's general usage and its user group. Surely, it increases the discipline and this qualification isolates the Optime from other applications in this direction.

Optime belongs to the user completely and is arranged according to the user's desire. Personal or business part features help his abstaining from the mess. For example, daily plans are not viewed in the time of the business part of the application. Also, the user can arrange the time intervals every feature of Optime.

Also, it can make a private work schedule for users. For instance, Optime can be a guide for a student who prepares for an exam. This schedule arranges the period of a working plan by determining break also which user requests. Working 25 minutes and giving a break 5 minutes, and after again working 25 minutes that can be an example of the work schedule on our application. Like the others, this is also reminded by notifications and alarm. In addition to these features, keywords can be searched on the seek bar, and so user rules over the all knowledge from past to present easily.

Optime is a mobile application that is so private and quick that users can always achieve and use this technological agenda at any time and anywhere easily in today's world. In brief, Optime allows its users not to miss the little details that make one's life easier, more efficient, more productive, so to have a more meaningful life, thus; the user can achieve success in his life step by step.

2. LITERATURE REVIEW

Every people use different ways to complete works, and every manager needs to control project steps, the performance of the team, and track the time. There are hundreds of online programs that do this. Some of these applications want to keep it simple with the workflow system while other applications add features such as chatting, calendar, etc. The right application is selected depend on work type or personal preference. The application which is named Optime is developed to assist your work automatically. Optime is an application that is used to assist personal tasks and the business project professionally. It allows users to optimize their time with a minimum time loss. It provides users with an intelligent schedule generation which calculates the available time of the user and plans tasks to do.

The most known application for project management is Trello. It can be used to organize projects, project steps, and organize works. The important feature of this project management tool is to create tasks containing images, attachments, lists. Another property is to drag and drop tasks onto another task list. So, it has a simple and clean user interface. However, it makes it difficult for its mobile application. The drag and drop operation between boards is so hard. It is a good issue for the web application. Another advantage is there are many extensions for Trello as scrum. Trello provides to create several boards for various projects. On the other hand, Trello can only be used online. The usage of web applications is seen in Figure 2.1.

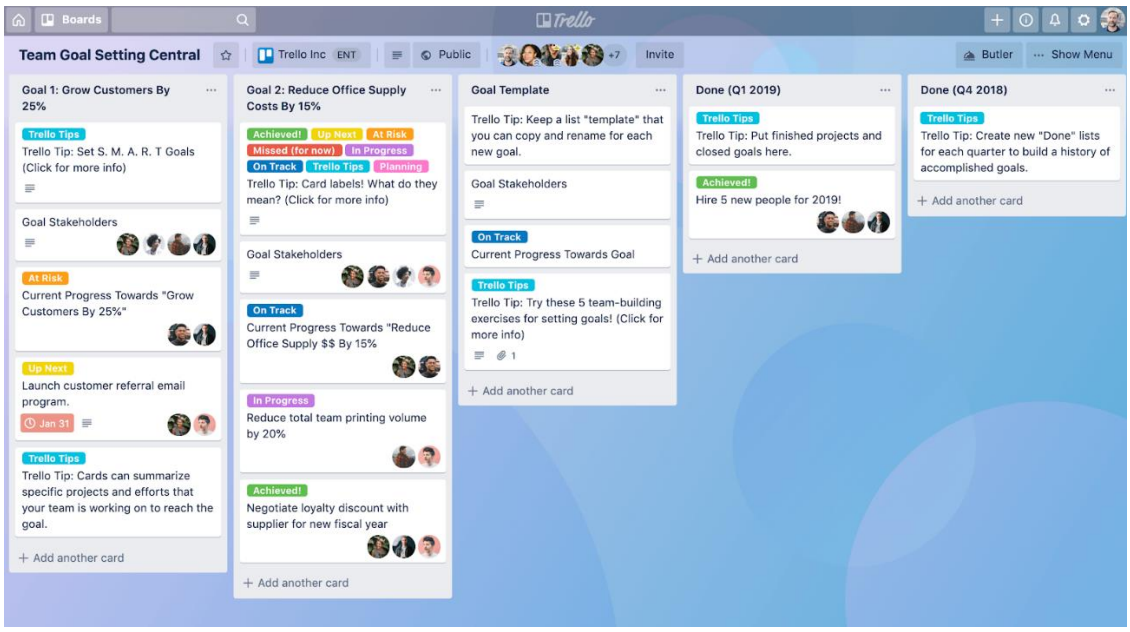

Figure 0.1. Web application of Trello project.

Another popular project management application is Asana. With Asana, everyone in the project can create tasks and share it with a team. However, there are many elements in the application which makes the application complicated. It also provides an

opportunity to create a timeline with tasks' deadlines. Asana is simple to use and has lots of integrations. Teams with a maximum of 15 members can use Asana for free. Another advantage of Asana is multi-device syncing. On the other hand, after 15 team members, the application is not free. Besides, Asana sends lots of emails and notifications to use it. Tasks that are added to the project can be assigned to just one person in this project management application. In addition to these, Asana has limited report exporting.

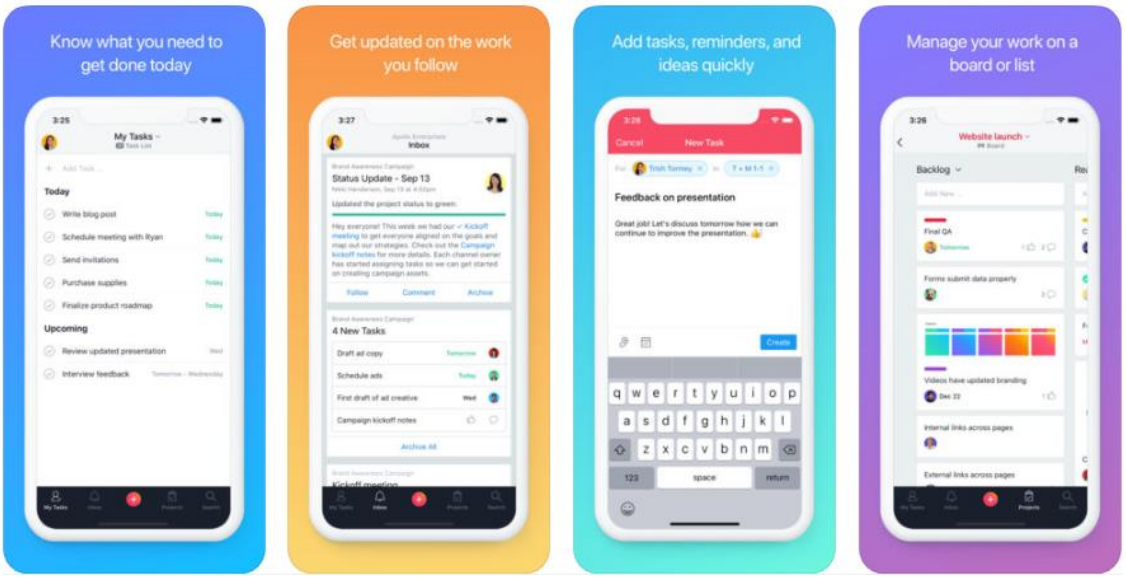

Figure 0.2. Mobile application user interfaces of Asana.

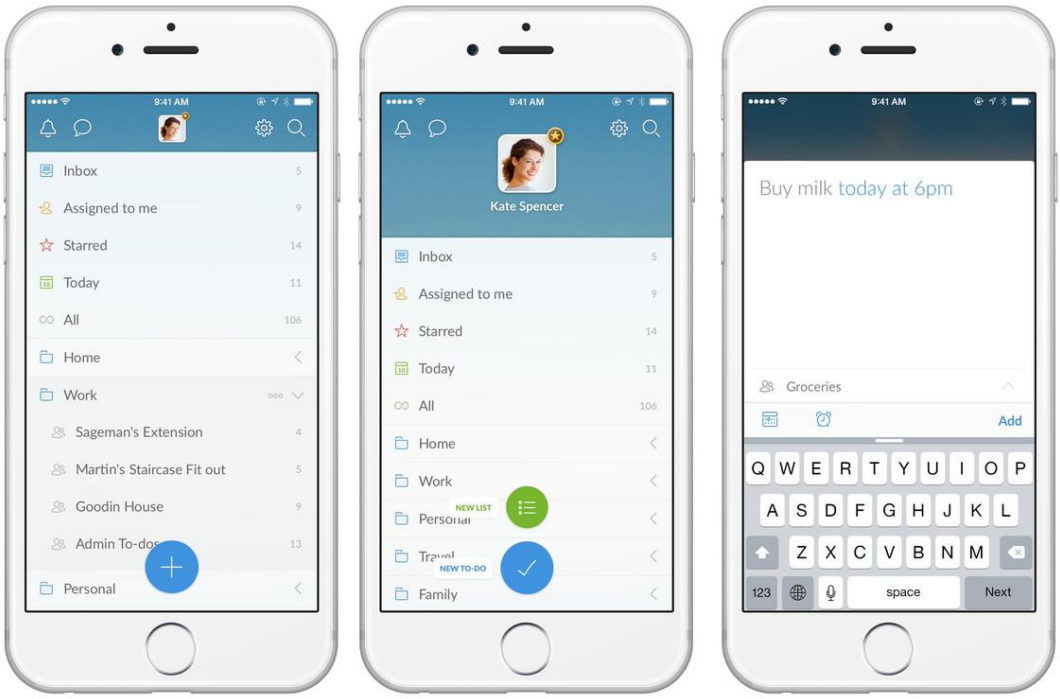

Figure 2.3. Wunderlist mobile application.

Wunderlist is a task listing application that was built for individuals and businesses to done tasks on time. It plans free times and managing projects easily without generating a schedule list. It organizes and shares a personal to-do list easily. Users can determine due dates of tasks and Wunderlist has a reminder to send a notification to the user. In addition to these, Wunderlist has integration with other applications. In the application, users can create subtasks inside of the tasks that help the user to organize their daily life. On the other hand, it has some disadvantages is that it difficult to create tasks in a mobile application and it has no date or time interpretation. Social connections with other users are not useful.

Optime provides to manage team projects with its intelligent user interface easily. It will be used to organize projects, create teams, schedule project steps. Besides, the project has a personal part to plan personal activities such as reading books, learning a new programming language. There are many differences from other applicatiıns. The first and most important one is the intelligence schedule generation. The algorithm shuffles all the tasks automatically and it plans user's day or week programmatically. Thus, it optimizes the user's time. It aims to manage the user's daily works and its job.

3. MATERIAL AND METHOD

In this task management project, the most important thing is that to control time depends on session time of the task and available time of user in a day. To calculate it, the waking hour, sleeping hour, and the working hours of a user are more important to generate a schedule list. In other saying, the first step of the algorithm is to the calculation of free times to plan tasks' schedule time. To get a more realistic schedule list, available times of user is required. If the user is a retired person (assume they have no jobs) the working time not necessary. Waking time and sleeping time is enough to calculate free time. On the other hand, if the user has a job, the beginning and the ending of working time is important for the application because it calculates these times to calculate available time in a day. The method of the calculation of available time is shown in Theorem 3.1 and 3.2.

Theorem 3.1. Available Time Calculation if user sleeps before 00.00 AM

$$\begin{aligned} Available\ Time \\ &= Sleeping\ Time - Waking\ Time \\ &- (End\ Working\ Time - Begin\ Working\ Time) \end{aligned} \tag{3.1}$$

Theorem 3.2. Available Time Calculation if user sleeps after 00.00 AM

$$\begin{aligned} Available\ Time \\ &= 23.59 - Waking\ Time \\ &- (End\ Working\ Time - Begin\ Working\ Time) \\ &+ SleepingTime + 00.01 \end{aligned} \tag{3.2}$$

In Theorem 3.2, if the sleeping time is bigger than 00.00 AM, subtraction sleeping time to waking time gives the wrong result. So, it is selected as 23.59, and sleeping time is added at the end of the time formula. The 00.01 means that 23.59 have a 1-minute loss of time. The algorithm calculates it as well. Consider that formula was generated depend on the TimeSpan data type in the C# programming language.

Users can have off days. In the circumstances, the days will be known to prepare the schedule list. The whole day will be scheduled to optimize time for users. The free time of the day will be selected between waking time and sleeping time.

After finding leisure times, the personal task of users will be listed. Tasks are separated by their status which definition is completed tasks and uncompleted tasks. Completed tasks cannot join the scheduling algorithm. Because the aim of the scheduling algorithm is to the preparation of plan using uncompleted tasks. Then, if the due date of some uncompleted tasks which are close, the priority of the tasks will be increased by the algorithm depending on the nearest due dates. It is controlled whether is uncompleted

tasks have a Pomodoro idea which is the most popular working algorithm with 5 minutes break time after every 25 minutes working. Every task, which contains Pomodoro, has some subtasks depending on-task time. A subtask lasts 25 minutes. If a task's time is 5 hours, then it contains 12 subtasks. Correspond to tasks that have Pomodoro, subtasks will be scheduled. If the task does not contain Pomodoro, then the period calculated by task time. If the task lasts 3 hours, 3 hours will be reserved for this task without any break.

If a task is a reminder such as taking medicine, it will be added to schedule depending on reminder time. If taking medicine time is10.00 AM, the notification will be shown at 10.00 AM. It is also important to know how many times is shown in a week or month. Depending on these properties, the schedule must also include reminder tasks.

Using available tasks and time of tasks, a list is generated by the scheduling algorithm that is implemented in the project. With task lists and free times, algorithms create a schedule for daily, weekly, and monthly. If a new task added to the program, a scheduling algorithm shuffles all tasks again to generate a plan.

Theorem 3.3. Recalculating after a task added to the day.

$$Remaining\ Time = Available\ Time - Task\ Session\ Time \tag{3.3}$$

In Theorem 3.3, the time of the day is calculated using the session time of the selected tasks. If the remaining time reaches 0, then the algorithm continues to schedule tasks for the next day until tasks are over.

Users can mark tasks as done or delay any tasks. If a task is marked done at the correct time, there is no change in the schedule list. On the other hand, if any task is marked as done earlier, the scheduling algorithm calculates time and tasks depend on the new part of the available time. In addition to this, the user can want to delay the task for a later time. The algorithm calculates time and tasks depend on the new part of free time and delayed task.

In addition to schedule algorithm, the project has a project management algorithm to manage business or events which are planned with a team. The project is formed as defining its name and definition by a director. At the same time, the members of the project are identified by using the user list in the check user page with checkboxes. After the project is formed, tasks can be added to it and these tasks can be added to it and tasks can be assigned to the members of the project. Thus, project members can be work simultaneously. Tasks can be added to boards. Also, these tasks can be added to the project without boards. The due date can be added to tasks. While making a to-do list for tasks which has the earliest due date take place on the top. So, users give priority to his/her plans according to the deadline. Tasks on the project schedule will not be used. Because the scheduling algorithm is used for organizing personal tasks.

4. RESULTS

The task management application, Optime, is used to manage tasks, track time, and easily collaborate with the team. Those are efficient for individuals, organizations to help them to complete tasks without missing any deadline. If a user working on a project, keeping everything about the project is important. This task management software helps users to keep everything together in the form of calendars, notes. The application helps the user to save time and allow accessing documentation easily.

With this project, the importance of collaboration in a team is noticed. The importance of the feasibility study to define possible problems and identify if the project is useful was learned. While observing similar applications and using that information to develop optime, it is understood that how necessary to research.

5. CONCLUSIONS

Optime is an intelligence schedule generation application to plan works. It is an application for Android. In detail, the application will plan tasks and projects. It provides users to schedule their time and manage business projects. There are many features of the application. However, the most important property is the intelligent schedule generation. The program can be used both as personal and as teamwork. With this application, everyone can easily schedule their daily routines. Thus, users can save time and do their works with a plan. There are many goals of the project that is help users to optimize time with a minimum loss, remind users about task deadlines, offer simple and clean user interface, etc.

Researches about the applications teach that to do requirement analysis depending on users' needs. Designing a flow diagram to show system requirements graphically is an issue to make project implementation understandable. To manage the project professionally, definitions of the business processes are mandatory.

The project provides users to reach the information that belongs to the project as documentation which includes reports, to create projects to manage business life professionally. Users can be able to share tasks with other users or team members to work together and everyone on the project can assign tasks to anyone else in the project team to increase project performance and efficiency. The application provides to see tasks at the top or bottom of the page depending on deadlines and status.

Task management applications allow the user to divide big tasks into small tasks to complete tasks without bored. Users can define free times which is out of the working time for designing personal time, with these approaches users can evaluate most efficiently. With AI, it reminds users of some tasks that are not done for a long while. It also controls repeating tasks and takes note of any tasks. The algorithm shuffles tasks depending on priorities to optimize users' time. Task prioritization is one of the key factors to meet deadlines for an important task. Optime helps users to overcome task prioritization issues that users can complete tasks on time. Additionally, the application gives users access to get tasks and works anywhere and anytime using Android devices. These features increase the productivity of an organization.

The system will be usable by students, businessmen, academicians, companies, all ages, and various groups of people. Because of that, it will be well organized in such a way that user errors are minimized. The application can handle many numbers of usage at the same time. On the other hand, the application has three main performance issues that are response time, workload, and platform.

In addition to the application, some features can be added to the application such as the application can lock the phone notifications when doing the task time or just if time is equal to doing any task which includes Pomodoro. It will be containing a counter for the time on the main page of the phone that calculates the remaining time to complete the task. On the other hand, users can exchange their tasks with a button without writing to add a new one.

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CURRICULUM VITAE

Fatma Erkan was born on the 26th of June,1997 in Burdur. She studied at Gazi Anatolian High School in Antalya. In 2015, she enrolled in Akdeniz University Computer Engineering Department. Besides her education, she has been actively involved in the sector since 2016 to improve herself and gain experience.