

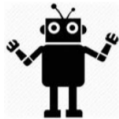
Included below is the Levels of Automation as defined by Sheridan and presented by Professor Intriligator in the course ENP 162-“Human Machine System Design” at Tufts University.

Levels of Automation (Sheridan):



The computer (automation):

1. Offers no assistance; the **human must do it all**
2. Suggests a complete **set of alternatives** to do the task
3. **Narrows the set** of alternatives to do the task
4. **Recommends one** alternative to do the task
5. **Executes the recommendation if the human approves**
6. Allows human a restricted **time to veto** before automatic execution
7. Executes automatically, then necessarily **informs the human**
8. Executes automatically, then **informs the human only if asked**
9. **Informs the human only if it decides to**
10. **Selects the method, executes the task, and ignores the human**



This criterion was used when considering which steps would be automatically completed by the machine. The steps that have been automated are listed in the table below, along with the Level of Automation and the reasoning behind each Level of Automation.

Task Step	Level of Automation	Reason for Level of Automation
Data about recycling	10	Data is collected completely automatically by Machine but operator taking photo of product
Decide if recyclable	7	The machine analyzes the collected data and compares it to what it knows about the product in order to decide if the object is recyclable. It only informs the human of the necessary information, which is if the object is recyclable or not. It does not provide any analysis information or what made it decide the object is recyclable.
Have data about what needs to be rinsed before being recycled	10	Data is collected completely automatically by Machine but only after process is triggered by operator taking photo of product.
Decide if product needs to be rinsed	7	The machine analyzes the collected data and compares it to what it knows about the product in order to decide if the object requires rinsing. It only informs the human of the necessary information, which is if the object needs rinsing or not. It does not provide any analysis information or what made it decide the object needs rinsing.
Acquire knowledge of what is proper recyclable form	10	Data is collected completely automatically by Machine but only after process is triggered by operator taking photo of product.

Decide what is proper recycling form of product	7	The machine analyzes the collected data and compares it to what it knows about the product in order to determine the proper recycling form. It only informs the human of the necessary information, which is the proper recycling form. It does not provide any analysis information or what made it decide the project's recycling form.
Determine if product will fit into recycling receptacle	7	The machine analyzes the collected data and compares it to what it knows about the product in order to decide if the object will fit in the EcoSort storage bin. It only informs the human of the necessary information, which is whether the object will fit or not. It does not provide any analysis information.
Put product into proper recycling form	Autonomatik only if product fits in machine-8	The product is put into recycling form by machine (via cutters, compactors, etc.). The machine will tell the user what the proper form is only if the user asks. (They might ask if they want to know how to recycle it when they are not at home).
Figure out when and where to bring bins out	10	Data is collected completely automatically by Machine. Information is updated whenever the device is connected to Wi-Fi.
Figure out when/where you are related to that day/location	7	Machine does this process automatically, then notifies user one day before recycling/trash collection.
Figure out when and where to bring bins in	10	Data is collected completely automatically by Machine. Information is updated whenever the device is connected to Wi-Fi.
Figure out when/where you are related to that day/location	7	Machine does this process automatically, then notifies user after recycling/trash collection.

As can be seen in the table above, most automated tasks in this process cannot be stopped by the humans. In future iterations, it would best if there is a user override in the "Put product in proper recycling form" step, so that if something accidentally ends up in the machine that not cuttable or bendable the machine won't break.