

Review of: "Internet of Things in Smart Grid: A Comprehensive Review of Opportunities, Trends, and Challenges"

Muhammad Zunnurain Hussain¹

¹ Universiti Putra Malaysia

Potential competing interests: No potential competing interests to declare.

The paper briefly mentions cybersecurity as a significant challenge in the integration of IoT with smart grids, but it lacks a thorough exploration of the complexities and specific threats involved. Cybersecurity is a critical aspect of smart grids because they rely on a vast array of interconnected devices, making them vulnerable to a wide range of cyber threats. The paper could be improved by providing a more in-depth analysis of the types of cyberattacks that smart grids are susceptible to, such as denial of service, data breaches, and ransomware attacks. Furthermore, the discussion on cybersecurity solutions is rather superficial, focusing on deep learning and cloud IoT as potential solutions without delving into specific methodologies or case studies that demonstrate their effectiveness. A more comprehensive examination of existing security protocols and the development of new strategies tailored to IoT-based smart grids would enhance the paper's contribution to the field.

While the paper does touch on the potential economic benefits of IoT in smart grids, such as cost savings and efficiency improvements, it lacks a balanced discussion of the economic challenges and social impacts. The deployment of IoT in smart grids involves significant initial investments, and the paper does not adequately address the financial barriers and the potential for unequal access to technology, especially in developing regions. Additionally, the social implications of IoT, such as job displacement due to automation and the potential invasion of privacy, are not sufficiently covered. A more nuanced analysis of how IoT in smart grids could affect different socioeconomic groups and the long-term economic sustainability of these technologies would provide a more holistic view.

The paper identifies interoperability as a challenge but fails to explore the intricacies involved in achieving it. The lack of standardized protocols and technologies can lead to fragmentation, where different systems and devices cannot effectively communicate with each other. This is a significant barrier to the widespread adoption of IoT in smart grids, as interoperability is crucial for seamless integration and operation. The paper could be strengthened by discussing current efforts and challenges in standardizing IoT technologies across various industries and regions. Furthermore, the role of international regulatory bodies and industry consortia in fostering interoperability should be examined to provide a clearer roadmap for overcoming these challenges. Exploring case studies where interoperability has been successfully achieved in similar fields could offer valuable insights and practical solutions.

