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FENG 497 PROJECT PROPOSAL



Personal Appointment Assistant

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## Contents

|          |   |          |
|----------|---|----------|
| <b>1</b> | <b>Introduction</b>                       | <b>2</b> |
| 1.1      | Problem Statement . . . . .               | 3        |
| 1.2      | Why Is This Project Worth Doing . . . . . | 3        |
| <b>2</b> | <b>Objectives of the Project</b>          | <b>4</b> |
| <b>3</b> | <b>Scope of the Work</b>                  | <b>4</b> |
| <b>4</b> | <b>Literature Survey</b>                  | <b>4</b> |
| <b>5</b> | <b>Project Plan and Schedule</b>          | <b>6</b> |
| <b>6</b> | <b>Risk Analysis</b>                      | <b>7</b> |

## Abstract

Nowadays, problems caused by time that is not managed efficiently are increasing and businesses challenge to do so. One of the places where this problem is most frequently seen is the businesses that work with appointments. Conventional appointment process is done via face to face communication and phone calls but it decreases the productivity of work and leads complexity in life. With the advancing technology, even though, there are some existing platforms that try to solve this problem, they focus only specific business industry. Therefore, people suffer to find the most related service among limited options. We aim to develop a platform that improves appointment process by bringing variety of business industries together and this will help business owners and also their customers. For recommending the most fitting service to a user, we will analyse already performed Collaborative Filtering techniques in the current literature. Afterwards, we will try to implement these techniques into the project in order to recommend the most fitting service for each user. Therefore, these features that are mentioned above will drive us one step further from among our competitors.

## 1 Introduction

Time is the most precious thing that all people have equally in the world without being aware of its worth. How they use the time makes all the differences. Efficiently used time brings along various benefits and takes them a step further. Thus, managing and planning time properly lead people to success. People who can not manage their time, may complain about not having enough time to fulfil their responsibilities and they delay them. Additionally, these people may not be able to spend time with their families, friends or themselves and not be able to focus their work due to not using the time productively.

With the advancing technology, variety of digital calendars, planners and such applications are available. In business life top firms strongly believe in the necessity of using that type of software in order to coordinate and track their flow of work which leads to an increase their value. SAP is the most known program among these types of programs, however, small and medium-scaled businesses may not afford it because of costs. Also, creating similar program may be challenging, in terms of, hiring qualified developers and having financial difficulties for small and medium-scaled businesses.

So far, we have discussed from the perspective of businesses and their management but when we look at the time management and planning issues from the perspective of individuals, there are not many products that help them to organise their time. Even though there are lots of digital calendars and planners, they do not serve as a bridge between users and businesses. Hence, these digital calendars and planners become useless at some point. In addition, when people wish to get a service from large business industry, they find it difficult to locate the most fitting service to be pleased. For example, when people would like to get a service, first, they wish to see photographs of a business, then, they

read comments about how that business served to other people in the past. So, this process may take long time during the busyness of the day. To sum up, it would be great to have a common program that helps people and businesses to manage their time and above all, to connect people and businesses.

## **1.1 Problem Statement**

There does not exist such a platform that brings variety of business services and their customers together to organise their appointment processes. Similar platforms do not provide personal recommendations for helping users to find services that fit them best. Therefore, people need more on the experience and recommendation of their friends when they are looking for a service.

## **1.2 Why Is This Project Worth Doing**

We name our project as Personal Appointment Assistant(P.A.A). We are going to create an online personal appointment assistant software which will include a variety of private business services in one place. It offers to users recommendations that fit them best when they search a service. There does not exist such a platform that brings all described features together.

In addition to the standard applications, we would like to help users by recommending services that fit them best. We aim to provide a good user experience to people by using collaborative filtering (CF) method. Main idea of collaborative filtering method is that users who like similar things earlier, may like common things in the future [1]. The details of the CF will be discussed in the Literature Survey. When users would like to get an appointment by using P.A.A, they had to give some information about themselves such as age, location, interests and hobbies. Afterwards, users will have a chance to choose a service that fit them best among variety of businesses from large business industry throughout P.A.A.

Another reason of doing this project is there does not exist an available common online appointment platform. Some of businesses have their own appointment application but it may not be preferable to download an application for each business by users. Therefore, businesses try to organise their appointments via phone calls or face to face. In this case, customers have to reach business owners when they need to make an appointment, however, business owners may not be available to answer phone calls all the time or even if they answer them, these phone calls may require long time to agree on an available time. On the other hand, these phone calls decrease the productivity of work and it leads to complexity in their private life. Moreover, businesses may not be able to reach a wide range of customers. Also, people may have difficulties finding alternatives for a specific service. From these problems, people and businesses may suffer. Obviously, it is inevitable consequence of not having a common appointment application.

## 2 Objectives of the Project

In our project we are going to create a platform which will help users as a virtual assistant to improve their appointment processes for both business owners and their customers. This platform will allow users to make appointment requests from variety of businesses. Also, the platform will help business owners to evaluate appointment requests and organise their flow of work.

Moreover, in order to collect users' appointments and daily plans in one place we aim to implement a special calendar. To do this, we will synchronise other calendars with the platform calendar.

Additionally, as we mentioned before, we are going to recommend best fitting business services for each user to increase user experience and this feature will carry one step further from among our competitors.

In beta version of the program to detect bugs and errors we plan to work with some businesses. After final release we will establish a start-up company and we will incorporate with businesses.

## 3 Scope of the Work

The project will be reachable from web and mobile devices. On the web side of the project, people will be able to find detailed information about the platform and provided business services. Also, business owners will manage their profiles by signing in such as, financial analysis, adding an employee, setting working hours, adding photos, reviewing comments. On the mobile side of the project, users should use mobile application to handle with all appointment processes. Business owners will evaluate appointment requests and also synchronise their calendars in one place. We plan to divide services into three categories. First category is health care: dentists, doctors, aesthetic offices, dietitians. The second category is beauty shop: hairdresser, barbers, laser epilation offices, massage parlours, beauty parlours. The other is entertainment sector: football centers, bowling, laser-tag, paintball, horror house. In the long term, we aim to work with all sectors that works with appointment.

## 4 Literature Survey

There are already existing hub services that bring several products and their customers together. For example, in Amazon, businesses sell variety of products, such as computers, phones, clothes and books in one and common platform. A domestic example is Yemeksepeti which brings different types of food companies together and people who use the platform are able to select desired food. For instance, a larger company Delivery Hero acquired Yemeksepeti for 589 million dollars in 2015 [2], which shows a work opportunity in this field.

Kolay Randevu, Doktor Takvimi are some of our competitors that provide to get appointments from businesses for people. Each of them focus only specific



Figure 1: The Differences Between P.A.A and Competitors

fields. See Figure 1. Kolay Randevu is established on 2015 and it provides appointments from personal care business industry such as hairdresser, massage parlour and beauty parlour. Co-founder of Kolay Randevu Uğur Çivi stated that in the last 2 years since the establishment of operations in Istanbul they get over 30.000 appointments monthly. Kolay Randevu mainly operates in Istanbul and Ankara also they have few business services at Izmir, Antalya and Eskişehir. In 2016 Kolay Randevu took 1 million Turkish Liras investment [3]. Doktor Takvimi is established on 2012 and it provides appointments from health care business industry such as dentist, dermatology, psychiatrist, orthopaedic surgeon. According to, analysis of doktortakvimi.com they reached 22 million user visit in 2015. Also, they increased number of doctors over %200 and they took 10\$ million investment from Docplanner [4].

The filtering mechanism that we plan to implement in our project is based on Collaborative Filtering (CF). CF is defined basically as a method that suggests an item to people who are similar to each other, based on their feedback [5]. Generally, CF can be divided into two groups which are memory-based collaborative filtering and model-based collaborative filtering. Memory-based collaborative filtering is also divided as user-based and item-based [1]. User-based CF anticipates score of an item by a user among similar users that has already scored on that item [6]. Item-based CF is gives suggestions according to earlier ratings on similar items [7]. To determine similarity between users or

items usually used as "k-nearest-neighbours" method is used. Previously trained relational user and item matrix is used for new recommendation in model-based collaborative filtering [8]. For better recommendation these techniques are not enough so, we need side information for users and items. Side information can be collected in two ways which are user-contributed information and social networks. We will focus more on user-contributed information. A detailed survey about social networks is available in [1].

User-contributed information became an important role for better recommendation in these days. These information can be collected in four different ways which are tags, geotags, multimedia content and reviews and comments. In the project, in order to improve our recommendations we will consider geotags, reviews and comments. See more detailed information about tags and multimedia content in [1]. Geotags is used for determining position of users and items. From social media posts, we can track footprints of a user [9]. This geotag information will help us to recommend a business service to a user according to location range. In addition, number of comments and reviews of an item may not be enough also, content of a comment and reaction on this comment by other community members is also plays an important role. This is a crucial side information for better recommendations [10, 11, 12, 13]. We will be considering reviews and comments in our project to provide reliable recommendations.

After collecting side information about users and items, predictions while recommending will be more acquired and precise. Traditional CF algorithms can differ in three forms such as, extending memory-based collaborative filtering, extending model-based collaborative filtering and graph-based approaches. We plan to more focus on graph-based approaches in our project. See more detailed information about extending memory-based collaborative filtering and extending model-based collaborative filtering in [1]. Graph-based approach combines side information of users and items into CF algorithms. All connection between user/item and their side information assets bringing together into one graph and then reconsider these in a graph mining technology [14]. For example, when recommending a movie, rated movies by a user can be related with genres of movies. So, preferences of the user can be identified from this reactions. In our project, we aim to develop such a technique that a service will be recommended to other users who have similar side information, based on preferences and ratings of similar users in terms of age, gender and location.

As we mentioned earlier, using an application for each business service would be difficult. We aim to improve user experience by bringing different business services in one and common platform. Also, by recommending the best fitting services to users, we aim to satisfy people when they search a desired service.

## 5 Project Plan and Schedule

We see this project not only as senior project, we consider it as a work opportunity from the gap in the industry. Therefore, we have other members who support us, Tuğcan Önbaş and Harun Sütçü. Mr. Önbaş is a student at Izmir

University of Economics in the department of visual communication design and he will work in the graphical design of the project such as; designing user interface, logo and advertisement design. Mr. Sütçü is a student at Ege University in the faculty of dentistry and he will work in the business development and plan subjects. They will not be involved in software development part. Project plan and schedule can be seen in Figure 2.

## 6 Risk Analysis

As in all projects, there are several risks that we might face. The first possible risk is, information security. In our application we are going to collect some personal information such as, user passwords, phone numbers, mail addresses. Besides using reliable web services also, we are going to use hashing algorithm to encode users passwords. Another problem would be incompatibility of libraries. Our plan B will be changing these libraries with their alternatives. Another problem would be, graphical designer may leave the team. If we face with this situation, in the beginning we will work with mock-ups and if it is not enough we may hire a graphical designer. The last possible risk is, not reaching an agreement with businesses. To convince them we may offer campaign and discount like three months free usage the platform.



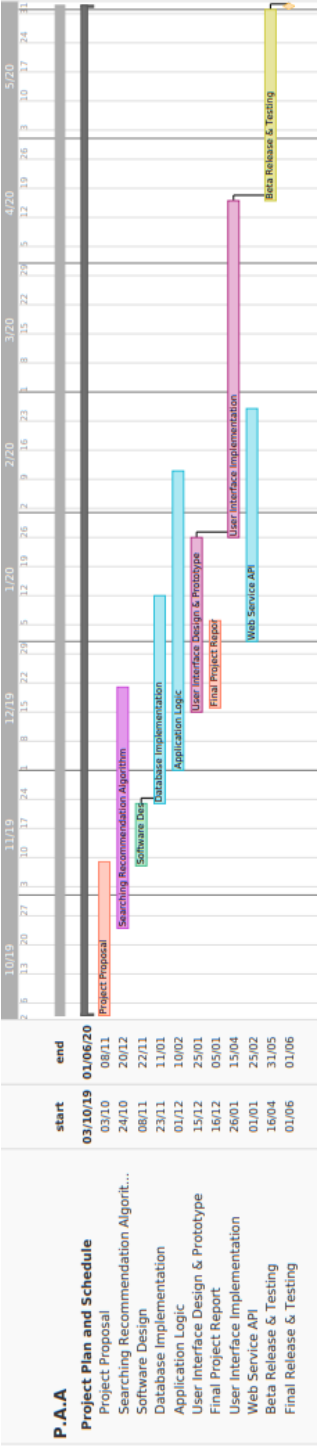


Figure 2: Development Process

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