Kyle Adrian del Castillo
CMSC 176 - B

A. S. Almadhoun and H. Jaafar, "Enhanced Solar Systems Efficiency and reduce energy waste by using IOT devices," Materials Today: Proceedings, 2023. doi:10.1016/j.matpr.2023.03.264

In this article, Almadhoun and Jaafar discuss the importance of renewable energy using the concept of using IoT (Internet of Things) devices to continuously monitor and analyze the performance of solar power systems. The authors present a web interface-based prototype device designed to monitor individual solar panels and alert users to system failures. Results of the research indicate that one of the PV power generation farms (Farm 2) experienced poor efficiency due to defective panels, highlighting the significance of real-time monitoring and maintenance.

However, the authors admit to limitations such as the challenge of locating and repairing defects in large solar power systems. Additionally, it does not address potential cybersecurity concerns associated with IoT implementation in energy systems. The authors suggest the addition of control devices to facilitate quick repairs on faulty solar panels, enhancing the overall performance of the maintenance warning system. They also mention the possibility of integrating the proposed system with automated solutions using machine learning and image processing methods to further improve efficiency. To enhance the study's applicability, the paper could benefit from more detailed technical specifications and a discussion of cybersecurity measures when implementing IoT devices in solar power systems.

B. Nast, A. Reiz, and K. Sandkuhl, "IOT-based diagnostic assistance for energy optimization of Air Conditioning Facilities," Procedia Computer Science, vol. 219, pp. 416–421, 2023. doi:10.1016/j.procs.2023.01.307

The authors explore the application of IoT technology and model-driven engineering (MDE) in the context of air conditioning and cleanroom technologies (ACT) facilities to optimize energy consumption and support predictive maintenance, highlighting the significance of IoT in transforming industrial environments, enabling the development of intelligent systems. The paper proposes an architecture for IoT application, a modeling language, and tool support for IoT modeling, emphasizing practical benefits in an industrial case. While discussing the complexity of ACT systems and the need for sensor data interpretation, it presents an architecture that integrates physical and logical views and tools for system configuration.

However, the paper primarily focuses on the technical aspects of implementing IoT in ACT facilities and may lack a detailed discussion of potential organizational or integration challenges faced by enterprises. Additionally, it does not delve deeply into the specific algorithms or machine learning techniques used for data analysis and optimization. It would be beneficial to address any limitations or potential obstacles that may arise during the practical implementation of the proposed IoT solution. The paper suggests that the developed modeling language and tool support make it easier for ACT technicians to configure and manage sensors, ultimately optimizing energy consumption. It could further emphasize the importance of user-friendly interfaces and highlight that end-users do not require in-depth IoT or data analysis skills. To enhance the paper, more details on the implementation of machine learning and data processing techniques for predictive maintenance could be included. Additionally, discussing potential challenges and strategies for overcoming them in real-world ACT facilities could provide valuable insights for practitioners.