Engineering Proposal

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Introduction

In class, one of the ideas we came up with was improving a closet and making it work like a machine, because it is one of the essential items we use in our household. We decided to try technologically improving a closet by adding devices inside and also make it compatible with AI, which makes the closet work automatically when turned on. We also came up with an additional feature for the closet, like making it work similarly to a laundry machine by only cleaning clothes and also removing wrinkles. One innovative invention we came up with is a machine that is built like a closet and is powered by A.I and devices that work like an iron, and air freshener. How this invention works is that we can put any type of clothing inside and after that, the devices inside can keep clothes clean, and it can also remove wrinkles. This closet can change many people's lives in their daily routine by providing them with a well-organized, dust-free environment for their clothes while also keeping them clean and fresh at all times. This innovation does offer an alternative method of keeping your clothes fresh, that is that it works similar to a laundry machine, but it should be noted that it can't completely substitute a laundry machine due to its functions not working the same way.

This idea was derived from a company called "Seven Dreamers" who has created the world's first laundry robot that can sort and fold clothes. The added functions that were described before would greatly improve the original innovation, because it is the complete version of the laundry robot with functions that make it work similarly to a laundry machine. If we add this innovation in the market, what we wish our customers to gain is to have a technological device

that is powered by A.I and can be used in their household. This innovation would also attract more people to buy this, because of its latest technological advancements that were never seen before on other machines.

Innovations

/ laundroid

While doing some independent research on the materials needed to create the folding mechanism of our closet. We found a company with a very similar concept to ours. The company in question is a Japanese company called "Seven Dreamers". This is an important topic to bring up because it highlights a company that had roughly a similar idea to ours but unfortunately was not able to execute on their part. This company had many early signs that would have predicted the downfall of their proposal such as the price tag that was attached to their invention, "The Laundroid" which was estimated to be $16,000, failed to show up and promote the product at CES 2019, an event where people introduce their tech ideas for personal use. "The Laundroid" despite its initial hype, never made it to the market for its price and slow folding mechanism which made it almost impossible for customers to purchase or go to on the market. This led to the company being in debt ranging from 20 million and losing about 200 creditors. The company was a no-show at CES 2019" (Oswald, 2019, para. 2). Fortunately for us, we tackled each problem that Seven Dreamers had, to make our product accessible to the public where we resorted to using cost-effective materials such as the ones found in the Material section of this essay.
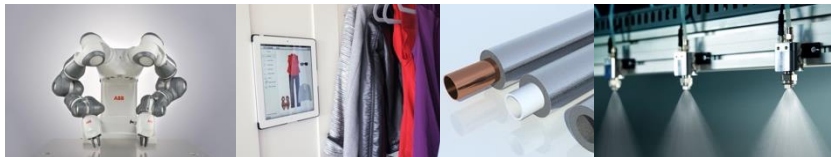
Materials

In terms of the materials used to construct the closet, the materials will mainly be metal and plastic components along with various electronic components such as sensors and motors. While certain functionalities that come from the closet will be made up of smooth and non-abrasive materials to avoid damaging the clothes the user puts inside. For the closet to work, the electronic components will be;

- **Folding Mechanism:** Robotic arms that expertly fold and arrange your clothes to meet the users' preferences

- **Sensors and Scanners:** Detects the material, color, and size of the clothes before being worked on, whether it should be folded, ironed, or sprayed with an aroma of your choice. This will also see if there are any incorrect objects placed inside, preventing any problems for the closet or for the user

- **A.I. Trackers:** Identifies and tells the robotic arms where certain clothes should be placed. The built-in A.I. can also maintain all other tools, notifying the user if there are any problems that can be resolved.

- **Control system/Screen/App:** Used and customized by the user to make the closet more fitting for them, whether it's the number of times the cologne should be sprayed on the clothes, or where certain clothes should be placed, all on your phone for you to choose, wherever and whenever and it's free!

- **Ironing Mechanism:** A pair of small, heatable poles that roll onto the clothes. The incorporated Sensors will evaluate each item for ironing. Furthermore, to ensure optimal

user experience, the system will display a notification on the screen, allowing the user to decide whether they would like the clothes to be ironed or not

- **Spraying System:** Integrated inside the poles, with small holes that dispense the preferred cologne or liquid at pre-defined intervals selected by the user. To prevent any molding, there will be built in cloths to clean and scrub out any mold formed.

- **Ventilation System:** Built-in fans located on the sides of the closet with proper airways will remove any heat or steam generated by the Ironing Mechanism or Spraying System. The A.I. will automatically activate the fans to prevent mold and ensure optimal air quality. Moreover, the ventilation system will also have a timer to maintain a consistent fresh air temperature/environment inside

- **Safety Mechanism:** Designed to prevent potential hazards such as, exceeding weight capacity, incorrect items being placed inside, Electric problem, Overheating, and more, will be installed on the A.I., where it will first notify the user of any potential issues and provide possible solutions to resolve the problem. The Mechanism also includes an option called "Factory Reset" where if an issue is still occurring in the systems, one can simply reset all the systems and help it feel like it was brand new

Though with all these expensive equipment's/functions that the closet provides, it is estimated that the closet will cost around $2,500. The chosen materials are for their durability, functionality, sustainability, and replaceability so that the closet can still feel like it was freshly opened out of the box.

Process

After we solidified our ideas, we began to sketch and make our prototype on a 3D
modeler called AutoCAD. After a long discussion, we decided on the shape, design, and the
dimensions of the closet are. The shape of the closet is like a rectangle, which we referenced
from a failed product "Laundroid" and the dimensions of the closet are: Length – 5 feet, Width –
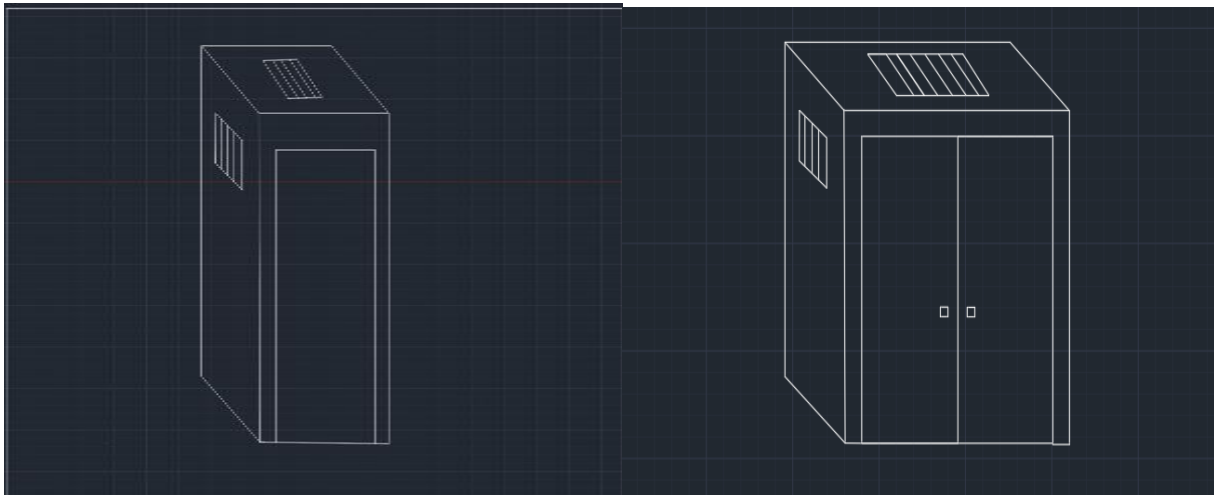4 feet, and Height – 8 feet.

Figure X: Prototype of the Magic Closet   *Figure X:* Final Design of Magic Closet

The Magic Closet will iron, fold, and freshen up the clothes, but how does it work? The
closet has a front door that can be open and closed. When you open the door, there are 2 bins at
the bottom of the machine that will hold your clothes. Each bin has a weight capacity of 15

pounds, making it 30 pounds. Once you put all the clean clothes in the bin, you can now use the app to decide whether to iron, spray, fold, or any combination of them and more. After selecting your preferences, the door will be locked, and the process will begin.

When the process begins, scanners on the side of the machine will begin to scan your clothes. Magic Closet will have a 3D model of your clothes and after this, robotic arms will pick up the scanned clothes and depending on what you choose, it will correspond. The arms will first raise the clothes up vertically, at the top middle of the machine. Two rods will begin to close in on the clothes and iron it. It will press the clothes from top to bottom, removing any wrinkles and straighten it.

After the ironing process, it will activate the spraying system. Before the activation of the machine, you will pour your choice of liquid cologne or liquid freshener into a compartment that holds it. When the spraying system is activated, the ironing rod will be placed in a storage room next to the vents, and two new rods will appear. The rods will spray any liquid in the compartment, evenly distributed to ensure a good scent, yet not overpower.

Once the rods have finished spraying, they will be placed where the ironing rod went, and the robotic arms will put the clothes in the middle of the closet. At the middle of the closet, there is a platform where the clothes will be lay out flat and straight. The arms will begin to fold the clothes into whatever you desire. Once folded, the arms will grab onto the clothes and put them neatly on the bins at the bottom.

Magic Closet will do its job with the consideration of your preferences. It accomplishes this by an app on any device. When you turn on the app, you will connect the closet using your phone by Bluetooth. After connecting, a menu will show up with 3 main sections: Ironing,

Spraying, and Folding. When you click on either of the sections, you can decide on your preferences. The selection can range from how long you want your clothes to be ironed for, to a unique folding style. If you don't what the closet to do any ironing, spraying, or folding, you can press the button "None" and that section will not have anything registered. If you suddenly decide to change your settings or want to stop the machine, you can click the button "stop" to stop the closet from doing its job.

Conclusion:

The purpose for this proposal is to improve a previously failed innovation and add new technological features that make it stand out compared to the original innovation. What we expect for this innovation is to introduce to the public on a new technological item with the latest A.I technology. One of the outcomes of this innovation is that it would be more successful than the original innovation, as it is much more improved and less expensive, which would attract more people to buy it for its features. In conclusion, we have focused on creating this innovation for household use and innovate the concept of A.I technology to another level.

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