

CITY UNIVERSITY OF HONG KONG

香港城市大學

**Unlocking the Potential: Exploring Strategies to Increase
the Adoption of Smart Green Building Technologies in
Commercial Buildings**

釋放潛力：探索在商業建築中增加智能綠色建築技術採用的策略

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by

Chan Chow Kiat

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Abstract

Global warming poses a significant threat to humanity, prompting international efforts to reduce carbon emissions. The building sector is a critical area for these efforts, as improving energy efficiency in buildings is essential for achieving carbon reduction goals. Despite the availability of existing technologies, particularly digital technologies, the adoption rate has been slow, and carbon emissions from buildings continue to rise.

Recent research has increasingly focused on the adoption of digital technologies, often within the manufacturing industry, typically employing a novelty approach that assumes the attractiveness of these technologies will drive adoption. Additionally, many models have operated under the assumption of a voluntary single-stage adoption process. However, the reality in commercial firms often involves a more complex, sequential process that includes both voluntary and mandatory adoption stages. In addition, resistance to change has been identified as a significant barrier to adoption, indicating that the characteristics of the technologies alone may not suffice to influence adoption decisions, especially for more complex technologies like digital solutions.

This research specifically examines the adoption of Smart Green Building Technologies (SGBT) in existing commercial buildings.

To begin, we conducted research interviews to validate the real-world practices surrounding innovation adoption in commercial buildings. Asset Managers (AMs) and Facility Managers (FMs) emerged as key stakeholders in the voluntary and mandatory adoption of SGBT, respectively. These stakeholders confirmed that

organizational factors significantly influence adoption decisions and highlighted the presence of employee resistance during the adoption process.

The insights gained from the literature review and research interviews informed the development of a research framework that integrates both novelty and resistance approaches to study SGBT adoption. This framework incorporates two stages to accurately reflect the sequential nature of voluntary and mandatory adoption in practice. Our empirical quantitative research focused on the perspectives of AMs and FMs, investigating the effects of technological and organizational determinants using constructs from the Diffusion of Innovation and Organizational Readiness for Digital Innovation theories in both voluntary and mandatory contexts.

We also introduced resistance as a moderating factor to assess how it influences AMs and FMs in their adoption decisions. A post-survey interview was conducted to further explore the findings.

Overall, our research contributes to both academic literature and practical applications, supporting the building sector's initiatives to enhance energy efficiency and reduce carbon emissions.