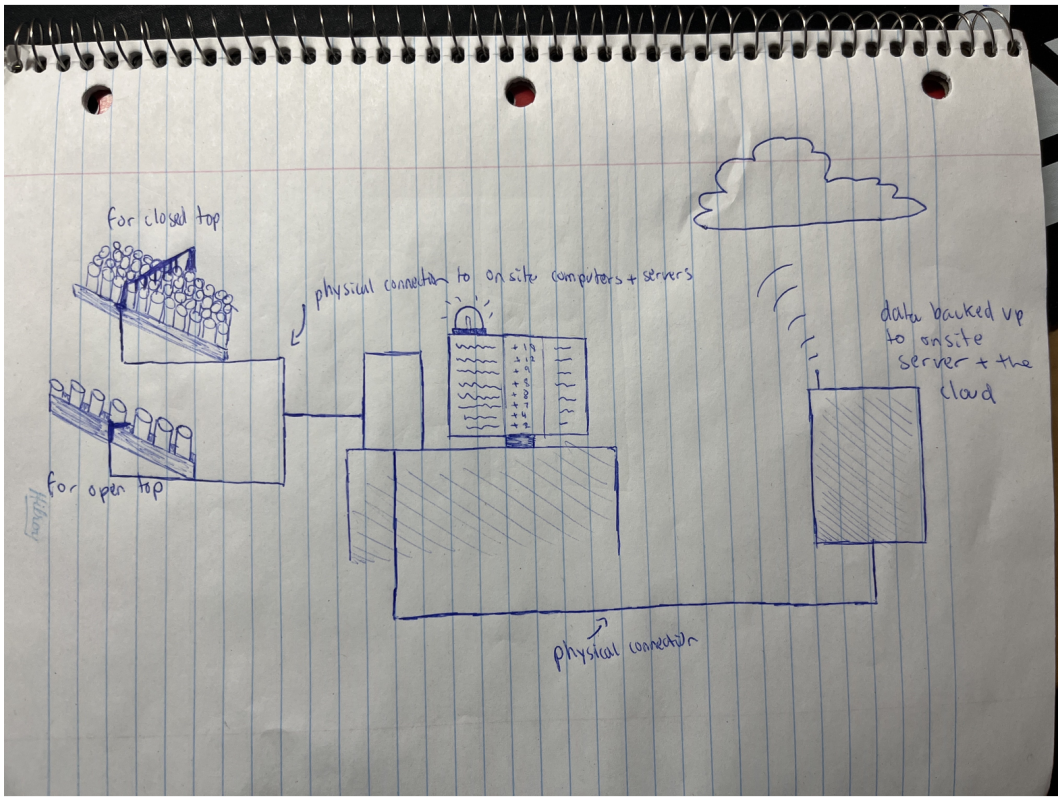
5. Deliverable E – Project Plan and Cost Estimate

1. Concept Sketch



2. Bill of Materials

Please see spreadsheet attached to this week's submission

3. List of Equipment

- Microswitches – small electronic switches that can be activated by a slight touch (Need to modify depending on mass of keg/bottle/can)

- Mounting brackets
- Metal bar for overhead sensors
- Connecting wires
- Protective case
- Power source for switch (Batteries)
- Data storage system (Might have to go with a USB stick...?)
- Software for data collection and analysis could be: “Hadoop”, “Apache Spark”
- Machine learning: “Tensor Flow”, “Scikit Team”
- Cloud based computing: MS Azure, Amazon web services

4. Significant Project Risks

There are two main risks:

1. Technical Failures: There is a possibility that the sensors and data collection process fail or presents inaccurate results. Therefore, we must conduct extensive testing of the system in order to mitigate the risk. We can have a regular maintenance of the sensors and other equipment. We can also prepare and test a backup system for our data breach testing. We can also have a few other options on the table for equipment and materials in case we need a quick replacement or fix.
2. Budget Overruns: There is a risk that the project exceeds the budget we were given. To mitigate this risk, we will monitor expenditures throughout the rest of the project’s duration to ensure that the project remains within budget. We will also be ready to reduce the scope of the project as a contingency plan. We will also look back at the BOM and leave some room for extra money in case we need to order more materials.

5. Prototyping Test Plan

Objective: Verify the feasibility of the switch sensor design and test its functionality.
Stopping Criteria: The test will end when the bottle passes through the switch sensor and the signal is transmitted to the acquisition system.
Test Parameters:
Bottle size: Use standard sized bottles. (500ml to 1L)
Switch Action Force: Test the force required for the bottle to pass under the sensor to activate it. Test mass of the bottles too to ensure they don’t flip on the production line.
Sensor Response Time: Must measure the time it takes for a signal to reach our acquisition signal.
Test Methodology:

1. To test the sensor's capacity to detect bottles moving at various speeds, place the bottles on the conveyor belt and alter the speed.

2. To confirm that the switch sensor can detect bottles of different sizes, repeat the test with several bottle sizes.
3. Use the data analysis to improve the switch sensor design.
4. Repeat the test with different sizes of bottles to ensure the switch sensor can detect bottles of various sizes.