Requirements were elicited by setting up a meeting with our instructor coordinator to get details on what the network admin/product owner needed to help with their problem. On our team we have some people familiar with raspberry pi’s and also have some understanding of the current checkin/checkout system that has given us more details about what may be needed for the app.

## Problem Description

## What is your product on a high level?

Our project aims at optimizing GSU’s check in and check out system, to automate functionalities for ease of use, and to ensure a better system for keeping track of items that are checked out and checked back in.

Whom is it for?

Our project is catered to the GSU Library where they offer technologies for students of GSU to check out as long as they have a panther id.

What problem does it solve?

Our project solves the inefficient and insecure method that is currently being used to keep track of what is being checked out and by who. It will also be able to tell if a student has not returned an item back in a timely manner and will alert attendants instead of having to manually scour the excel spreadsheet.

What alternatives are available?

There are no direct alternatives to solve the problem we are aiming to solve, there are some third party applications that perform similar tasks as we aim to do but none are quite as specific as we are aiming to be.

## Why is this project compelling and worth developing?

This project can help to streamline GSU’s check-in and checkout system for Raspberry Pi’s and keep track of equipment inventory. The system would also allow us to check for raspberry pi’s that may need to be replaced as their condition and quality diminish with repeated usage.

One main benefit for the system, is to give students a better way to be proactive with returning their rented equipment. The app would show them their raspberry pi kit photo and checklist of what they checked out, to help with returns. Scheduled notifications would be sent to them a week before and during the days of checkout returns. This should lower the rate of late check ins, and decrease the likelihood of students forgetting items from their kits.

## Describe the top-level objectives, differentiators, target customers, and scope of your product.

The main objectives of the project are to provide GSU with a system that tracks the status of their raspberry pi inventory, and lets TA’s seamlessly check in and out equipment to lab students.

With our system, we would digitize the initial checkout forms, the warning/disclaimer, and the TA checkin process. The system needs to be able to account for all loaned out equipment as well as their check in condition, and date returned. The system needs to report any damaged or overdue equipment so that GSU staff can replace and take action on a case by case basis.

The target customers are GSU lab students, who need to rent the equipment the entire semester for their classes. What differentiates us from the standard check in checkout system is our approach in nudges students to return items early, and giving them more value in terms of tutorials, and system overviews of their raspberry pi from the app.

We would also be able to use the diagnostic capabilities to send to GSU’s staff when there are issues with students raspberry pi. This may reduce the initial time spent configuring devices, and make it easier for students to complete their work, without needing to go to the TA desk for help throughout the semester.

## What are the competitors and what is novel in your approach?

For the google play store, there were no direct competitors, but we did find some apps that are doing similar things for different industries.

Check in Scan

<https://play.google.com/store/apps/details?id=com.checkinscansl.checkinscan>

Check in scan is an app that helps landlords/airbnb hosts simplify the check-in process and legal documents signing for tenants and guest renting their properties. They use digital signatures, and have an admin backend for the property owners to manage their rentals.

Check In Check Out Mobile

<https://play.google.com/store/apps/details?id=com.ss.checkinout>

This app was created to help businesses keep track of who is currently in the office, and who is out for various reasons (sick, business meetings, etc). It gives companies the opportunity to take note of trends and possible patterns, and schedule meetings at times that work best for the majority of the parties involved.

Raspberry Pi Tutorials

<https://play.google.com/store/apps/details?id=com.tutorials.raspberrypi.raspberrypitutorials2>

This app provides information on how to use the items that would be included in the raspberry pi kit. The tutorials go in depth and provide information on how to use sensors and more.

Handy Library

<https://play.google.com/store/apps/details?id=com.handylibrary.main&hl=en_US>

Handy Library is an app that allows users to search for books at their own library and scan book barcodes to get more details. The app sends out reminders to return books that have been checked out to friends and exports a backup file of the books on record to excel.

RasPi Check

<https://play.google.com/store/apps/details?id=de.eidottermihi.raspicheck>

This provides an overview of your raspberry pi’s status. It provides you with system information, runtime, disk usage, processes and allows you to send the raspberry pi custom commands and shutdown or reboot the system.

We believe that incorporating elements from these apps into our own can help make it more substantial than a tracking system.

By adding in a system checker, like the RasPi, if there are any issues with the app, the student can email these diagnostic details to the tech team, and get quicker answers on what may be wrong with their device. Through adding in helpful tutorials and custom commands for their raspberry pi, we can get students using the app for help with connecting sensors, and creating their lab projects.

With digital signatures and forms, we can remove the paperwork involved in the check in and checkout system, and provide notifications to students to turn in their equipment on time.

## What is interesting about this project from a technical point of view?

Technically the project requires some advanced elements (notifications scheduling and storing digital signatures), though the main challenge is balancing the features, and making it simple for TA’s to check out to students, and for students to also check in.

Providing a lot of information in the app can cut down on research time for the TA’s who need to keep track of inventory and for students, who want to know when they should return their equipment, and who to contact when the equipment has issues.

The goal is to leverage the existing resources for tutorials and reading material, and also streamline sending system diagnostics to the staff, so they can troubleshoot problems without meeting in person.

This app can be built using spring framework, and with the information that we have from our instructor coordinator, and some meetings with the School’s Network administrator, we should have enough resources to create a useful app.

## User Functional Requirements:

Download the app (or TA provides Tablet) and register a new account with my GSU email.

Registration form asks for students’ name, panther ID, and lab session (day/time).

TA goes through the process of listing checked out items, takes a photo of the kit, registers the device id under the students name and has the student digitally sign the warning/disclaimer.

Once checked out the student receives the equipment, is told the return date, and is also emailed a link to the app listing its features, a reminder of what they checked out, and when they need to return their equipment.

The app if downloaded will provide them with access to Raspberry Tutorials for setting up their equipment and provide technical information about their raspberry pi. If they run into issues, there is a button that can send the diagnostic details to the GSU staff along with a description of the issue to cut down on in person troubleshooting.

A week before Lab 14, the app sends a notification to the users email and through the app itself to show them a photo of their checked out equipment, where to return the device and all the things that need to be included.

The student returns the device kit to the TA, and the TA takes account of all the equipment and notes the condition upon return to the app.

--------------------------------------

From The Instructor Coordinator/Product Owner:

Before checking out the student needs to confirm to the disclaimer/Warning:

Student listed is responsible for the safekeeping and prompt return of all items listed on this form as checked out. If one or more components, becomes damaged or lost, the student is responsible for providing a replacement. Please speak with your instructor on what items are suitable. Failure to return all required material by the return date listed on this form may result in but i not limited to a failing grade of zero for this course, a hold on your student account, and any additional legal action Georgia State University may choose to pursue in accordance to the missing or damaged equipment.

Date: Signature:

Checkout: Your Raspberry Pi kit should contain:

Write the Raspberry Pi Serial#

Items: (Checklist record during checkout & during checkin)

* Raspberry PI 3 B+ with touchscreen
* Keyboard
* Power Cable
* HDM I Cable
* SD Reader
* Plastic Container

(Optional Notes)

Student Info Needed:

Name

Panther ID:

Lab Session: Lab Day, Lab Time

Email Address:

Checkout Date: ex: 01/31/2020

CheckIn/Return Deadline (During Last Lab Time - Lab 14 )

--------------------------------------------------------------

Database/Table

Student Name (First, Last)

Student Email (@student.gsu.edu)

Student Panther ID

Student Signature (yes/no boolean)

Device ID (ex: RPI-001)

Device Condition ( Enum: new, good, damaged, broken, lost)

Checkout Date (Today’s Date/ NOW() )

Check-in Date (NULL)

Due Date (estimated end of current semester - hardcoded/changes each semester)

Assigned By (TA’s Name who handled the checkout process)

--------------------------------------------------

Functions:

1. View all devices:

Basically view the database as is, formatted for readability

1. Check-out Process:

Fill in the following fields: name, email, panther\_ID, signature, device\_ID, checkout\_date, assigned\_by saved to database.

1. Check in Process:
2. Look up a specific record by device ID

Fill in the following fields: device\_condition, checkin\_date

1. Generate Report of all:
2. Checked Out Devices (If device ID is found in the database)
3. Overdue Devices (When Todays Date > due date)
4. Damaged/Broken/Lost Devices (When condition is either damaged, broken, lost)