



الجامعة الإسلامية العالمية ماليزيا
INTERNATIONAL ISLAMIC UNIVERSITY MALAYSIA
يُونِيسَيْتِي إِسْلَامِي، اِنْتَارَا بَعْثِيَا مَلِيسِيَا

Garden of Knowledge and Virtue

PROJECT NAME: THE SMART BIN

GROUP 4

SEMESTER 1 2020/2021

SECTION 22

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DATE OF SUBMISSION: 31 DECEMBER 2020

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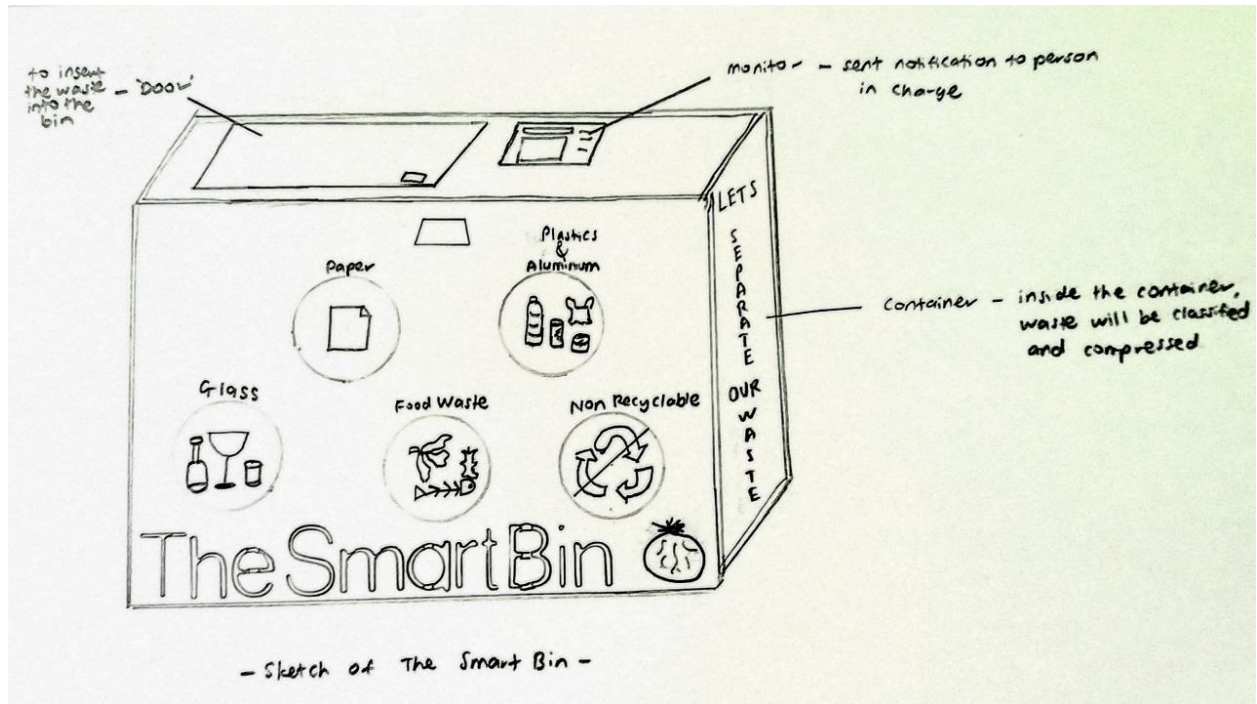
Background of the Project

Nowadays, improper management of municipal solid waste (MSW) is a serious problem in both urban and rural areas in many developed or developing countries. Municipal solid waste known as trash or garbage is a type of waste that consists of everyday items generated from industrial, residential, and commercial activities in a given area (“Municipal solid waste”, 2020). According to the Housing and Local Government Minister, Zuraida Kamaruddin (2019), she said that about 60% of the 32 million Malaysians did not dispose of garbage properly. They just mixed the garbage without sorting them according to their categories. Even the mahallah of International Islamic University Malaysia (IIUM) faced the same issue of improper waste management. Where all the wastes are mixed together and were not segregated into the right categories of the bin.

Therefore, our group has decided to propose IIUM to provide ‘Smart Bin’ at all mahallah of IIUM. Smart Bin is an intelligent bin that can separate waste into few classifications such as paper, glass, aluminium, food waste and also non-recyclable. Our objective of this proposal which is inlined with SDG 12: Ensure sustainable consumption and production patterns, where we want the students and staff of IIUM to have the applicable information and consciousness for sustainable development and lifestyles in harmony with nature by easing the process of waste separation using the smart bin. Firstly, this Smart Bin will be intelligent enough to recognize and separate the rubbish into its categories. Then, it will be placed into the containers and the intelligent sensor will measure its capacity load. The compactor then will compress the rubbish and measure the compacted trash resistance. Finally, this Smart Bin will inform the person in charge who monitors the bin when it reaches the full limit and ready to be emptied.

We have estimated the total cost for having this Smart Bin is about RM 10,000 to RM 15,000 each. For this reason, we have planned to acquire the funds by using the recycle items from the recycle centre and turning them into handcraft before promoting and selling to the IIUM and public community. Secondly, by making joint ventures with Alam Flora Sdn Bhd and Alam Sekitar Malaysia Sdn Bhd to gain funds, knowledge and support as they also the objectives are mutual.

Sketch of The Smart Bin



Objectives of The Project

“Heal the World, make it a better place”. Such a beautiful, meaningful lyric from the song ‘Heal the World’ by the late Michael Jackson. As responsible inhabitants of planet Earth, we strive to make the world a better place. To make it possible, we have to come up with a brilliant plan to heal our beloved Earth. Around the world today, we have been introduced to the news of people suffering from poverty as well as enduring hardship, conflict and war in certain countries as well as our beloved planet which is facing climate changes. Hence, the United Nations General Assembly has set the Sustainable Development Goals which is known as the SDGs in 2015 where all 17 goals are intended to be achieved by 2030. In this project, our main concentration is on the 9th and 12th goal from the SDGs which are ‘Industry, Innovation and Infrastructure’ and ‘Responsible Consumption and Production’ respectively.

One of the objectives of this project is to lessen the burden of the waste separation process in IIUM. Based on our observation, it is very rare to find a recycle bin that can be found in the mahallah area. Due to the lack of a recycle bin provided in mahallah, it might leave the students with no other choices but combine their waste without separating it to recyclable and non-recyclable. Hence, it might delay the process of organizing and treating solid waste. The person in charge needs to separate the waste manually before he could send the waste for further treatment. With the Smart Bin, it can assist the person in charge to recycle the waste ahead of time so that they will not have to do the job and straight away be able to send the final product (already-separated waste) to the recycling centre.

The second objective is to make use of advanced technology to innovate an object that provides convenience and advantage for humans. In this case, the invention of The Smart Bin will serve us by self-directing itself in separating the recyclable and non-recyclable waste into their own classifications. The Smart Bin obviously not only can be implemented in IIUM but in worldwide as well. Furthermore, with the innovation of The Smart Bin, it helps increase income and employment since the manufacturing process requires human skills and expertise. Besides, we can make big bucks from exporting it to other countries. Hence, it boosts the economy of our country.

Significance of The Project

Malaysian Government had made a mandatory for the society to separate their solid waste starting from 1 September 2015. However, in terms of the implementation, it is not fully practised by society due to lack of awareness and facilities. This is because, in some places, the facilities of the recycle bin provided is not enough to serve all the waste. Thus, this project is very significant in addressing this issue.

First and foremost, by using this system, the waste can be managed systematically as it will classify the waste automatically to several classifications such as paper, aluminium, plastics, glass, food waste and non recycled materials. Consequently, the further process of solid waste management and treatment will be more efficient. Also, it will decrease the amount of solid waste that will be sent to the landfills as it extracts recyclable materials from the waste. In addition, it has increased the recycling rate among the community. Due to this, some of the allocation of the government funds in organising and processing solid waste can be transferred for other purposes. Not only that, it will save more time as the process of organizing the waste has been started from the beginning even before the collection stage. Thus, the system has made the managing process of solid waste become easier and not time-consuming.

Next, this project can prevent odour pollution and unhygienic conditions. Generally, inappropriate management of waste will produce unpleasant odour which creates uncomfortable surroundings for the residents. One of the contributors is food waste as it is mainly organic and biodegradable materials. When the food waste has gone through the decomposition process it will produce odorous gases. Other than that, the open air concept of dumpster indirectly contributes to the bad odour. This can be proven as the smell of the garbage can be smelled even from a far distance. Not only that, unhygienic conditions that can be attributed to the dumpster or the dustbin can be prevented. Unhygienic dumpster or dustbin may attract flies, rats, mosquitoes or other pests to reside and breed at the dumpster as they can acquire their need such as food easily. As a result, there will be an outbreak of diseases such as malaria and dengue fever. It is proven by the experts that the flies, rats and mosquitoes are the carriers of pathogens that can spread diseases to humans. Therefore, by using 'The Smart Bin' the community not only can have clean and fresh air but also prevent themselves from the outbreaks.

Last but not least, 'The Smart Bin' will encourage the community of the university in practising 3R (Reduce, Reuse and Recycle) regularly and make it a routine. As a result, a greener and cleaner campus can be achieved. Also, it raises awareness to the society about the significance of organizing and separating their waste into several categories and being responsible for their waste. The community will appreciate the solid waste more as it may become one of the sources of economy and energy as some of the waste can be reused, repurpose and recycle. Moreover, this technology indirectly helps the nations to manage and sustain the natural resources for the uses of future generations as the solid waste has been separated into recyclable and non-recyclable.

Challenges

There are lots of challenges that we faced in completing this project as we are far from each other. During this pandemic, we could not do face to face discussion as some of the members are living on campus and some are off-campus. Hence, it becomes more challenging because we fully depend on the devices and internet connections to communicate with each other. Due to this, it sometimes has led to miscommunication among the members. Since we have to use our own mobile data for online learning purposes, we could not fully use google meet or zoom platform to have the group discussion due to the excessive data usage. Besides, internet connection is not really stable in certain places as it may get distracted due to the heavy rain. Thus, the flow of discussion sometimes has been delayed and consequently it could interrupt the smoothness of the process of completing the project proposal.

Next, due to a tight schedule of all members of the group, the allocation time to have group discussion is limited. As every member has a different schedule, therefore it is hard to find the right and best time to have all members are present during the discussion. There are some of us who have class in the morning, afternoon, and night. Even on the weekends, some of the members have quizzes and other assessments from other subjects. Thus, the members need to adjust and allocate their time to have a group discussion.

Other than that, the estimated cost of having this ‘Smart Bin’ in all mahallah in IIUM might be a little bit expensive. Hence, IIUM might not be able to cover all the costs due to limited allocation of funds to provide the bins. One of the initiatives that could be done in addressing this issue is by asking sponsorship from organizations or corporate companies that also support the idea and the aim of this project. However, the biggest challenge here is getting approval for the sponsorship as not every organization or corporate companies are willing to provide the sponsorship. Thus, we have to make extra efforts and strive our best to manage this financial problem properly so that our project will become successful.

Last but not least, it is hard to find the most suitable locations to place the “Smart Bin” in the mahallah as the “Smart Bin” may require some space due to its size. Besides that, all of us

are still not familiar with the campus as we have just enrolled in university and not so long we have to go back home as Covid-19 case increases so it is more difficult for us to find the right places for these dustbins. Thus, it is really challenging for us throughout making the project proposal doing well.

Recommendations

Attached to the proposal for our project “ The Smart Bin” we completed the task described in our proposal: familiarizing ourselves with the system used by the IIUM on waste and food waste across the campus, studying the different model or system for dealing with waste and food waste, determining the criteria to facilitate food waste collection, and performing the evaluation. To carry out these tasks, we perform secondary and primary research. We studied how to create a smart bin that does not require a lot of bins to collect, sort and press the waste. We also distributed questionnaires to IIUM students regarding the waste collection system on campus and interviewed some students. Then, we collated and analysed our data to come out with a solution which is Smart Bin.

Our main finding is that the system for collecting waste and food waste is by collecting all the waste from the whole campus using truck waste without sorting them according to their categories and bringing it to the centre to be separated and processed into new things. Therefore, our group has decided to propose IIUM to provide ‘Smart Bin’ at all mahallah and cafe of IIUM. Smart Bin is an intelligent bin that can separate waste into a few categories such as paper, glass, aluminium, food waste, and non-recycle. By using this technology, it can reduce the long-run operating costs to separate the waste and it saves more time.

The best system for our needs in order to have a better and more efficient way of managing waste is by installing these ‘Smart Bins’ at the campus. However, the costs to acquire those bins are too expensive as it has exceeded the budget. The ‘Smart Bin’ is very important especially for long-run use as it gives more benefits than losses. We recommend one course of action: testing a representative sample of the smart bin at any mahallah to observe its effectiveness to improve the waste management in IIUM. All in all, this Smart Bin project may become one of the best improvements in waste management systems in IIUM as it will upgrade the existing system to a better and more efficient system.

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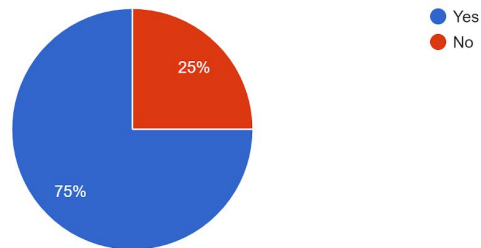
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Appendices

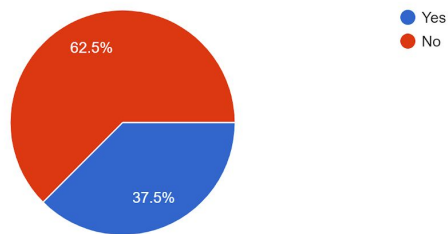
2. Have you ever seen recycle bin in your mahallah area?

16 responses



3. Do you separate your waste according to its classification?

16 responses



5. Do you think waste management in IIUM effective?

16 responses

