



University of Puerto Rico at Mayagüez  
Department of Computer Science and Engineering  
CHC 4151/INSO 4151 - Capstone



# **Project Proposal: Xchedule**

Developers:

Yetsiel Avilés - 802-14-0524

Carlos J. Ayala - 802-14-0560

Rex Reyes - 802-13-6510

Gabriel Rosario - 802-15-7424

Advisor: Marko Schutz

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## **Executive Summary**

Many businesses that are supposed to work through appointments for their clients do not have an organized way of scheduling them and keep track. In addition, even when certain

businesses have a way of sorting their appointments, it turns out to be tedious to schedule each client one by one, on their own. This is where the project involving the elaboration of an appointment scheduler app called “Xschedule” comes in. Through this tool, clients will be able to schedule themselves to specific services based on the available time and restrictions from the corresponding businesses. Hence, “Xschedule” will enable clients to have every different appointment they have through their weekly routines organized. Furthermore, this optimizes the time required for each business to schedule clients one by one, so they can execute their services during working hours effectively. Now, businesses will be able to flow smoothly, executing their corresponding jobs, while having every appointment organized with very little interaction.

“Xschedule” will have various features that are expected to facilitate organization and communication for any business that requires a schedule, and for any client that wants to schedule their appointments, or just constantly keep track of them in case of any changes. Clients will be able to communicate with any business through the app. This helps in situations of emergency or sudden alteration of plans from the business or client. Each user will require a profile inside the app to take advantage of its full usefulness. This will let clients configure their profile effectively to be identified by a business when an appointment has been scheduled. On the other hand, this will let users that own a business have announcements on their profiles, important information regarding the services, the schedule and time available so clients can coordinate their appointments.

## **Introduction**

As technology advances, humans have found ways to automate and optimize just about everything in our lives. From making online payments to reading electronic books, technology has greatly improved our commodity to be able to do almost everything from our

phones. However, there is still one aspect that almost all businesses have not tackled just yet. Most businesses people attend frequently do not have an effective scheduling system or don't have it at all. These businesses keep track of their appointments on physical paper and rarely give you a card as a reminder of the date, and they have to call you to confirm the appointment is still ongoing. This makes it hard for businesses to properly keep track of their pending appointments. Furthermore, for a business owner, it is time-consuming having to schedule a client through the phone, for example, while delivering the service to another client. Each business should focus their working hours on delivering their services without interruptions of any kind, but they still need a way to manage their schedule effectively. A way in which little to none interaction is required while keeping their clients satisfied. These sorts of situations are what this project's application expects to organize and optimize.

## **Problem Statement**

Our group saw an opportunity to improve business scheduling capabilities through a web application that allows users to schedule themselves remotely as long as the business has the available time or allows the client to schedule an appointment at some specific date. It is important for businesses to execute their services with almost no interruptions while still being able to keep track of their schedule. Hence, the main objective of this project is to help businesses that work with appointments, and their clients, maintain their schedules organized through little interaction while also being able to communicate properly. Furthermore, by allowing clients to schedule themselves to business services, some workload is relieved of businesses by requiring less interaction from them since nowadays most of the appointments can only be scheduled over the phone or in-person and keeping track this way is a lot more tedious. This would also be beneficial for the client since they can accommodate themselves at the most preferable date and time, as well as, giving them automated reminders that would

not rely on an actual person calling them to confirm the appointment. Each end, business and client, is being considered for this project. In relation to the scope of our project, businesses not only cover service providers but any other people who perform a job for which an appointment is required or encouraged. Fundamentally, the purpose of this project is to enhance the business-client relationship by optimizing the scheduling procedures and bringing a platform in which both ends can communicate in the most effective way.

## **Scope**

The scope of our project is scheduling management oriented to businesses. This consists of the process of planning, maintaining, developing, controlling, and communicating schedules for time and resources. The strategic benefit of scheduling management is that it will monitor the schedule during its life cycle.

## **Objectives**

Through “Xschedule”, businesses will have a profile in which appointments can be scheduled by clients. A business will be able to postpone or cancel these based on a particular situation or needs. Furthermore, businesses can modify their profile pertinently to better represent their services. Clients will be able to see available times and business operating hours so they can schedule accordingly. Our objective is to implement a web application with features that achieve everything that has been discussed until this point.

The completion of each task is expected to be measured by features through a Gantt Chart. Each group integrant will select different features to work on, but none are excluded from helping on another integrant's tasks. Ideally, most of the work is done when everyone is reunited for better tracking and testing. In terms of measuring the success of this project, we expect to divide features into fully functional deliverables through which based on the percentage completed in relation to the different progress reviews the team can better evaluate progress.

## **Summary of Solution**

In order to carry out the objectives stated above, a web application will be developed as a proof of concept. This would increase the effectiveness of the scheduling process for the business, allowing employees that use this to carry out their regular tasks without being interrupted to schedule potential clients. As for the client perspective, it would allow them to carry out the scheduling process for multiple locations and types of business and have them all visible in one place. Thus, minimizing the possibility of scheduling two or more conflicting appointments.

This solution could be commercialized by taking this digital approach and providing businesses the tool for a fee in order to appear on the application. For smaller businesses that might want to be more discoverable and grow faster, a "premium" option could be developed to have them appear higher in searches; giving them more visibility for potential clients. The client-side would be free with the possibility of integrating ads to the platform and having an "Ad-Free" version for a fixed cost.

# Technical Description

## System Architecture

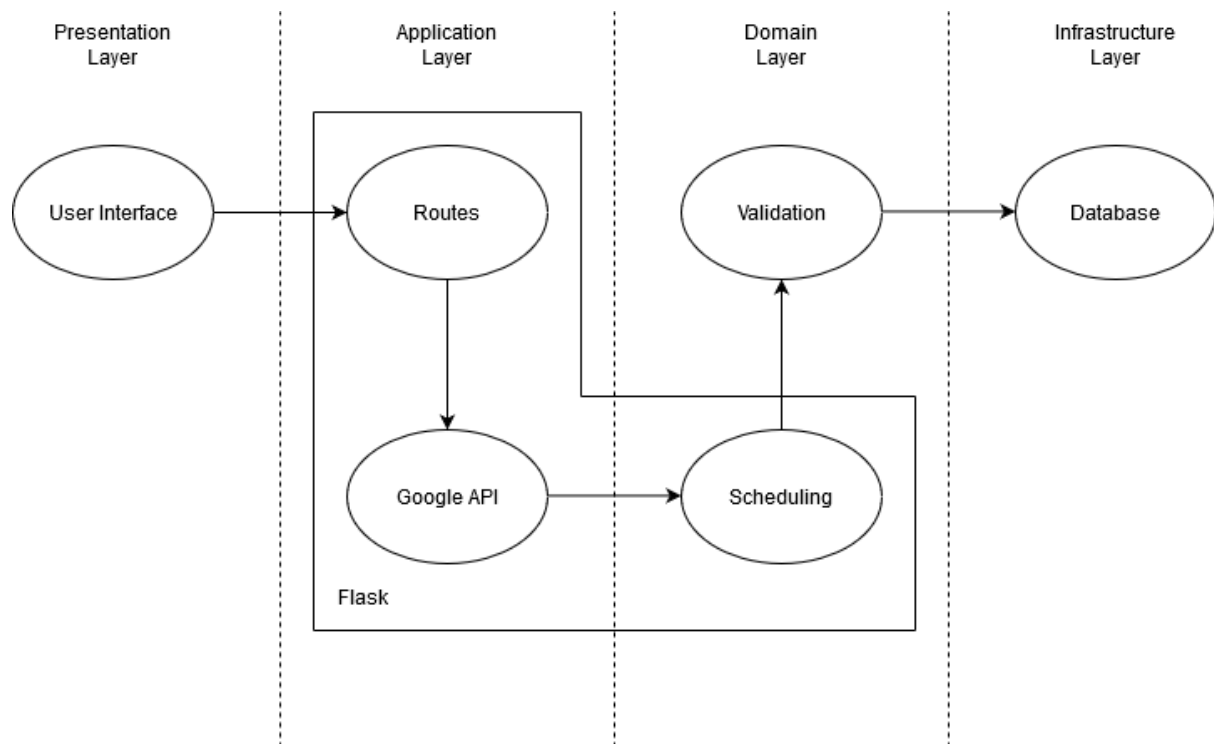
The Xschedule system is divided into two main sections, the front-end, and the back-end. The front-end application is to be developed using ReactJS. The back-end of the application consists of the database application and the REST API, these are to be developed using PostgreSQL and Python Flask respectively.

### *Front-end*

To develop the application's UI we choose to work with ReactJS. The ability to create reusable components and manage the current state of the application, which would be changing dynamically, is something that ReactJS is very powerful for.

### *Back-end*

The database system for the Xschedule application needs to be secure and easy to use. This means working with a good framework for the REST API, so we choose to work with Python Flask. The familiarity with this web application framework is the main reason why we decided to use it. The data in the application will be managed by a relational database system, for which we are going to use PostgreSQL. This was also chosen because of previous experience using the Python Flask-PostgreSQL combination to develop a database system.



## Modules to Implement

Modules for this project are divided by the pages the web application will contain, and some of these are divided by sub-modules. Here's how they are organized:

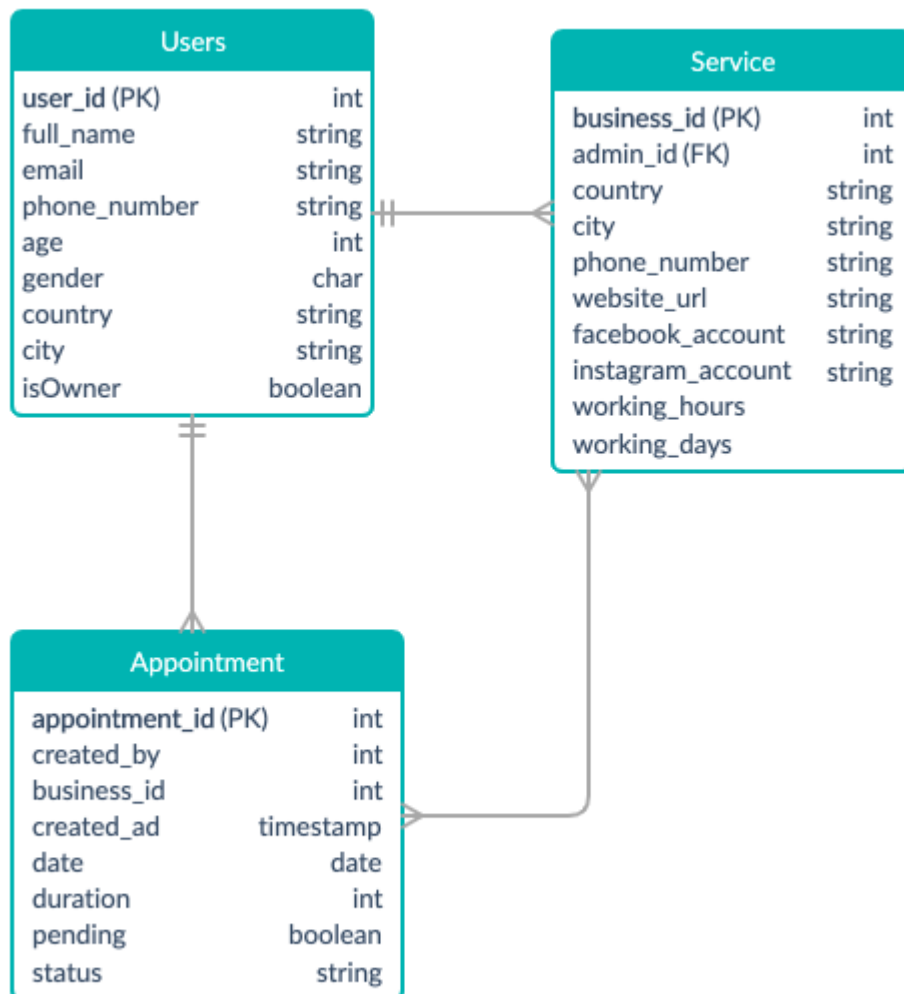
- Landing Page (About Us)
  - Mission and Vision
  - Available Businesses
  - Contact Information
- Login Page
  - Login form
  - Sign up form
- Calendar Page
  - Calendar that shows pending appointments
    - Option to edit an appointment
    - Option to cancel an appointment



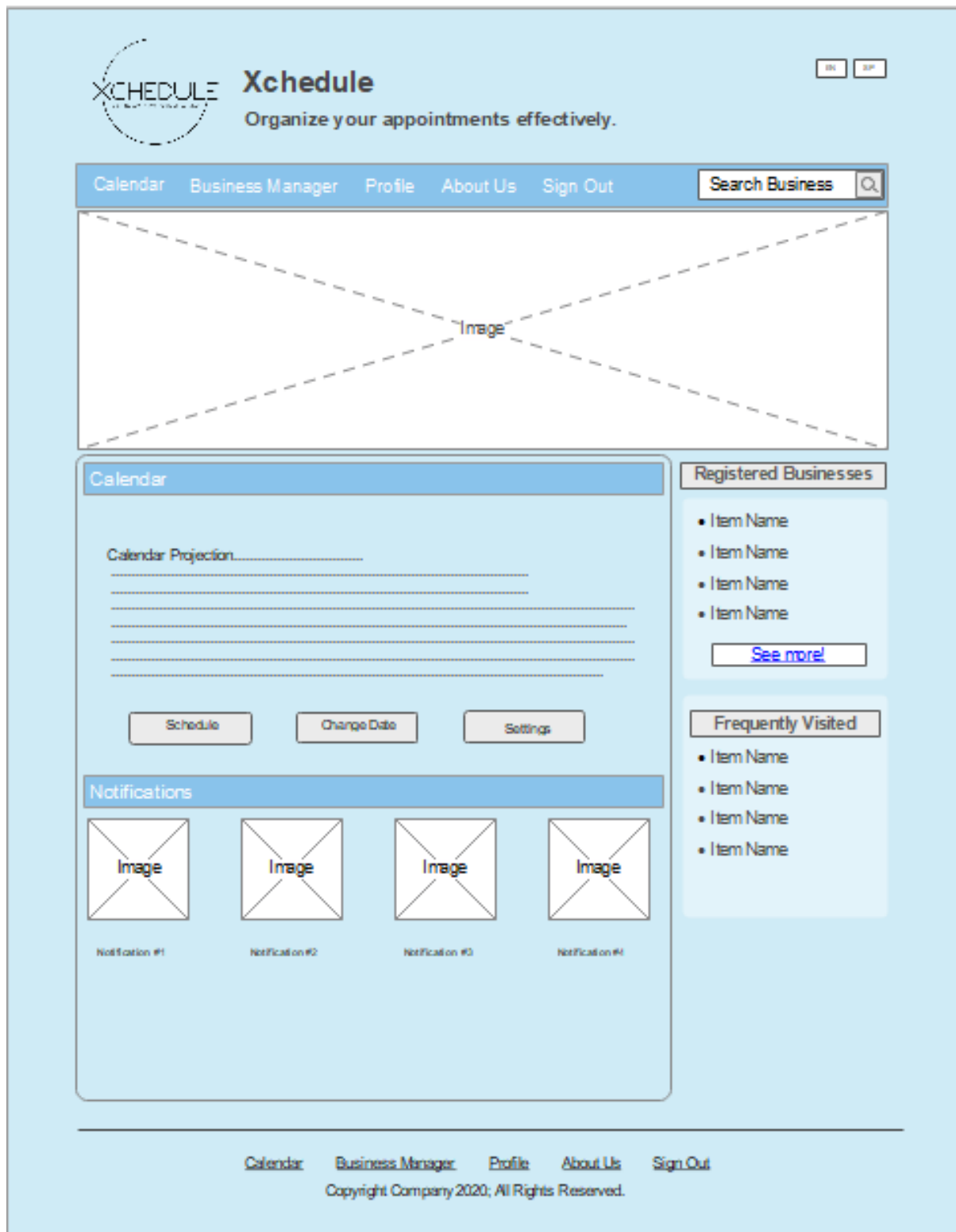
- Search engine to find businesses
- Notifications Area
  - Clickable notifications for more details
- Registered businesses list
- Frequently visited businesses list
- Links to the other pages
- Sign out button
- Business Manager Page
  - Create a business option
    - Only available when no business has been setup yet
    - Transfers to a page in which the user has to fill the corresponding form
  - Change business operating hours
  - See pending appointments
    - Postpone an appointment
    - Cancel an appointment
  - Manage business announcements
- Business Client Perspective Page
  - Option to schedule an appointment
  - Option to send a direct message
- Appointment Scheduling Page
  - Appointment scheduling form
- Specific Appointment Page
  - Edit appointment
  - Cancel appointment

- Direct Messages Page
  - Message structure that serves like a chat.
- Profile Page
  - Edit personal information
  - Change profile picture

## Expected Entity Relation Diagram



## Wire-frame for Xschedule's expected UI



# Project Plan

- Milestones
  - Phase I Progress Review
    - Deadline – 03/30/2020
  - Phase 2 Progress Review
    - Deadline – 04/30/2020
  - Final Project Review and Demo
    - Deadline – 05/25/2020
- Deliverables
  - Project Proposal
  - Prototype Demonstration / Midterm Report
  - Fully Functional Application
  - Final Project Report
- Team Organization
  - Each team member will be responsible for the modules assigned. This does not exclude other team members from helping. Most of the work will be done collaboratively for the purpose of efficiently merging everything done.
  - In terms of leadership, everyone will take equal responsibilities and initiatives regarding when to follow up and push to meet pertinently with pending deadlines. Every single member has worked together before and, based on this, a fluent and dynamic work environment is expected for this project.
- Collaboration Tools
  - Google Drive
  - Github

- Trello

## References

- [1] Trello. (n.d.). Retrieved February 18, 2020, from <https://trello.com/>
- [2] Google Calendar (n.d.). Retrieved February 18, 2020, from <https://calendar.google.com/calendar/r?pli=1>
- [3] Björner Dines. *Software Engineering: Domain, Requirements, and Software Design*. Vol. 3, Springer, 2006.