

An Integrated IoT Solution for Smart City Development

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ABSTRACT

Purpose: The rapid pace of urbanization, particularly in developing countries like Sri Lanka, has placed significant pressure on existing infrastructure, transportation systems, and public services. The purpose of this study is to explore the integration of Internet of Things (IoT) technologies as a solution to infrastructure, transportation, and public service challenges within the context of smart city development in Sri Lanka.

Design/methodology/approach: This research combines a comprehensive literature review, in-depth case studies, and primary data analysis collected from stakeholders, including city planners, government officials, IoT experts, and citizens, to identify key opportunities and challenges in implementing IoT solutions within urban environments.

Findings: The results reveal a significant positive relationship between IoT awareness and perceived benefits, which underlines the need to enhance the public's awareness to enhance the perceived value of IoT applications. But privacy and security issues greatly limit the adoption and integration of IoT technologies, which shows the need to address these factors to enhance the level of acceptance. The study also shows that regulatory and infrastructure readiness plays an important moderating role, increasing the likelihood of IoT adoption even in contexts with high awareness. Furthermore, perceived benefits have been shown to be a strong predictor of public support for IoT-driven smart city initiatives, whereas clear regulatory guidelines significantly increase public trust in these technologies.

Practical implications: The research contributes valuable insights into the socio-economic, environmental, and ethical implications of widespread IoT integration, offering actionable recommendations for policymakers, city planners, and stakeholders. These guidelines are designed to facilitate the effective deployment and management of IoT in smart cities, ensuring sustainable urban development and improved quality of life for citizens.

Originality value: This study improves understanding of IoT's socioeconomic, environmental, and ethical implications, addressing issues such as privacy, security, and regulation.

Keywords: *Internet of Things (IoT), Smart Cities, Urbanization, Regulatory Readiness*