Marketing Strategies for Smart Buildings

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Abstract

Globally, there is a growing proportion of the need to optimize monitoring and facility management of new and existing built facilities. Smart buildings provide waste reduction to the environment, flexibility to facility users, and optimization opportunities to the owner. Several research projects explore the monitoring, management, and maintenance of smart buildings towards efficient facility management (FM). However, there is a lack of defined, effective, efficient, and successful marketing schemes for smart buildings. Furthermore, smart buildings utilize the different technological possibilities and advancements in the smart building business and impact relevant stakeholders such as clients, facility managers, and users. Therefore, the study aims to develop a marketing strategy for smart buildings. The study adopts an integrative approach as the underpinning theory. The study's methodology adopts a robust analysis of different market strategies for various building types in the construction industry. In addition, lessons are deducted from the building typologies, such as sustainable buildings, tall and green buildings. The proposed marketing strategy requires four defined phases: segmentation, targeting, positioning and differentiations. The marketing directions focus on activities, actors, and tools through a comprehensive, detailed, and interpretative literature review. The proposed adaptable market strategy integrates client and facility users, focusing on the main drivers for marketing smart buildings. Therefore, the study is significant for facility managers, developers, and facility users.

Keywords: Smart buildings; Marketing; Strategy; Sustainability; Users

1 Introduction

There is need for reducing waste and adopting sustainable features by the three pillars of sustainability—economic, environmental, and social in the construction industry. The impact of buildings on energy consumption and carbon emissions is enormous. It is believed that intelligent buildings play a key role in enhancing the energy performance of buildings and cities (Doukari, 2022). In 2002, the Continental Automated Buildings Association (CABA) described a "smart building" as a building and its infrastructure that provide inhabitants with an efficient, adaptable, safe, and comfortable environment by integrating technology systems, controls, and communications (Karimi, 2021). The International Facility Management Association (IFMA), for instance, defines facility management as "the discipline of managing a company's activities and responsibilities within its working environment." It involves developing a business facilities strategy, making long-term projections, real estate, space inventory, projects (through design, construction, and restoration), building service and maintenance plans, and taking inventory of furniture and equipment (Milala, 2022). In smart building environments, facility management performance is elevated beyond normal buildings to include BMS platform operations. With its graphical representation of parameters, the BMS system is an effective tool for facility managers to gain an overview of the building's current operating values and the function of the individual systems while also allowing the parameters to be modified in response to changing needs (Paek, 2018). However, smart buildings have lacked substantial marketing strategies that can clarify the benefits of their use to all beneficiaries, including stakeholders, users, and facility managers.

2 Methodology

According to Synder (2019), the integrative theory described in Table 1 defines the integrative approach to managing mature or emergent topics. The objective of an integrative review approach is to provide an overview of the knowledge base, critically examine and maybe re-conceptualize it, and develop the theoretical basis of the topic as it matures. For newly emerging issues, the objective is to develop first or preliminary conceptualizations and theoretical models as opposed to reviewing older models. This form of review frequently necessitates a more innovative approach to data collection. Furthermore, the objective is typically not to cover all articles written on the issue but rather to mix viewpoints and insights from many fields of research traditions.

Table 1: Approaches to Literature Reviews Adapted from (Synder, 2019)

Approach	Integrative
Typical purpose	Critique and synthesize
Research questions	Narrow or broad
Search strategy	Usually not systematic
Sample characteristics	Research articles, books, and other published texts
Analysis and evaluation	Qualitative
Examples of contribution	Taxonomy or classification

This study aims to develop a smart buildings marketing strategy framework, using the methodology in Figure 1, within the construction industry, in which the strategy will outline the significance of marketing smart buildings and will outline the involvement of different parties, including the end user, the client, the government, etc. The study outlined the existing marketing strategies and available qualitative data collected within the current literature review, analysing the data and developing a marketing strategy framework. The framework was developed through a focus group that highlighted the existing marketing strategies related to smart buildings and adapted a qualitative approach to develop the outcome of the framework.
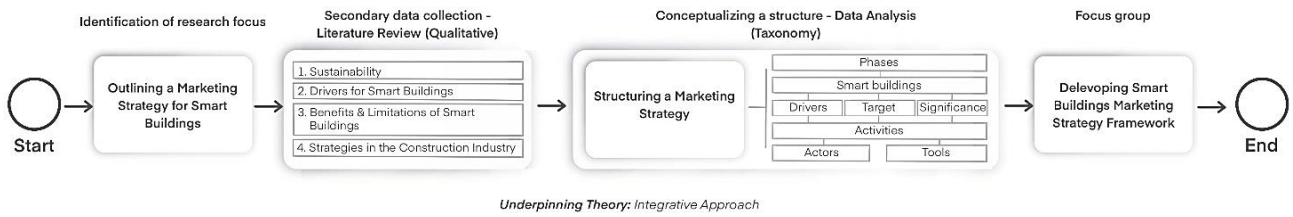
Fig. 1: Marketing Smart Buildings Framework Methodology

3 Literature Review and Analysis

In accordance with the commonly accepted concept of sustainability, meeting the needs of the public should not compromise the ability of future generations to do the same. The principles of sustainability include not just environmental but also social and economic factors. When the Earth's environmental systems remain stable, and their natural resources are used at a rate at which they can renew, environmental integrity is preserved (Froufe et al., 2020). Globally, the economic pillar works to preserve the economic autonomy that allows access to the financial and other resources required to meet the needs of the public, ensuring that economic systems remain intact and everyone has access to activities. The social pillar often refers to public policies that support social concerns. These social issues affect our well-being, including healthcare, education, housing, employment, etc. Sustainability is a shared ideal across several individuals and organizations, as seen by their policies, daily operations, and conduct. The concept of "smart buildings" has gained prominence in recent years. The evolution of the smart product market and the energy management service sector has propelled the global expansion of smart home technology. Several studies have documented the numerous benefits of smart home/building systems, such as better thermal comfort and safety, lower energy costs, and greater flexibility. There are many drivers for smart buildings, as described (Froufe et al., 2020) in Figure 2. These are categorised to the owner, user and environment.
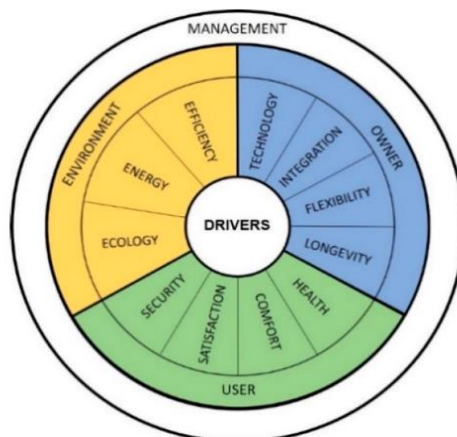

Fig. 2: Smart Building Drivers grouped by Category (Froufe, et al., 2020)

When it comes to environmental monitoring, sensor-actuator networks, embedded systems, and distributed software engineering are converging in exciting ways, as seen by the rise of "smart" buildings and cities. Therefore, it is crucial that smart buildings be included into the smart city ecosystem. New technologies are driving the growth of smart buildings because they enable smarter resources and processes, which in turn improve the building's efficiency, adaptability, interactivity,

and sustainability. A few certifications have been tailored to certify whether the building is smart or not, as shown in Table 2. The key target audience is decision-makers, interested in or supporting the certification process or conveying their knowledge to the market (Habash, 2022). Developers, builders, architects, government representatives, real estate businesses, and foreign companies engaged in market development are examples. The end users who want to buy or rent-smart buildings should be guaranteed that the decision-makers and developers certify the buildings and adopt the smart building certification requirements once they are applied.

Table 2: Smart Buildings Certifications (non-exhaustive list)

Certification	Focus	Country	Reference
SmartScore-WiredScored	Design & Operations	US, UK, Singapore	https://wiredscore.com/certify-a-building/smartscore/
Smart Building Collective	Design	Netherlands	https://smartbuildingcollective.com/
SPIRE™ Qualification Program	Assessment	US, Canada, Australia, Belgium	https://spiresmartbuildings.ul.com/
SpaceWell	Operations	Belgium	https://spacewell.com/
TIA-Telecommunication Industry Association	Assessment	US	https://tiaonline.org/
Kriea - Korea Research Institute of Eco-Environment Architecture	Design	South Korea	https://www.kriea.re.kr/eng_index.php

The energy consumption of a building may be drastically reduced by using data collected from a building's smart features to predict and adapt to the needs of its inhabitants. The automation of routine duties and the resulting reduction in operating costs are two major advantages for building owners. They have the ability to detect leaks such as ones arising out of fire, water, and gas. In the event of a breakdown or a deterioration in performance, smart buildings' built-in diagnostic systems will send a warning to the building's residents. Embedded expert systems may contain information regarding any home or industrial domain. In all smart construction decisions, the health of the occupants takes precedence; temperature, light intensity, air conditioning factors, etc., reflect this by providing a safe and comfortable environment, intelligent buildings can enhance the quality of life for the elderly and disabled who live alone (Habash, 2022).

Smart buildings boost the owner's market competitiveness and return on investment and boost ROI and competitiveness, making them more desirable. Even when construction process improvements may reduce costs, it is important to note that the cost-benefit ratio must be evaluated throughout the building's lifespan. Smart buildings cost more because of their technology, but the same technology improves energy efficiency, reduces water use, and optimizes infrastructure maintenance to save on lifecycle costs (Yang et al., 2021). Interoperability across processes, products, and people, adaptability to new environments and setups, and longevity thanks to regular technological upgrades, maintenance, and the incorporation of new features are all enhanced by system integration. These points strengthen the case for smart buildings in general, and certified smart buildings will soon become the norm. Smart buildings that have earned the Value Certification will be more reliable than those that have not. As a result, the hope for growth in the future is the primary factor luring investors. The price difference is admittedly due to the higher quality certified buildings and the guarantee of sustainable investment value. This expectation is strongly aligned with the overall trend of moving

towards sustainability (Angelidou, 2014).

Several elements, including return on investment, financial risk, pre-integration, and initial planning influence the construction industry's entry into the smart building market. The budget and investment of a project always determine its success. The bank loans typically finance such large projects, and risk is a significant deciding element. Slow and non-agile businesses, such as those in the construction industry, cannot afford to provide value to the end user without a return on investment or a reduction in cost risk (Kim et al., 2022). Due to the high risk of building projects, it is difficult to convince construction companies to include more stakeholders and vendors in a project with a limited budget. Integration is crucial for both stakeholders and builders. Retrofitting is expensive and does not necessarily offer value to individual users, particularly when the end user becomes unclear after the product's completion (could be a tenant, owner, renter, etc.). Stakeholders are enthusiastic about contributing their funds to the pre-planning and planning phases of a smart building. Laws and regulations govern the initial phases of a building project. By involving small stakeholders in the planning process, it is possible to save money instead of incurring fixed costs (Ma, 2016).

Table 3: Marketing Strategies for different types of buildings

S. No.	Description	Focus Area	Reference
Client Dimension			
1	Targeting the owners into marketing green development of buildings and developing the business aspects of different successful cases	*Sustainable Buildings*	Yudelson (2007)
2	Discussing the policies in japan to promote more sustainable development of buildings and facilities in order to encourage the industry of sustainable buildings.		Sunikka-Blank (2011)
3	The development of sustainable buildings history in the middle east and Africa and how their growth is a profitable business enterprise		Sayigh, A. (2013)
4	The connection of strong integration of sustainability and health with intelligence is needed in the future to market smart buildings to owners	*Intelligent buildings*	Habash, R. (2022)
User Dimension			
1	Comparison of the benefits when renting or selling sustainable/green properties owned by stakeholders	*Sustainable Buildings*	Kozlovská et al. (2014)
2	Using the summary index of the top sustainable buildings in the world to promote users to invest in sustainable properties		Sayigh, A. (2013)
3	Segmentation, targeting, positioning, and differentiation	*Green Building*	Popescu et al. (2015)

Various marketing strategies have been developed targeting different types of buildings, sustainable, intelligent, and green buildings as shown in Table 3. Yudelson (2007) developed a marketing strategy that targets smart buildings and discusses different cases that have shown success in construction. Popescu et al. (2015) developed a scheme, when approached to market green buildings, it showed major success, in which a 4-phase marketing scheme was developed accordingly.

Table 4: Benefits and Limitations of Smart Buildings

S.No.	Description	Sustainability Pillar	Reference
Benefits			
1	Increasing entertainment and comfort	Economical	Kim et al. (2022)
2	Increasing energy-saving schemes that cut out costs for the owner		Yang et al. (2021)
3	Increasing economic benefit for the user as well as the owner		Yang et al. (2020)
4	Increasing utilization of other technologies integration		Yang et al. (2021)
5	Increasing equipment's monitoring activities		Rameshwar (2020)
6	Increasing healthcare services	Social	Kim et al. (2022)
7	Increasing users comfort		Yang et al. (2020)
8	Improving the users' quality of life		Yang et al. (2020)
9	Reducing energy waste	Environmental	Karimi et al. (2021)
Limitations			
1	Increased project cost at initial installation	Economical	Angelidou (2014)
2	Increased complications during adoption and implementation		Yang et al. (2021)
3	Increased cyber security risks	Social	Kim et al. (2022)
4	The unfamiliarity of the user with the user interface		Karimi et al. (2021)

Smart buildings have limitations that are considered a back draw in both the development and marketing processes they accompany. Table 4 identifies the benefits and limitations of smart buildings within the current market. Angelidou (2014) hints that, although smart buildings increase the economic benefits for the client as an owner and the end user, the initial installation cost of a smart building is significantly high, which makes the investment in a smart building questionable to the extent of not considering it, depending on the owner's budget, as most owners are more interested in the initial construction cost, rather than looking at the long term benefits of investing in a smart building. Kim et al. (2022) mention that a major limitation within smart buildings is the increased cyber security risks when is developed, as a smart building would be completely dependent in majority on the internet connection, there are more chances that an external attack, would occur and target the data acquired within the smart building database, whether from the owner or the end users.

4 Focus Group

Blackstone (2014) described a focus group as scheduled and aimed to generate group involvement and "get perceptions on a designated area of interest in a nonthreatening setting." A group of 3 to 5 is optimal. Groups larger than that, particularly when discussing contentious issues, can soon become unmanageable. Some advocate a group size of between 6 and 10 members for focus group research (Morgan, 1997). A group of six participants participated. These include four architects (4) and two engineers (2) focused on developing the framework for marketing smart buildings. The participants had an average of five years of experience. The participants attended three sessions that lasted from 45 minutes to one hour. The study adopted a qualitative approach. The focus group questions included highlighting and deducting relevant themes for the smart buildings with a significance on the smart building drivers and relationships between user and developer. The group focused on the existing marketing schemes for other types of buildings, including green and sustainable buildings, while adapting the qualitative approach to develop the framework. The framework was developed to link the accompanied parties within the process, the government, the client, and the user.
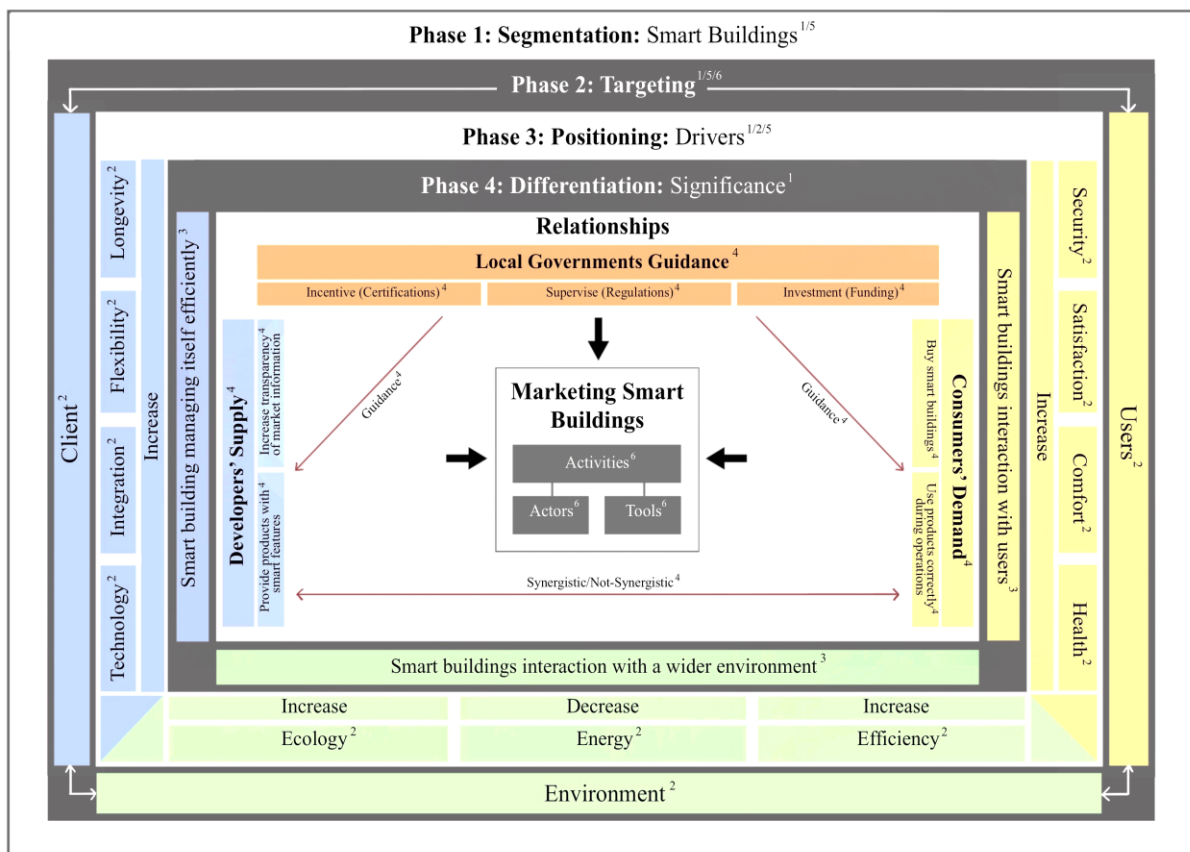
Fig. 3: Marketing Smart Buildings Strategy Framework

The developed framework in Figure 3 approaches marketing smart buildings in four different phases that will lead to the essential target, Segmentation, Targeting, Positioning, and Differentiation (Popescu et al., 2015). *Phase 1* starts by segmenting the smart buildings from other types of buildings to be called out. *Phase 2* would target the audience, the user, the client, and the environment, which are the key targets in this framework. *Phase 3* is then adapting the drivers, in which the marketing strategy for smart buildings is needed. *Phase 4* incites the significance of smart buildings as per Table 3. The marketing strategies developed by Yudelson (2007) linking the client, the user, the developer, and the government institutions; a relationship link is created between them, developing a closed loop that guides the user and client by the government.

5   Discussion

The incentive to certify a smart building by the government, supervise the process, and invest in the development of smart buildings, as described by Yudelson (2007) is the motive to market smart buildings to owners, developers, and end users. The government will guide the construction industry concerning the user and the client. In contrast, the synergistic information exchange between the client and the user will adhere to better development of smart buildings.

Whether the user is renting or buying, they will be able to see the value of investing in a smart building thanks to the marketing strategy that emphasizes their safety, satisfaction, comfort, and health. In addition to making an investment in the technology, the user must also operate and utilize it in accordance with the developer's guidelines and applicable government requirements. The marketing plan for a smart building would explain the technology employed in its construction and the extent to which the owner may exercise discretion in overseeing the building's operations. The longevity of

the technology used is a long-term investment that would show value within the project's lifespan. Integrating the technology into the building to develop a better understanding of the investment choice taken by the owner. The developer must supply genuine, smart products with features that will best serve the client and user and match the cost invested in the project. Transparency is a key factor for the developer to follow while being guided by the government by acquiring the required certification. The environment as a target would be driven by the decrease in energy waste, the increase in ecological enhancements, and the increased efficiency of using all natural resources such as water and energy. The smart building marketing strategy framework guides the involved parties to understand the process scheme, starting from identifying the segment of the construction industry as smart building and developing the scheme to understanding the role and requirements of user, developers and government to satisfying needs and demands. The marketing tools require the participation of relevant actors and end-user demands to meet defined targets.

6 Conclusion and Recommendation

Smart buildings lack a clear marketing strategy that drives them into the market and recognizes them from other types of buildings. Smart buildings are a part of smart cities, which are being adapted worldwide and aim to be the future of all cities, as adapting smart integration is the leading innovation of the day. Hence, directing investors, governments, users, developers, etc., to adapt and develop the adaptation of smart buildings within smart cities is the way to advancement. Therefore, the study targeted the development of a marketing strategy for smart buildings in the construction industry. The framework targets the government as the guiding authority, the owner and user as parties of investment, the developers as the integrators of smart buildings, and the environment as the medium of effective resource and concern. Future research can further validate the developed framework with developers, clients and users to respond to further limitations of smart buildings.

7 Limitations

The study develops a conceptual framework model that aligns with the construction industry's marketing strategy adopted by different building categories. However, the framework focuses on smart buildings. Furthermore, the strategy proposes that the government encourage certification to enable the users to receive effective and efficient buildings. Conversely, there are limited certification institutions worldwide. Moreover, the framework was only validated with the focus group members.

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