

UNIVERSITI TEKNOLOGI MARA

**DESIGN, ANALYSIS AND
FABRICATION OF AUTOMATIC
PLANT WATERING SYSTEM**

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ABSTRACT

The Automatic Plant Watering System is a crucial innovation in the field of agriculture, aiming to alleviate the challenges associated with manual watering and ensure the optimal growth of plants. In this era of increasing population and limited resources, efficient irrigation systems are necessary to conserve water and enhance crop productivity. The existing conventional methods of plant watering are labour- intensive and prone to human error, leading to inefficient use of water and inadequate hydration for plants. Moreover, the lack of real-time monitoring and control mechanisms often results in under or over-watering, leading to suboptimal growth and reduced yield. Therefore, there is an urgent need to develop an automated system that can accurately monitor soil moisture levels and dispense water accordingly, ensuring the appropriate hydration of plants.

The main objective of this final year project is to design and implement an Automatic Plant Watering System that utilizes sensor technology and intelligent control algorithms to maintain the ideal moisture levels in the soil. The system will enable real-time monitoring of soil moisture and automatically activate the irrigation mechanism when required. Additionally, it will incorporate a user-friendly interface for setting custom watering schedules and providing notifications/alerts regarding water levels, ensuring convenient management and minimal human intervention.

Expected result upon successful completion of this project, we anticipate the development of a reliable and efficient Automatic Plant Watering System that optimizes water usage, minimizes manual labour, and maximizes plant growth. The system's ability to accurately monitor soil moisture levels and dispense water in a timely manner will result in improved crop yield, reduced water wastage, and enhanced resource sustainability. Furthermore, the user-friendly interface will empower farmers and gardeners with better control and management of their irrigation processes, ultimately contributing to the advancement of smart farming practices and addressing the challenges of modern agriculture.

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CHAPTER ONE

INTRODUCTION

1.1 Background of Study

In many areas of the world, plant watering and irrigation is a necessary activity for the maintenance and survival of crops, gardens, and landscaping. However, manually watering plants can be time-consuming and inefficient, making it difficult to keep up with the necessary watering demands. As a solution, automatic plant watering systems have been developed to simplify the process of plant irrigation. The automatic watering system works by automatically dispensing water to plants, thus reducing the physical effort required for manual watering and improving the efficiency of the watering process.

The application of automatic plant watering systems is becoming more popular due to the benefits that they offer. One of the key advantages is that automatic watering systems are able to accurately deliver the required amount of water needed by the plants, thus avoiding over-watering or underwatering. Over-watering or underwatering can lead to plant damage and ultimately, plant death. By introducing an automatic watering system, the watering process can be tailored to the specific needs of each plant, optimizing plant growth and reducing the risk of plant damage.

In addition, the use of automatic plant watering systems can reduce labor costs, as there will no longer be a need for personnel to manually water plants. The system can be programmed and calibrated to deliver the necessary amount of water at the necessary intervals, freeing up time for other tasks. The system can also be monitored remotely, giving the user real-time updates on plant watering progress and making it easier to manage water usage.

Despite the benefits of automatic plant watering systems, there are still some challenges that need to be addressed. One of the major concerns is the potential for water wastage, especially in areas where water is limited or in high demand. To mitigate this