

# Software Systems Engineering Capstone Project Report Document

Pencil

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## Section 1 - Project Description

### 1.1 Project

Pencil: Simple Scheduling

### 1.2 Description

Pencil is a software as a service application (SaaS), that simplifies the once complicated task of customer scheduling. By allowing business owners to easily create their own online schedule, potential customers can see available time slots, and book desired appointments. Furthermore, users are able to find other businesses that are also using Pencil, making it a one of a kind, online business aggregator.

### 1.3 Revision History

Date	Comment	Author
2019-10-30	Initializing the document, populating section 2	Paul Hewitt
2019-11-22	Populating document for Project bazaar	Ian Quach
2019-12-05	Adding System Architecture Information	Paul Hewitt
2020-02-10	Adding in jot notes	

### 1.4 Timeline

## Section 2 - Overview

### 2.1 Purpose

We are beginning to see more and more entrepreneurs and small businesses pop up everyday. It is important that this market is supported by scaleable, and simple technology. Pencil provides any industry that requires scheduling with a platform that is enjoyable for both customers, and business owners alike. Applications that currently exist lack key features that are necessary for an enjoyable experience.

Pencil we include gamification features, SMS alerts, third party integration (Social Media, Square Payments), and customer tracking. The gamifications aspects help motivate continual involvement and use by the customer with the business. Maintaining a customer's persistent memory allows the business to track their needs and wants.

The intended audience of Pencil is both business owners and their customers. Large, and small businesses alike will be able to leverage the vast array of features designed to streamline the scheduling experience. Customers will be able to use Pencil to find specific businesses in their area, and then book appointments with each one. Business owners will have additional access to tools in order to keep track of, and reward their customers. These features will be encapsulated away from the customer, included only in the business owner dashboard. It is hoped that one day Pencil's data could be available in API form, allowing developers to work with, and manipulate the data, similar to services such as Google Calendar.

### 2.2 Scope

Pencil is an all encompassing customer scheduling, and management application. On top of this, it will work as a business aggregator, working like a phone book, in which users can search for businesses, and then book desired appointments. All the data used in Pencil will be user generated, and it does not pull in any outside business data. Data will be tagged by the user, in order to be searched more efficiently. Pencil will integrate with certain third parties, in order to streamline the user experience. Social media integration will function as user login and account management. Square can be integrated to handle payments. Amazon SNS will be the platform used to send out SMS messages to customers.

### 2.3 Requirements

Pencil needs, based off of our interview with our client, to be a lightweight easy to use client. Since the client will be a nontechnical person it also needs to be very low maintenance which requires sound software development principles. The customers will also need to be able to access the clients services at all times to book appointments so

in tandem with that a web application that is accessible anywhere serves those needs. The entrepreneurs will also need a secure login for their users as personal information may be stored on our service. Another important feature is the gamification elements which support the users to remain with the business. Social media integration will also help bolster the continued support from the customer. On the UI/UX front the web application will need to be modular or easily configured to fit the client's needs quickly. A separate dashboard for both customers and owners is necessary.

## 2.3.1 Estimates

#	Description	Hrs. Est.
1	UI/UX prototyping	
	Complete Frontend design	
	Social Media Integration	
	Gamification aspects	
	Gamified Notifications	
	AWS setup	
	Secure login	
	<b>Total:</b>	

## 2.4 Business Model

The business model for Pencil will be a 'Freemium' business model. You are able to use a free version of the application but it will lack certain quality of life functionalities. Using the premium version will include all of those features.

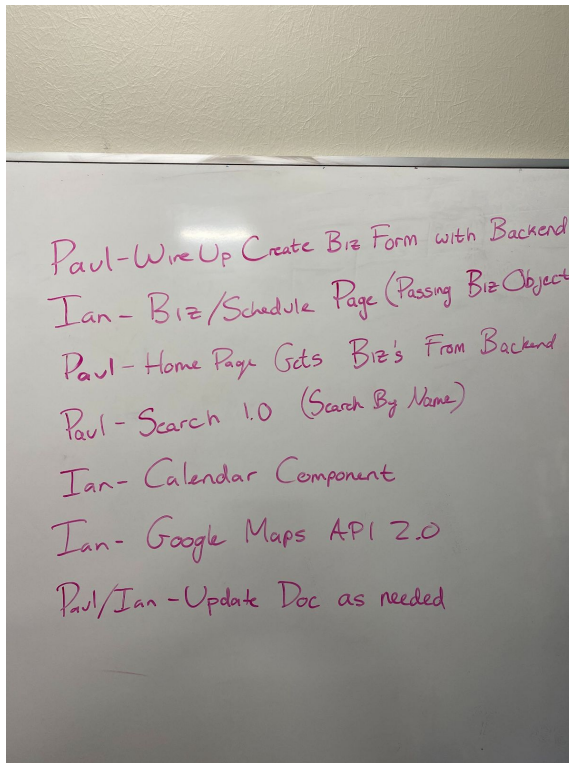
## 2.5 Competitive Advantages

Currently the main competitors consist of SquareSpace and YouCanBook. SquareSpace offers a template based website builder than can be used to book clients into a calendar and take payments. Beyond the use of a basic day planner it does not offer any of the innovations that Pencil offers. No SMS alerts, third-party integration, customer tracking, or gamification elements. YouCanBook is a bit more robust and friendlier on the UX department. YouCanBook offers SMS alerts and third party integration, like Facebook and Instagram. While it does offer quite a decent scheduling application there is still no customer tracking. Pencil intends to offer all of that with the addition of contactless booking. The gamification will motivate clients to continually use the business earning rewards that the business owner can dictate. The customer tracking allows for a persistent memory of the client's needs and wants so there is no guesswork if the client gives vague requirements.

## Section 3 - Design Methodologies

### 3.1 Scrum Process

- Scrum before each coding day
  - Stand up meeting of what needs to be designed
  - Lofi paper design
  - Break off and take on the components that suit strengths
  - Complete 1.0 of components
  - Gather together to critique design
  - Paired programming for redesign and finalization for MVP 1



### 3.2 User Story Map/MVP Management

- **MVP1**
- Basic user functionality
  - Login
    - Login page
      - FB only signup, temp button
      - pull info from fb login
      - User profile information populated with facebook info
      - Google Maps integration to display local businesses
  - Business Sign up
    - Basic HTML/JS business sign up
      - name, email, password, business type

- attaching business with owner user
- Business Functionality
  - Business searching
    - search 1.0, parse businesses based on business name
      - Design DB objects diagram
      - Search with business name, type, location
      - Use unique business ID to link user with business
  - Calendar
    - Calendar scheduler displaying appointments
      - Creating new appointments and wired to backend
      - deleting the appointments made
- **MVP2**
- Business Functionality
  - Business Searching
    - Search 2.0, with business type and location
  - Calendar
    - Draggable events on calendar for better UX
    - Expandable to multiple years, currently only on 2020-2021
    - edit appointments to change name and times
- User Profiles/User Homepage
  - Display upcoming appointments on the homepage
- **MVP3**
- UI/UX
  - CSS/Website flow
    - Improve UI/UX
      - Make website look less ugly



## **Section 4 - System Architecture**

### **4.1 Tech Stack**

Pencil is built as a SaaS web application. Using an Angular front end, and a AWS back end, we are utilizing an industry standard cloud platform, combined with one of the world's most popular front end frameworks. We decided to use a modern, powerful tech stack for a couple of different reasons. Both AWS and Angular are extremely powerful, allowing you to build small test applications, up to industry ready, scalable software capable of handling millions of daily active users. We also wanted to consider security. AWS is one of the most secure platforms in the world, and we wanted to trust Pencil's backend with one of the world's leading cloud platforms. Programming with security is a fundamental skill for any software engineer, and crucial in the real world.

### **4.2 Serverless**

Using the Serverless Framework, we were able to make Pencil completely "Severless". Again, this framework is industry standard, trusted by large companies such as Expedia, and Electronic Arts. There are a couple of reasons why Pencil went Serverless. The first is to reduce the amount of time and effort involved in backend deployments. Serverless abstracts away most of the tedious work normally required to deploy to a cloud platform like AWS, for example configuring Trust Policies. This allowed Pencil to be rapidly developed and prototyped, which worked perfectly with our Agile development practice. Another reason is scalability. If Pencil were to scale suddenly, Serverless would be able to handle the sudden influx, and the application would see no real hit in performance.

### **4.3 - Data Models (code snippets)**

### **4.4 - Calendar backend communication**

### **4.5 - Authentication**

## **Section 5 - Frontend Design**

### **5.1 Application Structure**

### **5.2 Navigation**

### **5.3 Owner View**

## Section 6 -

## Section 7 - User Stories

### 7.1 Basics

#### Customer

- As a customer I want my own login information
- As a customer I want to be able to see appointments offered by a service
- As a customer I want to book my desired appointment
- As a customer I want to receive notifications about my appointment
- As a customer I would like to prepay for my appt
- As a customer I would like to rebook easily
- As a customer I want to be able to make changes to my appointment or cancel if necessary
- As a customer I would like a way to contact the service provider
- As a customer I would like to be rewarded for reusing a serviceAs a customer I would like to see the various services offered around me

#### Service Provider

- As a service provider I would like to create appointments to be filled by customers
- As a service provider I would like these appointments to be customizable and flexible
- As a service provider I would like to be able to contact my customers
- As a service provider I would like to accept payment
- As a service provider I would like to track all existing/previous customers
- As a service provider I would like to offer rewards
- As a service provider I would like to limit who can book

### 7.2 Andy/ChungCuts

- No login for users
  - Slow and tedious. Users should be able to book quickly, and efficiently.
  - Can use Phone Numbers to verify the users
  - Use Phone numbers to track the users
  - First, Last, and Phone number should be the only required fields
- Ensure different 'types' of time slots
  - YouCanBook only has one type of time slot

- Would like to see:
  - Regular Appt
  - Hair Dye
  - Lunch
  - Personal
  - Etc.
- Be able to have control over his employees schedule as well
  - Essentially have some sort of hierarchy system in place
  - Owner of the business could have admin rights
  - Employees could have their own pages/schedules, the owner should have control over them
- User Tracking
  - See how many times someone has been in that month, how many times total, etc
- Be able to pre pay for appts
  - Would be great for last second cancels or no shows
- Automatically send reminder texts to customers
  - Can set and forget
  - Send a text one day before, one hour before, etc

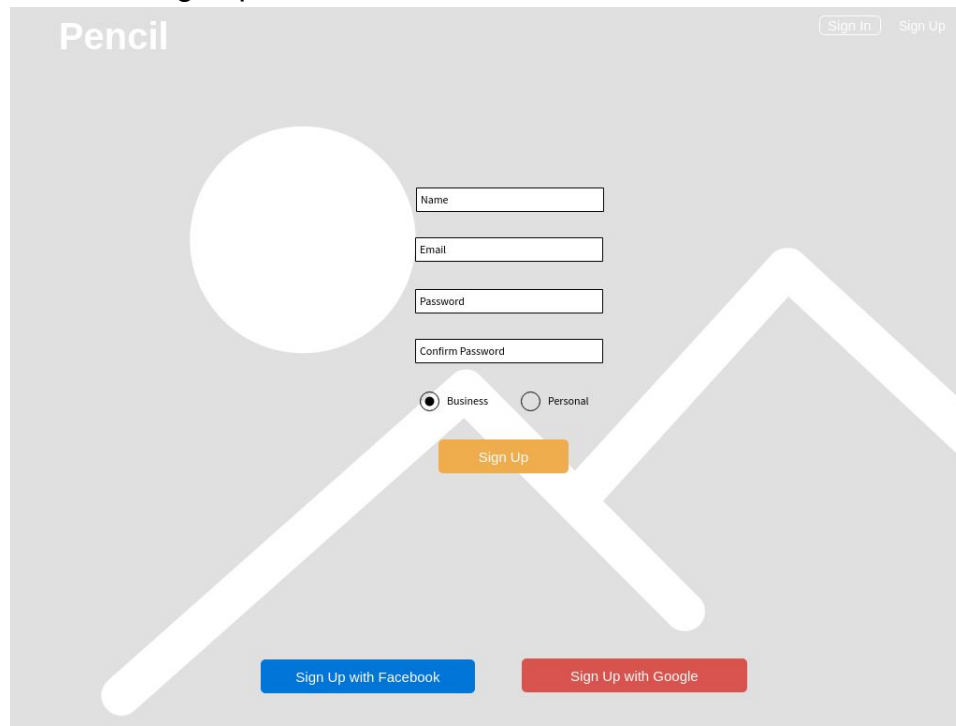
## Section 8 - User Interface Design

### 8.1 User Interface LoFi Designs

Customer sign in

The image shows a low-fidelity (LoFi) design of a customer sign-in page. The background is a light gray with a large, stylized white graphic of a mountain and a sun. The word "Pencil" is in the top left corner. In the top right corner, there are two links: "Sign In" and "Sign Up". The sign-in form consists of two input fields labeled "Email" and "Password", followed by a yellow "Login" button. Below the "Login" button are two buttons for social login: "Login with Google" (red) and "Login with Facebook" (blue).

## Customer sign up



The image shows a customer sign-up form for 'Pencil'. The form is set against a light gray background with a large, faint white mountain graphic. In the top left corner, the word 'Pencil' is displayed in a large, white, sans-serif font. In the top right corner, there are two links: 'Sign In' and 'Sign Up', both in a small, white, sans-serif font. The form itself consists of several input fields and buttons. On the left side of the form, there is a large white circle representing a profile picture. To the right of this circle are four stacked input fields for 'Name', 'Email', 'Password', and 'Confirm Password'. Below these fields are two radio buttons: 'Business' (selected) and 'Personal'. Below the radio buttons is an orange 'Sign Up' button. At the bottom of the form, there are two buttons: 'Sign Up with Facebook' (blue) and 'Sign Up with Google' (red). The overall design is clean and modern.

Pencil

Sign In Sign Up

Name

Email

Password

Confirm Password

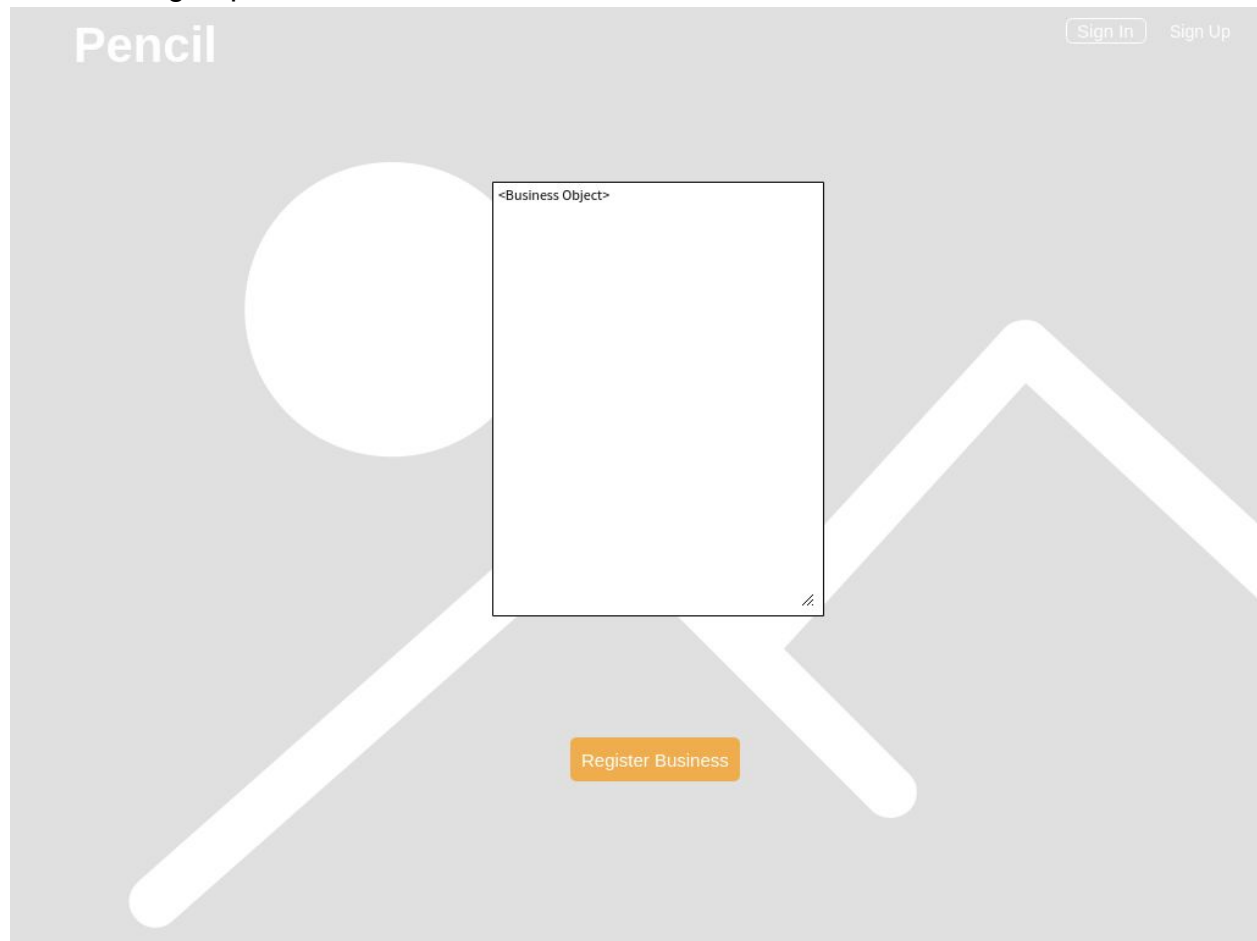
☒ Business ☐ Personal

Sign Up

Sign Up with Facebook

Sign Up with Google

## Business sign up

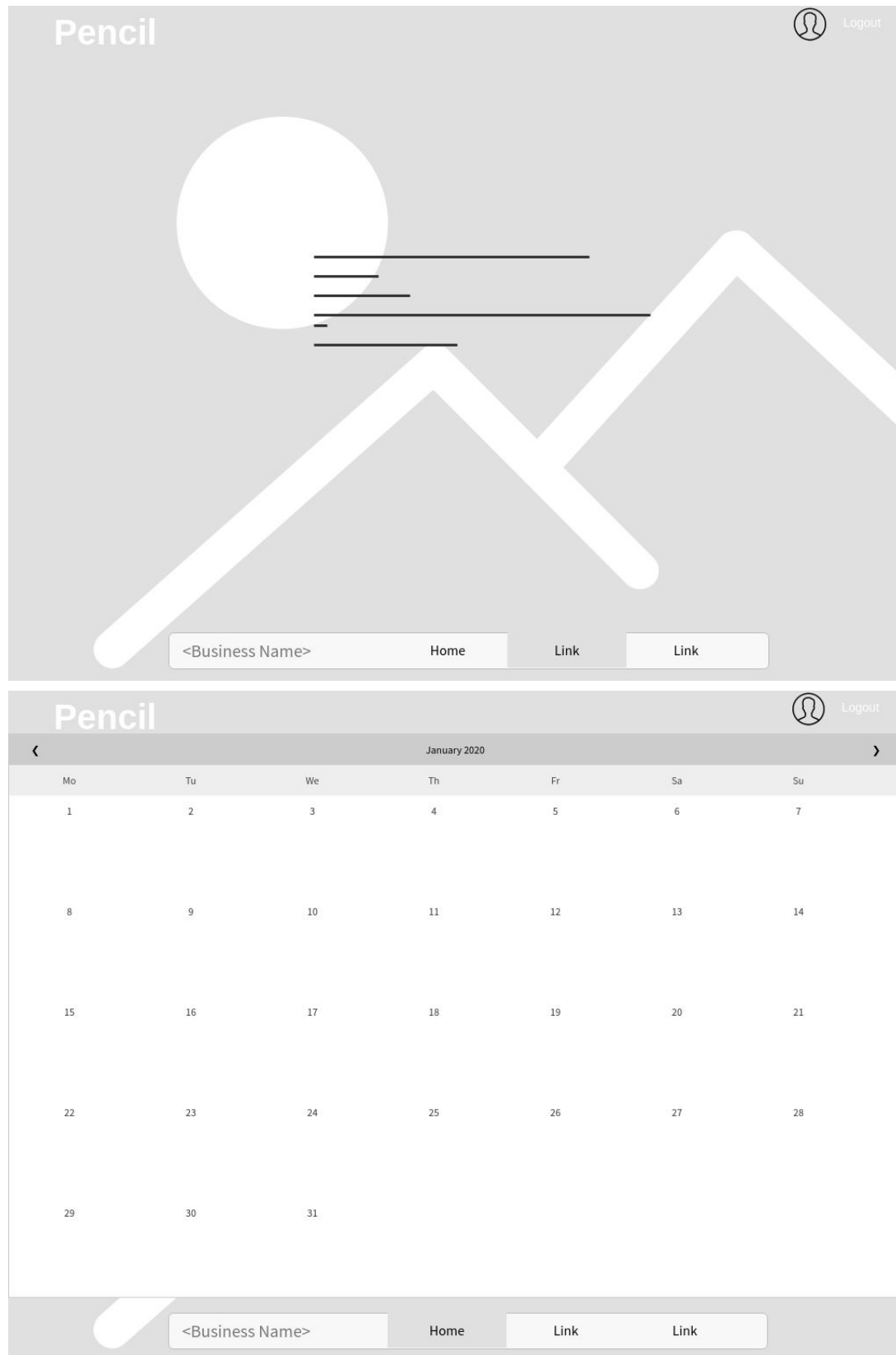




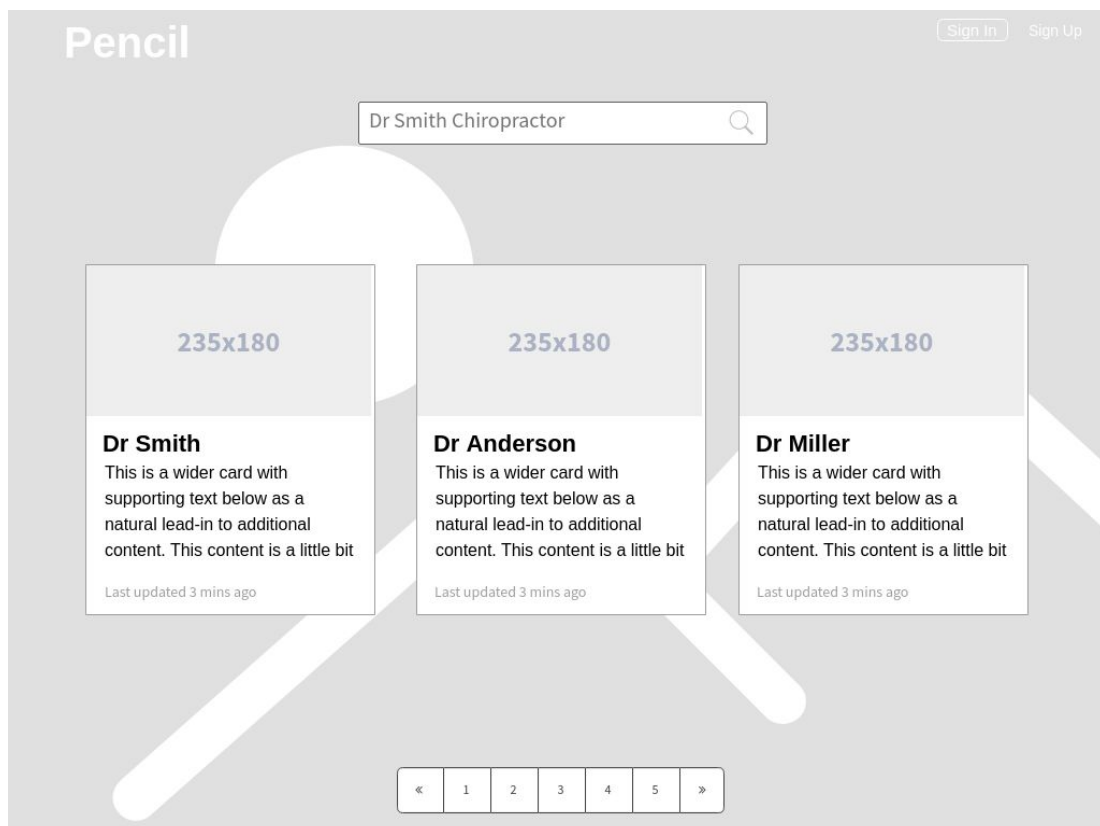
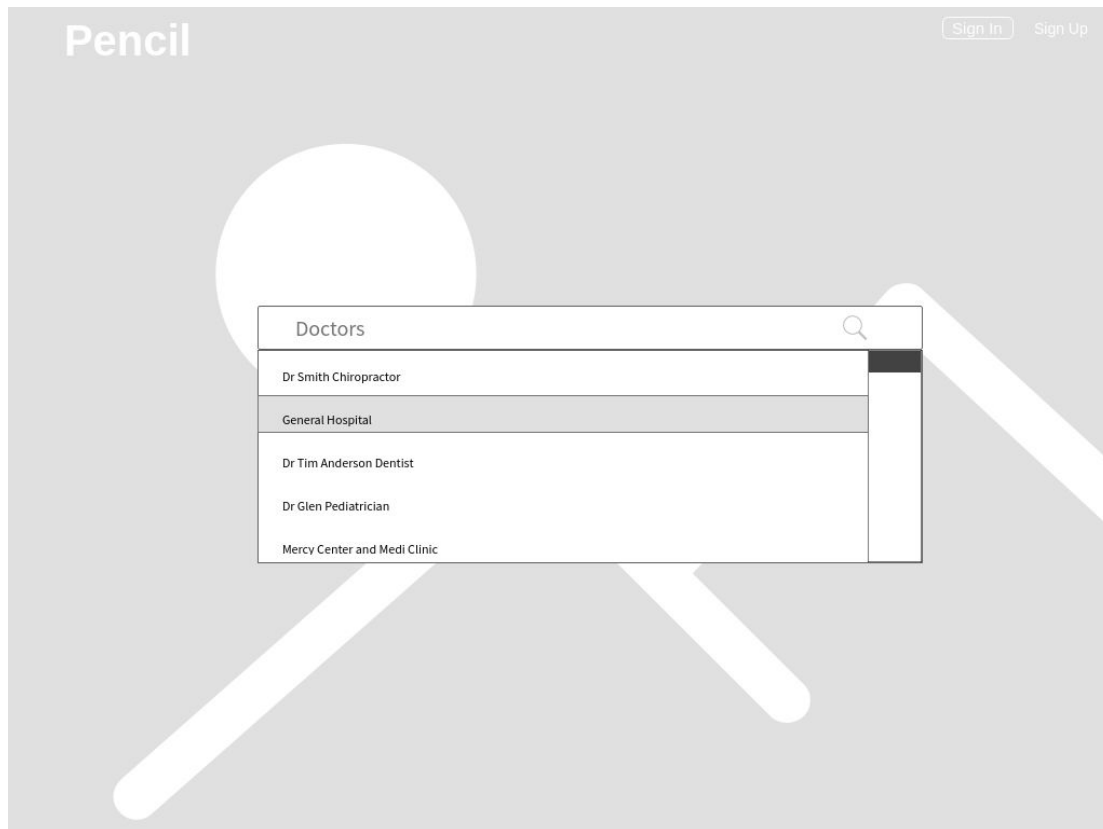
# Pencil

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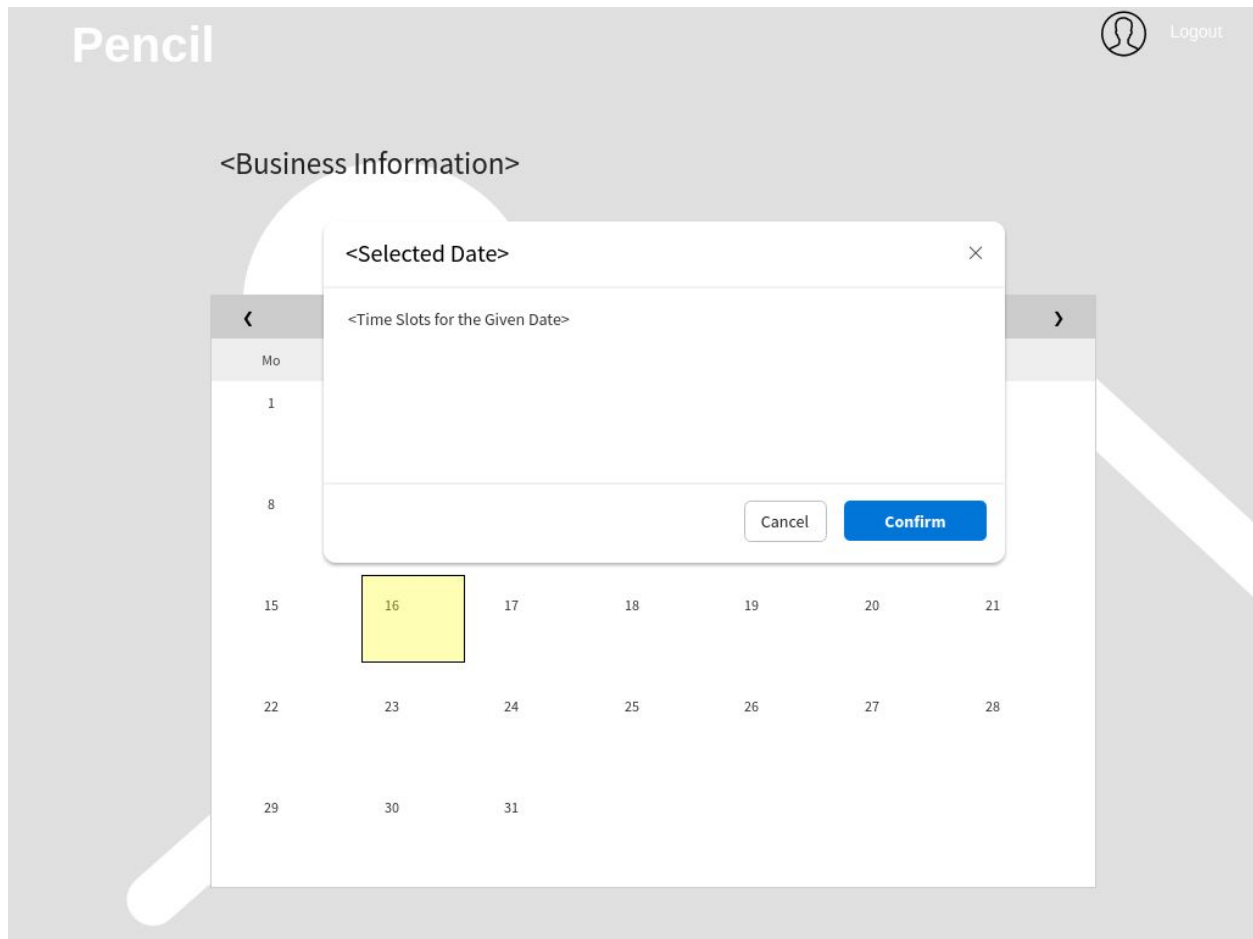
## Owner view/owner tools



## Search



## Time Picker Modal



## Section 9 - Business Decisions

### 9.1 Project Pencil Expenses

## Section 10 - Testing Plan

## **Section 11 – References**

Andy Meeting - 1