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# Automatic T-Shirt Folding Machine

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***Abstract:*** — The scope of this study focuses the designing and developing a Clothes Folding Machine as an idea for final year project. Nowadays, housewives are busy with other tasks and have no time to complete just a simple folding. They also need to take care of children especially babies. Then, a busy women and men also do not have much time to fold their clothes. This will cause major stress as they realize their unfolded clothes at home. Packaging are very important in the industry of packing activities. Currently, many clothing markets do not have sufficient folding machines. This is because of the market's expenses cannot be wasted on machines and employees have to manually fold the clothes. Thus, this production of Clothes Folding Machine helps to fabricate a machine that provides an ideal folding machine for users who are unable to manage their clothes due to works and surroundings factors. Other than that, this project used electronic components such as Arduino, servo motor, circuit and others. Besides, this folding machine is fully automatic where users place the t-shirt on the board, press the start switch and within fraction of seconds the t-shirt will get folded. Moreover, this project will definitely be a helpful hand to the working women where at the same time, it saves energy, time and money. Last but not least, Clothes Folding Machine was expected to be prepared with low prices which affordable to all generations and friendly product to customer.

***Keywords**: **Folding machine, Busy women, Folded, Clothing markets, etc.***

## I. INTRODUCTION

In modern times all the sophisticated electrical and electronic equipment is used daily. Therefore, the main scope we want to introduce is to focus on the industry sector which is one of the long-standing and indirect sources of economic growth in Malaysia. In addition, with today's ever-increasing technology, we can indirectly learn how to do things using existing technologies. Thus, we learned a single creation with many uses where we had agreed to come up with a project called a Clothes Folding Machine. Clothes Folding Machine is an automatic motor controlled clothes folding machine powered by a Arduino system. The aim of this project is to fold t-shirts merely by pressing a button. The folding machine is fully automatic where one has to place the t-shirt on the folding tray and press the button. It will then fold the t-shirt by itself. Usually, a person uses conventional method to fold the clothes which by hand folding. People nowadays have been living with tight schedule in their daily life. Household chorus despite gender discrepancy has been a burden for many. This work is a burden for many and sometimes tiring depending on the amount of clothing and number of people in a house.

In addition, most of the clothes folding machine in market are either for industry use or too expensive.

We are trying to build a portable automatic clothes folding machine with cheap cost to serve most people. The operation of the machine requires less manpower involvement, which is significantly useful for people who are not willing to organize their clothes.

## II. LITERATURE SURVEY

**Electric systems** An electric power system is a network of electrical components deployed to supply, transfer, and use electric power. An example of a power system is the electrical grid that provides power to homes and industry within an extended area. The electrical grid can be broadly divided into the generators that supply the power, the transmission system that carries the power from the generating centers to the load centers, and the distribution system that feeds the power to nearby homes and industries. Smaller power systems are also found in industry, hospitals, commercial buildings and homes. The majority of these systems relyupon three-phase AC power, the standard for large-scale power transmission and distribution across the modern world. Thus, a single creation with many uses had learned where we had agreed to come up with a project called a Clothes Folding Machine. Clothes Folding Machine is an automatic motor controlled clothes folding machine powered by an electric system. The aim of this project is to fold t-shirts merely by pressing a button. The folding machine is fully automatic where one has to place the t-shirt on the folding tray and press the button. It will then fold the t-shirt by itself. For this project, an electric current is conducted by using a plug adapter. The system used to obtain product usage accuracy. When the switch is turned on, the current will flow fromthe main switch through the Arduino panel box to transfer energy to the motor servo wherethe servo motor will receive electric current. The arm of servo will rotate 180 degrees to begin the process of folding the shirt.

**Automatic Folding Machine** The automatic cloth folding and stitching machine which is produced by the factory is a highly automated machine and developed according to market demand. It is often used in conjunction with automatic fabric strip slitting machine and straight twill cloth rolling machines, which can replace traditional cutting machine, will greatly improve working efficiency. This machine is about two-thirds the size of your washer or dryer. The user, perhaps a teenager convinced to help with chores, simply hangs or clips the shoulder area of the shirt on two hooks and steps back. The device pulls the shirt in. A series of rollers and arms that also move up-down-sideways straighten and fold the item of clothing. Optionally, the device can spray the clothing with a wrinkle-reducing agent or fragrance. It is not completely hands-off after clipping the item. User have to button a shirt before handing off to automatic folding machine. It also cannot handle big items such as a beach towel and possibly not loose-fit XXL athletic shirts, for instance. Still, most shirts, undershirts, T-shirts and pants should fit into the auto-folder. Socks are too small to be folded.

**T-Shirt Folder** It is easy to see why this is the most popular folding board. In three simple steps this board folds anything from T-shirts to pants to sweaters. Unlike a lot of similar boards on the market, this board features adjustable hinges so that you can easily fold thinner or thicker garments. Folded up it is 11 inches by 9 inches, 1.2 inches thick, and features a hook that makes it super easy to store.

**Plastic Board** Besides that, this sturdy plastic board is style of T-shirt folder that most retail professionals use — and for good reason, too. It is simple, compact, and the handle makes it easy to slide out of a folded top. This one even comes with directions engraved on it for easy reference. It is a little more than 12 inches tall and 8.5 inches wide, so it is ideal for tees and collared shirts

## III. PROBLEM DEFINATION

Strict daily routines at work often make one have no time to do their homework. If clothes are handed over to the washing machine, folding machine will now helps to do the folding work. Currently, many

small industries do not have sufficient folding machines. This is because high prices cause an industry to receive low demand and high losses. Moreover, they can save their cost, energy and time by having this clothes folding machine. At the same time, a high-tech machines such as this folding machine should fabricated which emulated the sophistication of technology from abroad. Thus a low cost and quality machine created

## IV. Proposed System

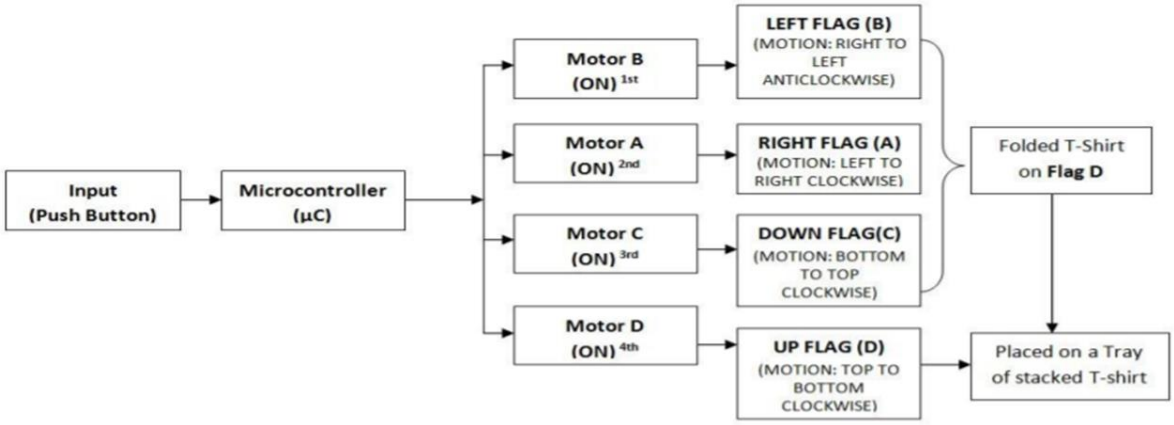


**Fig 1.1: System Architecture**

Process of this easy t-shirt folding machine will start once the push button is m pressed. When the push button is pressed, motor B or flag will rotate anticlock wise. Once it reached the time set in the program, it will stop. Then motor B or flag will back to the original position by rotating clockwise. The sequence of the motor will be same for motor A, C and motor D. This process is simplified in Figure. The folding motion of this machine is monitoring by the motor which is attached with the folding material listed as Motor A, B, C and D as in figure. Motor B is the first motor to rotate where it will make the B flag of the to rotate to the left. Then follows by motor A will lift up and make flag A to rotate from left to right.

Then followed by motor C from bottom to top to completes up the folding mechanism and finally motor D will move from top to bottom to slide the folded T-shirt on a conveyer tray that will stacked the folded t-shirt. This motion continues until the shirts are finish

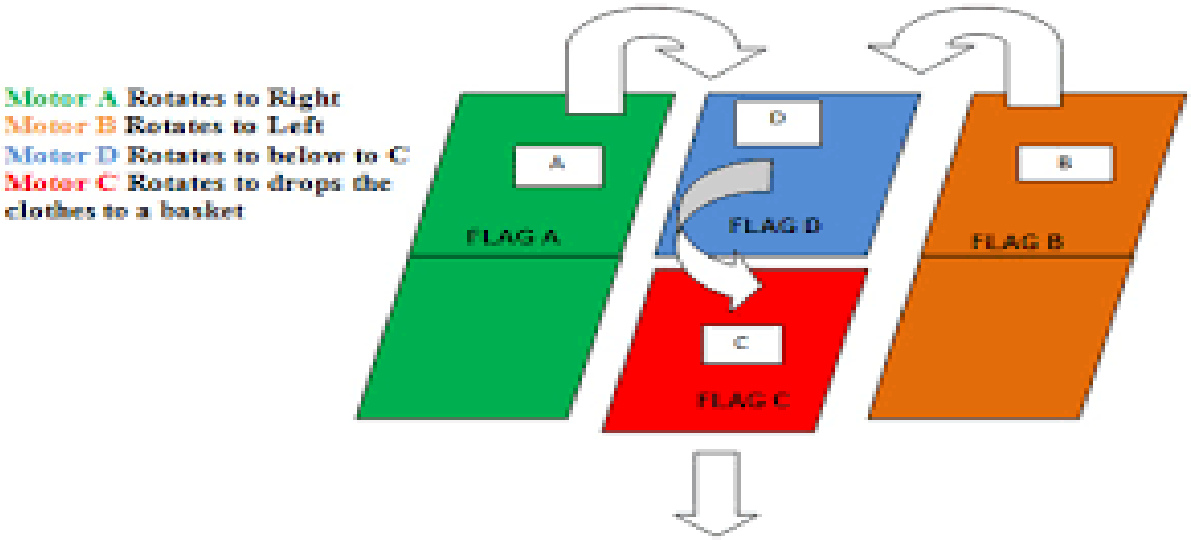


Figure1.2: Process in Details

## v. RESULTS:

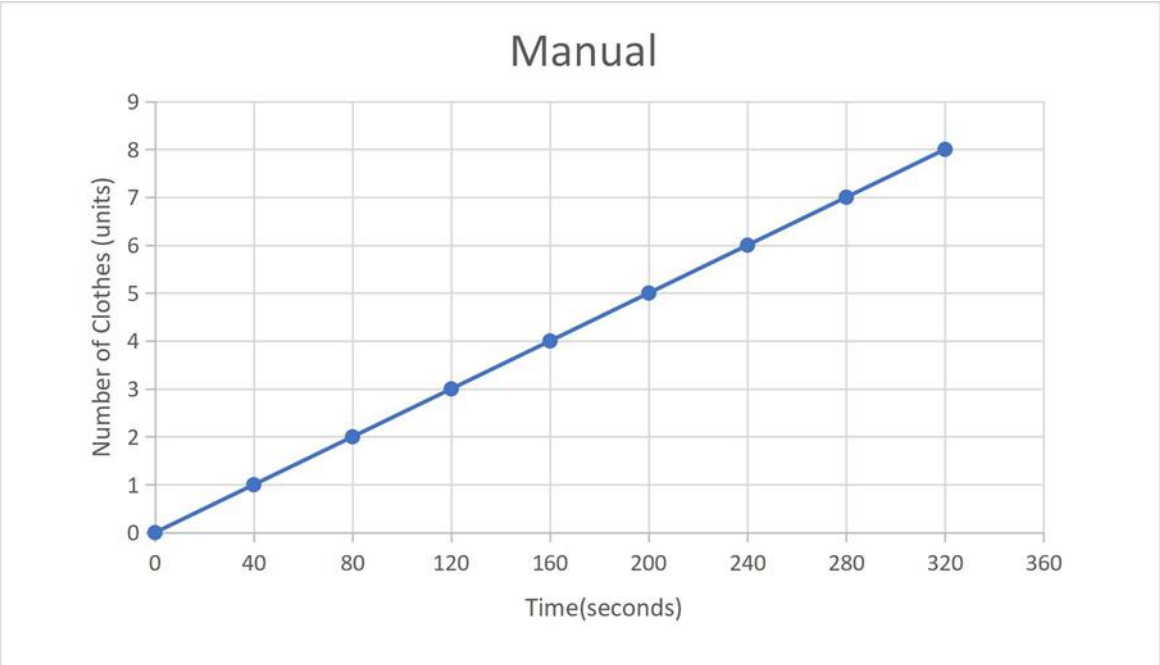


Table2.1: Graph of Number of Clothes (Units) Versus Time (Seconds) Manually

Figure 36 shows that the number of shirts per unit can be folded manually should take 40 seconds. In fact, we can see here that the more the number of shirts, the more time used. For example, in this graph, it has proven if someone want to fold 2 pieces takes more than 40 seconds and will continue for the rest. In addition, anyone who uses this manual method requires more time and more manpower is used. In addition, this manual method can cause the size and finish of the fold will also be not the same between the shirt with other clothes unless those who are really careful will be able to result in a neat and orderly fold.

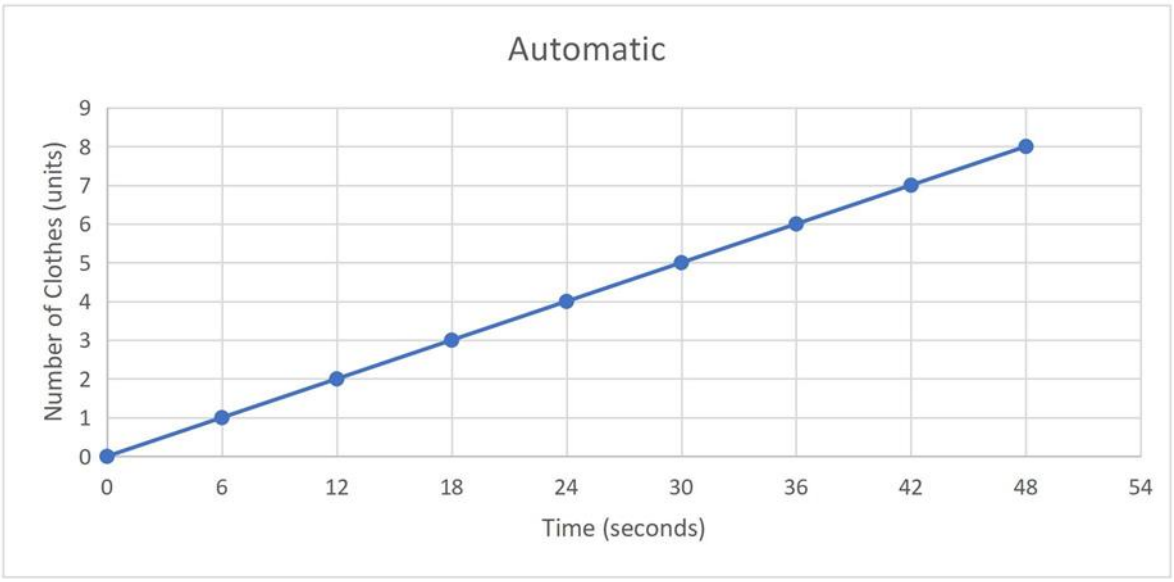


Figure2.1: Graph of Number of Clothes (Units) Versus Time (Seconds) Automatically

The data in this Figure 37 states that a shirt can be folded automatically only takes 10 seconds This has proven that the use of automatic folding machine can save time. In addition, themethod of using automatic machine can reduce human labor compared to manual. However, this machine should also use a little energy to press the Start / Stop switch for this machine can be moved but it is not a big problem to worry about. Next, the more the number of shirts, the more time used. For example, we can see the

number of shirts of 2 pieces can be folded in 20 seconds and it will continue in multiples. In addition, anyone who uses this automatic folding machine will be guaranteed to get neat folding clothes.

## VI. CONCLUSION

In conclusion, it also useful for some industries such as home, clothes industry, laundry services, hospitals, boutique and so on. This machine can help users to reduce their load and is very useful for users with many clothes to fold. The time spent in folding the clothes has been cut in half as the machine is able to fold almost half the time taken manually. This is because, this machine is completely automatic and is proven by a complete cycle of folding the shirt by just pressing a button. It is recommended that the promotion to be carried out for home, living and clothing purposes.

The results of the experiments conducted on this clothes folder with other electrical everyone can use it even for all 10 and above age generations. Furthermore, now is the covid-19 pandemic season where Recovery Movement Control Order(RMCO) has been carried out causing our movement to be limited to find more items to make this product more compact. However, this is not a big deal to worry about as we have done our best to complete the Clothes Folding Machine successfully.

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