

Explanation of Results

(1) Introduction of F.D. provided.

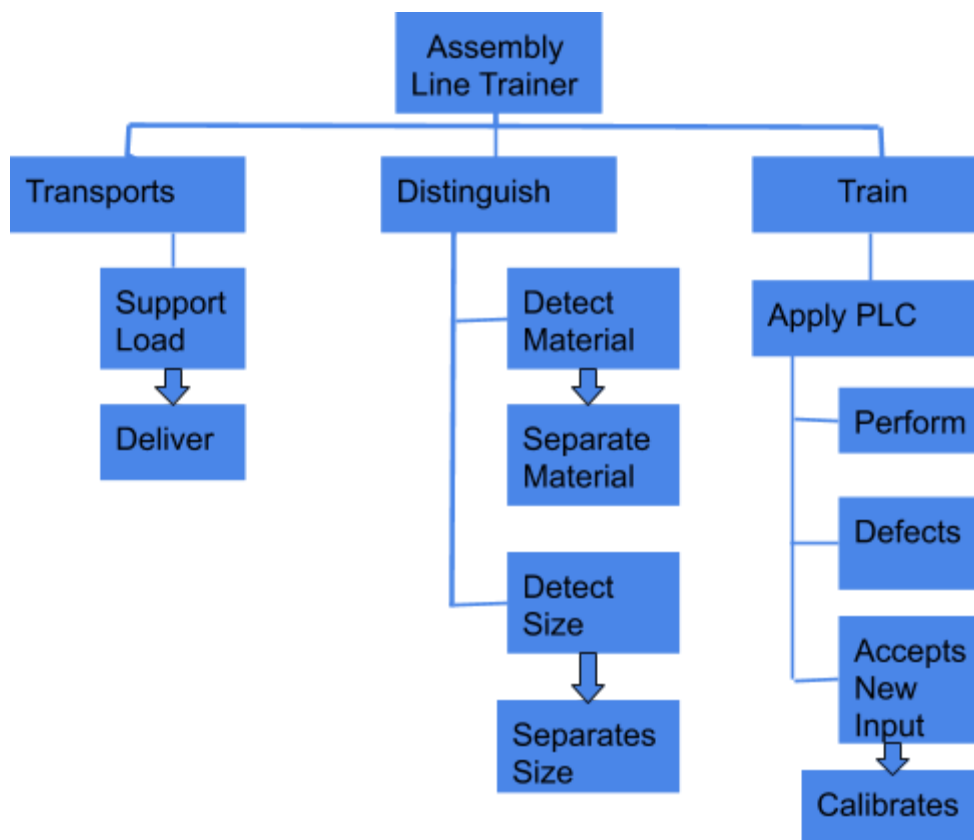
The functional decomposition provides a visual aid to understand the smaller tasks used to accomplish the greater or ultimate purpose of the project. The project description that the design team must meet is to deliver a device that detects material type and size of an object and sorts accordingly. The system will operate using a traditional industry recognized automation system. To accomplish this goal from an engineering perspective the team must break down the overall goal into smaller tasks, the functional decomposition is a visual representation of this breakdown.

(2) Discussion of the data generation

The data generation process for the functional decomposition was a result of the team discussion on what tasks the device needs to accomplish. To further simplify the figure the group summarized their statements into verbs that the device will physically perform from the large overall tasks down to the smallest subtasks.

(3) Introduction of the graphics:

The final product of the group discussions was the functional decomposition diagram below.



(4) Discussion on how the F.D. was gathered.

The functional decomposition structure was generated once the overall goals of the product and subtasks were defined using verbs. The team organized the functional decomposition into a chart structure due to the simplicity of defining tasks and subtasks in this representation.

(5) Mentions function relationships.

Documents how a series of functions relates to subsystems of the project.

The three main tasks to be accomplished by the device were to transport, distinguish, and train. To accomplish these tasks the subtasks had to be defined. The relationships are shown in the figure as the subtasks are connected to the main tasks with a vertical line connecting the subtasks to the main function in a descending fashion.

Highlights how function(s) will have cross sub-system relationships

One of the functions that has a cross subsystem relationship is the distinguish function which will relate to the deliver function under the transport function. This is because the sort function will determine where the object being sorted will be delivered depending on the size and material composition of the object.

(6) F.D. Cross Reference Table

	Transports	Distinguish	Train	Sum
Support Load	X			1
Detect Size		X	X	2
Deliver	X	X	X	3
Detect Material		X	X	2
Apply PLC	X	X	X	3
Sum	3	4	4	

The chart above shows the functions which are most prevalent to design. Transportation is ranked the lowest but is very important for the materials to be sorted. Distinguish and train are ranked the same since the PLC program will be used to distinguish the materials and sizes. The PLC program will also be used to train students how to troubleshoot the program.

