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Control of LED using BOLT Wi-Fi Module through Bubble web app over Internet

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Abstract— This paper presents an economical and reliable solution for LED control by utilizing the Bolt Wi-Fi module through a Bubble web app integrated with the Internet of Things (IoT), eliminating the need for programming skills. Leveraging a User Interface (UI) builder, Application Programming Interface (API), and the Bolt Wi-Fi module ESP 8266MOD (ISM-2.4GHz, PA +25dBm, 802.11b/g/n) operating at 2.4GHz frequency, LED control is achieved. The paper introduces a block control system for LED ON and LED OFF, allowing users to select appearance styles – a success button for LED ON and a danger button for LED OFF. Digital wire plugins are employed for both LED states, utilizing pin zero with a high status for LED ON and low for LED OFF.

Keywords— LED, Bolt Wi-Fi Module, ESP 8266, Android Phone.

I. INTRODUCTION

In the realm of advanced automation, there is a growing need for remote control devices. This paper aims to address this need by focusing on the remote control of lights in various locations, emphasizing the importance of energy conservation. Energy efficiency stands out as a crucial factor in the pursuit of sustainable practices. The approach taken in this paper involves the utilization of the Bolt Wi-Fi module to control LED light. Author presents a cost-effective IoT-based Smart Monitoring System using ESP8266 Node MCU module to monitor air quality, temperature, and humidity in three food stores at remote locations; the system utilizes DHT11 and MQ-2 sensors, allowing data sharing through a web server. Automatic control actions, such as turning on an air cooler are applied based on environmental conditions. The system offers manual control via a web server, proving its efficiency in maintaining desired environmental conditions. The ESP8266 module's low cost and versatile capabilities make it a preferable choice over GSM modules for data and control actions [1]. In the Street Light Control along with GUI. The author uses LDR sensor and Zigbee for controlling the Street light. Light intensity of the daylight measured by LDR sensor. Also, it will activate climate conditions, environmental action and many more possibilities. Infrared Sensors are devices which measure and detect infrared radiation. The Controller section manages a

lighting system with a GUI (Graphical User interface) application. The sensor transfers important information to the PC. Zigbee is used for wireless communication technology aspect [2]. The authors addressed an Intelligent Auto-bot for the financial system, integrating Bolt IoT, Twilio, and real-time API to provide alerts on cryptocurrency stock fluctuations, aiding investors in decision-making. The system incorporates LED, buzzer, and SMS alerts based on profit percentages, demonstrating potential for mitigating financial losses [3]. In the Smart IoT Street LED Lighting System experiment, the author employs the Blynk mobile application platform compatible with both iOS and Android to remotely control the ESP8266 Chip via the Internet. Blynk, a versatile IoT platform connecting devices to the cloud, finds applications in Smart Homes, Industrial setups, and Environmental Monitoring, showcasing its broad utility across diverse domains [4]. LED Control Testbed for IoT (Internet of things) use different techniques to control the LED. The paper emphasizes techniques such as LED color mixing, Raspberry Pi, and IoT for real plant growth in a daylight-mimicking settings[5].The study focuses on remotely controlling and detecting LED degradation in IoT devices through temperature monitoring. Experimental analysis includes obtaining and evaluating voltage, temperature, half-width, and surface temperature of the LED module, providing valuable insights into the IoT-based LED performance [6].The study at [7] introduces a solar-powered street lighting system with intelligent charging, utilizing stored solar energy efficiently, and managing LED lighting via GSM-based TCP/IP communication for environmental sustainability and energy savings in urban areas. IoT-based health monitoring, employing Arduino UNO and sensors, enables individuals to assess heart rate, blood pressure, body temperature, and oxygen saturation, providing comprehensive health data for effective patient care[8]. Rehan et al. implemented a centralized SMS-based control system for motor speed, DC motor, LED, and temperature, offering an effective automation solution for home security. However, emphasizing the need for added flexibility, it suggests the incorporation of a technique allowing control from multiple locations [9]. Apsitis et al. LED lighting system utilizes two wireless control approaches: radio wave and internet connectivity, and Zigbee network integration with internet implementation for enhanced versatility [10]. IoT is employed for healthcare monitoring, measuring vital signs like oxygen saturation, heart rate, and blood pressure.