PTC: Internet of Things Application

Overview
For our project, we set out to use the Thingworx application development platform to create an Internet of Things application. Our project was to map occupancy data for a classroom environment. The application would collect data like occupancy time for chairs in a building, which chairs were most frequently occupied, and whether any given chair was currently occupied.

Objectives
We split the project into three parts: configuring the Raspberry Pi and hardware integration, programming using the Thingworx platform, and visualizing the processed data on an Android application.

Approach
- Used Raspberry Pi computers to read data from ultrasound sensors and to take pictures from the Raspberry Pi camera module.
- Connected to the Thingworx platform, a cloud-based platform, and by using the Thingworx C and Java SDK.
- Transmitted the data we collected using the Raspberry Pi computers to the platform for processing.
- Created a graphic user interface (GUI) on the Thingworx platform to display our data as well as compute and process various results.
- Supported event handling services that allowed the platform to remotely trigger camera events on the Raspberry Pi as well as use Thingworx’s file transfer protocol to grab these images off the Raspberry Pi.
- Utilized the platform’s direct connectivity with the ultrasound sensors so data could be updated in real time.
- Created an Android application to display the data collected and analyzed on the platform in a mobile environment.

Outcomes
Provided PTC a proof of concept on how their platform can be utilized.