UNIVERSITI TEKNOLOGI MARA

AUTOMATED DOOR GATE FOR DAM WITH IOTS

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ABSTRACT

The Internet of Things (IoT)-based automatic door gate system for dam monitoring and control is a cutting-edge solution that increases dam safety and efficiency dramatically. This project uses IoT technology to provide remote monitoring and control of dam-related parameters. Water level sensors, a microprocessor or Programmable Logic Controller (PLC), a communication module, and a motorised gate mechanism are key system components. The controller of the system analyses real-time data from water level sensors and uses established criteria to determine ideal gate placements. The motorised gate mechanism, which is powered by a motor or actuator, accurately responds to the controller's inputs, allowing for automated and exact control. Because remote access and control features have been integrated, authorised workers can monitor water levels and gate status in real time via a user-friendly web-based dashboard or application. In the event of an emergency, the system is prepared to generate alarms and notifications, instantly contacting the appropriate persons or authorities. The strong security measures put in place ensure the system's integrity and prevent unauthorised access, protecting the entire infrastructure. Overall, this automated door gate system improves dam safety by enabling proactive monitoring, improved water flow control, and informed decision-making. The system's importance in modern dam management methods is highlighted by the minimization of risks connected with potential disasters and the optimisation of dam operations.

ACKNOWLEDGEMENT

TABLE OF CONTENT

CHAPTER ONE

INTRODUCTION

1.1   RESEARCH BACKGROUND

In Malaysia, hydropower energy, mostly generated through the use of water reservoirs known as dams, plays a critical part in supplying the country's energy needs. The lack of an automatic system for dam door gates, on the other hand, creates safety concerns when water levels exceed the approved safe threshold. This project seeks to address this issue by including a water level detector, water-flow monitoring, and an automated dam door gate system [1], [2], [3], [4], and [6]. The overarching goal is to create a system in which the dam's front gate can open and close autonomously based on water levels, assuring safety. Ultrasonic sensors are used to monitor accurate water levels, while water flow sensors assess the rate at which water flows through the dam's gate [7, 8].

Using the ESP8266, the project collects data on water flow, which is then communicated to the Blynk app, which serves as an IoT platform. In addition to improving operating efficiency, the project decreases the risk of dam collapse by preventing water overflow [9], [10]. The major goals of the project are to develop and build an IoT-based automated door gate system for dam management and security, as well as to create a user interface for dam operators to monitor and control the gate system. By combining aspects from earlier projects [6, 11, 12], the inclusion of LED and LCD displays allows for easy monitoring of gate status and water levels, giving critical information for rapid dam safety decision-making. This holistic strategy not only tackles the existing safety risk, but also streamlines monitoring processes, contributing to dam operations' overall efficiency and security.

In summary, the multifaceted nature of this project extends beyond addressing immediate safety concerns associated with dam water levels; it also strategically leverages advanced technology to make significant contributions to environmental sustainability within Malaysia's hydropower generation sector. The incorporation of cutting-edge IoT features and the creation of user-friendly interfaces highlight a comprehensive approach to dam management. The project not only ensures enhanced