

Abstract

Gordon Food Service uses wall mounted timeclocks which cost \$1,800 to \$2,000 per unit for hourly employees across 130 distribution centers. By replacing current timeclocks with \$300 tablet, software, and mount package for a potential savings of \$200,000.

Goal

Develop a networked clock that leverages commodity hardware and software to reduce maintenance and replacement cost over dedicated time clock solutions.

Challenges

As an operating system and ecosystem, Android is optimized single user mobile applications. Commodity hardware Maintain consistent experience across various API devices

Initial Software Options

- AngularJS Web Application
- Native (Java) Android Application

Application Features

Time Clock functionality including ability to clock in and out for work and breaks as seen in figure 1. Flexibility to scan user badge using device camera, barcode scanner, or manually. The Android application makes use of a persistent configuration via. Android SharedPreferences. In addition the application makes use of offline or disconnected mode.

Open Source / Libraries

- Zxing (<https://github.com/zxing/zxing/>)
- Realm-java (<https://github.com/realm/realm-java>)
- Retrofit (<https://github.com/square/retrofit>)
- OkHttp(<https://github.com/square/okhttp>)
- FasterXML (<https://github.com/FasterXML/jackson>)
- RxAndroid(<https://github.com/ReactiveX/RxAndroid>)

Options Screen

Figure 1(phone)

Admin Panel

Figure 2 (tablet)

Implementation

The timeclock Native Android app, with backwards compatibility for Android API 17, Android 4.2 Jelly Bean. Offline functionality using a local Realm database to store cached punches. Configuration using Android shared preferences to hold passwords and API information. Network connectivity is achieved through the Retrofit library to build API calls. FasterXML/Jackson is used to translate between Java objects and JSON. Image downloading and caching is handling using the Picasso library

Future

Deployment will require a few steps to be taken by GFS prior to going live. Distribution center Wi-Fi will have to be tested to ensure maximum coverage. Exploration of a 3D printed mounting solution. User interface testing will be needed to assert parity with current timeclocks. Finally in depth hardware consideration will be recommended to maximize project profitability.

