

VISVESVARAYA TECHNOLOGICAL UNIVERSITY

“Jnana Sangama” Belagavi – 590018



PROJECT REPORT ON “A SOIL NUTRIENT MANAGEMENT SYSTEM WITH IOT INTEGRATION”

Submitted in partial fulfillment of the requirements for the award of degree

BACHELOR OF ENGINEERING IN ELECTRONICS & COMMUNICATION ENGINEERING

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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

CERTIFICATE

Certified that the project work entitled "A SOIL NUTRIENT MANAGEMENT SYSTEM WITH IOT INTEGRATION" is a bona fide work carried out by

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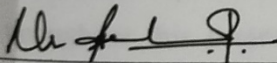
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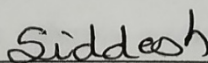
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in partial fulfillment for the award of **BACHELOR OF ENGINEERING** in **ELECTRONICS & COMMUNICATION ENGINEERING** of the **VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI** during the year 2023–2024. It is certified that all corrections/suggestions indicated for Internal Assessment have been incorporated in the report deposited in the departmental library. The project report has been approved as it satisfies the academic requirements in respect of Project work prescribed for the Bachelor of Engineering Degree.



Signature of the Guide

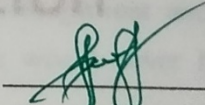
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ABSTRACT

India, with its diverse climatic conditions, is a land of rich agricultural potential. The country's economy is primarily agrarian, with a significant portion of its population engaged in farming. However, the agricultural sector faces numerous challenges, including the need for more efficient and sustainable farming practices. One of the key aspects of sustainable farming is the efficient use of fertilizers, particularly Nitrogen (N), Phosphorus (P), and Potassium (K), collectively referred to as NPK. NPK are the three primary nutrients required for plant growth. Nitrogen is essential for the growth of leaves and stems, phosphorus is needed for root development and flowering, and potassium ensures overall plant health by improving disease resistance. The balance of these nutrients in the soil significantly influences crop yield. Farmers traditionally rely on their experience or generic guidelines to decide the quantity and type of fertilizers to use. However, this approach often leads to over-fertilization, resulting in wasted resources and potential environmental damage. A more scientific method involves analyzing the soil's NPK content to determine the precise fertilizer requirements. This is where the proposed project comes into play. The project aims to develop a device that can accurately measure the NPK content in the soil. This device uses cutting-edge technology to provide farmers with real-time data, enabling them to make informed decisions about fertilizer application. The device features an LCD panel that displays the nutrient levels, making it easy for farmers to understand the result. The truly innovative aspect of this project is the integration of a fertilizer dispensing system. Based on the specific NPK requirements determined by the device, the system can automatically dispense the right amount of each fertilizer into the soil. This feature not only ensures optimal fertilizer use but also significantly reduces the manual labor involved in the process. By providing precise information about soil nutrient levels and automating the fertilizer dispensing process, this device has the potential to revolutionize farming practices in India. It can lead to increased crop yields, improved soil health, and greater profitability for farmers. Moreover, by promoting more efficient use of fertilizers, the project also contributes to environmental sustainability. In conclusion, this project represents a significant advancement in agricultural technology. By harnessing the power of modern technology, it provides a practical solution to one of the most pressing challenges in agriculture: the efficient and sustainable use of fertilizers. As such, it holds great promise for enhancing the productivity and sustainability of India's agricultural sector.