Brick by Brick: Exploring Sustainable Operations in the Built Environment

A Comparative Case Study of Swedish Real Estate Organisations' Decision-Making Processes

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Abstract

The purpose of this study was to investigate the decision-making processes of real estate organisations in the built environment with respect to sustainable operations, as well as how they relate to management systems and building certifications. In the study, we utilised the proposed framework by Schrettle et al. (2014) after examining the relevant literature on operations management in general and built environment-specific research, as well as acquiring insights from multiple studies. The framework included areas regarding sustainability decision motivators, mediators, approaches, and actions, as well as their impact on sustainability performance and firm performance. Therefore, we conducted a comparative case study of six Swedish real estate organisations responding to calls for more in-depth research on these topics.

Our findings support the applicability of Schrettle et al.'s (2014) conceptual framework to conceptualise and examine sustainable operations decision-making processes in the built environment. This study's results underlined the impact of stakeholder expectations and organisational capabilities influence on the strategic approaches and actions of an organisation's sustainability transition. According to the findings, active engagement from all key stakeholders is required to provide economic value as well as social and environmental achievements. It also described how real estate companies could comply with regulations, attract tenants, and prepare for the future by adopting sustainable practises at all levels of decision-making. Aligning sustainable practises with business performance is advantageous for all parties involved, resulting in cost savings, enhanced quality, and growth opportunities. Through empirical evidence, qualitative case studies, and insights into strategies, methods, and actions employed by real estate operators, this study contributes to the fields of sustainable operations management and the built environment. Additionally, linking concepts from the field of management system theory to these fields by demonstrating how management systems and certification act as green labels that increase resource efficiency, make it easier to create sustainable products, and contribute to improving firm and sustainability performance.

Keywords

Sustainable operations, Decision-making processes, Sustainability performance, Management systems and certifications, Built environment.
# Contents

1. **Introduction** ........................................................................................................................................... 1

2. **Literature review** ................................................................................................................................. 5
   2.1 Sustainability in the Built Environment - The Context ................................................................. 5
   2.2 Sustainable Operations Management and its Relation to the Context ....................................... 6
   2.3 The Framework of Sustainability Decision Making ................................................................. 7
      2.3.1 Triggers and Mediators ........................................................................................................... 7
      2.3.2 Approach and Action ............................................................................................................. 8
      2.3.3 Firm and Sustainability Performance .................................................................................... 9
   2.4 Management Systems and Certifications within the Built Environment .................................. 9
   2.5 Limitations of the Theoretical Framework .................................................................................. 11

3. **Research Methods** ............................................................................................................................... 12
   3.1 Research Strategy - Qualitative Approach ..................................................................................... 12
   3.2 Research Design - Comparative Multiple Case Study ............................................................... 12
   3.3 Methods for Data Selection .......................................................................................................... 13
      3.3.1 Selection of the Studied Organisations ............................................................................... 13
      3.3.2 Semi-structured Interviews .................................................................................................. 13
   3.4 Data Analysis ..................................................................................................................................... 17
      3.4.1 Operationalisation of the Research Question ....................................................................... 17
      3.4.2 Documents Analysis ............................................................................................................. 18
      3.4.3 Thematic Coding and Network Analysis .............................................................................. 18
   3.6 Research Ethics ................................................................................................................................. 20
   3.7 The study’s Authenticity and Trustworthiness .............................................................................. 21

4. **Empirical Findings and Analysis** ......................................................................................................... 22
   4.1 Sustainability Operations must Comply with Multiple Pressures ........................................... 22
   4.2 A Strategic Approach Facilitates Sustainability Transitions and Makes Resources Available ................................................................................................................................. 24
   4.3 Integrating Sustainability into Operations Requires Decision-making on all Levels............. 24
   4.4 Implementing Sustainability Enables Real Estate Actors to Meet Standards, Recruit Tenants, and Prepare for the Future ........................................................................................................... 25
   4.5 Sustainability Success as a Driver for Improved Firm Performance and Promoting Further Sustainability Initiatives ....................................................................................................................... 27

5. **Discussion** ........................................................................................................................................... 30
   5.1 Triggers, Mediators, Approaches, and Actions ............................................................................ 30
   5.2 Firm Performance. .......................................................................................................................... 31
   5.3 Managements Systems and Building Certifications. ................................................................. 32

6. **Conclusion** .......................................................................................................................................... 33
   6.1 Managerial Insights and Implications .......................................................................................... 33
   6.2 Future Research ............................................................................................................................... 34

7. **References List** ................................................................................................................................. 35

Appendix A. **Interview Guide** .............................................................................................................. A.1
1. Introduction

Humans profoundly impact the natural world, the economy, and society through their activities in developing, maintaining, and using the built environment Wang et al. (2019). Half of the worldwide CO2 emissions are positively correlated to energy consumption and mined materials (World Green Building Council, 2021), and the management of the built environment causes massive CO2 emissions during the building’s entire life cycle (Wang et al., 2019). Professionals in the built environment industries must engage in efforts towards achieving sustainable development (Kibert, 2016; Lewis, 2003). Furthermore, stakeholders within the built environment put substantial pressure on these organisations to implement concrete measures towards sustainable business practises at all levels (Rivera-Camino, 2007; Wheeler et al., 2003).

The growing attention from diverse stakeholders, including investors, financial institutions, and the legislative initiatives of the European Union, to advocate for a more environmentally conscious real estate industry offers both opportunities and challenges. According to Fjeldstad and Gustavsson (2021), this will stimulate a drive within the sector to enhance transparency regarding the allocation of funds, including expenditures associated with sustainable economic practises. Moreover, companies that have established a history of sustainability through gaining expertise and competencies in sustainability management are better equipped to comply with future legislation and participate in additional sustainability initiatives (Schrettle et al., 2014; Eisenhardt & Martin, 2000). Thus, such companies gain competitive benefits (Kleindorfer et al., 2005) and experience a reduction in compliance expenses (Orsato, 2009).

"Sustainability is really about two things: having both awareness of the fragility of living things, their ecosystems and the resources on which they depend; and about seeking to implement technical and economic efficiency with a soul and a conscience" (Roper & Beard, 2006, p. 1).

United Nations entities and scholars have made calls for improved comprehension of integration, support, and maintenance of sustainability decisions and operations in the built environment (UNEP FI; 2014, Priess et al., 2017; Wang et al., 2019); Sustainable operations management is a continuous area of academic research that centres on the organisational frameworks that incorporate sustainable development objectives as an integrated component of an organisation's strategies and operations. Additionally, it covers the methodologies and tools used in transitioning to and managing sustainability (Nunes et al., 2022). According to Orsato (2009), an organisation's strategy is influenced by its capabilities, products, and processes; it is also impacted by design specific to the industry in which it operates.

In the real estate industry, reporting and implementing sustainable practices at the corporate, portfolio, and single-building levels (see Figure 1) is imperative throughout the properties’ construction, management, and demolition phases (UNEP FI, 2014; Vieira de Castro et al., 2020). In addition to this, via synchronisation with the business ecosystem (Vigren, 2022). The Property Working Group of the United Nations Environment Programme Finance Initiative (UNEP FI, 2014) has exemplified the type of decisions that could be affected within real estate organisations; On a corporate level, decisions regarding investment strategy, structures for corporate sustainability management, performance targets for portfolios, sustainability reports, building documentation, and industry-specific standards: on a portfolio
management level, decisions regard sustainability performance objectives, compliance, and building-related information. Also, sustainability concerns regarding a three-dimensional approach to portfolios, on a building level, decisions regarding sustainability performance goals, facility management processes, project requirements, building-related information and documentation, and leasing agreements.

Figure 1: A data-driven illustration in UNEP FI (2014) that shows different levels in a real estate organisation, adding a sustainability perspective.

Consequently, the operationalisation of a sustainability strategy creates challenges at many decision-making levels and for traditional operations management performance targets when attempting to adopt sustainable plans across the value chain (Nunes et al., 2022). These challenges will pressure leaders within the built environment to make decisions on motivating and organising sustainability initiatives. Questions to be asked and linked are: why specific environmental elements of the business should be decided upon in a market and in response to stakeholders, where in the organisation the most impact is located, and what proper measures could help this impact (Opresnik & Taisch, 2015).

As a means to investigate decision-making processes, this study uses parts of Schrettle et al.'s (2014) framework to explore this operationalisation. Despite the fact that the proposed framework is primarily designed for investigating manufacturing firms, this research suggests that its comprehensive approach makes it a valuable tool for examining the previous questions in a built environment setting. The proposed framework establishes various drivers and mediators that facilitate the integration of sustainability into an organisation's operations. Additionally, the framework outlines potential outcomes that may arise from such integration, as well as the interactions between these outcomes and the organisation's sustainability initiatives. The model suggests that an organisation's sustainability transition is mediated by various factors, including but not limited to prior performance, business size, and the current level of environmental activity. This set of drivers and mediators urges a shift in operational strategy towards new manufacturing technologies, environmentally friendly products, and supply chain efforts. The authors suggest that this change be either radical or gradual (see figure 2). Given the holistic nature of this framework, certain limitations are necessary to facilitate the investigation. Accordingly, two proposed mediators, namely knowledge management and the cost of technology, have been excluded.
More about these modifications are discussed in the sections dedicated to limitations. Therefore, this paper’s first question is: *How do real estate actors within the built environment decide upon organising sustainability aspects within their operations?*

![Diagram of decision-making process]

Figure 2: modified framework from Schrettle et al.’s (2014) framework is reviewed and related to the built environment in Section 2.

Moreover, many international standards have evolved in order to guide and facilitate the sustainability transition and to help organisations with the quality management of the implementation and reporting of their sustainability activities (e.g., ISO 14000, ISO 21929-1 and GRI). Other ESG metrics, ESG risk analysis, and international bodies produced ESG benchmarking to aid the corporate level in better comprehending the scope of applicability of sustainable action within the built environment (Vieira de Castro et al., 2020). In addition, several certifications and assessment benchmarks in the built environment (e.g., BREEM or LEED) provide independent verification of the sustainability performance of particular building types or building life cycle stages (Díaz-Lopez et al., 2019). These systems function as a set of rigorous criteria that impose certain success factors, tools, and data measurements at different levels within the built environment (Vieira de Castro et al., 2020).

While managing their traditional activities, actors in the built environment must deal with multiple sustainable operations management practices. These systems and certifications generate a sophisticated, interlinked information flow that the organisation must manage systematically. Investors, workers, and the entire value chain must thoroughly grasp them and how their metrics translate into actions (Vieira de Castro et al., 2020). For example, the company has to choose and oversee a green building certification while changing its operations to ensure environmental and social management systems are in place and its entire value chain reports on sustainability. There have been calls for integrating management systems and aligning these systems with operations and strategic planning (Roper & Beard, 2006; Vieira de Castro et al., 2020). Therefore, this paper’s second question is: *how do real estate actors within the built environment relate their decisions to established management systems and certifications?*
Management scholars should participate in research about the built environment to help stakeholders (policymakers, enterprises, and individuals) make better decisions and practices in this field. Previous research has called for a better understanding of the linkages among drivers, decision approaches, mediators, and outcomes of the decision-making processes for a sustainability transition. Understanding sustainability decisions within the built environment and its sustainability challenges provide opportunities to create a better-built environment from a systematic perspective. Thus, the study's theoretical framework is primarily based on Schrettle et al.’s (2014) framework and informed by management system theory. Both frameworks are employed to carry out the investigation within the context of the built environment.
2. Literature review

This section will elaborate on the built environment as a contextual framework for the study's investigation. Then, an introduction to the sustainable operations management research field and its relationship to the built environment will be established. The paper moves on to present a conceptual framework from the decision-making field. The management system theory is then introduced and contextualised.

2.1 Sustainability in the Built Environment - The Context

The built environment is a field in the literature that aims to study the "human-made space in which people live, work, and recreate on a day-to-day basis" (Roof and Oleru, 2008, p. 1); which includes buildings and their surrounding environment, belonging facilities, infrastructures, inputs of materials, and cultural elements. This field "addresses the design, construction, management, and use of these man-made surroundings as well as their relationship to human activities" (Wang et al., 2019, p. 11). As part of this environment, the real estate industry plays an essential role in the development of cities by providing the infrastructure that directly or indirectly serves human needs and economic possibilities. In addition, function, scale, and contribution to social and economic growth are connected and related to the importance of actors within the real estate industry (Zhang, 2015).

Changes in the global climate, energy shortages, urbanisation, infrastructure ageing, and economic growth paradigm shifts are all significant threats to the built environment (Wang et al., 2019). The notion of sustainability in this particular domain was initially introduced by evaluating the environmental sustainability of buildings (Lee, 2012; Berardi, 2012). Subsequently, it was broadened to encompass factors such as safety, health, and economic viability, incorporating a systemic approach by considering the three fundamental pillars of sustainability. Consequently, corporations operating within the built environment have realised a substantial role in the sustainable development of the environment, economy, and society (Priess et al., 2017; Kibert, 2016; Lewis, 2003).

Although sustainability as a concept has been widely discussed and incorporated for a long time by international bodies, industries, and researchers, there is still considerable confusion about what it means and whether it is implementable or not in the world of business and organisations (Contrafatto & Bruns, 2013; Gray, 2011; Gray & Milne, 2002). Sustainable developments should "meet the needs of the present generations without compromising the ability of future generations to meet their own needs" a definition offered by the United Nations Commission for Sustainable Development in 1987 to which various terms often refer (UNWCED, 1987).

Therefore, sustainability refers to the totality of human actions' potential to support life over time and concerning the world's physical state (Contrafatto & Bruns, 2013; Gray & Milne, 2002; Bebbington, 2007). Still, there exists a debate over whether theoretical sustainability discussions should be either business oriented (focused on growth and the contribution of technological advancements) or ecocentric (defining limits to the available resources on earth). This paper follows in the footsteps of Milne et al.
(2009) and Contrafatto & Bruns (2013) by finding a balanced perspective on understanding sustainability between these two sides.

Ecological efficiency in resource use and environmental and social fairness in resource distribution, both within and beyond generations, are central to the apprehension of sustainability. "Sustainability is really about two things: having both awareness of the fragility of living things, their ecosystems and the resources on which they depend; and about seeking to implement technical and economic efficiency with a soul and a conscience" (Roper & Beard, 2006, p. 1). This paper aims to contribute to the ongoing research on the applicability of this idea to the world of business and the ramifications it would have for organisations' activities (Nunes et al., 2021; Milne et al., 2009; Orsato, 2009). Additionally, contributing to research on the built environment has called for more studies to participate in the ongoing debate on promoting sustainable development through responsible management (Wang et al., 2019).

### 2.2 Sustainable Operations Management and its Relation to the Context

The research field of sustainable operation management (SOM) is expanding, with an emphasis on minimising the negative impact of operations’ inputs, processes, and outputs that businesses adhere to (Bettley & Burnley, 2008; Nunes et al., 2022). SOM engages in translating sustainability development goals inside an organisation into policies and strategic objectives. Also, SOM incorporates a set of tools and techniques that include operational-level sustainability considerations in light of the company’s competitiveness, return on assets, and organisational environment (Nunes et al., 2022). SOM takes into consideration both internal and external operations, including the organisation’s supply chain (Kleindorfer et al., 2005).

When making a product or delivering a service, operational decisions involve transformation processes within a global ecosystem, which consume a vast number of resources (including energy, water, and various types of materials) and produce waste (Hammond and Winnett, 2009; Bettley & Burnley, 2008). Furthermore, the company's operations expose individuals both inside and outside the company to hazardous working environments and repercussions. As a result, operations management is directly responsible for both the causes and remedies of many environmental and societal issues. Consequently, companies must take part in the pursuit of sustainable development on all fronts and make sustainable practises a reality (Kleindorfer et al., 2005; Walker et al., 2014; Nunes et al., 2022).

Hence, SOM provides a challenge to the decision-making and assessment of conventional performance objectives of operations management, such as quality, cost, speed, reliability, and flexibility, by necessitating the incorporation of sustainability factors (Nunes et al., 2022). To meet the sustainability challenge, current operational and management practises must be revisited and improved to integrate sustainable practises, which in turn has a significant impact on the decision-making process of manufacturing firms in developing their policies and strategies (Schrettle et al., 2014).

Researchers call for the establishment of frameworks in operations management that can facilitate, endorse, and maintain sustainable practises in the built environment. Organisations within the built environment seeking to establish a competitive edge through sustainable practises must first comprehend
and devise strategies that account for the internal and external drivers of sustainability at the corporate level, portfolio level, and building level (Vieira de Castro et al., 2020; Wang et al., 2019; Kibert, 2016). Also, comprehend sustainable development’s fundamental objectives, how it pays off, its time-related dimension, and its operational implementation (whether internal or external) (Hart and Milstein, 2003; Orsato, 2009). The strategy for this type of work is industry-specific, as an organisation’s capabilities, products, and processes are mutually influenced by and influence the strategy at hand (Orsato, 2009).

Complexities in the built environment’s existing business models provide challenges for businesses operating at every stage of the value chain (Vigren 2022; Wang et al. 2019; Kibert 2016). This calls for a rethinking of current approaches to sustainable pricing, cost analysis, and valuation (Priess et al., 2017; Roper & Beard, 2006). By using a variety of tactics, the business has to transform its current, non-sustainable business model into one that can achieve success in the future. Among these tactics are the establishment of sustainability-related goals and objectives, the use of sustainability-related performance measures, and the creation of a new business model (Nunes et al., 2022).

### 2.3 The Framework of Sustainability Decision Making

The previously mentioned challenges will pressure leaders within the built environment to make decisions on motivating and organising sustainability initiatives. Therefore, managers need to answer and connect the following questions: why (triggers, mediators, and outcomes); where (strategic and tactical operational) the most impact should be made; and what (technology, supply chain initiatives, and new or adjusted products) appropriate measures could help this impact (Opresnik and Taisch, 2015; Signes and Diez, 2021).

Research on the built environment has called for more studies to support answering these questions (UNEP FI, 2014; Priess et al., 2017; Wang et al., 2019). Also, the operations management research on sustainability integrations suggests more updated (Nunes et al., 2022) and adjusted (Signes and Diez, 2021) frameworks for the industry studied (Orsato, 2009). In order to explore these questions, this paper finds the theoretical framework suggested by Schrettle et al. (2014) helpful in breaking down the questions into parts. It also adds a “how” question relating to the transition approach, whether it’s radical or incremental.

#### 2.3.1 Triggers and Mediators

Regulations, societal norms, and market demands are all examples of external triggers for sustainability decision-making, along with internal triggers like a company’s principles, strategy, and capabilities (Banerjee, 2001; Etzion, 2007; Schrettle et al., 2014). Schaltegger (2011) argues that organisations need to consider non-market processes with a risk focus, including social and regulatory factors, that can impact the firm’s market position. This implies that market strategies focused on economic value creation are not the sole driver of competitiveness. Within the built environment, this is reflected and discussed by new valuation standards that started to include risk assessment metrics related to the triggers, as mentioned earlier, that property valuation agencies use (RICS, 2015). Consequently, strategic choices must consider impacts that are not inherently linked to the organisation’s operational activities.
Past firm success, firm size (resource capability), and the present level of sustainability action are organisation-specific factors that are proposed to have a mediating effect on the sustainability transition of the organisation (Schrettle et al., 2014). Also, past firm success impacts sustainability strategy renewal and resistance to change (Lant et al., 1992; Miller, 1993; Ferrier, 2001). High-performing firms won’t change their business plans unless they become more viable. Poor past performance raises the likelihood that firms incorporate sustainability into their business plans because current business practises are getting doubted and argued. This urgency makes them more likely to differentiate themselves from competitors by building a sustainable firm identity (Lant et al., 1992; Miller, 1993; Ferrier, 2001).

Strategic initiatives need money and people; therefore, prominent firms can undertake more sustainability projects with longer durations, and firm size moderates the relationship between sustainability drivers and sustainability efforts (Schrettle et al., 2014). Large firms can invent new products, GSCM, and manufacturing processes, while low-resource capacity firms must make the best choice. Investments may limit the resource capacity of the firms’ sustainability efforts before returns (Ibid.). Additionally, past sustainability choices and investments affect future environmental efforts. Low-environmental-action firms will face more pressure from sustainability drivers like government, customers, and rivals than high-environmental-action firms that meet sustainability standards (Pil and Rothenberg, 2003; Eisenhardt and Martin, 2000; Teece et al., 1997).

Different industries have different product-service attributes, so controlling customer preferences is necessary to study the connection between sustainability efforts and performance. Studies on sustainability efforts and firm performance have indicated different results depending on whether they are extra financial expenses that reduce profits or whether efficiencies are gained, and growth opportunities contribute to increased profits and competitive advantage (Luchs et al., 2010). This makes customers’ behaviours a catalyst for more sustainability initiatives. Implementing sustainable practices within the built environment has a significant strategic impact, such as lower operating costs and improved occupant performance (Lewis, 2003), and a willingness to pay a premium rent for sustainable spaces (Ellison & Sayce, 2007).

### 2.3.2 Approach and Action

These triggers and mediators are proposed to set the stage for increasing or decreasing strategic (radical - long-term focused) and/or daily (short-term focused) operational practices (Schrettle et al., 2014). The short-term focused sustainability transition reacts to these triggers when they intensify, calling for immediate action (Ibid.). The strategically focused transition leads by exceeding the expectations of regulators and policymakers, therefore giving more attention to the long-term benefiting sustainability transition (Ramanathan et al., 2010). Given the changing demands of stakeholders and the necessity for novel products and business models that align with sustainable industrial systems, researchers identified three sustainability-related business priority areas. These are mainly regarding Lean, green operations, green-product design, and closed-loop supply chains, which were the most significant sustainability concerns in operations management (Nunes et al., 2022; Schrettle et al., 2014; Kleindorfer et al., 2005).

Actively pursuing sustainability can trigger a feedback loop on a firm’s internal drivers. When sustainability is firmly embedded in a company’s operations and management fully embraces it, it dramatically improves resource allocation, strategy, and corporate culture (Etzion, 2007). Disciplined
sustainability activity execution can grow human resources and institutional abilities by creating a supportive culture and focused strategy processes (ibid.). Organisations concerned with their future sustainability must incorporate environmental and societal concerns into their operations (Ertz and Leblanc-Proulx, 2018; Signes and Diez, 2021).

2.3.3 Firm and Sustainability Performance

The sustainability transition is proposed to have three main components; sustainable products, sustainable initiatives within firms’ value chains, and investments in new technology (Kleindorfer et al., 2005; Ijomah et al., 2007; Schrettle et al., 2014). Through this change, a new business model allows for differentiation in cost and competitive focus (Orsato, 2009). This evolves as new products and services are made or changed, the traditional operation model is replaced with a total product system, and new performance goals and indicators are set up that include references to the sustainable development goals (Walker et al., 2014; Nunes et al., 2022).

Sustainable operations design may evolve in which more attention is given to the product service system perspective, optimisation of life cycle performance, engagement of stakeholders, and integration of reverse supply chains when designing sustainable operations (Bettley & Burnley, 2008). Consequently, sustainability performance is part of the decision-making process while keeping firm performance in mind (Schrettle et al., 2014). This results in an interaction between sustainability performance measurements and the strategising of organisational change (Contrafatto and Burns, 2013). This is discussed from two points of view, the customer’s willingness to pay and the threshold to which investments in sustainable practices pay off (Schrettle et al., 2014).

Sustainable investments within the built environment have led to higher building value, productivity gains, and environmental gains (Priess et al., 2017). Facilities with sustainable elements have a long-term beneficial impact on employee productivity, job satisfaction, and energy costs (Roper & Beard, 2006). Furthermore, social sustainability practices allowing an ethical, feasible, and viable response to resource consumption and the health of the building’s users (Lewis, 2003; Kibert, 2016). Moreover, investments in green buildings may result in a tenfold return on investment (Kats, 2003). However, businesses with a proactive approach to sustainability have a tendency to invest in green initiatives beyond what is economically feasible or sustainable (Orsato, 2009; Schrettle et al., 2014). Therefore, while managing operational performance, operations managers must deal with tradeoffs, prevent high administrative costs, and reduce uncertainty (Nunes et al., 2022; Orsato, 2009).

2.4 Management Systems and Certifications within the Built Environment

In the real estate sector, corporate real estate managers can make a difference in their industry and the world by putting in place sustainable operations in their building portfolios by participating in formulating and implementing policies for reducing the organisation’s environmental and social impact (Alexander, 1996; Roper & Beard, 2006; Kibert, 2016). Sustainable operations in the real estate sector aim for total quality and responsible use of natural resources to conserve scarce resources, reduce energy consumption, and improve environmental quality (Kibert, 2016). Consequently, internal and external
demands for this shift intensify as several international standards are adopted (e.g., ISO 14000 and GRI),
certifications are obtained, and assessment benchmarks are established (Díaz-Lopez et al., 2019).

Many management systems have arisen as a result of early efforts by firms to fulfil the expectations of
different stakeholders regarding customer satisfaction, cost reduction, and long-term competitiveness
(Foley, 2005). This has prompted managers to place greater emphasis on systematic and standardised
approaches to managing the quality management of processes, their inputs and outputs, environmental
risk assessments, social responsibility, and leadership. Measurements and assessments of the level of
compliance with these requirements are conducted by management. These measures provide a
comprehensive understanding of the organisation’s progress towards more controlled operations. These
systems could become integrated into a single bundle of interrelated processes that utilise one pool of
resources (e.g., inputs, information, infrastructure, and finances) in order to meet a set of stakeholder
satisfaction-related objectives (Karapetrovic and Willborn, 1998; Karapetrovic; 2003). As an approach to
meta-management, integration is the coordination of all the organisation’s sub-systems (e.g., quality into
a coherent system that works as a unified whole (Asif et al., 2010).

Similarly, environmental consciousness has prompted the creation of grading systems that evaluate a
building based on sustainable criteria over its whole lifespan. Building certification systems aim to ensure
that sustainable practises are considered at every stage of the building life cycle (from conception to
demolition). Quality systems, sustainability reporting rules, and the UN's Sustainable Development
Principles are also considered. Analogously, rating bodies are green certification systems that provide
impartial and objective assessments of a building's eco-friendliness (Vieira de Castro et al., 2020; Bamber
et al., 2002).

Since these systems and standards may be implemented independently, the organisation faces many
strategic challenges (Labodova, 2004). It could only partially realise its underlying strategic goals (Asif et
al., 2008). Existing standards and systems were changed, and new standards were developed to include
the needs of additional stakeholders in the creation of the organisation's strategy, imposing extra
complexity (Asif et al., 2010). Therefore, the plurality of sustainability models, standards, and
certifications may complicate sustainability integration, assessment, reporting, strategy, and practical
decision-making. Vieira de Castro et al. (2020) show how the corporate, portfolio, and individual building
levels of a real estate company's structure all play a role in the dissemination of the linked sustainability
agencies’ reports.

Thus, management systems produce a complex, connected information flow that must be managed and
understood by investors, workers, and the entire value chain through goals and actions. It is suggested
that real estate actors in the built environment must improve their synchronisation with the ecosystem
(Vigren, 2022) and combine systemic approaches, including environmental management systems (Roper
& Beard, 2006). In the literature, industries and researchers have called for the integration of management
systems into one system based on finding commonalities and dealing with their vulnerabilities (Thomé et
al., 2016; Rebele et al., 2015; Ivanova et al., 2014). Additionally, sustainable operation management
requires an aligned strategy, structure, and management system to coordinate the organisational activities
and influence the staff members. The sequences of inputs, processes, and outputs are recognised as key
performance drivers (Gianni et al., 2017). Hence, a management system with integrated guidelines and
regulations might provide and add corporate sustainability with control mechanisms as part of the whole (Gianni et al., 2017; Cheng et al., 2010; Hahn et al., 2010).

2.5 Limitations of the Theoretical Framework

There are several theoretical limitations to the previous literature study. Nunes et al. (2022) have presented a comprehensive framework for sustainable operations management that covers many aspects of an organisation’s value chain. The present study has not examined or critically reviewed the research on sustainable supply chain management. The scope of our theoretical research was limited to examining the decision-making processes in relation to the operations of the organisations under investigation, despite the potential benefits of a more comprehensive approach to sustainability management. Subsequently, two proposed mediators, namely knowledge management and the cost of technology, have been excluded from the proposed framework by Schrettle et al. (2014). As the authors did not test or suggest interdependence among the areas of investigation in the framework but rather proposed them, this study concludes that the modified framework is still comprehensive and meaningful for conducting research. Moreover, we have limited the problematisation of management system theories to their complex nature in relation to decision-making by practitioners within the built environment.

Furthermore, during the process of our literature review, we discovered that a certain amount of the research on sustainable operations management had been approached from an engineering standpoint. As a result, we chose to focus on theories that are relevant to our investigation concerning the processes for making decisions. Therefore, no particular sustainability technologies that engineers may look into have been looked into. In addition, due to the operational nature of the questions, we avoided any particular accounting approaches or practises in relation to sustainability. It is important to note that our research and problematisation were not limited to any particular sustainability domain, as we aimed to engage in comprehensive and insightful dialogues with the participants. Finally, we propose some ideas about future research in these areas in the future research section.
3. Research Methods

This section will present the ontological and epistemological foundations of the study. Subsequently, we clarify our approach to conducting this research, the criteria upon which our sample and selections were based, and the manner in which we have operationalised our research questions. The chapter ends with a summary of the ethical foundations and trustworthiness aspects that were taken into account in the study.

3.1 Research Strategy - Qualitative Approach

The research paper aims to investigate how real estate actors within the built environment make decisions regarding sustainable operations and how they relate those decisions to established management systems and certifications. In order to achieve this purpose, we employed a qualitative approach. This research is based on recognising that human cognition, value, interest, and motivation are inseparable components of social reality. This approach allows us to study a phenomenon as a process instead of entities (Bryman & Bell, 2019). Taking an epistemological interpretivism stance helps us comprehend the decision-making process, the factors that go into making a choice, and the consequences of that choice for the operational procedure. The truth for this study is socially constructed through interpretations of the interactions of individuals within the context. Therefore, it is essential to understand the way in which managers interpret practices in conjunction with diverse functions and processes in order to gain answers to the research questions (Bryman & Bell, 2019). Furthermore, by implementing the abductive approach, we reduced the level of theoretical explanations; We increased the number of concepts, allowing us to shift our level of theorising and analysis from the micro level to a level that includes broader perspectives (Bryman & Bell, 2019). The research question justifies the choice of a qualitative methodology, as it offers comprehensive and detailed representations of the issues under analysis.

3.2 Research Design - Comparative Multiple Case Study

We employed comparative design, utilising a multiple case study approach to investigate the decision-making of six real estate organisations operating within the Swedish built environment. The objective is to examine and better comprehend a social phenomenon in terms of what is common and unique among the cases in order to enrich the study’s theoretical findings (Swanborn, 2010). Since real estate organisations build, operate and sell properties in various forms, we find them the most appropriate actors to include in our study. This is because their decisions and actions majorly affect the supply chains. Case studies are a research methodology employed to examine a particular location, institution, or individual. Comparative design is implemented by utilising comparable techniques. The application of comparative logic has the potential to facilitate comprehension of diverse scenarios across various analytical levels (Swanborn, 2010; Bryman & Bell, 2019). The present study has looked into the analysis levels of corporate, portfolio, and single-building levels within the studied organisations (recall figure 1). The utilisation of multiple case studies may offer several advantages, including enhanced interpretability, better arguments, increased precision, and stability of findings. Also, this approach becomes a natural step for discussing the results of a paper focused on studying organisations with varying ownership structures, sizes, and past performance of sustainability actions (Bryman & Bell, 2019).
The use of multiple case study approaches has been criticised due to the risk of emphasising the discrepancies between cases over the contextual nuances of each case study. This risk can be mitigated by adopting a more open perspective at the start of a study, prior to searching for differences. One potential criticism of combining levels of analysis is that it could result in misunderstandings and a less detailed analysis of the interrelationships between distinct analytical levels. In order to prevent ambiguity, it is imperative for the researcher to establish a clear understanding of the analytical level being examined during the investigation of the cases (Rousseau, 1995).

3.3 Methods for Data Selection

We gathered the data through online semi-structured interviews, annual reports, and secondary documents. The formulation and post-processing stages of interviews involved the utilisation of annual reports and secondary data. The utilisation of diverse data sources and consultation with three experts yielded a substantial dataset that was subjected to thematic analysis. According to Bryman and Bell (2019), the utilisation of triangulation techniques can effectively improve the gathered data, ultimately leading to increased validity of the study results. In contrast to a quantitative methodology, the qualitative approach employed in this paper collects less standardised data and allows for the potential for elaboration. The most notable aspect of this matter is the respondent's comprehensive and specific responses (ibid.).

3.3.1 Selection of the Studied Organisations

To ascertain the selection of companies, we had to establish criteria for this selection that outline the cases, clarify the constraints, and identify the unit of analysis (Merriam, 2010). Concentrating on a specific cluster of enterprises that exhibit comparable traits makes it easier to develop more tangible frameworks that focus on addressing sustainable issues and enabling factors (ibid.). There had to be a potential for standardisation among the participating organisations to function within identical industries and/or encounter comparable economic and societal circumstances (Ibid.). It has been determined that the context of this study is the built environment in general and in Sweden in particular. Therefore, the primary actors within our study are Swedish real estate actors. These actors share a similar institutional environment, although they may be affected by it to varying degrees. These businesses engage in comparable construction, management, and leasing processes. Nonetheless, we have selected organisations based in various geographical locations in Sweden to determine whether there are any interesting differences (see table 1). The actors in question adopt distinct portfolio strategies for commercial and residential properties. Additionally, the ownership structures of the participating organisations vary, as we analysed three municipally owned companies (referred to as municipal companies in this paper), two private companies, and one publicly traded company.

3.3.2 Semi-structured Interviews

We use semi-structured interviews with open-ended questions because they are characterised by their flexibility and adaptability to the flow and trajectory of the dialogue with the participants (Qu & Dumay, 2011). A criterion for the selection of respondents was required (Merriam, 2010). Because the purpose of the study is to gain in-depth knowledge of organisational decisions and practices, the interviews had to
discuss how individuals who play a role in initiating, facilitating, and developing these practices make decisions. Therefore, we determined that the candidate must be a senior, middle manager, or co-worker who coordinates and makes decisions regarding sustainable practice operations. In addition, they must be specialists in this field. As a result, we conducted interviews with six participants from six distinct real estate organisations and four experts who met these criteria (see Table 1).

The initial communication was established through e-mail with prospective participants in every organisation. The purpose of the email was to grab the respondents' interest in the proposed research ideas while also providing contextual information about the paper, its significance, and the focus of our study. Due to the geographical dispersion of the participating organisations and the participants' limited availability, interviews were conducted online. In addition, we sought to minimise the possibility of interruptions during the interviewing process and obtain clearance of recordings. Most interviews are recorded and transcribed. It has been observed that the process of recording an interview can induce a sense of insecurity in respondents, thereby hindering their ability to provide honest responses (Qu & Dumay, 2011). This has posed a significant challenge for researchers to overcome. Utilising coding techniques for respondents' names and the names of their respective organisations (See Table 1) was a method for mitigating respondents' potential insecurity. Additionally, it should be noted that the interviews were conducted in Swedish, whereas the thesis is written in English. Consequently, it is possible that some transcripts will be lost in the translation process. The interview recording mitigates and avoids this risk and constraint.

The interviews were structured to avoid casual talk through the identification of important topics and ideas drawn from the framework of Schrettle et al. (2014) and the literature review on management systems and certifications (see Appendix A). As a result, we could have more flexibility to elaborate on questions and answers during the interviews. In accordance with this approach, the interview's sequence of questions didn't need to adhere to our predetermined structure, even if that was our original intent. However, we preserved the structure for the purpose of ensuring the significance of the comparison, as suggested by Qu and Dumay (2011). First, we did an interview guide for all participants that are employed by the studied real estate organisations that included questions that regard the following structure: pressures, mediators, approaches, actions, sustainability performance, and firm performance (see Appendix A for more details). After having analysed the interviews, we discussed our findings with the experts and asked them questions regarding the relationships of the findings with management systems and certifications to understand their perspectives in relation to the industry as a whole.

Following a series of interviews with the participants employed by the organisation under study, it was observed that a substantial number of the insights obtained from the last four interviews were repeated. This was understood as a positive indication that could potentially suggest that the study was nearing a stage where a sufficient amount of information had been acquired. It is important to note that O'Reilly and Parker (2012) argue that achieving data saturation in inductive research may not be feasible, given that the range of themes that can arise from a data set might be unlimited.
<table>
<thead>
<tr>
<th>Organisation</th>
<th>The organisation’s characteristics</th>
<th>Respondents</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>A multinational company, the portfolio is mainly commercial properties. Publicly held company.</td>
<td>PA - Regional sustainability manager.</td>
<td>Approx. 60 min</td>
</tr>
<tr>
<td>B</td>
<td>A national company, the portfolio is mainly commercial properties. Privately owned.</td>
<td>PB - Head of sustainability department.</td>
<td>Approx. 60 min</td>
</tr>
<tr>
<td>C</td>
<td>A municipal company in the south of Sweden, the portfolio is mainly housing.</td>
<td>PC - Sustainability manager.</td>
<td>Approx. 60 min</td>
</tr>
<tr>
<td>D</td>
<td>A municipal company in the Stockholm region, the portfolio is mainly housing.</td>
<td>PD - Organisational developer.</td>
<td>Approx. 60 min</td>
</tr>
<tr>
<td>E</td>
<td>A private company, the portfolio is mixed in commercial spaces and housing. Its main geographical area is in the Stockholm region.</td>
<td>PE - Sustainability manager.</td>
<td>Approx. 120 min</td>
</tr>
<tr>
<td>F</td>
<td>A municipal company in the north of Sweden, the portfolio is mixed commercial spaces and housing.</td>
<td>PF - Sustainability manager.</td>
<td>Approx. 60 min</td>
</tr>
<tr>
<td></td>
<td>Organization Description</td>
<td>Participants and Their Merits</td>
<td>Time Spent</td>
</tr>
<tr>
<td>---</td>
<td>--------------------------</td>
<td>--------------------------------</td>
<td>------------</td>
</tr>
<tr>
<td>G</td>
<td>A branch organisation within the real estate sector.</td>
<td>PG - Expert in climate action and previous work with sustainability within the real estate sector.</td>
<td>Approx. 60 min</td>
</tr>
<tr>
<td>H</td>
<td>A consultancy.</td>
<td>PH - Expert in management system tools and previous work with sustainability within the real estate sector.</td>
<td>Approx. 60 min</td>
</tr>
<tr>
<td>I</td>
<td>A consultancy.</td>
<td>PI - Expert in sustainability management systems and previous work with sustainability within the real estate sector.</td>
<td>Approx. 60 min</td>
</tr>
<tr>
<td>J</td>
<td>An established bank.</td>
<td>PJ Bank employee (expert) with a duty to investigate green finance of real estate projects. Took part in the interview with PB.</td>
<td>Approx. 60 min</td>
</tr>
</tbody>
</table>

Table 1: The table describes the participating organisations and an important characteristic, the participants and their merits, and the time spent on each interview with each participant.
3.4 Data Analysis

3.4.1 Operationalisation of the Research Question

The present study's operationalisation delineates the methodology for investigating and analysing the research question (Bryman & Bell, 2019). We defined the study's theoretical focus by sub-themes that stem from the research question and the study's purpose. The determination of data collection methods has been based on the theoretical sub-themes. Then, after that, we analysed all data sources, and empirical themes were generated through the generated codes for the critical quotations. This paper asks two questions:

1. *How do real estate actors within the built environment decide upon organising sustainability aspects within their operations?*

2. *How do real estate actors within the built environment relate their decisions to established management systems and certifications?*

The theoretical framework by Schrettle et al. (2014) and research questions give rise to the following theoretical sub-themes:

- **Sustainability decision-making motivators and mediators**

Through this subtheme, we categorised and investigated the motivators and mediators of sustainability decision-making. Then, all the generated empirical themes were analysed in relation to the codes that are generated by the management systems utilised by the studied organisations. The collection methods for this subtheme were primarily interviews and internal and external documents.

- **Sustainability decision-making approach and actions**

Through this subtheme, we categorised and investigated the sustainability decision-making approaches and actions carried out by the studied organisations. Then, all the generated empirical themes were analysed in relation to the codes that are generated by the management systems utilised by the studied organisations. The collection methods for this subtheme were primarily internal and external documents. Interviews will be complementary.

- **Sustainability performance and firm performance**

Through this subtheme, we categorised and investigated the sustainability decision-making performance and outcome measured and controlled by the studied organisations. Then, all the generated empirical themes were analysed in relation to the codes that are generated by the management systems utilised by the studied organisations. The collection methods for this subtheme were primarily internal and external documents, in addition to interviews.
3.4.2 Documents Analysis

The process of documentation analysis involves the interpretation and investigation of documents to derive meaning, comprehension, and empirical findings within the context of the research being conducted. (Bowen, 2009). We gathered and analysed documents that are either publicly available online and produced by the organisation or internal documents that the respondents have provided. These documents predominantly contain text but include engaging visual representations of various concepts (Ibid.). The objective of scrutinising the annual and sustainability reports is to verify the information obtained from the respondents during the interview process. They provide more details about the organisation’s green transfer strategies. These reports also help formulate further inquiries to comprehend sustainability practises. In addition, the organisation offers supplementary details regarding the motivators and reports on the management systems and sustainability certifications it has chosen to adopt. The objective of examining internal documents, processes, and reports is to gain an in-depth understanding of how management decisions are disseminated.

3.4.3 Thematic Coding and Network Analysis

We used thematic coding to identify, analyse, organise, describe and report on themes (patterns) in respondent answers (Braun & Clarke, 2006). Thematic analysis is a flexible technique that can be adapted to fit the needs of a variety of research projects. It produces a thorough and nuanced examination of the data and is relevant to a number of research epistemologies and problems (ibid.). This paper’s abductive method implies that helpful themes will be built from theory and empirical data. This is to assess how actuality relates to theory and whether empirical additions to current knowledge are possible (King & Brooks, 2019). The previously mentioned sub-themes helped operationalise the research questions to guarantee a consistent process, followed by discovering and studying empirical data (see chapter 3.4.1).

Using codes, researchers may eliminate irrelevant information and focus on the most critical factors (ibid.). During the coding process, we identify significant parts of the collected textual data (quotations) that demonstrate the qualitative magnitude of the issue under study and indicate them with codes (labels) that relate them to a theme or issue in the data. We reviewed all the data and coded the important quotations from the interview transcripts. Moreover, we used parallel coding (King & Brooks, 2019) because one text can pertain to multiple codes. After all the data was coded, codes with little effect or meaning were removed. The codes that were backed by the most relevant quotations were then grouped together based on their similarity to form empirical sub-themes. Then, the codes and sub-themes were compared by analysing the most frequently occurring codes and code categories across all participating organisations to generate insights regarding differences and similarities within a code and a category (see table 2). Finally, the empirical sub-themes are grouped and contrasted with the theoretically generated themes.
Figure 3: An example of the code category “Sustainability performance” and a few codes that generated this category, which was then contrasted with the theoretical subtheme.

Table 2: An example of the comparison of the number of occurrences of codes within three code categories that were cross-analysed between three of the participating organisations.

<table>
<thead>
<tr>
<th>Quotations</th>
<th>Empirical codes</th>
<th>Empirical sub-themes</th>
<th>Theoretical theme</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quotation 1, 2,..., n</td>
<td>Sustainability pay off</td>
<td>Sustainability performance</td>
<td></td>
</tr>
<tr>
<td>Quotation 1, 2,..., n</td>
<td>Past sustainability performance</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Quotation 1, 2,..., n</td>
<td>Sustainability award</td>
<td></td>
<td>Firm performance</td>
</tr>
<tr>
<td>Quotation 1, 2,..., n</td>
<td>Sustainability measurement</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Quotation 1, 2,..., n</td>
<td>Sustainability performance</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Quotation 1, 2,..., n</td>
<td>Management system efficiency</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Quotation 1, 2,..., n</td>
<td>Profiting of management systems - quality models</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Quotation 1, 2,..., n</td>
<td>management system comparison</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 2: An example of the comparison of the number of occurrences of codes within three code categories that were cross-analysed between three of the participating organisations.

<table>
<thead>
<tr>
<th>Code categories/organisations</th>
<th>Org A</th>
<th>Org B</th>
<th>Org C</th>
<th>Totals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Certifications</td>
<td>26</td>
<td>31</td>
<td>2</td>
<td>59</td>
</tr>
<tr>
<td>Energy efficiency</td>
<td>5</td>
<td>4</td>
<td>8</td>
<td>17</td>
</tr>
<tr>
<td>Pressures</td>
<td>28</td>
<td>20</td>
<td>16</td>
<td>64</td>
</tr>
<tr>
<td>Totals</td>
<td>59</td>
<td>55</td>
<td>26</td>
<td>140</td>
</tr>
</tbody>
</table>

Then, we analysed what each theme captures and identified what is of interest about them and why to build the stories about the insights that were generated from the collected data. We also utilised thematic networks to deconstruct themes and relate codes to each other in order to identify explicit proofs and their underlying implications. Thematic network analysis is a technique for organising thematic analyses of qualitative data. Lowest-order premises, categories of fundamental themes, and superordinate themes are systematically extracted and illustrated as web-like maps (Attride-Stirling, 2001). Figure 4 represents a non-structured example of the network of the subtheme "actions," while Figures 5 and 6 depict more structured code groupings later in the paper.
The research used an intercoder comparison to prevent differences that may occur due to various perceptions and interpretations (O’Connor & Joffe, 2020). This means that the researchers have compared the codes produced from the data during the study to ensure that the themes are of high quality. Each researcher then managed the codes of the others to inspire new views on the data (King & Brooks, 2019). Intercoder comparison has been criticised for strengthening the scholars’ agreement and thus achieving no truth (O’Connor & Joffe, 2020). This research shows that these critics do not conflict with the adapted epistemological ground; therefore, the technique is applicable.

3.6 Research Ethics

Adhering to ethical principles is of utmost importance for us when conducting semi-structured interviews. The Swedish Research Council (2017) points out the importance of researchers prioritising the safeguarding of individual privacy interests during the course of their research while also mitigating any potential risks or harm. In order to satisfy the information requirement, the study’s objective and the protocol for handling interview data, we have effectively communicated to the interview participants. We provided the details of the information and the protocols surrounding anonymity, and the recording of the interview was initially communicated via e-mail and subsequently stated at the onset of the interview. The respondents chose to attend the discussion independently and then agreed to the study’s use of citations from the interviews. Additionally, there is the potential for withdrawing from the interview process and indicating any confidential information that the authors should not reveal. The practice of anonymising interviews and companies is considered a suitable measure to prevent the disclosure of ethically sensitive information to unauthorised individuals (Alshenqeeti, 2014).
3.7 The study’s Authenticity and Trustworthiness

The relevance of validity and reliability in establishing trustworthiness is typically not emphasised in qualitative research. The qualitative methodology does not aim to ascertain objectivity and universal generalisations. The rationale behind this phenomenon can be attributed to the epistemological and ontological presuppositions of the methodology in question. This methodology seeks to comprehend, analyse, and engage in extensive discourse (Slavitch, 2011; Bryman & Bell, 2019). Lincoln and Guba (1985) have discussed the four primary criteria, namely “credibility,” “transferability,” “dependability,” and “confirmability.”

The confirmability criterion is fulfilled in this study by utilising citations that have been said during the interviews. The establishment of credibility is typically achieved through a rigorous process of peer review, effective communication, and solicitation of respondent feedback regarding the findings. Additionally, triangulation of methods is often employed to enhance the overall validity of the research. The study’s dependability is enhanced by ensuring transparency regarding the methods used and documenting the process accordingly. Transferability is sought by giving information about empirical data (relevance of the setting, organisations, and respondents), rich analysis of the results in connection to the shared theory frameworks, and data collection.

Employing diverse data collection techniques, such as conducting interviews and analysing documents, enhances the credibility of a qualitative investigation and constitutes a reliable strategy for comprehending intricate social phenomena within organisational contexts. (Bryman & Bell, 2019). In order to strengthen the credibility of a study, it is recommended for the interviewer to minimise the presence of biased questions. The consideration of interviewer views and potential merit overloading is also important; This lowers assumptions and misunderstandings about what is said and requested during the discussion (Cohen et al., 2007, Alshenqeetis 2014). The research conforms to Alshenqeetii’s (2014) recommendations of refraining from posing suggestive questions and allowing the respondents to elaborate upon and summarise their responses.
4. Empirical Findings and Analysis

In this section, we provide the study's most consistent empirical findings and offer theoretical interpretations of those results. In some cases, we provide network analysis developed through a set of connected empirical codes and subthemes.

4.1 Sustainability Operations must Comply with Multiple Pressures.

Our findings illustrate the role outside influences play in the transition and operationalisation of the sustainability work of the participating real estate actors (Schrettle et al., 2014). Companies that possess a well-defined sustainability operational strategy have demonstrated clarity in managing stakeholder expectations, as noticed in their annual reports and interviews with participants in four of them (A, B, C, and F). In order to manage stakeholders' pressures, all participating real estate organisations conduct stakeholder mapping through “...stakeholder expectations surveys and analyse stakeholder expectations for the operations...” which is seen as “...a prerequisite for creating sustainable value...” (PB). Subsequently, a comprehensive materiality analysis was conducted to determine the critical areas of focus for the organisation's strategy. Then, after operating in accordance with the sustainability strategy, the organisations developed a sustainability report, which incorporated a range of measured indicators pertaining to stakeholder satisfaction and sustainability concerns. Additionally, relevant indexes were reported on to provide information on the organisation's performance in these areas.

All participants identify "multiple perspectives and many different stakeholders" (PA) with overlapping and sometimes conflicting interests. Many stakeholders' expectations imply “binding requirements must be followed, otherwise [the organisation] will receive a sanction fee” (PI). Such pressures on the firm's sustainability transformation were identified by all participants, which included government bodies, regulatory agencies, owners, customers, and suppliers, as well as an extended "society approach" (PB) that includes "research and reports coming from the international community" (PA). This comprehensive approach to mapping stakeholders "reaches beyond the properties themselves," including their neighbouring environments (A's annual report).

The pressures exerted by public agencies, regulatory bodies, and shareholders have been reflected in the organisation's materiality analysis and operational decisions. This contrasts between municipal corporations, which are governed by municipal directives, and private and public corporations, which are affected by direct EU directives "from the owner's perspective, the pressure on this issue is also much clearer" (PB). Participants from private and public companies recognise that shareholders expect operations to implement sustainable changes, as reflected in their published policies and sustainability reports. This means that the companies cannot ignore environmental policies and laws established by the government, municipalities, and the European Union, as doing so would have severe legal and reputational implications (Banerjee, 2001; Etzion, 2007). Each organisation disclosed how they modify
and align the organisation's objectives, operations objectives, and activities with these directives. As stated by PB:

“...all sustainability work up until now... has been based on voluntary efforts, and lots of voluntary certifications, and voluntary frameworks. And now there is a lot that is no longer voluntary but is now mandated. Until a couple of years ago, when it became a significant part of the strategy conference, and then it was like half the board meeting was about sustainability-related issues, and they wanted information about how we are doing with the EU taxonomy; they wanted to know how we plan to meet the new reporting requirements”.

Organisational approaches to sustainability transition vary, even though municipal real estate organisations share a common ownership structure, stakeholder groupings, and portfolio structure. This variation depends on the degree to which politics promote this transition since “the municipality is the owner, and politicians sit on the board” (PI). This variation was illustrated by PC's explanation of the organisation's historical political pressure to become a leader in sustainability: "So there is engagement in politics and the municipal group, (...), which is why all companies in the municipal group were given the task of becoming leaders in sustainability, not only as a brand but also to drive the local business community".

The effects of customer preferences on operational decisions (Nunes et al., 2022; Schrettle et al., 2014) in the study’s findings vary substantially based on the tenant portfolio of the organisation, whether the tenant portfolio consists primarily of commercial or residential spaces. This consumer pressure theme is most prevalent in organisations with commercial tenants; as PA stated, “an ordinary person who rents a home has no requirement for sustainability reporting. But companies do have that requirement, and it's only for those above a certain turnover or number of employees, ..., and then the space they occupy becomes part of that effort. ...So we have received questions from tenants about whether the space they are in complies with the EU taxonomy, and I receive questions about the energy use of the building, and whether it has recycled materials, and if there are co-working spaces”.

Commercial customers also put pressure on the organisation to adopt specific management systems and certifications in order to comply with their demands (Asif et al., 2010; Foley, 2005), as it is observed by PB in how “over the past ten years, it has gone from being a single customer to almost all customers having it on their list of requirements that we should be environmentally certified and/or [X] certified”. Also, sustainability managers compare and choose between various building certifications strategically because “tenants care about whether their property is EU green or not... what we have seen over the past ten years is that customers who demand x1-certification can be persuaded to rent a x2 certified building instead when we show how much broader x2 is. But it's difficult if it's a global company that has a standard that we should sit in x2 certified buildings... Then it becomes such that here [A-competitor] builds a building and it is [x2] certified, so then the customer sits there. So the customer doesn’t need to explain to their boss” (PB).
4.2 A Strategic Approach Facilitates Sustainability Transitions and Makes Resources Available.

The actions and organisation behind the operational sustainability work of the larger participating organisations exemplify how many of the participating organisations' sustainability transitions were significantly aided by the firm's resources, as Schrøttle et al. (2014) proposed. In organisations that took a strategic approach to work on sustainability, the operational departments were provided with resources to prioritise this transition; “So, despite having people who work on sustainability, we can't be involved in everything, we bring in consultants who help us with these issues” (PA). As a consequence, new business plans were developed, and "the management becomes more systematic with clearer vision, clearer goals, and clearer planning on how to achieve the goals. Then it will facilitate for employees and everyone else to fulfil their tasks because they understand what they are doing and how it contributes..." (PD). PB stated that "there was a shift, probably in [year x], when [they] started working on green financing. Until that point, [their] then-CEO and a few other leading executives realised this was important". However, organisations with limited resources and a lack of a clear strategic directive for transitioning to sustainability have encountered difficulty in achieving the desired transition because "no one is driving the issues and there is no one with the authority to drive the issues..., and as a result, it becomes very stagnant, and there are ad hoc initiatives" (PD).

4.3 Integrating Sustainability into Operations Requires Decision-making on all Levels.

We used the analysis levels of this study, namely corporate level, portfolio level, and building level, as outlined by Vieira de Castro et al. (2020) and UNEP FI (2014); we illustrate the themes derived by the most frequent codes to show the relationship between sustainability integration and operational decision making in Figure 5. The results indicate that the participating organisations with a more integrated sustainability structure have incorporated sustainability decisions on multiple levels, as also highlighted in the decision-making levels by Nunes et al. (2022), via the formulation of a sustainability strategy, the measurement of targets, and the subsequent reporting of the roadmap to achieve these targets.

Those organisations that have adopted a holistic management system (Asif et al., 2010) have declared on a corporate level short-, medium-, and long-term strategy-related metrics pertaining to the three sustainability aspects, which were then broken down into an operational strategy. An example of this was when “A” organisation described that “All operations in A-company are covered by the sustainability initiatives, which are governed by the use of a management system that consists of group-wide policies, guidelines, short- and long-term measurable goals, and detailed action plans, and that ensures compliance with legislation” (A’s annual report, 2022). Many participants characterise the management system as a strategic-level instrument that guides “…work and procurement, and it has a whole chapter dedicated to sustainability...” (PA), and “a way of working that involves all employees, and everyone should work with this. It's a way of working, a method, and a systematic approach to quality and sustainable success...” (PD).

Additionally, managers who are dissatisfied with their organisation's current level of sustainability have set sustainability integration as a goal. An example of many quotations was “I want sustainability issues
to be integrated – they are not currently” (PE). As a result, they find themselves in the position of having to make decisions concerning the management system that is most efficient. I.e., “we haven’t developed a quality management system aligned with our operations (...) This is a research-based model (...) It always provides at least a 4.3% improvement” (PD). Moreover, uncertainty, time, and effort spent in decision-making characterise the negative consequences and influence; an example of this was when PE said; “We need to decide what to follow up on, who will be involved in reporting the data, and what systems are needed for this reporting” (PE).

![Network building of interlinked generated codes regarding sustainability integration in operational decisions.](image)

**Figure 5:** Network building of interlinked generated codes regarding sustainability integration in operational decisions.

### 4.4 Implementing Sustainability Enables Real Estate Actors to Meet Standards, Recruit Tenants, and Prepare for the Future.

The findings of our analysis suggest that there are differences between commercial and residential portfolio participants with respect to certain aspects of the operational sustainability strategy (Nunes et al., 2022), while there are similarities in other aspects. Several actions were taken by four of the participating organisations to integrate sustainability into operational decision-making processes, illustrating the components of the sustainability transition (Schrettle et al., 2014) and what and where this transition happens in the organisations (Opresnik and Taisch, 2015; Signes and Diez, 2021).

The most recurring findings regarding operational decisions are setting goals for sustainability in operational processes, employee training, sustainable product development, and initiatives within the
supply chain. “We’re supposed to transition, and everyone within the organisation should think about sustainability...” (PC). These organisations have perceived a change in their operational goals because they “didn’t do that because [their] mandate was to deliver cheap building plans” (PC). This illustrated that a shift in operational priorities and planning is essential for the more effective implementation of sustainability strategies (Nunes et al., 2022). "Integrating sustainability into our business model gives us good conditions to meet future challenges and opportunities.” (F’s annual report, 2021).

All participating organisations have established various methods to "being able to measure, follow up, keep statistics, and make it scalable" (PA) to operationalise their sustainability strategies. These methods include statistical analysis, questionnaires, and performance reports, all stated in the organisations’ sustainability reports and indicated by the participants; as exemplified in "we work with the “x” and "y" surveys" (PC) and in; "we are meeting and exceeding that target, with a 2.2% reduction in our energy consumption each year" (PD). Additionally, some companies are developing tools and systems for measuring sustainability based on their organisational capacity and capabilities, as evidenced by the quote, "We have streamlined and simplified our goal-setting process and created overarching measurable goals that we did not have before." (PD). However, one company revealed that they are in the early stages of integrating and implementing sustainability within the organisation, stating, "I want sustainability issues to be integrated – they are not currently" (PE). These findings demonstrate that sustainability metrics and goals increasingly guide decision-making within organisations.

All participants have stated that employee training and involvement are critical factors in the sustainability work within the organisation, “each employee needs to ask themselves, "What does this mean for me as an employee?" (PD). Furthermore, many participants emphasised that they engage in decisions regarding the internal structure of sustainability work. According to the participant, employee involvement is achieved through a built-in sustainability structure rather than having a separate sustainability department; “we realised that it might be smarter to distribute the competence where it's really needed. Sometimes I get the question about how many of us work with sustainability at [B-organisation]. And I usually say that we are [X]00, that's how many employees we have” (PB). Still, in these organisations with a more integrated structure, there is a designated role with a mandate and responsibility for the operational sustainability strategy. Many other roles are specifically involved in operational sustainability activities, such as controller, “energy coordinator, a reuse coordinator, a certification coordinator, or an environmental coordinator.” (PA).

Organisations with a commercial portfolio have strategically decided to adjust their new product development, namely the new buildings and facilities, in accordance with well-established sustainability certifications. As an example of how developing sustainable product attributes creates growth opportunities that contribute to increased profits and competitive advantage (Luchs et al., 2010), PB said: “It affects our financing opportunities. Since we work a lot with green bonds, green bank loans, and loans from European and Nordic investment banks”. Two organisations plan and budget for activities such as “Which properties should be certified now? Which properties should be re-certified?” (PA). The basis for these decisions is, among others, “one motivation... is to make these green loans more attractive to banks and other investors” (PA). Therefore, “A-organisation sets requirements that all new production must have a net positive impact on the property’s ecosystem services” (A’s annual report, 2021). Both organisations A and B use these certifications as a way to comply with regulatory pressures for sustainability and attract commercial tenants. This was exemplified in PA’s quote, “We know that if we
certify and achieve this rating, we can check that box, and then we are both in compliance with EU requirements and also obtain the certification. So that's one of the factors that influences the decision-making process” (PA).

Commercial companies have more resources, which has been reflected in the level of their actions (Schrettle et al., 2014). These companies utilise several risk analysis methods for the existing buildings to “plan and implement measures that will be required to adapt the properties concerned to a changed climate.” (A’s annual report). Also, using ideas behind reporting “scopes … to identify areas where organisational structures can integrate sustainability efforts (PA). They also take an extended sustainability perspective, including tenants and suppliers, through initiatives such as tenant agreements (green leases), “This is to promote collaboration with tenants and influence their behaviour” (PA). These organisations are also engaged in decisions at the building level regarding “...energy consumption [they] should aim for, the certifications [they] should target, the materials [they] should choose, how [they] should address social issues, how [they] should calculate climate impact, and how [they] should handle reuse inventories, etc. Similarly, in [their] management, [they] have goals for reduced energy and water consumption, achieving recertifications, and implementing new differentiated approaches” (PB). However, the municipal companies have a more general ad hoc- approach to sustainability initiatives, except for company C, which has clear directions for a more strategic approach.

4.5 Sustainability Success as a Driver for Improved Firm Performance and Promoting Further Sustainability Initiatives.

Four of the participating organisations have succeeded in aligning sustainability performance with sustainable operations (Contrafatto and Burns, 2013). And as suggested by Priess et al. (2017), they perceived the outcomes of their sustainability strategies as a “direct return on investment” (PC). And they have explained how “it becomes a win-win situation” (PA) to take certain sustainability initiatives. The systematic approach to sustainability performance together with an integrated sustainability approach (Bettley & Burnley, 2008) has resulted in four of the participating organisations receiving recognition and rewards (Kats, 2003) from external bodies, i.e., “X shares received green labelling from [an index], the first major real estate company in the Nordic region to be approved and classified as a green stock. The purpose of green labelling is to increase visibility for investors seeking sustainable investments” (PA).

This differentiation from other actors through a new strategic position in the industry was perceived as increasing the organisation’s competitive advantage (Foley, 2005; Orsato, 2009). This has been illustrated by A-organisation being “the world’s most sustainable office developer...[by an external body’s]...survey... covering a significant portion of the globally listed real estate sector.” (A’s annual report). Similarly, the B-organisation has “issued the world’s first green commercial paper.” (PB). An example of how success is coupled with being labelled as green (Díaz-Lopez et al., 2019) PB has stated that “the company is Sweden’s largest issuer of green corporate bonds, and all bonds issued during the year were green”. Also, PA explained how “banks have made it easier to obtain loans if you are sustainable. It is becoming more and more common for banks to not lend to companies that do not work with sustainability”, which was supported by PJ, who works with financing sustainable real estate organisations at a major bank.
The findings indicate that the operational strategy for sustainability significantly impacts the organisation's overall capabilities and growth, thereby stimulating further sustainability initiatives to maintain the sustainability label (Orsato, 2009; Priess et al., 2017). Figure 6 illustrates this finding regarding the relationship between sustainability integration and firm performance. This illustration is based on a network of interlinked codes we generated from the interviews and other related data. The firm performance aspect of sustainability initiatives has been referenced by all participants, as observed by Walker et al. (2014) and Nunes et al. (2022). I.e., PB stated that “it’s not just fun to win the world championship in sustainability – it’s also very profitable. It increases our revenue and lowers our costs. It also helps us deliver on our assignment from our owners”.

Also, PA stated that “everyone benefits from it, as it reduces costs and environmental impact, and the tenants can also benefit from it.”.

Complying proactively with tenants' and regulatory bodies' sustainability requirements has resulted in cost savings for four participating organisations. As suggested by Bettley and Burnley (2008), they also implement new strategies to hedge against potential future increases in demand. I.e., PA said: "So if we certify a building according to the (current certification system) and achieve a gold rating on certain indicators, then we know that we are in compliance with the EU taxonomy". Furthermore, the organisations that have decided to use renewable energy strategically have seen that “the return on renewable energy broke all records during the year, and the repayment period for X installations of numerous solar PV systems on its properties shrank from 12–13 years to 3–4 years” (PB). As argued by Priess et al. (2017), sustainability investments had crucial outcomes in increasing productivity and increasing profit and income for four participating organisations.

One of the findings is that sustainability performance and the implementation of sustainability by the operation department are not necessarily coupled with particular certifications or management systems. Although one of the participating organisations does not adopt any management system or certifications, they still “have received green financing and [they] received investment support from the Swedish Energy Agency to work on achieving a certain energy level in various construction projects. This allows [them] to keep rents low. [They] seek support where [they] see that it benefits both [them] and [their] tenants.” (PF). The overall sustainable performance was the key factor that benefitted the organisation and the stakeholders in different ways (Kleindorfer et al., 2005; Ijomah et al., 2007; Schrettle et al., 2014; Orsato, 2009).
Figure 6: Network building of interlinked generated codes regarding the relation between sustainability integration and firm performance.
5. Discussion

The purpose of the research paper is to investigate how real estate actors within the built environment make decisions regarding sustainable operations and how they relate those decisions to established management systems and certifications. In order to gain a thorough understanding of sustainability operations within the built environment, the relevant literature concerning operations management in a general sense was examined in conjunction with research carried out specifically on the built environment. We also use insights from multiple studies (Vieira de Castro et al., 2020; Kibert, 2016; Asif et al., 2010; UNEP FI, 2014) to examine how management systems affect choices in the built environment at various levels of analysis (building, portfolio, and corporate). Through the integration of relevant literature, our results were able to offer a comprehensive understanding of sustainability and its several components within the built environment. In this section, we will examine the reasons why the details of our case and their interpretation may be interesting. We'll look at how the theory we've embraced may help businesses and what role a decision-making framework may have in the future creation of sustainable business practises.

This study utilised a sustainability decision-making framework developed by Schrettle et al. (2014) to examine the implementation of sustainability in the built environment. The study looked into the sub-themes of motivators and mediators within the framework, as well as the decision-making processes surrounding approaches and actions. Additionally, the study examined the connections between these factors and both firm performance and sustainability performance. The present study provides empirical evidence supporting the applicability of Schrettle et al.’s (2014) conceptual framework for investigating rational decision-making in the context of planning and implementing sustainable practises. While the framework is initially intended for the analysis of manufacturing firms, our research offers valuable perspectives on the decision-making processes of real estate stakeholders in the built environment and establishes linkages among the proposed subthemes. In doing so, the study addressed questions about the why, what, and where of sustainability in the built environment (Signes and Diez, 2021; Opresnik and Taisch, 2015). In the following, we refer back to the theoretical themes and discuss our major findings in light of the study’s literature review.

5.1 Triggers, Mediators, Approaches, and Actions

We illustrate stakeholder pressure's influence on decisions regarding sustainable operations, confirming Schrettle et al.’s (2014) external triggers as part of the framework. This regards how real estate actors have to comply with environmental policies and laws established by the government, municipalities, and European Union, as well as customer pressures, through their operational decisions. In addition, we illustrate how the effects of customer preferences and political pressure on operational decisions differ depending on whether the tenant portfolio consists predominantly of commercial or residential spaces. The study’s results confirm that for operations to meet these pressures, it is crucial to acquire a high level of capability in order to meet not only the predominant demands of the stakeholders but also new trends in the future (Nunes et al., 2022; Luchs et al., 2010).

Drivers, resource capacity, and firm size (mediators) have interconnected effects on the strategy and broadness of sustainability action. This confirms Schrettle et al.’s (2014) proposition regarding mediators.
Organisations with greater resources (assets and personnel) were more capable of effectively transitioning towards more sustainable practices and behaviours. Consequently, the implementation of strategic sustainability initiatives resulted in the allocation of resources towards operational departments, with the aim of prioritising the transition. In addition, despite the fact that the previous level of sustainability action was proposed as a mediator, we find no interesting findings that support or neglect that it influences the sustainability strategy of the participating organisations (Pil and Rothenberg, 2003).

The findings of our study support Schrettle et al.’s (2014) proposition that sustainability drivers lead to a sustainability move that is both characterised by being incremental and strategic. The strategic move is coupled with the organisation formulating business plans and implementing a more methodical approach to managing sustainability, characterised by a well-defined vision, objectives, and strategic planning. Also, sustainability was integrated through setting sustainability-related goals for the operational processes, employee training, sustainable product development, and initiatives within the supply chain. Organisations with incremental sustainability moves, such as municipal organisations, faced obstacles in achieving their sustainability transition objectives due to restricted resources and the incompleteness of a well-defined strategic direction. However, with political support, a particular municipal organisation was able to secure additional resources to prioritise the aforementioned transition.

5.2 Firm Performance.

The findings of our analysis suggest that organisations that have incorporated sustainable practices into their business operations and aligned them with sustainability performance have experienced concrete advantages. The alignment mentioned here is considered advantageous for all parties concerned, which confirms the works of Bettley and Burnley (2008), Orsato (2009), Foley (2005), and Priess et al. (2017). This advantage was demonstrated by changes in business models that gave companies a competitive edge by reducing costs, increasing profits, and enhancing their market position. Consequently, these companies have become role models and leaders in their sector (Orsato, 2009; Foley, 2005). Furthermore, our study confirms that organisations implementing sustainable operations have been able to increase growth opportunities (Priess et al., 2017; Kats, 2003). These results exemplify when it pays to be green by Orsato (2009); when some of the participating organisations were able to receive awards and pay off by securing green investments and green loans through their sustainability differentiation and labelling the majority of their buildings as green. Also, this implementation has contributed to firm performance through increased quality and reduced costs (Kibrt, 2016).

The results build on Schrettle et al.’s (2014) framework to give further industry-specific insights regarding how sustainability components, such as product development and supply chain initiatives, contribute to overall organisational performance within the built environment. We found prioritising sustainability makes real estate actors gain improvements in both sustainability and firm performance. Also, sustainable operations performance and firm performance result from integrating corporate sustainability within the organisational strategies, which is confirmed by Cheng et al. (2010), Hahn et al. (2010), and Gianni et al. (2017). For example, they develop new buildings and services that are green or socially friendly and adjust existing buildings to meet certain standards and certifications, therefore labelling them as green. By implementing sustainable operation design, they optimise product life cycles and engage stakeholders (Bettley & Burnley, 2008). Our results confirm the importance of stakeholder
engagement in achieving higher performance, productivity, value, and social and environmental gains (Priess et al., 2017).

5.3 Managements Systems and Building Certifications.

Our results confirm Vieira de Castro et al. (2020) and Asif et al. (2010) that building certifications are used to inform operational activities and decision-making at the building level, as well as during the development of new buildings. Examples of this were illustrated by the commercial portfolio companies that have made the conscious decision to adjust their new product development (in this case, their new buildings and facilities) to meet the standards of recognised sustainability building certifications. Also, these certifications influence decisions at the building level regarding energy consumption, materials, addressing social issues, calculating climate impact, and handling reuse inventories. Furthermore, it has been observed that the integration of sustainability practises among the participating organisations shows a certain level of variability. Also, the attainment of green labelling by companies can result in revenue growth, cost reduction, and environmental impact mitigation, as proposed by Priess et al. (2017). This observation presents an opportunity for further exploration in future research to look deeper into the complicated nature of this integration.

Furthermore, our findings support prior research (Priess et al., 2017; Kibert, 2016; Lewis, 2003), indicating that real estate firms involved in the built environment have implemented a comprehensive sustainability strategy through the employment of management systems and certifications. Our research contributes to the growing body of literature describing management systems as comprehensive frameworks for guiding corporate behaviour. However, our investigation has not yielded any convincing proof to support or neglect the notion suggested in the literature review of our study that the existence of several management systems has an apparent effect on the level of complexity for the participating organisations, as proposed by previous literature (Vieira de Castro et al., 2020; Asif et al., 2010) Our findings are in line with Díaz-Lopez et al.’s (2019), that the achievement of sustainable operations is not constrained by particular certifications or standards. Rather, it necessitates the identification of both performance and operations as being environmentally sustainable. In addition, we illustrate how actors with a commercial tenancy portfolio utilise management systems and certifications as a strategy to deal with particular pressures and preferences. This is especially interesting because such decisions are coupled with the organisation's need to acquire certain resources and expertise.

Finally, our study contributes to the field of sustainable operations management (Nunes et al., 2022; Kleindorfer et al., 2005; Bettley & Burnley, 2008) through qualitative empirical case studies from the built environment illustrating strategies, tools, and activities adopted by actors within this environment (Wang et al., 2019). Additionally, our study contributes to the research field on the built environment by illustrating a comparative case study of multiple real estate actors. Moreover, we made an attempt to contribute to a bridge between the sustainability operations management field and the management system theory field by connecting ideas from both fields.
6. Conclusion

This research aims to learn more about how organisations operating in the built environment make choices about sustainable operations and how those choices connect to management systems and certifications. In this study, we empirically analysed Schrettle et al.’s (2014) model within the built environment. We conducted a comparative case study of six real estate organisations in Sweden to investigate the decision-making processes of real estate stakeholders in the built environment with regard to sustainable operations, as well as how they relate to management systems and certifications. Sustainability strategy and implementation were studied using Schrettle et al.’s (2014) decision-making model and offered a comprehensive model that helped investigate the necessary alignment of an organisation's sustainability-related decision-making with its operations. The study has proven that the framework is useful for developing and enacting such strategies in the built environment. The sustainability decision drivers, mediators, methodologies, and actions, as well as their effects on sustainability performance and firm performance, were all part of the framework's scope of investigation. This was accomplished in response to calls for more extensive research on this topic.

The findings show the influence of stakeholder demands, resource capacity, and company size on sustainability activities while also providing insights into the decision-making processes of real estate organisations and establishing linkages between the framework's suggested sub-themes. Our research shows that active participation from participating organisations is essential to creating economic value, as well as social and environmental benefits. Likewise, sustainability transitions might be facilitated by using a strategically planned approach. We also explain how real estate organisations can comply with regulations, find tenants, and plan for the future by incorporating sustainable practices into all levels of decision-making. By doing so, we illustrate how organisations within the built environment can achieve improved resource efficiency, environmentally friendly buildings, and enhanced operational and sustainability performance. Since sustainability performance has become an integral part of firm performance, we observed that the integration of performance metrics for evaluating sustainability performance has led to an overall improvement in the organisation's performance.

Finally, our study contributes to the field of sustainable operations management by providing empirical evidence based on companies in the real estate sector in Sweden and practical insights. The research also demonstrated how management systems and building certifications affect business procedures and choices in the built environment. Therefore, we contribute to the field of sustainable operations management by providing qualitative empirical case studies on these effects. Moreover, we illustrate that integrating concepts from the field of management system theory could give a deeper understanding of sustainable operation management and its outcomes in the built environment.

6.1 Managerial Insights and Implications

The matter of sustainability constitutes a significant challenge for real estate stakeholders. A conceptual framework has been adapted from the sustainability literature to provide guidance for real estate managers in their decision-making processes. There exist two distinct mechanisms that force firms to undertake measures aimed at enhancing sustainability. Initially, external factors such as mandatory regulations may
exert force on a company to initiate sustainability efforts in order to avoid downsides or sanctions. Second, firms see the possibility of gaining a competitive edge by implementing sustainability initiatives, which motivates them to participate in sustainability efforts actively. The sustainability challenge presents various opportunities that can be leveraged to gain a competitive edge, such as the creation of new markets for sustainable products and the reduction of resource consumption during the manufacturing process, leading to cost savings. Real estate firms must determine whether or not they intend to take action as a suitable response to the drivers of sustainability, whether that action is prompted by market pressure or the seizing of opportunities.

For our findings to have a broader impact, we provide concrete recommendations for managers in the real estate business, politicians, and other stakeholders. These include striving to integrate sustainability into operations management via the decision-making processes, starting by engaging stakeholder groups and striving to align sustainability performance with firm performance. For real estate managers, alignment means coupling a sustainability performance measure with performance measurements on the building, portfolio and corporate levels. Also, an important insight for real estate managers is to comprehend the loop starting from triggers to performance. This means a sustainability manager may start by understanding the implications of their stakeholder management strategies on the firm's overall performance. We illustrate, for example, that commercial real estate firms are keen to label their buildings with the help of different building certifications because they have coupled performance parameters with the labelling. By doing so, companies will achieve long-term success, make contributions to a sustainable future, and increase their positive impact on society.

6.2 Future Research

Finally, the effective implementation of integrative solutions that address multiple performance criteria is a crucial aspect of sustainability management, which necessitates the involvement of operations management students in research on the design and performance of such solutions. This study reveals three implications that must be considered. Firstly, the operations management field and function must broaden its scope to address sustainability concerns effectively. Secondly, the operations management function and role in organisations must adapt to handle the complexities of the expanded function. Lastly, practical tools are necessary to aid operations managers in their broadened and increasingly sophisticated duties.

We, therefore, encourage future research into the connection between sustainability initiatives and the transition to sustainable operations management. Moreover, a comprehensive analysis of social sustainability and environmental sustainability in the built environment, either independently or in conjunction, would enhance both theoretical and practical approaches in both of these areas. Furthermore, a comprehensive investigation into sustainable supply chains is necessary to enhance awareness of their effect on the built environment. Conducting research of this type is of critical importance in addressing knowledge gaps, increasing operational performance, and creating more sustainable industries.
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Appendix A. Interview Guide

Hi!

The purpose of our essay is to study the sustainability work of real estate companies. Everything we will discuss is from your perspective, so feel free to tell us what you think. We want to discuss the requirements and expectations of stakeholders, what you do in terms of sustainability work, and your organisation's own conditions. We will ask about the so-called sustainability work, and you can answer from whichever sustainability perspective you think is most relevant to talk about at the moment and for your organisation. We will also refer to management systems or certifications if you apply them.

It is important to mention that the interview will be recorded to be then able to write down quotes from our interview. We will code all organisations and names of everyone we interview so that you feel more free to talk about this. We will then send the quotes we have used to you if you wish. Let us know if any questions are unclear or if you want us to skip any question.

If you feel that any of the questions are unclear, please let us know so we can clarify them, and if you do not feel like answering any question, you can tell us, and we will skip it.

Interview Questions

Stakeholder expectations and sustainable practises

- How do you understand what your stakeholders expect of you regarding sustainability?
- In what ways do customer preferences affect your sustainability actions?
- Do management systems help you understand and relate to stakeholder expectations? How?
- How do you decide on sustainable practises to implement? Do stakeholder expectations play a role?
- Do existing management systems and certifications help guide your sustainable practises?

Alignment and contradiction in sustainability expectations

- Do you think stakeholder expectations about your sustainability work differ, align, or contradict each other?
- How do management systems add to or mitigate differences in stakeholder expectations?

Organisational size and resource capabilities in relation to your organisation's size and resource capabilities

- What effects do you think they have on your practises of sustainable operations?
- Does this affect your organisation's focus on all three aspects of sustainability?
- Do you perceive any balance or imbalance in this focus?
- Impact of sustainability practises
- In what areas of the organisation have sustainability practises had the most impact?
- Why do you think this is the case?

Integration of sustainability into goals and processes

- Within these areas, how is sustainability integrated into the organisation's goals and processes?
- How does this integration relate to management systems or certifications?
How does integrating sustainability help the organisation achieve its goals?

**Transformation towards sustainability**
- Have you experienced any transformation towards sustainability in these areas?
- What factors do you think have contributed to this transformation?
- How incremental or radical is your organisation's approach towards sustainability?
- How do you perceive your current level of sustainability compared to your past level of sustainability?
- What kind of changes in processes has happened to integrate sustainability?
- How do management systems affect this change?

**Planning for sustainability initiatives**
- What timeframe do you typically consider when planning for sustainability initiatives in relation to critical areas (short term - long term)? What does the timeframe depend on?

**Measuring and controlling sustainability goals**
- How do you measure and control sustainability goals?
- Do you focus on specific goals or a set of goals?
- What methods do you use to collect data for reporting to stakeholders?
- Who collects the data, and what technologies do you use to support data collection?

**Internal discussion of additional sustainability initiatives**
- Have you had any internal discussions about additional sustainability initiatives?
- What factors do you consider when deciding whether additional sustainability initiatives would pay off?