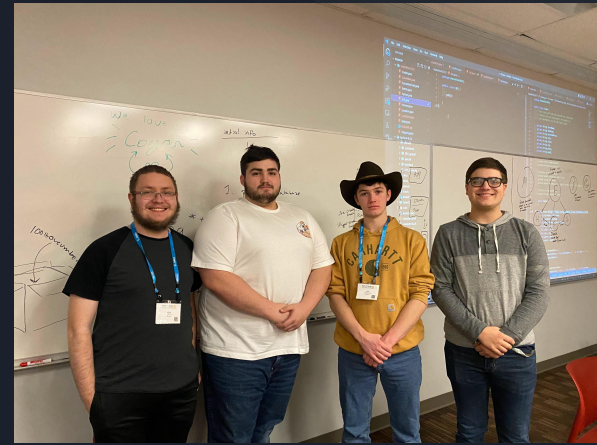


2023 Hackathon

Team 5:

By: Kyle Cox, Carter Mansell, Tyler Sowards, and Cade Mason





Challenge 1:

A farmer named Beth Farmer lives in Hastings, Michigan. This farmer has 2 plots of land and 320 acres of land. Beth chills the produce she gets ready to ship it to the co-op by associating the cases with a serialized shipping code (SSCC) and load the product onto the truck. Our farmer has been a long-time member of the Produce Traceability Initiative (PTI) and has joined GS1.

Our challenge is to be able to track cucumbers all the way throughout the process of picking, packaging, labeling, chilling, and shipping said cucumbers with RFID and Barcodes with due process to FDA Food Traceability.



Why Our Product?

- User friendly, very easy to start using and very straight forward
- Helpful to those without wifi
- Portable on Iphone
- Free to use App
- Helps Small Businesses Grow Faster



Supply Chain and how our product integrates with it:

Field Harvesting:

The farmer harvests one of his fields and then inputs the field he is in and what his produce is on our app

Weighing and packaging:

The farmer uses a scale that (in a perfect world) links up to our app and would automatically stop at every 100lbs. Intervals. The app then takes care of formatting the barcodes and RFID chips.

Making pallets and chilling:

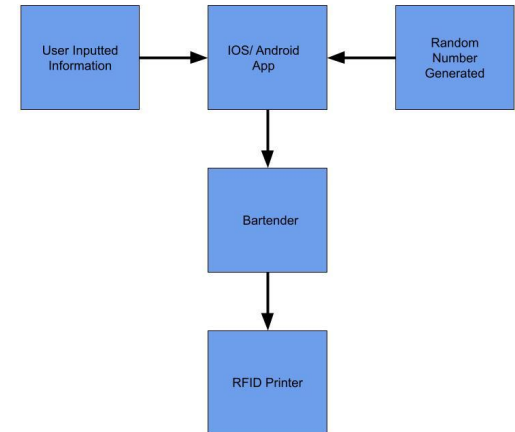
The farmer then would take the boxes to the chilling area (within FDA timeline) and form the pallets and mark what boxes are with what pallet in our app. The app then takes care of formatting the barcodes and RFID chips.

Shipping:

The farmer then indicates where the product is being shipped to and enters it in the app. Finally, the app takes care of the last of the barcode and RFID chips.

Designing Process:

We started off the Hackathon by going through the process step-by-step to indicate what we would need to track within each step. We then created a plan to try developing an “app” that would allow farmers to easily track information of their data and involve label creation within that. This would be done initially without internet access, and it would transfer required data to the internet when a connection is made.





Coding:

- We used java to code the questions of our program.

The code asks for many things to be put on the Barcode Label as well as the RFID including, address of user, place of harvest, and crop. The java code has hardcoded is the serial number we use a file to read into the code what the last serial number was and then the next serial number will add 1 for the current packs of cucumbers. This will be sent back into the file as the new serial number. This gives us almost 9 million combinations for the serial number.

- We used flask (python package) to create a webpage. Then we used a REST API to help handle wireless data transmission with json files.



BarTender/RFID Tags:

- In Bartender we created two different files one housing a barcode and text information while the other has an encoded RFID chip.
- On these labels we have the GTIN of the cucumbers, the GLN of the farm, the serial code for that specific case, and the lot number which signifies which field the case is from.
- With given more time we would make two more sets of these labels, one for when the cucumbers are chilled and one for when the cucumbers are shipped
- The last labels would have to include additional information about where the produce is going in order to meet FDA standards.



Difficulties:

- Our Laptops Downloading Bartender
- Figuring Out How Bartender Works
- Learning the Supply Chain Terminology (KDEs)
- Creating a Label for the Cucumbers
- Transferring the Java programming into the Python Server



Future for the Idea:

- Map out each subsection for the plots of land to be more exact pinpointing if something bad happens to the crops.
- Finish the App, Allow the app to send the data to Bartender.
- Building a scale that integrates into the app.
- Add extra features into the app to more in depth add into the versatility of the app.



What We Learned:

- Design Processes for RFID Labels
- Standards (FDA, GS1, etc.)
- Python (Rest API, Flask)
- Lots of other information provided by the sponsors during the event.



Any Questions?