AWS Capstone Project Description

Background

Amazon Web Services (AWS) is the world's most comprehensive and broadly adopted cloud platform, offering over 165 fully-featured services from data centers globally. The Clemson Makerspace is a student organization providing training, prototyping, and fabrication equipment (e.g., laser cutters and 3D printers) to the Clemson community. For this Capstone project, motivated students and AWS mentors will leverage the power and ease-of-use of AWS to create an equipment maintenance management system for the Clemson Makerspace that delivers lasting value.

Business Problem

Every semester, the Clemson Makerspace serves hundreds of students across multiple locations, with many different types of equipment. Their current system for tracking required maintenance tasks is very manual and prone to errors. Providing the Makerspace with a new equipment management system will allow them to improve customer understanding, provide better service, and accurately justify funding and space allocation requests. Capabilities of the system could include:

- Automation of scheduled maintenance alerts
- Data Analysis of equipment utilization metrics
- Integration with a reservation system for 3D printers, laser cutters, or even borrowed hand-tools.
- Mobile app that reflects some of the system web-based capability.
- Exploration of AI/ML techniques to predict 3D printer failure based on success rates or other instrumentation.

Deliverables

The Capstone project's customer is the Clemson Makerspace's student and faculty leadership. The student team will engage the customer to understand Clemson Makerspace business processes, the current management software systems, and vision for growth. With this customer understanding and knowledge of the existing system, they will propose, design, and develop a new system that delights the customer. This new system should reuse as much of the existing system as is reasonable. The students will hand off the project to the Clemson Makerspace before the end of the semester. This includes providing the source code in Git with an open-source license, deployment of the service onto the Makerspace's AWS account, a user manual, and leading a training session with the Makerspace staff to familiarize them with the solution.

Technology and Required Skills

Students are expected to select and justify the technical stack and AWS services needed to develop their solution. No specific technical competencies or skills are required for this project but familiarity with AWS, SQL, Java, Python, Ruby, JS, React, or Angular would be helpful.