

The role of IoT technology in agriculture

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Abstract— Agriculture has been one of the most important occupations since the beginning of human civilization to meet the basic human needs. The use of the Internet of Things can have a tremendous impact on agriculture, especially food, not only in less developed areas but even in metropolitan areas. This article introduces the Internet of Things and its main layers, some of its applications in agriculture, and the technical challenges of developing this technology. The Internet of Things depicts the world of technologists in which objects are interconnected. An object based on IoT technology consists of measurement layers, Network, application layers.

The sensing layer is used to collect data, the network layer is used to store and analyze information, and the application layer is used to send a message to the setup operator. Among the technical challenges of IoT development are limitations in data collection, data storage, networking, hardware suitable for agricultural environments, as well as ensuring the accuracy and security of data. The application of this technology in agriculture reduces costs, improves management and increases productivity. The Internet of Things is growing rapidly. The high economic profitability of this technology is the main incentive for investors to invest in this field.

Keywords: IoT, smart farming, wireless sensor network, cloud space

I. INTRODUCTION

According to the World Food and Agriculture Organization, the world's population is projected to reach 6.9 billion by 2050 and demand for food will increase by 70%. Increasing global population as well as increasing demand for agricultural products, the need to modernize production

methods and increase productivity in the use of agricultural institutions is increasingly necessary [1].

The Internet of Things is one of the emerging technologies. It is predicted that agriculture will be strongly influenced by the development of this technology[2].

The Internet of Things is a term coined by Kevin Ashton in 1999. The Internet of Things depicts an technological world in which many objects, such as sensors, tools, and everyday devices, are connected using the Internet and network capabilities[3].

Due to the novelty of this technology and its ability to be used in agriculture, the purpose of this article is to acquaint the audience with IoT technology, infrastructure, challenges and some of its applications in agriculture.

II. THE STRUCTURE OF THE INTERNET OF THINGS

Everything with IoT technology consists of 3 main layers: The perception layer, network layer (data transfer), and application layer (data storage) [4].

A. The perception layer

The perception layer deals with technologies such as radio frequency detector, wireless sensor network and near field communication.

Radio Frequency Detector Technology: The first and most basic example of connecting objects to each other[5]. This technology is a wireless identification system that can exchange data by transferring information between a label attached to a product, object, card, etc., and a reader. This