# Project Scope

## Project Description

The objective of this project is to reduce errors and industrialize the results of the previous senior design team 522 to create a manufacturing educational demo for STEM engagement that resembles a real-world engineering environment. A physical item should be able to be produced by a non-technical user.

## Key Goals

For this project to be successful, the previous senior design team's results should be built upon to improve reliability of the system. The system should have a simple method for fault resetting upon failure. The system designed must teach the audience about the automated manufacturing process. The system must also produce a tangible item for the audience to take away after the experience. The system should represent a realistic automated manufacturing environment.

## Markets

The primary market for this product is educational institutions ranging from grades K-12. The educational institutions include educators, other faculty members, and students aged 5 and up. A secondary market may be after-school STEM learning clubs in a local community that aim to expose their members to engineering topics and higher education systems, such as universities. In addition, this product holds interest to individuals who are looking into automated manufacturing for expansion of their personal knowledge. A fourth market is professional development industry workshops providing training and insights into the industrial automation field to attendees who are looking to advance their careers.

## Assumptions

It is to be assumed that the system will operate with some level of user input. This allows the user to proceed at their own pace and explain the different steps of the manufacturing process. The system will also need access to 120-volt outlets. Provided this is true, the system will be adequately powered as the current design uses two 24-volt power supplies to run the system. Another assumption is that the user does not need any prior knowledge to operate the system. The operation and setup of the system will be well documented to ensure that anyone can operate the device. This also means any fasteners or tools needed will be provided with the system. This ensures that the product can be encompassed by educational institutions with no present manufacturing or engineering curriculum. A fourth assumption is that the system will be provided ample space and level surfaces for operation. The system is producing a physical item that involves moving parts. Adequate space and leveling will ensure the product can be operated safely without tipping over or falling down.

## Stakeholders

The product’s main stakeholder is the company Rockwell Automation, who serves as the primary consultant on the project. These sponsors include Rockell engineers Cliff Rice and James Fadool, as well as Rockwell consultants Shayla George and Tajaey Young. Rockwell Automation has the most investment and interest in the project, as the premise of the project is a direct request from the company and the budget is primarily sourced from them.

A secondary stakeholder, Dr. Shayne McConomy, holds a stake in evaluating the team’s progress and deliverables alongside the course teaching assistants. In addition, Dr. Ordonez, as the faculty advisor, is another secondary stakeholder, providing oversight and technical knowledge essential for the development of the project.

Additional stakeholders include the FAMU-FSU College of Engineering as they provide institutional backing and potential funding. Stakeholders also include the Florida School Board Association, which would need to approve the product before it can be implemented in schools. Their influence will ensure that the product aligns with educational standards and is suitable for safe use in classroom settings. Materials and logistic providers, such as the university’s machine shop, are also stakeholders. Their ability to support the project by providing the necessary components impacts the project’s execution. Additionally, the student team, ourselves, is a stakeholder, as the project’s success is dependent on our work.

The end users of the product, teachers and students, are the most notable beneficiaries. With the success of the project, Rockwell Automation aims to send the produced manufacturing system to schools to educate and engage young people in the automated manufacturing process, a topic many early elementary schools do not include in the curriculum. The teachers and students will derive new learning topics from the project, therefore, they have vested interest in the project’s outcome.