SYSTEM ARCHITECTURE DESIGN DOCUMENT

FOR

CLOVER BOOKING APPLICATION

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NO APPROVALS REQUIRED

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1 Purpose

This document presents the Solution Development Lifecycle (SDLC) Design / Installation Information for a Project affecting the Clover Booking Application.

2 Scope

The design of this application involves having a Clover POS system to make reservations. The objective is to be able to allow employees of a company to create, remove, and edit reservations. The Clover Booking Application will utilize the Google Calendar API, the Clover POS system API and the Android framework. The Coding Standard reference that will be used is the Android Open Source Project (AOSP) Java Code Style.

2.1 Exclusions, Assumptions, and Limitations

To be able to utilize this application, a Clover POS system is necessary. A web application may be available in the future. Based on the time frame for the project, some features may not be able to be implemented such as employee credentials. We must gain permissions from the user to access employees.

3 Solution Design Overview

The Clover Booking Application is an Android App that keeps track of reservations and appointments by using Google Calendar. The application then allows employees to create, edit, delete, and check on those appointments via a Clover POS system. Creation of the application is done within Android Studio

4 Technical Architecture

In an effort to reduce cost and complexity, minimizing the amount of hardware required to manage and maintain this project has been made. Additionally, open source software is preferred when available and as capable as purchasable software.

4.1 Hardware Inventory, Specifications and Locations

4.1.1 Servers

This application does not require any servers in order to function.

4.1.2 Input / Output Devices

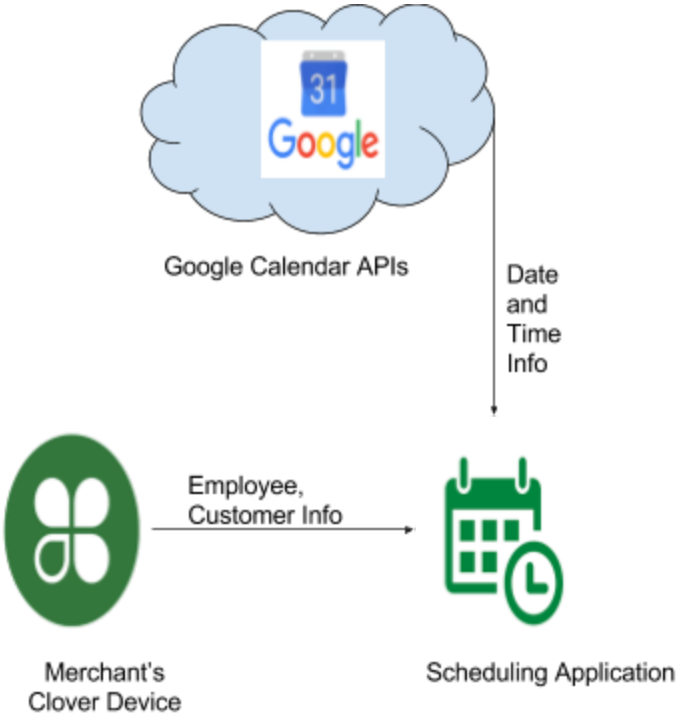
The Clover Station is a touchscreen equipped with an encrypted swiper, a cash drawer, and a high-resolution camera for barcode and QR code scanning. The Clover Mini is smaller touch screen that can accept multiple credit and debit payment types, a built in printer, and a front facing camera for scanning barcodes and QR codes. The Clover Mobile is an even smaller version of the Clover Mini designed as a standalone device or as a complement to the Clover Station. For more detailed specifications on these Clover devices, please visit https://help.clover.com/devices.

4.1.3 Other Devices

Other Clover accessories are available to view at https://www.clover.com/get-paid/accessories. For this project, these accessories may not be mandatory.

4.1.4 Infrastructure/Application Diagram

As the application will not need to make use of any servers of its own, the application's infrastructure is fairly simple. The application will utilize data coming from two main sources: the device the application is housed on, and Google's Calendar API. Below is a simplified drawing showing this connection.



4.1.5 Middleware Hosting

- Google Calendar API: Function calls to the Google Calendar API will be implemented.
- Clover API: Function and variable calls to the Clover API will be implemented.

4.2 Interfaces with Other Hardware and External Integration Points

Not applicable to this application.

4.3 Physical Layout

4.4 Additional Information

This project is a work in progress. While in development some changes may be made in hardware or software platforms.

5 Configuration Specification

Android API 17 and higher is required. Due to software bugs in the Genymotion emulator settings, an Android API 19 is used.

The screen size required is 1366x768px with 160 dpi for the Clover station and 1280x800 with dpi for the Clover Mini.

The Clover Engine APK is also required to be installed on the device. The device must have developer options enabled.

6 Solution Design Specification

The Booking Application is an Android Application that runs on Clover devices. It receives most of its functionality from Google Calendar. Google Calendar allows the application to view, add, remove, and edit reservations on the business' own calendar. Merchants are able to log into their calendar to view all of their reservations.

6.1 Software Description

- Git (2.7.4): Necessary for code management and collaboration.
- Android Studio (2.3.3): IDE for developing the application.
- Clover Android SDK (137): Necessary for the development of the application on the Clover platform.
- Genymotion: Necessary to emulate the Clover POS system.

6.2 Coding Standards

The Coding Standard reference that will be used is the Android Open Source Project (AOSP) Java Code Style.

6.3 Solution Data, Information View, and Data Requirements

The application will make use of various complex collections of data that have been put in the Clover device by the Merchant. These collections of data contain many fields all of which may not prove useful for this application. Below is listed what fields from these collections that are necessary for this application.

The data collections can be placed into two major categories; Employee data, and Customer Data. Information required regarding the Employees are as follows:

- List of All Employees
    - Array of Type Employees
    - `GET /v3/merchants/{mId}/employees`

This list of Employees returns all Employees tied to this Merchant. From this list, pertinent information from each Employee can be pulled as follows:

- Name
    - String, Name of Employee, required for display purposes
- Shifts
    - Array reference of all shifts tied to this Employee, required for filtering and display purposes
- Email
    - String, potentially useful for Customer to maintain contact with Employee

The application will frequently be tasked in creating a new Customer to tie to a reservation, making use of the following API call: `POST /v3/merchants/{mId}/customers`. The fields the application will fill out are as follows

- firstName
  - String, useful for display and identification
- lastName
  - String, useful for display and identification
- Id
  - String, useful for identification
- emailAddresses
  - Array of emailAddresses, useful for contact
  - `POST /v3/merchants/{mId}/customers/{customerId}/email_addresses`
- phoneNumbers
  - Array of phoneNumbers, useful for contact
  - `POST /v3/merchants/{mId}/customers/{customerId}/phone_numbers`

6.4 Module Description

The application will utilize two main modules, Clover and Google Calendar. The application will link these two together through API calls to create a simple data flow. The main interface of the application, the calendar, will be created from the Calendar API and will allow it to keep track of dates and times of the reservations. The application requires other data regarding a reservation, taken from Clover's APIs listed above. With information about the Customer, the Employee, and the Date and Time of the reservation, the application can create a reservation that is unique and trackable.

6.5 Early Prototype Functionality

The early prototype of the application includes the following functionality:

- Events are retrieved from a Google Calendar account using the Google Calendar API.
- Utilizes a test UI to test adding events to a Google Calendar account.

7 Roles and Responsibilities

The *IT Solution Delivery Lifecycle* Procedure, describes the Roles and Responsibilities for developing, verifying, and implementing a Solution. Additional responsibilities relevant to this document are:

Role	Responsibilities
Patrick Carroll	Main Clover API Developer
Brandon Gordon	Secondary Clover API Developer, Secondary Android Application Developer
David Ferrara	Main Android Application Developer
Michael Bayruns	Secondary Android Application Developer, Secondary Google Calendar Developer
Tyler Ligenzowski	Main Google Calendar Developer
Jason Pagotaisidro	Secondary Google Calendar Developer, Secondary Clover API Developer

7.1 Implementation Plan for Mid-Assessment Period

A Mid-assessment Implementation will be a simplified android application that has been loaded onto the Clover sandbox. The calendar view will be fully implemented with Google Calendar API, and the rest of the interface will be present, but not functional. This mid-assessment will demonstrate mastery of android application development as well as implementation with the Clover emulator and sandbox. It will also demonstrate mastery of Google Calendar's APIs.

8 Terms and Definitions

The IT Glossary of Terms maintains the common terms in this document. Additional terms and definitions specific to this document are included below:

Term or Acronym	Definition
POS	Point of Sales
IDE	Integrated Development Environment
SDK	Software Development Kit
API	Application Programming Interface

9 Supporting References

There are no supporting references specific to this document.

10 Revision History

Version	Version Date	Revisions
1.0	9/26/17	Initial Release