

Development of a Blockchain-based Technology Solution for Tackling Food Waste and Supporting Food Insecure People

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Abstract

Food waste constitutes a major global issue, entailing immensely significant environmental and socio-economic repercussions. The increase in the atmospheric concentrations of greenhouse gases, land degradation and irrigation water scarcity turn out to be the most ecologically destructive ones. Furthermore, the substantial detriment in the form of economic loss owing to food cultivation, storage, processing, transportation, distribution and disposal, while millions of people, both in developing and developed countries, are affected by food insecurity, indicates the social and economic ramifications of the problem. The alleviation of this situation can be achieved through focusing on food waste throughout the food supply chain, which, as far as developed countries, are concerned, occurs during the final consumption stage. The presented research introduces a technology solution, allowing food-service establishments to utilize the surplus food, which would otherwise be disposed of, by providing it to food insecure people. The research concentrates on the intersection of two rapidly growing scientific areas, that of food waste management and that of Blockchain technology, which will be used to ensure continuous communication between food-service establishments and food insecure people, using an online ledger, where the quantity and type of food made available by each contracting party will be shared with a view to optimizing the allocation of excess food. The aim of the project is to develop a mobile platform, composed of three subsystems: a) A data collection subsystem, gathering data streams such as photos and nutrition information, pertinent to the available portions of food, for visualization purposes, b) A reward subsystem, through which food donations are monetized, by providing tokens, as a reward, to the contracting parties, thereby creating a co-operative incentive and c) An application subsystem, enabling the visualization of the information gathered and offer value-added services to both food-service establishments and food insecure users of the application. The integrated system is used to ensure continuous communication between both parties, so as to optimize the allocation of excess food and thus, minimize food waste. In the long term, the abovementioned project aspires to promote an analytical and sustainable plan to reduce food waste in food-service establishments, while providing food aid to people in need. Moreover, it plans on scaling the implementation of its results up into such a way that it also permits consumers to provide edible food, which they do not need and would otherwise dispose of, to food insecure people.

Keywords: Food waste, Blockchain, Mobile platform, Tokens, Food insecurity

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