

Food waste management program design using a comprehensive benchmarking method: a case study in Bytedance Inc, Beijing, China

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ABSTRACT: The objective of this research is to design the food waste management program as a part of reverse logistics using a comprehensive benchmarking method in order to answer the main question posed by the researcher on how can company design a system that minimizes the environmental impact and upgrades the value from the food waste, as the following questions are (1) How can company methodically find the most suitable and sustainable solution to manage food waste? (2) What information is needed to model the food waste management program and consequently estimate the results obtained? (3) What types of food waste are generated and how can they be systematically categorized? The findings from this research cover the objective of this research that the food waste management program design using a comprehensive benchmarking method gave an optimal-adaptive design to the company (Bytedance Inc.). Resulted in the innovation because of the methods and change of the food waste management inside the company. The present-future company can make an internet-platform application that brings benefits to the company and the world for the effective food waste treatment and also gives further suggestions about management of food waste that is analyzed in accordance with current changes and future perspectives.

Keywords: Food Waste Management Program, Reverse Logistics, Food Waste, Benchmark

1 INTRODUCTION

Globally, food waste has become an increasingly recognized environmental issue over the last decade. In fact, the issue of food waste becomes an ethical one worldwide where approximately 800 million people suffer from hunger and the environmental impacts of producing food waste can no longer be overlooked. As population and urbanization grow, more food is being produced and wasted. Moreover, food waste in an urban context creates severe environmental and public health consequences that have a negative impact on human well-being and the environment. Despite the obvious environmental gain from waste recycling, collection and transportation of recovered products have an environmental burden due to greenhouse gas emissions. Tsoulfas & Pappis (2006) show that minimizing this burden is important in order to increase the total environmental gain from recovery.

The issues of food waste and loss of efficiency have attracted people attention worldwide. Although seems to be a simple problem, both issues are actually much more complex. The complexity of the food

waste issue is related to the three pillars of sustainable development: economic, social, and environmental. This does not mean that reduced food waste automatically results in sustainable development, Eriksson et al. (2016) say that the waste-reducing measures is more recourse demanding then the savings they achieve but reducing unnecessary food waste has the potential to make an important contribution and also has high symbolic value. Food waste can be associated with a substantial waste of money and natural resources and has moral implications in relation to food security (FAO 2012).

Chen et al. (2017) conclude that, sustainable management of food waste is a vibrant research area that has grown rapidly over the past years. In the 21st century, the most common approach to reducing global food waste challenges is to increase the efficiency of the use of food. Ghiani et al. (2014) states a waste management system can be decomposed into two major sub-systems, (i) a regional waste management system dealing with strategic decisions in network design (e.g. investments for recovery facilities) and (ii) a municipal collection system dealing with tactical and operational decisions

such as transport routes and waste flow allocation. Bytedance Inc as one of the biggest internet platform companies in China serving breakfast, lunch, and dinner for approximately 1,000 people who work there. In order to reduce the environmental impact, considering the perception of the negative impacts generated, many organizations have started to invest in re-designing processes and products to make them more sustainable, one of them is doing the CSR (corporate social Responsibility), like implementing the reverse logistics of the food. Food waste management is also included in reverse logistics processes that will cover up the CSR program of the company which in summary it is expected that there will be initiatives and campaigns from the company to tackle food waste using food waste management program as a reverse logistics process in the company.

Food waste is a key issue, which has direct environmental, economic, and social impacts, in attempts to achieve global food security and good environmental governance (Dahiya et al. 2017, Stenmarck et al. 2016). The main issue of this research is that large amounts of food are produced for human consumption, but never consumed. The difference between the number of hungry people in the world and the amount of the food waste provides an enormous moral problem and food waste management indeed one of the most challenging issues that humankind is currently facing worldwide. It is a global problem that affects all stages in both developing and developed countries. As an agricultural country with a population of about 1.4 billion people, food worth over 200 billion Yuan is thrown away annually, while economic development and population growth result in the increasing generation of food waste (Li et al. 2016, Zhang et al. 2014).

Because food waste types are so many and not all the strategies and systems are suitable depending on the area of research that is why to find the most sustainable way to manage the food waste is paramount to minimize negative impacts and maximize the benefits of the processes. Nowadays, in America, excellent results have been achieved to obtain value from food waste through the extraction of some of its valuable compounds, or to obtain energy by means of anaerobic digestion. Others alternatives heavily used in the past but hazardous to the environments, such as land filling and incineration, have fortunately been less favored.

There is no global agreement for now on the meaning of the concept of food waste, ways to quantify it, measure its impacts, classify different types of food waste, and optimal procedures to manage. Therefore, timely and effective management is required in order to conserve energy and minimize the

environmental impacts associated with food waste (Salihoglu et al. 2018). Likewise, there is a need for a better understanding of the shortcomings concept associated with food waste management program and also a holistic approach necessary to define own concepts and methodologies. We, as a human being, must act fast and right to identify the knowledge gaps and implement the practice. Besides, we must know that food waste management is expensive and difficult to do, that's why all the nearest approaches must be implemented so the balance between the use of food waste management and the value for the company must be at the right degree. It is hypothesized that a benchmarking of the systematic framework scenarios will support company to implement more sustainable solutions and strategies for food waste management program.

The objective of this research is to design the food waste management program using a comprehensive benchmarking method that gives an optimal-adaptive design to the company (Bytedance Inc.) and change of the food waste management inside the company. Meanwhile, in the future, the company is expected to apply the design in order to bring benefits to the company and the world for the effective food waste treatment and further suggestions about management of food waste are analyzed in accordance with current changes and future perspectives.

2 RESEARCH METHODS

This research aims to design food waste management program as a part of corporate social responsibility to minimize costs from the logistics process inside the company and investigate the value from the food waste. In order to achieve that, the following objectives have been identified and investigated:

1. Review relevant literature to understand how much food is wasted in a company context, identify the types of food waste, and provide a systematic categorization of food waste;
2. Develop a framework using a comprehensive benchmark method to harmonize different approaches and systems used by other companies that already use food waste management program before in order to identify the most sustainable solution to manage the food waste.
3. Apply the system generated using quantitative strategic planning matrix to see the decisions can be made for the company case studies and thus validate them.

This research used a three-step approach. As the first step of using literature, the researcher identified a general research framework comprising the drivers, the strategic and operational topics for analyzing

waste management. As the second step, the researcher analyzed and identified issues that occur in the company's real food waste management. As the third step, the researcher used a comprehensive benchmarking method by surveying the operations of food waste management in order to analyze and evaluate the design of other food waste management programs as well as evaluate the issues that have been addressed and the modeling methods used to address them. A comprehensive benchmarking method was also used to categorize the literature review findings and identify major research opportunities for the company future.

3 DISCUSSIONS

The results of this research are food waste management program retrieved by using a comprehensive benchmarking method from 20 companies experienced in food waste management program. Meanwhile, the innovation from this research is a program that gives an optimal-adaptive design to the company (Bytedance Inc.). An optimal-adaptive design includes changing the way of food waste management inside the company, adapting the problem inside the company, and using the right-optimal strategies retrieved from the benchmarking method.

By using a comprehensive benchmarking method, the company can invent applications that bring benefits to the company and the world for the effective food waste treatment as well as develop an internet-platform to gather users waste and producers of the food waste. The results also provide further suggestions about the management of food waste that is analyzed in accordance with current changes and future perspectives

4 CONCLUSION

There is no global agreement for now on the meaning of the concept of food waste, ways to quantify it, measure its impacts, classify different types of food waste, and optimal procedures to manage. Therefore, timely and effective management is required in order to conserve energy and minimize the environmental impacts associated with food waste. Step by step, this kind of optimal-adaptive design can be another company benchmark because of its adaptive design.

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