

Senior Design: Team sdmay18-14

Mobile and Web Timecard

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Overview

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Problem Statement

Genova and other companies contract employees for specific projects. The time spent working is recorded in a timecard in order to compensate with pay rates that correspond to each project.

Genova's old timecard broke due to a separate software update. Since then, they have been in need of a timecard app that their company can use.

This problem may not be unique to Genova. As such, the timecard system we developed will be built upon and sold by Genova to other companies needing similar solutions.

Functional Requirements

- Timecard software that works on iOS, Android, and web
- Display relevant information to user about timecard
 - Past timecard summaries for Employee
 - Team/Department/Company time summaries for Managers
- Software can integrate with existing accounting systems (Dynamics) at Genova
- Different functions for different levels of users
 - Employee, Manager, Admin
- Works for different timecards
 - timecard periods of 1-week, 2-week, 1-month, etc...
 - Does the work week start on Monday, Sunday, etc...?

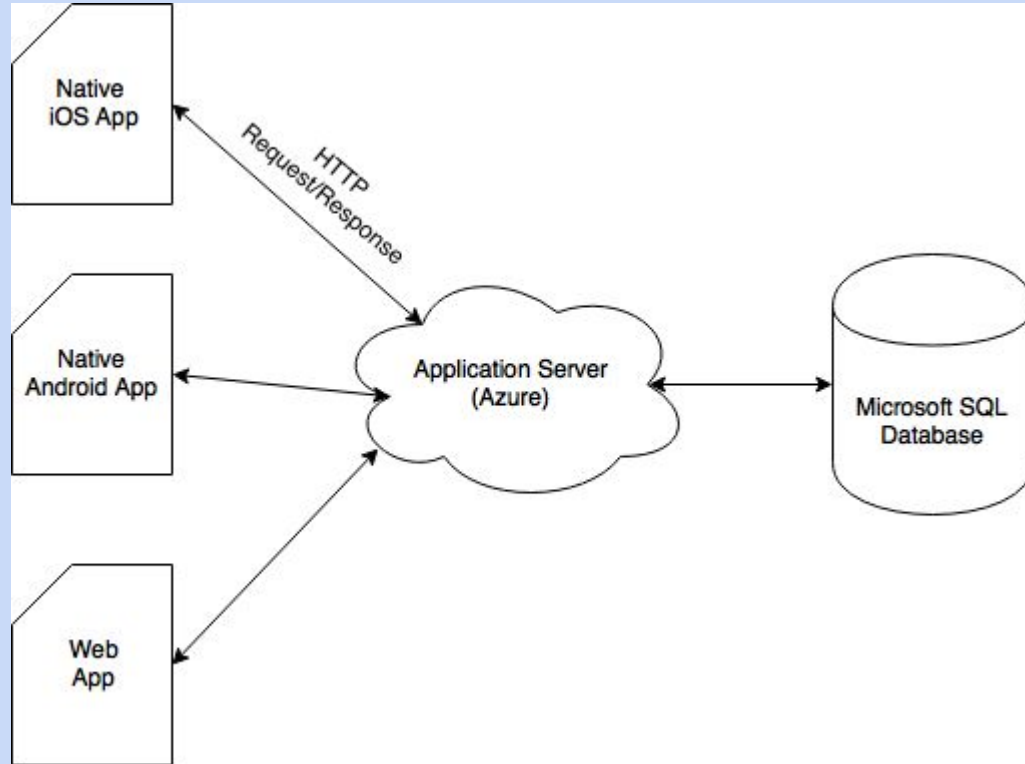
Non-Functional Requirements

- Simple to use
- Similar design and function between mobile and web platforms
- Secure database and communications
 - Sensitive business information is stored and sent
- Scalable
 - Any number of employees
 - Any business

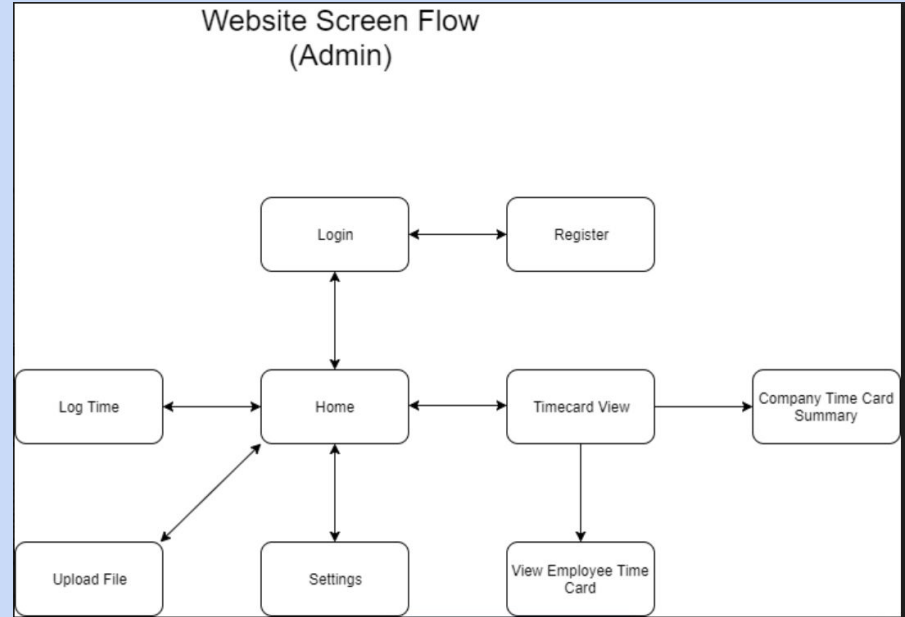
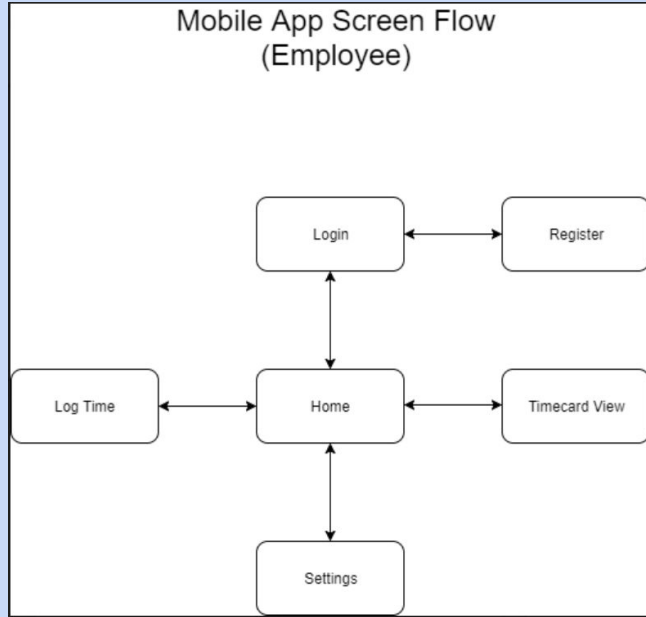
Market Survey

- There are already existing timecard programs
 - E.g. Microsoft, T-Sheets
- Most are complex, don't have multiplatform support, or are not free to use
- Not flexible - have a set weekly timecard start/end days and weekly periods
- Genova wants control over application
 - Be able to change specific parts functionality for other customers
 - Rather have an in-house application rather than pay someone else

Conceptual Sketch



UI Flows



Software Platforms

- Microsoft Azure to host servers
- Programming Languages
 - Java, for Android development
 - Swift, for iOS development
 - C# for backend server (.NET)
 - Javascript, JQuery, Bootstrap website development
- Tools
 - Xcode
 - Android Studio
 - Visual Studio
 - PostMan

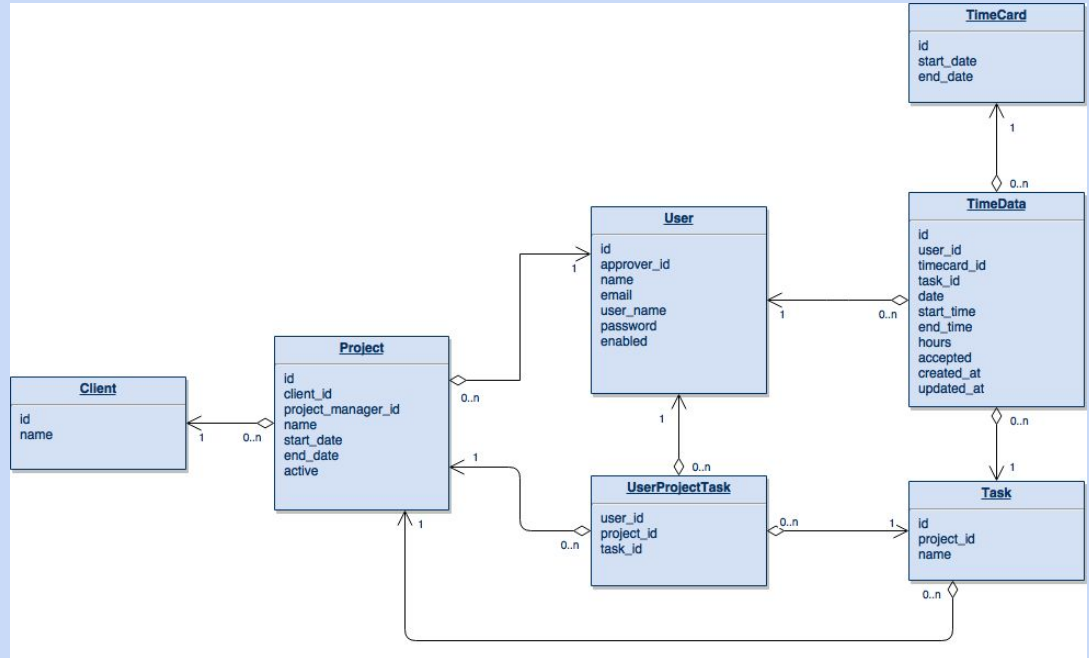


Backend Development

- API endpoints for login, user registration, and getting projects and tasks, and for getting and creating user time data
- Uses JSON web tokens for user authentication
- Design based on MVC Model

Database Development

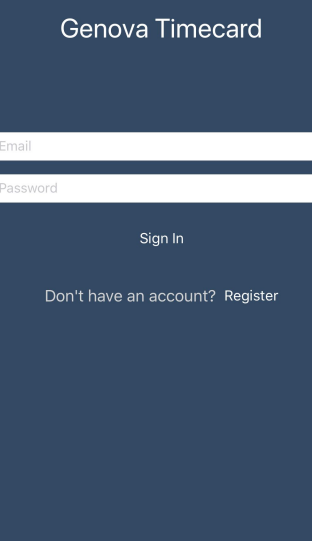
- Created with .Net Core Code First
- Deployed on Azure
- Database Migrations



iOS Development

- Swift
- MVC architecture
- JSON Web Token Authentication
 - Apple's Encrypted Keychain
- Networking
 - Singleton design pattern
 - Codable protocol
- Login/Register, View Timecard, Submit Time

iOS Screenshots



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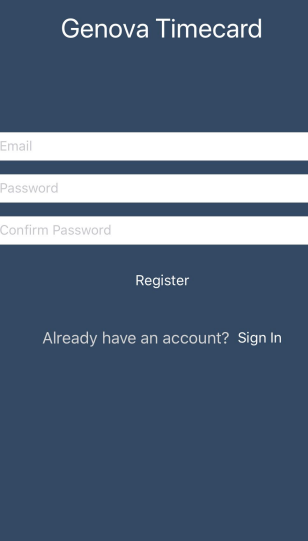
Genova Timecard

Email

Password

Sign In

Don't have an account? [Register](#)



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Genova Timecard

Email

Password

Confirm Password

Register

Already have an account? [Sign In](#)

[illegible]

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Back

Add

Clock

Block

Client

Company A

Project

Company A - SurfnTurf (Sin...

Task

Development & Coding

Date

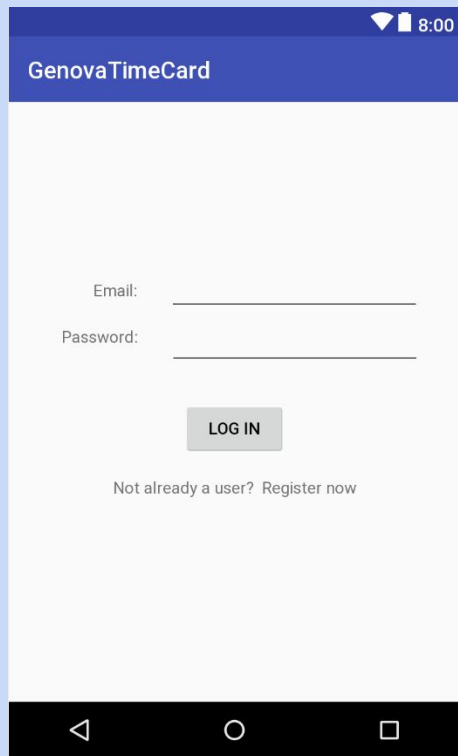
February	16	2016
March	17	2017
April	18	2018
May	19	2019
June	20	2020

Start Time

End Time

Android Development

- What was done
 - Login, Register Users, Get Projects
- Kotlin vs Java - start of semester debate
- iOS lead development off the start
 - Android followed suit
 - Usually about 2 weeks behind
- Development split towards end of semester
 - Christian assigned to help out
- Rework at end of semester



Web Development

- Began using ASP .NET Core
 - Meshes well with Microsoft development environment
 - We had no experience, overly complicated
- Switched to Javascript, JQuery, Bootstrap combination
 - Also no experience
 - Quickly made progress, tons of documentation, simpler
- Login/Registration Page, Project List Page, Timecard Page

Web Screenshots

[Genova Timecard](#) [Projects](#) [Calendar](#) [Settings](#)

Genova Technology Projects

ProjectId	GenoVald	Project Name
1	90140054	Company A - SurfTurf (Singiresu) 2015

[Genova Timecard](#) [Login](#) [Projects](#) [Calendar](#) [Settings](#)

Please Login or Register

[Login](#) [Register](#)

[Genova Timecard](#) [Projects](#) [Calendar](#) [Settings](#) [Logout](#)

Timecard

Create New Timecard Entry

Date	Start Time	End Time	Hours	Date Created	Date Updated	timecardId	taskId
2018-04-01	23:59	23:59	10	2018-04-01T23:59:59	2018-04-01T23:59:59	2	12

Testing

- Endpoints
 - Postman
 - Authentication
- UI
 - Automated Swift UI tests
 - Android Studio XML viewer
- Database
 - Check local database for data

Current Functions

- User can login and logout
- New users can create accounts
- Users can create a new timecard
- View submitted times for current timecard
- Users can record time for specific client, project, and task
 - Block and start/end time formats.
- ~~● Users can submit timecard to manager for approval~~
- ~~● Users can view reports of previous timecards~~
- ~~● Administrator/Manager Functions~~

Requirements Standing

- ✓ ☐ Timecard software that works on iOS, Android, and web
- ✓ ☐ Display relevant information to user about timecard
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We will take this time to answer any questions.