

# FamilyTurn - A web application for optimal time management with family

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**Abstract.** We live in an Internet era, with fast travel by train, car or airplane, a time when we want to do as much as possible at work and out of it, but at the same time, we don't want to neglect our family. Today time seems to be the main culprit for our shortcomings, especially those related to family. Even if we accept the myth that time has shortened, the way we manage it is vital, knowing that we are living our lives at a much faster pace and we are overcharging ourselves. In this paper, we describe a new web application called FamilyTurn, a solution that supports families with children to organise better their time. FamilyTurn has a lot of functionalities that help reduce stress in family life, including finding an available family member to be there for their child, to synchronize the calendar of all members and to add events, etc.

**Keywords:** human-computer interaction, family time management, web application, Google Service, Facebook.

## 1. Introduction

In last years, technology has evolved more and more, and, nowadays, it represents a significant part of human lives (Peeters and Schuilenburg, 2016; Novak-Marcincin *et al.*, 2014). All the devices we have (mobile phones, laptops, tablets, etc.) are used daily, almost excessively, and we are losing our ability to manage our priorities as efficiently as possible (Modrak *et al.*, 2014). Time is often fuzzy since different people may judge it as the main reason for their failures (Zhou and Hripcsak, 2007). We have the impression that the duration of a day shortens from year to year and continues to decrease. In reality, all these devices give us the courage to solve time problems (Wing, 2006) and design all kind of systems that respond according to our speed.

Time management can also be solved by technology that matures –

especially the AI component (Khurana *et al.*, 2017) – the computer will start to deliver expected answers to our queries.

Managing our time is easier than ever with the help of a specialized application. The users don't need to carry an agenda anymore and they can add and remove events from the application. In addition, other people can invite them to events with a few touches of a screen.

In this paper, we describe a new web application called FamilyTurn, an intelligent mode that helps families with children, to organise better their time. In this context, parents are able to monitor how their children use the time on their devices, and can act accordingly if they believe they should change their behavior. (Moffitt *et al.*, 2011; Sektnan *et al.*, 2010). Children have the opportunity to manage their time, especially their spare time. At the same time, FamilyTurn proves to be an important help for people in general, many with depression and anxiety, giving them the opportunity to use their time to finalize the best of their actions.

The paper is structured in 4 sections. Section 2 shows some applications with similar features. Section 3 describes the FamilyTurn application, highlighting the peculiarities of synchronizing time between family members. Finally, the conclusions and future work challenge the reader to reflect on his own time, while stressing the importance of the new application in our lives and how it could be improved in the future.

## 2. Similar Applications

There are many similar applications that we will present below, but FamilyTurn includes other features in syncing calendars of members of the same group or different groups, making it a user-friendly and easy-to-use application.

### 2.1 FamilyTime

FamilyTime<sup>1</sup> is an Android, iPhone, and Kindle app for parents and children. The application is addressed to older children who have and use a personal phone, giving parents the ability to monitor how they use the device. Messages, calls, locations, installed apps, and other usage data are recorded.

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<sup>1</sup> <https://familytime.io/>

Parents have access to them on their devices. Another available option is to monitor the driving speed of the adolescent's car and receive an alert if he or she drives at a higher speed than the legal one.

Parents can block certain apps on their child's phone and can limit the time they use the device, while children can send alerts to their parents, or signalize their parents where they are.

A child-friendly functionality is the ability to establish the time for fun within a day or for a period of time. In addition, the child learns to save time as currency. One drawback, however, is that developers have not implemented a model similar to banking, in which the child receives something, for example an "interest", for the time saved.

Another feature of the app is the introduction of a family calendar similar to the one in our FamilyTurn, as well as an additional map with the position of all family members and a communication sector (similar to chat).

The FamilyTime application comes with a useful suite of functionalities, but excessive adolescent monitoring by the application may have harmful effects, according to a study by the University of Haifa (Mor and Mogilevsky, 2013). Adolescents will feel constrained by this monitoring, away from the family, and considering parents' excessive protection as proof of lack of confidence.

Our application competes with FamilyTime only because both have the family calendar feature. In addition, our application allows the user to save memories files on Google Drive and in his/her own database, as well as to import them from Facebook. Moreover, parents can add notes about child behaviour, health, menus, allergies, things the child says that the parent does not want to forget, or other useful information.

## 2.2 TeamUp

TeamUp<sup>2</sup> is an application that allows a group of users to share a calendar in which they can add events and mark the time intervals in which they are unavailable. Finding a person available within a given range can only be done manually. However, it is provided a way of viewing the calendars of several people in parallel, which makes easier to find a free time.

In addition, our application offers the E-mail or Slack alert to users about an event, but they need to check their agenda daily. Moreover, FamilyTurn

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<sup>2</sup> <https://www.teamup.com/>

allows free file upload and automatic calendar synchronization.

A component to be appreciated on TeamUp is that it allows the user to view calendars in several ways, which can be added in the future to our application. TeamUp is closer to the concept that we implemented in FamilyTurn than FamilyTime, because it aims more to synchronize calendars, even if it does not attempt to address the parent category of customers.

### 2.3 Our Home

Our Home<sup>3</sup> is an application available in the browser, on Android and on iOS, dedicated to families, which proposes family organization by assigning a number of tasks to each member. Tasks can be assigned to the entire family and members can assume them, being rewarded with points (convertible to family exits, etc.).

The interface is attractive, especially for children. There are a number of predefined tasks, but users can create their own tasks, each having a value based on the estimated time to be allocated to it.

The application does not have file upload functionality, its main purpose being to share the housekeeping tasks between family members.

OurHome is similar to our application in that it helps families share their tasks, but it differs because it focuses on housekeeping tasks, not on automatically finding a parent or other tutor who can be available for a certain child-raising task.

## 3. FamilyTurn Application

Unlike existing time management applications presented in the previous section, or applications such as *Google Calendar*<sup>4</sup>, our application, suggestively called FamilyTurn, offers the users multiple calendars at once, in order to synchronize their agendas. Moreover, with this application, users can automatically find their group colleagues who are available in a certain time frame.

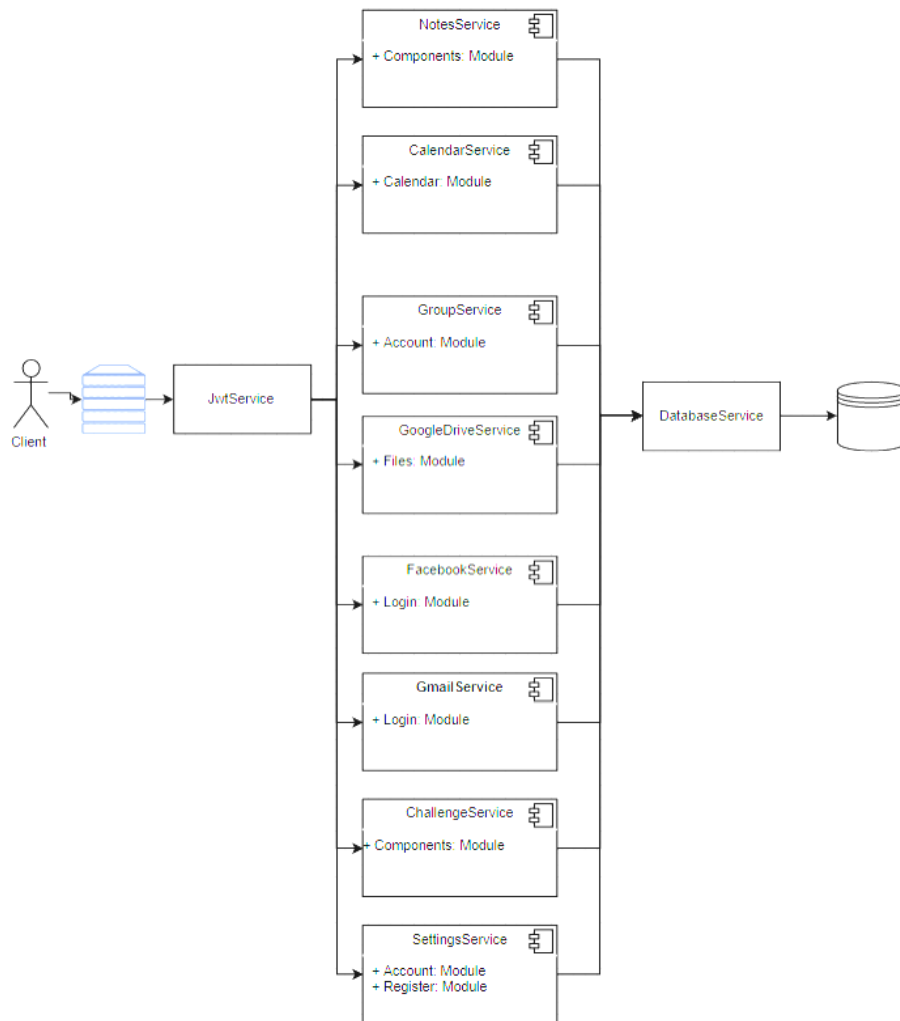
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<sup>3</sup> <http://ourhomeapp.com/>

<sup>4</sup> <https://gsuite.google.com/>

### 3.1 FamilyTurn Architecture

In implementing this application, we opted for a modular approach. Thus, the code obtained it is easily maintained, modified and improved throughout the implementation period, being divided in Modules, Services and Utilities (Figure 1).



**Figure 1:** FamilyTurn Architecture

*Modules* are components that manage requests from clients by using the

functionalities of *Services*, the results being compiled and sent back to the clients. *Utilities* are used by services for data processing, especially when there are operations that multiple *services* use.

The modules correspond to the pages they offer the back end for. Thus, the **Account** module is used for managing the users and groups they belong to, along with operations involving their personal data. Operations related to editing and viewing the users' schedule are offered by the **Calendar** module. We also have a general module called **Components** that is used for simple tasks, such as sending alerts to users.

The **Files** module offers functionalities regarding the files uploaded by the users, such as searching for files or streaming binary data. The first module used by any client is **Register**, which handles new users. Closely related is the **Login** module, which manages sessions. The pages in the applications are created by the **Main** module, which renders the *ejs* files.

The good functioning of these modules is based on the services, which facilitates writing and reusing the code. The **CalendarService** communicates with Google Calendar via HTTP requests, being a wrapper for the Google API. In addition Google API is related with **GmailService** which is used for logging in or registering, and **GoogleDriveService** which offers an easy way to get files from Google Drive. Another service that uses Google API is **GmailService**, for sending e-mails generated by the application to the users. This service is not public and is intended to be called by other services. Similarly, **FacebookService** is also a wrapper for the Facebook API. We preferred writing such components because it is a much better alternative to writing HTTP requests in more parts of our code.

The **ChallengeService** can be used to modify database information about the challenges the users can complete or refuse, while the **GroupService** contains methods for processing users groups, by creating or deleting them, adding or removing members, including oneself. The **NotesService** can be called when the users need to add, remove or edit the notes they can share in a group. Finally, the **SettingsService** has functionalities regarding editing a user's data, such as name, e-mail or Slack WebHook URL. All those services use the **DatabaseService**, which functions as a wrapper for the NodeJS driver for MongoDB, making inserts, updates and queries for the database simpler and more secure.

The **JwtService** is used for coding and decoding JSON Tokens<sup>5</sup>, which are

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<sup>5</sup> <https://jwt.io/>

used for login purposes, but it eliminates the need of storing sessions in the database and the user's cookies, so that the database is not queried for every request the users make. This method also enables the server to be used for mobile apps, without any additional changes, because mobile applications seldom use cookies.

### **Sending HTML pages to the client**

The application FamilyTurn uses Embedded JavaScript (EJS<sup>6</sup>) to send HTML pages to the client. Thus, the pages will be rendered on the server, the result being a HTML page that can be processed by the browser. EJS uses an intelligent caching system, such that the performance is not affected, the access speed being higher than sending a classic HTML page. This technology uses a templating system that replaces placeholders with actual values, creating a rendered HTML page. Dynamic data of the page will be retrieved via a HTTP request to the application API, as the EJS should only be used to inject data that does not change on the page.

#### ➤ 3.2 Main Functionalities from FamilyTurn Application

From a practical perspective, usage scenarios show the role of the time management process in which the main components of our application actually participate.

### **Dashboard**

After the users have registered using their Facebook or Gmail accounts, or directly through the application, they will be redirected to the *Dashboard* page (see Figure 2). In this page, the users can view their personal calendars from all their registered accounts.

Using the menu on the left side of the page, the users can select their current groups, based on which they can view and edit their information and navigate through the application.

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<sup>6</sup> <http://ejs.co/>

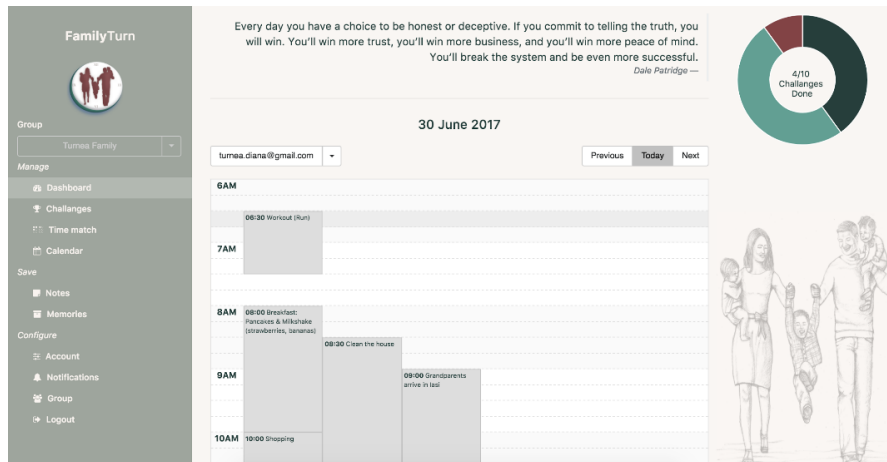


Figure 2: Dashboard Page

## Challenges

If a family member wishes to submit a challenge for the family (see Figure 3), he or she needs to add a new entry in the *Challenges* page. A daily challenge will be chosen, and depending on the final status, a family score will be computed.

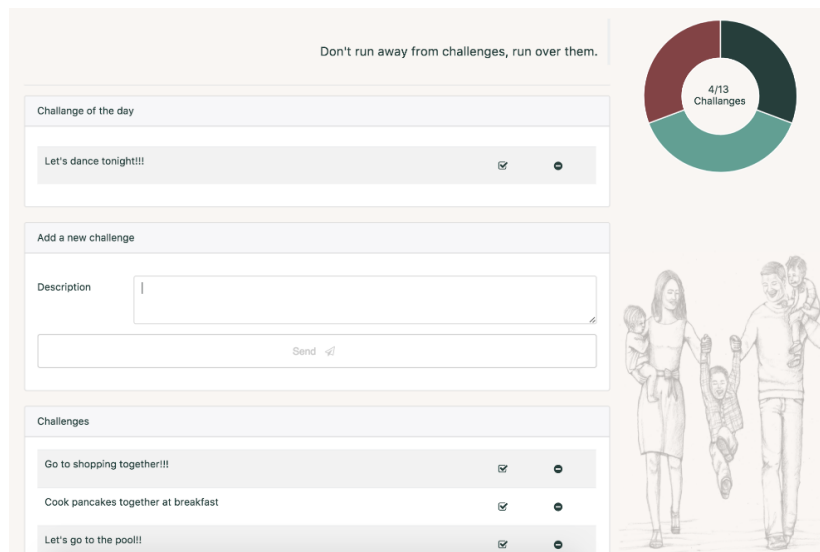


Figure 3: Challenges Page



### Time match

Let's suppose that someone needs a family member to be present at a certain event in the child's life, not knowing the availability of the other adults. The user of the FamilyTurn application will input the time interval in the *Time Match* page (see Figure 4) and will sort the availability of people in decreasing order of their free time or manually according to his/her intentions. The system will create the event in the person's calendar, as well as sending him or her notification.

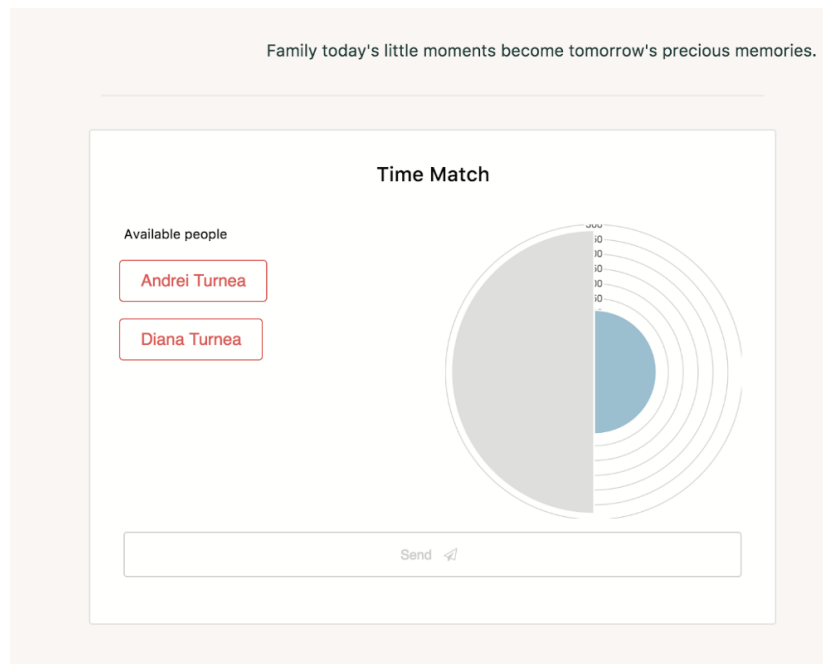


Figure 4: Time Match Page

### Calendars

If the user wants to view his/her calendars (personal and professional), or the calendars of other family members, he/ she can use the *Calendars* page (see Figure 5).

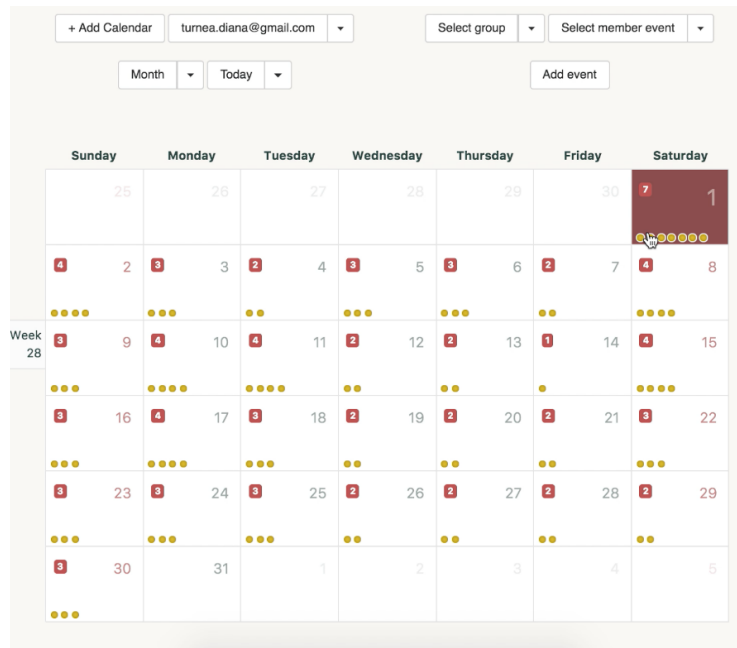


Figure 5: Calendars Page

The user can view events, including their details, by day, week, month, and year. While clicking on an empty time slot, the user can create an event using edit option.

### Notes

When family members want to have an archive of written memories, or share important details about their kids (e.g. child's health), the *Notes* page (see Figure 6) offers the possibility to save text notes and search through them using a *tags* system or certain keywords, offering search operator support. The users can also see a statistic of most common words and tags used, to provide an overview of the saved data. In this way, a babysitter will have immediate access to important medical information about a child he/ she takes care of.

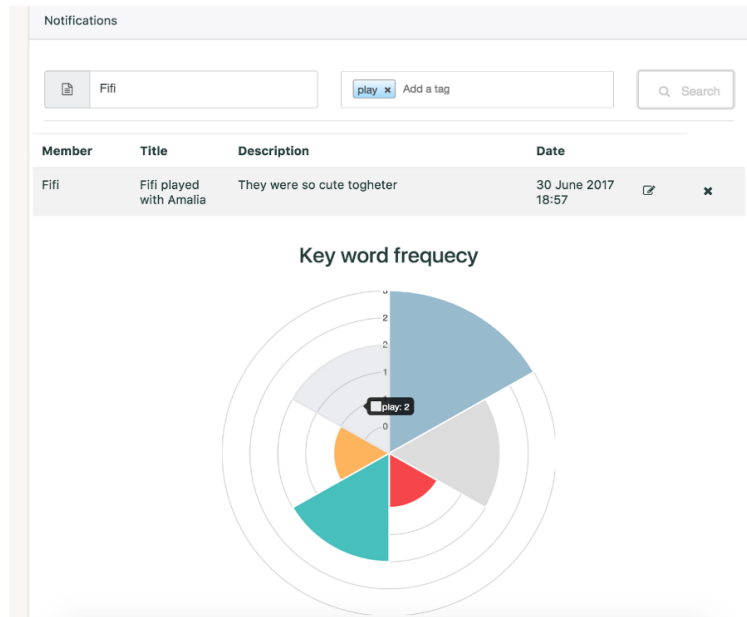


Figure 6: Notes Page

## Memories

One of the most attractive use cases of our application is archiving digital memories (see Figure 7) by date, tags, or description.

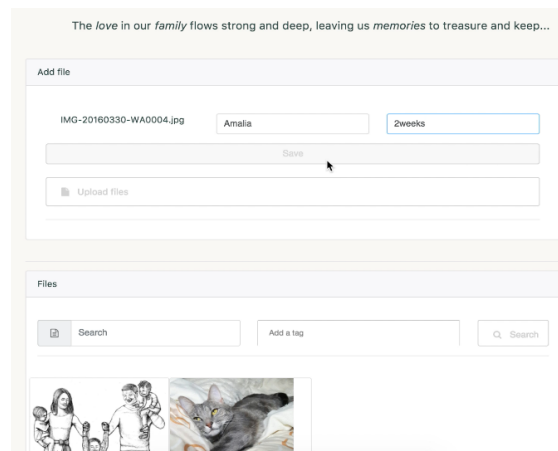
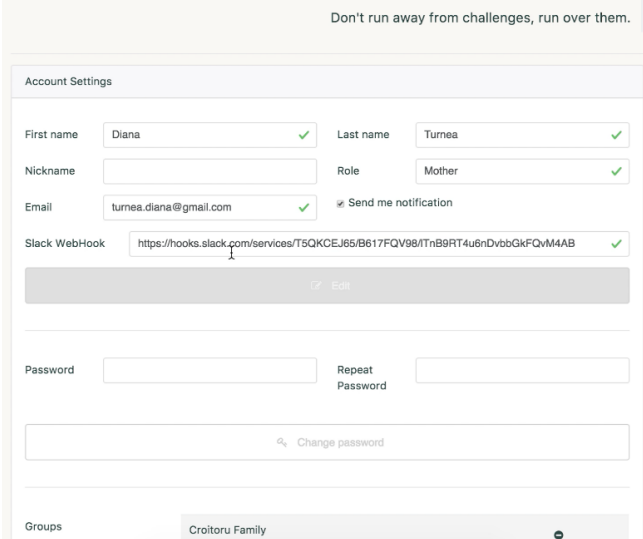


Figure 7: Memories Page

The user can search for the memories, being able to use advanced search operators such as exact matching, logical operators and simple regular expression based operators, such as wildcards.

### Notifications

If a member wants to send a message with good news or a reminder about a recital to other members of the group, he/ she can use the *Notifications* page (see Figure 8). Here, they have the possibility to send notifications to all family members, via e-mail or Slack, using the available API for each service. Notifications can also be sent via email to users to invite them to join a family, containing a unique generated URL used for quick registration purposes.



Account Settings

First name: Diana ✓ Last name: Turnea ✓

Nickname: Role: Mother ✓

Email: turnea.diana@gmail.com ✓  Send me notification

Slack WebHook: https://hooks.slack.com/services/... ✓

✎ Edit

Password: Repeat Password:

🔍 Change password

Groups: Croitoru Family

Figure 8: Notifications Page

## 4. Conclusions and Future Work

For a modern family, excessive monitoring becomes harmful. Still, this new web application, called FamilyTurn, offers a simple and intuitive way of organising and managing time.

We have tested the application on two families with children and they considered that all the features are helpful and they function as expected. Furthermore, code reviews made by other programmers were positive,

appreciating the ease of adding new features and maintaining the existing ones.

This application is based on integrating services offered by Google and Facebook and augmenting their functionality with options such as automatically finding a free time slot in a schedule, adding tags and descriptions to uploaded files and offering a private cloud for the user's files and notes. Users belonging to the same groups can send notifications to one another or schedule their sending at a certain time. In a world in which phone notifications are the norm, the users can opt for Slack messages, using WebHook URLs, or via email, receiving a notification on their mobile device at the same time.

In the future, the introduction of SMS notifications or creating an Android or iOS app could boost the application's efficiency. Moreover, we will implement the introduction of a payment system that increases the maximum size of the uploaded files and removes advertisements from the application, a chat system for members of the same group, and the possibility to reach the location of an event, via GPS.

### Acknowledgement

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