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IOT FOR REDUCING FOOD WASTAGE REDUCTION IN AUSTRALIA

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Abstract:
Iot is a system of interconnected devices which are able to transfer data to and fro without the human-to-human interaction but over through other devices. IoT is now used for various purposes ranging from smart homes for controlling smart devices within the home, smart cities in which all the network devices operate synchronously, autonomous vehicles which is still a work in progress. With the advent of 5g comes the improvement in transmission rate, the number of devices available in square kilometer and the elimination of congestion. The topic in discussion is reducing the food wastage in Australia by leveraging IoT. A large number of techniques are used to accomplish the said task such as qualitative analysis, inductive design and production data. The challenge is to maintain the freshness of the food by detecting the decay early on and warning the supplier when the food must be replaced thereby decreasing the wastage of food. The IoT devices requires to monitor the food, detect and alert the supplier when the food must be replaced. In this way the quality of the food can be supervised and reduce the wastage of the food.

Keywords: IoT, food wastage, IoT devices, Quality of the food, shortage

1.INTRODUCTION

IoT is relatively recent technology in which a system of devices forms a network in which the devices communicate as a one whole system in which each independent devices are aware of every other device recording their current states and changing accordingly with the purpose of the task. It is one of the technologies where there is no need of much direct human interaction with the devices and the communication with the devices can be remotely with the help of a device. Food wastage is one of the growing problems of Australia that is bringing in huge losses which can otherwise be avoided if the food is constantly monitored by the IoT devices. This purpose can be achieved by deploying IoT devices which work synchronously and monitor the quality of the food with the help of IoT sensors and providing real time feed about the biological data of the food and providing estimates when the food must replace and forewarning the supplier about the said thing. The purpose of the report is to assess the importance of IoT network for achieving the said goal. My position is to evaluate the current research and provide relevant information to better employ the IoT devices in preventing the wastage of the food. The research problem we are dealing with is the significance of IoT in reducing the wastage of food. There is relatively less research done in this particular domain but nevertheless we are going to evaluate the current research and form data to aid the future research in advancing the knowledge in this particular area. We have included a section for literature survey to analyze the research data and provide valuable summary for the employment of IoT in reducing the shortage of the food.

1.1 Research Objectives

The primary aim of this report is to analyze the use of IoT in the reducing wastage of the food in Australia. The research questions that we deal with is how to improve
the reduction of the wastage of the food with IoT.

2.LITERATURE REVIEW

It is only recently occurred that IoT can be used in the reducing the wastage of the food. This section assesses the history of IoT in the reducing the wastage of the food

M. Savitha (2018) dealt with the growth of the crops by monitoring the soil texture. This system employs the use of IoT and made the irrigation system automated which yielded in the increase in the output of the crop with the same irrigation supply. The Arduino controller is used to constantly monitor the water supply. It is found that with the help of this technique the production of crop was increased by 40% saving human energy, time and cost. The system works by learning from the predicted information and again improving the predictions.

De Vaus (2019) explored the use of IoT in the supply chain management of the Australia. The summary is that IoT improves the supply chain process in the food retailers of the Australia with the integration of customers and

suppliers. With the information sharing of the IoT devices the integration of logistic devices improves the supply chain process in terms of cost, delivery time and flexibility.

Jagtep(2019) explored the use of the IoT in reducing the potato wastage. He contrasted the use of the tradition wastage reductional methods like paper logs with the more advance methods like IoT devices to track the supply chain. He argued that most of the food is going waste before it reaches the end consumer. Neural Network is used to track the wastage of the food. Image processing was used with the help of neural networks which were able to monitor the potato and detect the changes with 94.95 accuracy compared to manual handpicking

Raul parade (2019) analyzed the use of radio frequency identification to analyze the use of the food reduction mechanism. The method is to read the information about the food with the help of RFID. There is no need for human interaction as the RFID automatically reads the barcode of the food package and informs when it must replace or discarded. They developed an application which provide recipes with the nutritional information provided on the food thereby preventing the wastage of the food.

Sani Abba (2019) explored the use of the autonomous sensor interface to automate the irrigation and control of irrigation remotely with the help of IoT devices. Arduino device and embedded c program are used to achieve the specified task and to create real working prototype. The prototype provides real time information about the power supply and sensory information of the crop which helps us to increase the production of the crop.

Dharunkarthi(2019) analyzes the problem of irrigation where there is water scarcity. Environmental monitoring systems are employed to improve the quality of the crop. The model makes use of real time sensory data to maximize the use of water in the field. The farmer can monitor the sensor information remotely to control the flow of water remotely.

Julie Liegeard (2019) explores ways to minimize the household food wastage with the help of intelligent packaging to prolong the shelf life thereby reducing the food wastage before expiry date occurs. The author argues for the use of interactive packaging like antimicrobial and antioxidation films, temperature sensors which constantly monitor the food inside and provides valuable information to the customer to prolong the shelf life of the product thereby reducing the wastage of the food. Author coins the term intelligent packaging that monitor the package with the help of sensors and provides information the user about the shelf life and other valuable information

Agrawal (2019) provides techniques to maximize the production of food with the help of IoT connected devices to monitor the irrigation system, increase the productivity, water conservation. The author provides method for monitoring the temperature of the crop and sending the signal through digital form in with the help of a micro processing unit. Author also advocates for the use of IoT to provide the farmers with the valuable information about the crop and to share the information between the farmers producing the same crop to increase the productivity of the crop.

Shadi Alzubi(2019) advocates for the use of the machine learning in making irrigation decisions such as controlling the flow of water and to provide the real time data to the farmer. The research focuses on the optimal employment of the smart devices to maximize the production of the crop. The system makes use of the sensors that detect the moisture of the soil and turn the irrigation on or off based on the available data.

Rahul Kodan(2019) advocates for the use of the precision agriculture , to monitor the nutrient information . The author provides method to monitor the moisture of the sol with sensors and control the flow of water with the real time data. In addition, soil conditions like pH, moisture level. The author provides solution to increase supply chain process with the help of IoT devices.

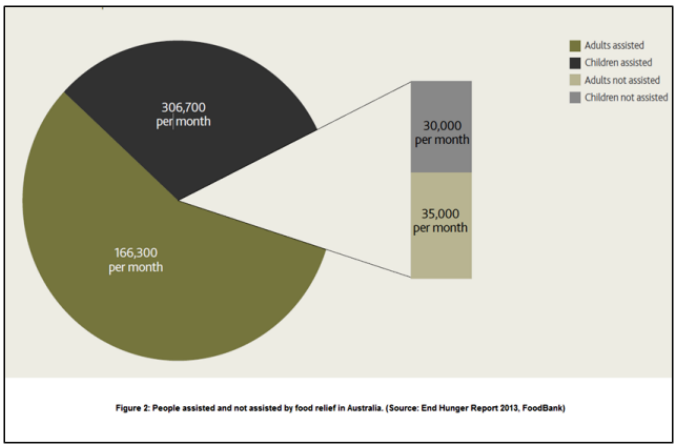

Figure 2: People assisted and not assisted by food relief in Australia. (Source: End Hunger Report 2013, FoodBank)

The above image shows the wastage of food in Australia graphically.

3.RESEARCH METHODOLOGIES.

Research methodologies are the methods how the information and data is collected for the given research. It includes data mining, data analysis, deduction approach and the general scientific method. The methodologies give the researcher a sense of direction to continue the research in the future.

3.1.RESEARCH DESIGN

Research design is a research methodology which gives the researcher a suitable plan on how to carry on with the existing research. Quantitative analysis is the supporting the research with data and statistics whereas qualitative analysis is providing the accurate and relevant information

3.2 RESEARCH APPROACH

The research approaches this report employs is the inductive approach rather than deductive approach. Inductive approach is the in-depth analysis of the existing data. The various journals have been thoroughly analyzed to produce research findings.

3.3.DATA COLLECTION

Data collection is of two types. Primary data and secondary data. Primary data is the collection of statistics about the particular area of research. Secondary data is the application of primary data to obtain a conclusion. This report uses secondary data to form a larger picture of understanding.

3.4.DATA ANALYSIS

Data analysis is the analysis of the existing data to fill the research gaps. This report analyzes the data by previous researchers (Alugubelli 2018) to fill the research gaps effectively and provide valuable information for future researchers to provide a direction.

4.RESEARCH FINDINGS AND RECCOMENDATIONS.

By analyzing the report, the following findings can be produced. IoT can be used in Australia to significantly reduce the wastage of the food. IoT can be implemented in the supply chain to speed up the process. IoT devices can monitor the irrigation with help of sensors to provide real time data to the farmers thereby increasing the production of crop. IoT devices have smoothen up the tasks for the suppliers and sellers to reduce the wastage of the food. In conclusion IoT devices can be implemented in Australia to reduce the wastage of the food.

5.CONCLUSION AND FUTURE RESEARCH.

In conclusion, we can confidently say that IoT devices can be employed for the reduction of wastage of food in the Australia. With the advent of 5g networks , IoT technology will be further improved in the future and the this particular area of research can be further improved upon. With the constant monitoring of the data provided by the sensors, we can reduce the wastage of food effectively. Monitoring the quality of the food can lead to prolonged shelf life of the food which leads to reduction in food wastage. Devices such as smart refrigerators which provide real time data about the contents of foods can also be a huge factor in reducing the food wastage in Australia.

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