COMPLETION REPORT

Reverse Vending Machine (RVM): Study of Practical Implementation in Japan and Feasible Implementation in Malaysia to Empower Recycling Activity and to Realize Waste to Wealth Concept

Dr. Mohd Razali bin Md Tomari
Senior Lecturer
Universiti Tun Hussein Onn Malaysia (UTHM)

The main objective of this project is to investigate the feasibility of Reverse Vending Machine (RVM) application in Japan for implementation in Malaysia to improve the recycling activity. A site visit was conducted in Japan from 28th August 2017 to 2nd September 2017. Two RVM machines was visited in Tokyo in which the redemption system is based on lottery and point card. Another system which was found in Omotosando street (Smart Thrash Bin by BigBelly Solar Inc.) works based on solar power and crush the received item automatically without any redemption. A visit to Saitama found almost the same system in Tokyo in which use the point card for the redemption. An interview with staff and students in Saitama University found that most of them does not aware about the RVM existence since they usually separate the waste and put it in the collection station near house. However from the visit, it was observed that when the RVM machine available people eager to dump their waste inside it even with a little amount of reward received and it can indicate the effectiveness of the machine

Back in Malaysia a prototype of RVM was constructed to give an idea about how the system works and how it can be attracting people to do recycling. After series of discussion with SWCORP (waste management authority) and NLB Consulting (CSR project), an auto collection recycle system with online point redemption was developed and given a name as Smart Recycle Bin (SRB). The system proof of concept was presented in various occasions such as Local Government Eco-Initiative Program, Green campus sustainable program, Low carbon society capacity building program and in academic international conference. During the promotion, a feedback from the audience is welcoming and they very interested to know when such system can be available in Malaysia. Based on age observation, students from primary and secondary school show much interest to test the system compare to other ages. An initiative to develop the SRB apparently was given opportunity for launching by Minister of Housing and Local Government on 17th August 2017. From the launching, the minister suggested the SRB-like system to be implemented in every school across Malaysia as an early exposure to nurture the recycling activity in their daily life. Starting 2018, SWCORP installed five units of SRB in their headquarters to test the system feasibility and to promote such technology to the waste management company. Apart from that, NLB consulting also locate one SRB in Spine& Joint Clinic in Sri Hartamas to observe people acceptance of such technology. The SRB-like system is expected to be implemented in Malaysia starting 2019.

Publication of the Results of Research Project:

Verbal Presentation (Date, Venue, Name of Conference, Title of Presentation, Presenter, etc.)

1. 29-30 August 2018, Kota Kinabalu (Sabah Malaysia), The Fifth International Conference on Computational Science & Technology 2018 (ICCST-2018), Empirical Framework of Reverse Vending Machine (RVM) with Material Identification Capability to Improve Recycling, Razali Tomari
2. 22 October 2017, Impiana Hotel Senai (Johor Malaysia), Low Carbon Society Capacity Building Program, Reverse Vending Machine: Waste to Wealth, Ruhiyati Idayu & Razali Tomari
3. 24 May 2017, UPM Serdang (Selangor Malaysia), Green Campus Sustainability Convention 2017, Smart Recycle Bin Concept, Razali Tomari & Aeslina Abdul Kadir
4. 12 October 2017, Dataran Mahkota Iskandar (Johor Malaysia), Local Government Eco-Initiative Program Towards Progressive Johor, Smart Recycle Bin : Proof of Concept (POC), Razali Tomari & Aeslina Abdul Kadir

Thesis (Name of Journal and its Date, Title and Author of Thesis, etc.)

Material Science Forum Journal (Trans Tech Publication ISSN 0255-5476), 22 July 2018, Empirical Framework of Reverse Vending Machine (RVM) with Material Identification Capability to Improve Recycling, Razali Tomari, Mohd Fauzi Zakaria, Aeslina Abdul Kadir, Wan NUrshazwani Wan Zakaria and Mohd Helmy Abd Wahab

Book (Publisher and Date of the Book, Title and Author of the Book, etc.)