**Project Hot Sauce**

Start Date : Jan

Expected Completion Date : June?

1. **Project Overview**

**Objective**

To develop an environmental monitoring system for building 225 using sensors to collect data on indoor/outdoor temperatures, CO2 levels, humidity, etc., and display this information on a dashboard to highlight inefficiencies in the building's climate control.

**Background / Problem or Issue**

The project aims to address the temperature and air quality issues in building 225, making it more comfortable for occupants.

**Scope**

The project includes air quality, temperature and humidity sensor selection and installation, data collection and storage with AWS, dashboard development, analysis of building occupancy and environmental conditions, and proposed suggestions to building operation team and building owner.

**Expected Deliverables**

1. **Budget and Timeline**

**Initial Budget**: $1,000 for sensor, AWS services and any additional development tools.

**Timeline**: Initial version to be running by June. Team to continue improving the project through out the summer.

**Link to current task list:** [**Project Hot Sauce Tasks**](https://northeastern-my.sharepoint.com/:x:/r/personal/k_aden_northeastern_edu/_layouts/15/Doc.aspx?sourcedoc=%7BA9A43F27-04C0-434F-BC67-27F215D2789C%7D&file=Project%20Hot%20Sauce%20Tasks.xlsx&action=default&mobileredirect=true)

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| --- | --- | --- |
| **KEY MILESTONE** | **START** | **FINISH** |
| **Phase 1** | | |
| Locating CBRE Sensors on the Floor Maps | Jan | Feb |
| Determining NU Sensor Locations | Feb | March/April |
| Developing Software on AWS | Feb | March/April |
| Testing Devices | March | April |
| Designing Dashboard | March | April |
| Capturing Population Data | March | April |
| **Phase 2** | | |
| Placing Sensors | April 11 | April 17 |
| Data collection | April 18 | May 18/  June 18 |
| Data Analysis | May 18/  June 18 | July 15 |
| Improvement Phase | May 18/  June 18 | July 15 |
|  |  |  |

**Stakeholders**

Northeastern University

Operation group

**Budget & cost**

1. **Requirements**

**3.1 AWS Storage and Data Collection**

* Data Collection Frequency: Sensors will collect data every 5 minutes.
* Data Types: Temperature (indoor/outdoor), Humidity, CO2 levels, PM2.5 (Air Pressure ? VOC?)
* Cloud Architecture Diagram: Develop a diagram outlining the cloud infrastructure, data flow, and component interaction.
* Storage Solution: Use AWS DynamoDB Database for storing the collected data.
* Security

**3.2 Sensor Devices**

* **Sensor Selection**: Determine the types of sensors needed (temperature, CO2) and their specifications.
* **Sensor Installation Locations**: Total of 20 sensors to be located on 4 stories (5 sensors per level). Identify optimal locations for sensor placement to accurately measure indoor and outdoor environmental conditions. The sensors should also cover a variety types of space to provide a realistic reflection of building performance.
* **Memory Requirement**: Calculate the required storage based on the data collection frequency and size per data point over a year.

**Team to revise or confirm assumption:**

Estimate the required storage size based on the data collection plan.

Based on the calculation, the project will require approximately 0.98 GB of storage to hold the sensor data collected every 5 minutes over a year by 20 sensors. This estimate assumes an average data point size of 500 bytes, covering temperature, CO2 levels, and potentially other environmental measurements.

**3.3 Dashboard**

* **Functionality**
* Real-time data visualization in comparison with outside / external data sources alerts for abnormal conditions.
* Highlight rooms on dashboard if the temperature, humidity, CO2 contents and PM2.5 are out of comfort range?
* Alert NEU operation group and provide recommendations to resolve the issue? (open/close windows?)
* **User Access**: NEU operation team and project team members.
* **Customization**: Ability to filter data based on specific sensors, date ranges, and types of data?

**3.4 External Data Sources**

* Weather data
* Temperature and humidity data: NOAA & Weather.gov
* PM2.5 Particulate Matter air quality date: AirNow

Note: Both NOAA, weather.gov and AirNow provide API

* Building occupancy data

**Risks?**

**Assumptions and Dependencies?**

**Constraints?**