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MyTabung: An Automatic Counting Machine for Money

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ABSTRACT

Saving money is a wise thing to do in life. Children have been taught to save money and give 'sadaqah' till it comes naturally to them from an early age. Normally people will keep their cash in a variety of sized and shaped money boxes. The market has a wide variety of money boxes, some people even make their own money box from recycled materials and as it fills up, the money inside must be counted before depositing in the bank. Most people have struggled with money counting, especially when handling big sums of cash. Currently man must count the money manually and it is time-consuming, tedious and higher tendency of error due to many reasons. Money counting machines do exist, but exclusively used in banks, and only count the number of notes, not the total amount of money. To address this issue, alternative money-counting methods can appear to be crucial because accurate money-counting is able to provide quantitative output and time saving. This will be the main purpose of this innovation. This innovation consists of Arduino Uno and various components such as colour sensor, servo motors, RFID and LCD display. A colour sensor is used to develop the automated gadget known as MyTabung, which counts the total amount after determining the colour of the notes and displays it on the LCD screen. MyTabung uses RFID technology to provide high levels of security, and only authorised users are allowed to access. The management of the mosque, individuals, and those in charged for financial management are believed to profit from MyTabung's distinctive qualities. MyTabung able to save time and money while increasing accuracy and security. It provides faster processing time, higher accuracy, reduced labour costs and potential theft. Therefore, allowing more efficient and precise information acquisition.

Keywords: Automated device; Arduino; time saving; accuracy; less costs

INTRODUCTION

Most people have struggled with money counting, especially when handling big sums of cash. The Federal Bill Counter Company of Washington, D.C. created the first automatic bill counters or known as money counters that were released in the 1920s in the United States. The Federal Reserve Bank's tellers will work more efficiently and make fewer mistakes thanks to these devices [1]. However, it was not really a counter machine as the machine's counter would halt when the number of notes in any container reached 100. The teller then used a wooden block to insert to separate the 100-bundle bundles and when the count hit 100, that device began to signal rather than operate as a counter. Despite this restriction, it was very helpful to bankers in keeping up with the expanding amounts of money in circulation at the time. The real currency-counting device was created only in the late 1950s by a small-time banker in China named Zhi Tian Sie, who created it to win a competition [2]. The technology used by contemporary counting machines was created by Tokyo Calculating Machine Works of Shinagawa, Tokyo,

and unveiled in 1962. It immediately became the market leader in terms of accelerated speed and accuracy [3]. Most banks today utilise some kind of machine to expedite counting cash and speed up the process of spotting counterfeits, making banks the most likely site to witness a currency-counting machine. There are other variations of counting machine, such as banknote only, coin counting, coin sorting, and counting both banknotes and coins and to detect fake notes [6]. Optical sensors, image processing and computer vision are technologies being utilized in the modern currency counters [4,5].

Currently man must count the money manually and it is time-consuming, tedious and higher tendency of error due to many reasons. There are machines that count money, but they are only found in banks and only count the quantity of notes, not the total amount. Since accurate money-counting can result in quantitative output and time savings, alternative money-counting techniques may seem essential to solving this problem. This is going to be the main goal of this innovation. Besides, the goals of the innovation are to provide a secure way in manage, count and save money and to monitor the saving towards specific financial goal. As for this innovation, it is aiming the small to medium scale usage of counting machine. Individual, religious organization or mosque management, charitable organization and medium business are the target users as this innovation is more to saving or collecting money with automated counter purposes. Normal money box only serves as a place to collect money. MyTabung offer a better money box with unique features; only authorized person can access the money box via RFID technology which give better security and display amount of money inside the box via LCD display.

INNOVATION DEVELOPMENT

The innovation consists of Arduino UNO, servo motor, LCD display, lock, RFID reader, and colour sensor. The colour sensor in MyTabung is a sophisticated piece of technology in detecting the colour of notes that being deposited in the box. The colour sensor comes with algorithms that are capable of accurately identifying the colour and measuring the values. In other words, each time a note being deposited in the box, the Arduino UNO, which act as the brain of the innovation will count the money based on the colour detection. The amount will be displayed via LCD module which located inside the box.

Only authorised individuals can use RFID technology to open the box and gain access to MyTabung. These features give MyTabung a secure and time saving output.

COMMERCIAL POTENTIAL

The innovation is designed to save or gather money with automated counter purposes that offer high levels of security, therefore its target market is people who have encouraged their children to save money. Even though there are many colour and shape options for money boxes on the market, they may still be uninspired and uninspired enough. Religious organization or mosque management is one of the potential users. To avoid theft, ordinary "sadaqah" money boxes that are placed in mosques typically have a padlock as a locking mechanism and compel management to tally the amount of cash in the box. This will make the process of totalling the money less safe and subject to human mistake. Small- to medium-sized businesses and non-profit organisations are likewise susceptible to the same predicament. As a result, they will also be the target users.

The conventional money counting machine already in use is thought to be more suited for large scale business use and not the intended users of the innovation. Additionally, the cost for personal use is rather high if using conventional money counting machine. People can now have the same technology utilised in large scale businesses at a low cost because to this invention. The expected profit margin will be 35% at most for this innovation.

Due to uniqueness of this innovation, MyTabung is now in the middle of applying for Copyright form the authority. Once it is awarded, the innovation can be commercialized in peacefully.



Figure 1: Front view of MyTabung

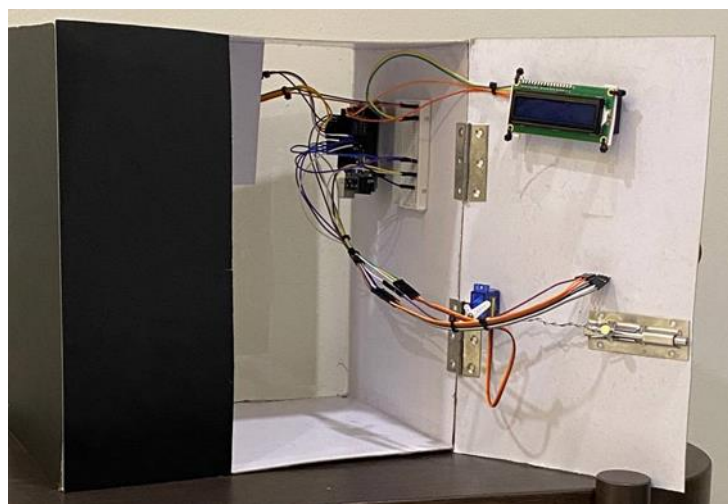


Figure 2: Inside of MyTabung

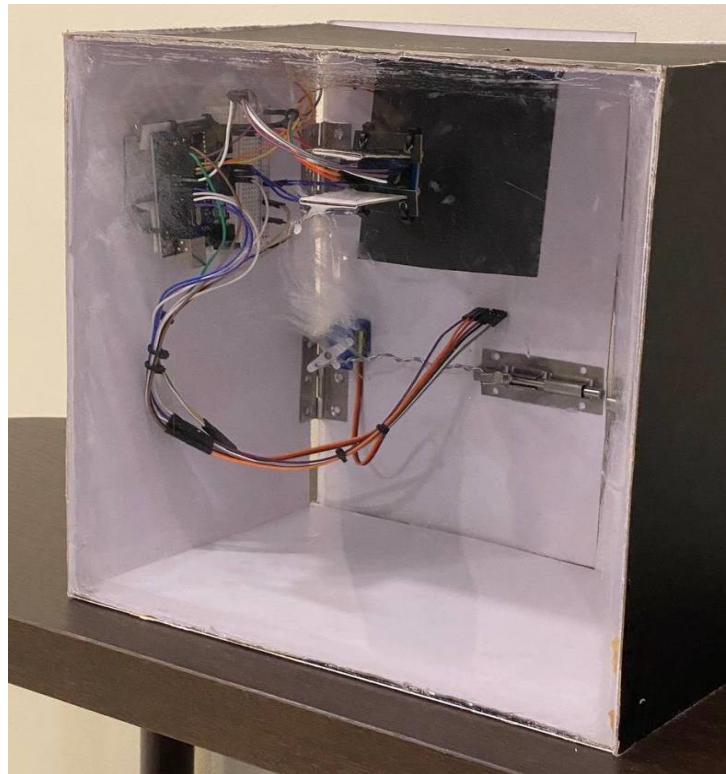


Figure 3: Back view of MyTabung in lock position

CONCLUSION

MyTabung is a technological advancement that addresses the problem of money counting while enhancing security. It is firmly believed that by using MyTabung, parents may motivate their children to save money in an enjoyable way, and individuals who oversee managing money in an organisation can work stress-free. MyTabung is a financial management solution that simplifies tracking savings towards specific goals. It provides motivation and accountability for individuals and businesses, making it easy to manage, count and save money securely. In addition, it promotes ‘sadaqah’ habits and provides a fun way to set charity goals and track progress.

Future improvements will include wireless connectivity, which enables users to connect to the internet or other devices wirelessly, facilitating data transfer and enabling remote progress monitoring. It can use IoT technologies to achieve this. This indicates that a user's smartphone or other internet-capable device can obtain real-time updates on their savings.

One of the upgrading features for this innovation may be multi-user support. This tool adds still another degree of flexibility and convenience, making it simple for numerous people to work towards common financial goals. It also encourages teamwork and collaboration, making it ideal for families and organisations with similar financial aspirations.

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