# Customer Needs

Rockwell Automation is partnering with the FAMU-FSU College of Engineering to create a model aid that showcases the automated manufacturing process. Building off last year’s design, Cliff Rice, James Fadool, Shayla George, and Tajaey Young from Rockwell Automation are the primary advisors for this project. Rockwell Automation is the primary customer for this project as it’s being designed specifically for their use. To better understand their needs, the advisors were asked the following questions.

Table 1. *Customer Needs Table*

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| **Questions Asked** | **Customer’s Response** | **Interpreted Need** |
| As the design is producing a physical item, how fast would you like each item produced? | A rate of 60-90s per product would be good. Because this is a demo machine for learning, we want the process to be fast enough that it's interesting, but slow enough to watch each step. We also want a small group of people to have a product in a reasonable time frame. So 3-4 people could each have a product in about 5 minutes.  | The product completes a cycle in a timely manner, roughly one minute. The product is slow enough to follow the process but maintains engagement. |
| Once powered on, is the design expected to continuously produce items until powered off or take user input to operate on each cycle? | 1. We expect a start, stop, fault reset, and potentially a pause input.
2. If portions of the process require human intervention, you need to engineer in physical and or software safeguard.
3. If the machine can auto-cycle, producing several buttons without additional inputs between cycles, that is a bonus. In this mode, it would need to monitor material levels and stop when empty.
 | The product contains simple, useful safeguards for potential errors, as well as a start and stop input. |
| What are the expected aesthetics of the project? | 1. The machine should be capable of being shipped, set up and operated by a non-technical user with no background on the machine. While we want the machine look to look clean & sharp, indicator lights go a long way towards this, but that is secondary to the physical requirement.
2. A setup guide will be required, either integrated into the machine on the operator interface or as a separate document/video.
 | The product is clearly explained for solo use by a non-technical user. |
| Are there critical milestones set by Rockwell that we should be aware of? | None yet. We will communicate them to you in advance. | N/A |
|  | Clarify Answers Below |  |
| What are some of the key goals that you would like this project to accomplish | We would like the project to be aimed at educating K-12 students on the manufacturing process. | The product captures key components of manufacturing and teaches students about the processes  |
| What aspect of safety should our group aim to meet? | The device should be safe for kids aged K-12. It should also not pose any risk to non-technical users when being set up and operated. | The product poses no risk to non-technical users.  |
| Based on the previous teams' design, do you want us to expand on it or go in a different direction? | You guys should expand on the current design and do as minimal scrapping as possible. We don’t want to move backwards, think forward action only. The team last year produced a solid solution, but we’re looking for a higher level of reliable automation. If another direction is sought out for an aspect of the design run it by us for approval. | The product expands upon the results of the previous team with a focus on automation improvement. |
| Is there a specific group you would like this project to be aimed at? (K-12, College, Professional)  | This project should be aimed at an educational setting. Work with a 1st grade teacher in mind as the operator and think of the audience as K-12 students. | The product is simple enough for use by a young, non-technical audience. |
| Would you like the final product to operate under supervision or somewhat autonomous? | The product should be able to take user input but also complete a cycle autonomously. The buttons that currently exist and do individual steps of the process would be nice to maintain for error analysis; however, the goal is for a button to be fully produced with minimal user interaction. | The product is operable and functions with minimal human intervention. |
| What are the restraints in terms of size and weight? (Basically, are we keeping the project mobile) | The product should be easy for anyone to assemble and disassemble so it can be moved around. | The product is easily transported.  |
| Where will this product be showcased? | It is expected to be showcased at mainly K-12 schools, but also potentially colleges and career fairs. | The product is understandable by all ages. |
| Is there anything that you want to be incorporated into the final design?  | Use Rockwell technology and hardware when applicable. You should focus on making the current design more reliability, more industrial, and like a real engineering environment. | The product is reliable and realistic as a manufacturing process. |
| Are there any assumptions that need to be made about the final product?  | Anyone should be able to operate the product with relative ease and no safety threat. | The product is safe for all ages. |
| Is there any instructional component you want us to include or focus on? | The product should focus on the manufacturing process and resemble a real-world scenario. It should operate slowly and simply enough for the K-12 audience to follow each step. | The product resembles a realistic manufacturing environment.  |

The information was gathered over the span of roughly two weeks with multiple forms of communication between the senior design team and the Rockwell sponsors. A set of initial, broad questions were verbally asked during a weekly cadence Microsoft Teams meeting. This allowed a longer list of questions to be generated from the first vague direction. The senior design team then communicated through email with the Rockwell employees to present the final list of questions included above. The Rockwell replies were directly copied and assessed to derive proper interpreted needs. These needs are positively phrased, expressed in the form of a product function, and follow the specificity of the initial Rockwell answers. The customer statements and interpreted needs allow the design team to ensure that realistic goals are set, and the customer is satisfied.