Fujitsu
Smart Cities User Applications

Winston Ruan, wxr093020@utdallas.edu, Michael Bortnyck, mbortnyck@utdallas.edu, Jacob Chen, jkc140830@utdallas.edu, Nick Ferrel, nrf090020@utdallas.edu, Rym Wenkstern, rymw@utdallas.edu, Ladan Pickering, ladan.pickering@us.fujitsu.com

Abstract
Fujitsu is developing a smart cities application. The overarching smart cities concept will utilize the connected Internet of Things (IoT) devices as well as internet enabled devices to facilitate the management of the day to day roles that a city must fulfill. The smart cities application represents a evolution of traditional city management.

Our project involves the development of multiple proof of concept mobile applications to realize the potential UI and functionality of the installer and user applications. These applications are limited specifically to the Smart Parking portion of the overall smart cities application. Our applications had to be able to portable to other platforms as well as modular enough to be adapted to other potential features of Fujitsu Smart Cities umbrella.

Results
Our application is able to perform a multitude of functions. The applications are written using the Cordova application development framework to ensure that we can port the application to Android and iOS. This framework utilizes JavaScript, HTML, and CSS to allow web developers to be able to work on these applications.

For smoother performance and load times, we opted to create our application as a single page application with all the HTML elements in one file to reduce the loading time of the application and make the application run smoothly. The page transitions are handled by jQuery page transitions.

Below are some screenshots that showcase the core functionality of these applications.

User Flow

Log In
Site Selection
Device Installation
Parking spot select
Installation checklist

Device Monitor
Monitoring Page

User Option
Navigate to parking spot
Reserve parking spot

Time Selection
Spot Selection
Spot Reservation

Impact
Our project allows Fujitsu to see the design and functionality of portions of the smart parking wing of the smart cities application. The installation application will facilitate the conversion of normal parking lots to connected, smart parking lots as well as provide the owners of the parking lots the ability to easily and quickly monitor the installed devices.

The user application allows the end user to reserve a spot in advance as well as find and navigate immediately to a parking spot. This should reduce the amount of congestion in the parking lot by eliminating the search for a parking spot. Another benefit to this system is that the monitoring of the parking spots will allow the parking lot management to easily monitor the spots as well as more effectively monetize their parking lots.

Success of this application is primarily determined based on how much of the desired functionality we were able to achieve for each application.

Summary
For the Fall 2017 semester, our team worked with Ladan Pickering at Fujitsu Network Communications as well as Rym Wenkstern to develop the requirements as well as the user experiences for these applications.

The applications are only at a proof of concept stage. The final design and functionality could be vastly different from what is presented at this stage. However, we believe that these applications demonstrate a close approximation of the end product as well as provides a good baseline for the final development of these applications.

Unfortunately our group was not able to attach functionality to a back end service such as a database nor were we able to tie functionality to the final parking sensors as neither has been finalized.