

THE DEVELOPMENT OF IOT BASED INDUSTRIAL CONVEYOR USING ARDUINO MEGA AND ESP 32 WITH SQL DBMS

ABSTRACT

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The increasing demand for automation and sustainable engineering solutions has led to a growing interest in the development of efficient and adaptable mechatronics systems. This study addresses the need for automated product sorting in various industries while also integrating sustainability by exploring renewable energy options such as solar power. The project aims to develop an IoT-based industrial conveyor system that reflects current trends in automation, green technology, and intelligent systems design. This study utilizes the Experimental Prototyping Method, where the concept and prototype are built and tested for functionality and user acceptance. A descriptive survey method was employed using a 5-point Likert scale to assess the system's performance in terms of efficiency, sustainability, safety, cost-effectiveness, and portability. Respondents were selected through purposive sampling based on their relevance to the project's application, and their demographic data were also recorded. The collected responses were analyzed descriptively. The prototype—an IoT-based industrial conveyor system powered by Arduino Mega and ESP32 and integrated with an SQL database—was successfully developed and functioned according to its design specifications. It included product classification, product-level monitoring, conveyor control, and database management features. Survey results showed that respondents rated the system highly across multiple indicators, especially in terms of operational efficiency, sustainability, and ease of use. These positive evaluations validated the effectiveness of the system in an industrial setting. The project demonstrated the successful implementation of an IoT-based industrial conveyor system using Arduino Mega and ESP32. The development process confirmed that these microcontroller and microprocessor units are reliable tools for integrating real-time control and data management functions in industrial automation. The study concludes that the use of Arduino Mega and ESP32, paired with SQL DBMS, offers a practical and scalable solution for smart, sustainable industrial systems. Future enhancements may include cloud integration and solar-powered operation to further advance its green technology potential.

RECOMMENDED CITATION

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