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The Role of Organisational Culture and Structure in Data-driven Green Policy and Decision-making

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Abstract

The study explores how organizational structure and culture in the South African property sector influence decision-making on Environmental, Social, and Governance (ESG) challenges and Green Policy development. It hypothesized that traditional hierarchical structures and non-participative cultures hinder digitalization, impairing data collection essential for informed ESG decisions. In contrast, participative cultures and modern or matrix structures facilitate data-driven insights, expediting ESG and Green Policy advancements.

Qualitative methods, including unstructured in-depth interviews with key decision-makers across various sectors (listed companies, commercial developers, financiers, real estate agencies), alongside interviews with digital application developers, provided perspectives on organizational impacts. A systematic literature review supplemented the data. Thematic content analysis of the data revealed traditional structures and cultures complicate decision-making, impede digital transformation, and delay ESG and Green Policy implementation. Conversely, participative cultures and modern structures streamline data-driven decision-making processes, promoting ESG and Green Policy progress.

The findings highlight opportunities for traditional organizations to enhance structures and cultures, removing barriers to digitalization and accelerating ESG and Green Policy initiatives. This study underscores the critical role of organization dynamics in fostering sustainability within the built environment, emphasizing digital transformation's importance in driving positive environmental and social outcomes.

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Keywords

Organisational structure; Organisational culture; Digitalisation; Data-driven decision-making; Organisational decision-making

1. Introduction

This study commenced amidst the transition from the fourth to the fifth industrial revolution, characterized by Industry 4.0/5.0 and Society 5.0, marked by significant digital advancements and enhanced social connectivity. Digital technologies have been central in driving rapid global change. While the progression to Industry/Society 5.0 and Enterprise 2.0 accelerated the adoption of big data, data-driven decisions, and Artificial Intelligence (AI), it also introduced substantial uncertainty and disruption. Despite these digital technology advancements, the property and construction industry has been slow to embrace digitalization, lagging behind other sectors as noted by the McKinsey Global Institute Industry Digitisation Index (Agarwa *et al.*, 2016).

While technological advancements have profoundly impacted sectors like clean energy and financial services, the built environment has not made comparable progress in Environmental and Social Governance (ESG) and green policy. For instance, initiatives such as Net Positive buildings and the use of renewable construction materials to promote circularity remain underdeveloped, particularly given the construction sector's significant contribution to global greenhouse gas emissions (United Nations Environment Programme Report, 2023:1).

Amid abundant opportunities available in digital technology, this disparity prompts inquiries into why ESG and green policy implementation did not advance more swiftly. This study hypothesized that organizational structure and culture play critical roles in facilitating access to essential data for informed decision-making and the advancement of green policy. Notably, recent research underscores "the lack of access to effective data and analytics" as a primary barrier confronting property industry organizations (JLL Global Research, 2022:26), highlighting the urgency of addressing these challenges.

The study commenced with an investigation of secondary data after primary data was collected. Secondary data was sourced through a systematic literature review, drawing from reputable databases such as Scopus, ScienceDirect, and the Merensky Library (University of Pretoria). Selected sources included accredited journal articles, conference proceedings, books, as well as relevant industry reports and media sources. Criteria for selection encompassed contextual relevance, based on sound scientific theory, alignment with the research problem and questions, and publication date to ensure coverage of both historical perspectives and current trends. A concise overview of the literature findings is provided in 1.1 to 1.3 below.

1.1. Organisational Hierarchy, Structure, and Culture

Traditional hierarchical organizational structures, characterized by formal chains of command and top-down decision-making, may hinder the adoption of digital initiatives aimed at data-driven decisions such as Building Information Modelling (BIM) and Building Management Systems (BMSs) to name but two examples in the built environment. In contrast, modern decentralized structures, such as matrix or holacracy models, empower employees and facilitate faster decision-making processes especially when it comes to digital data collection and data-driven decisions (Safont, 2020). As industries move towards Industry 4.0/5.0, traditional hierarchical models face challenges in managing vast amounts of data and responding to rapid changes. The property sector is witnessing a shift towards modern organizational structures, driven by a changing mindset and the adoption of structures similar to matrix and flat organizations (Indeed, 2022).

The Holacracy model further decentralizes power and aligns with humanistic and organizational democracy culture, empowering employees to achieve self-actualization and meaningful work (Lee & Edmondson, 2017; Laloux, 2014). Decision-making in such models follows a bottom-up approach, emphasizing consensus among employees in teams (Safont, 2020).

The current focus on governance, responsibility, decarbonization, and resilience in the property sector underscores the importance of integrated technology platforms or ecosystems to manage collective intelligence and drive transformative changes (Puybaraud, 2022). During times of complexity and uncertainty, such as the present context of the built environment, inter and transdisciplinary teams are better suited for decision-making and problem-solving than traditional hierarchical structures with non-participative cultures (Suarez & Montes, 2020).

1.2. Organisational Structure, Culture, Cognitive Barriers, and Inertia

Recent studies underscore the key importance of organizational hierarchy and culture in navigating digital transformation amid rapid technological and environmental changes (Volberda *et al*., 2021). They emphasize that successful digital initiatives necessitate a culture with a mindset open to change, alongside structural adaptations that enable effective digital routines. Transitioning from a mindset encumbered by cognitive barriers to a ‘learning’ mindset is deemed essential for transforming business models (Volberda *et al*., 2021).

C-suite executives, often rooted in established cognitive frameworks, may overlook emerging possibilities, including ESG alternatives. Departing from a bounded rationality perspective based on the seminal work of Simon (1982), Tripsas and Gavetti (2000) discuss how these cognitive frameworks shape organizational culture as well as

managerial decisions, and influence problem-solving approaches. They explain how mental models are shaped by past experiences rather than focusing on contemporary or future perspectives, potentially hindering decision-making.

During periods of rapid change, organizational founders or senior executives may struggle to adapt their mental models, resulting in organizational inertia defined as "the organization's ability to make internal changes in the face of significant external changes. When inertia gradually occurs in the organization's actions, the organization automatically reacts based on past experiences and strongly resists against changing" (Moradi *et al.*, 2021:172).

The Polaroid case illustrates how cultures, entrenched in fixed cognitive frameworks, hindered adaptation to technological shifts despite employee awareness (Tripsas & Gavetti, 2000). Polaroid's traditional hierarchical organizational structure and autocratic leadership perpetuated a cognitive barrier resistant to agile adaptation. Although Polaroid had invested substantially in digital photographic technology research and developed a superior prototype digital camera by 1992, it faced considerable competition when it finally launched its megapixel digital camera in 1996.

Volberda *et al.* (2021) advocate for an organizational culture with a holistic approach to digitalization, addressing cognitive barriers, establishing new digital routines, and fostering adaptable organizational structures. They caution against ineffective information systems causing strategy paralysis, emphasizing the need for robust digitalization strategies.

Research from Harvard Business highlights the role of organizational culture and routines as cognitive barriers that resist change during volatile periods (Suarez & Montes, 2020). They recommend decision-making teams over a culture of top-down decisions to enhance agility in reshaping task execution, identifying it as a defining capability of resilient organizations. Involving employees in decision-making teams facilitates quicker decision-making and innovative problem-solving in unfamiliar contexts.

1.3. Behavioural Economics, Decision Theory, and Cognitive Barriers

The study explored organizational structures and cultures from the theoretical framework of Behavioural Economics and Decision Theory, specifically Cumulative Prospect Theory informed by psychology. It juxtaposed traditional hierarchical organizations with non-participative cultures against modern or matrix structures with participative cultures in decision-making processes, necessary for making data-driven decisions to accelerate green policy and its implementation. Decision theory explains how decision-makers navigate uncertainty and complexity, which is particularly pertinent for organizations in the property industry, as underscored by Starr *et al*. (2021:165) who stressed the importance of adaptability, innovation, and agility in response to rapid change.

2. Materials and Methods

After a systematic literature review of the secondary data investigation outlined above, primary data were collected to examine how organizational structure and culture influence decision-making in the South African property sector concerning digitalization, data-driven insights, and green policy. Ethical clearance was obtained from the University of Pretoria's ethical committee. Primary data were collected through conducting unstructured in-depth interviews with the decision-makers of five prominent South African property sector organizations and the digital product/technology developers or sellers who sold these products to the property sector organizations. These organizations were purposefully selected based on their previous decisions regarding digitalization, financial commitments to these initiatives, successful implementation, and their representation within the industry. Despite the limited sample size, these organizations control a significant, if not majority, share of the local property market. Organizations comprised the following (displayed in the table below under Data Set 1):

- Two of the top five Real Estate Investment Trusts (REITs)
- The largest commercial property developer
- The largest commercial property financiers
- The leading real estate agency

The study focused on South African decision-makers but considered that these organizations operate internationally or have a presence in other African countries. The digital technologies/products these organizations invested in, represented diverse initiatives across property types, customer interfaces, and investment scales. These five digital technology applications served as case studies (table below under Data Set 2). Some of the property sector organizations invested in more than one of the case study digital products. Lastly, the developers or providers of these digital technologies/products, who sold these products to the property sector organizations were also interviewed as displayed in the table below (Data Set 3).

Table 1: Three sets of primary, as well as Literature and Theory (secondary data), were collected and analyzed

<table>
<tr><th>Data Set 1</th><th>Data Set 2</th><th>Data Set 3</th><td rowspan="8">Secondary Data:
Literature
and
Theory</td></tr>
<tr><td>Property Sector Organisations</td><td>Digital Products these organizations invested in</td><td>Developers/Sellers of Digital Products</td></tr>
<tr><td>Primary Data</td><td>Case Studies</td><td>Primary Data</td></tr>
<tr><td>REIT 1</td><td rowspan="5">Construction & Project Management Ecosystem (A)
Property Management Ecosystem (B)
Automated Valuation System (C)
Automated Access Control, Parking Management, Payment & Security System (D)
Precinct Management Application (E)</td><td>(A)</td></tr>
<tr><td>REIT 2</td><td>(B)</td></tr>
<tr><td>Commercial Property Developer</td><td>(C)</td></tr>
<tr><td>Commercial Property Financier</td><td>(D)</td></tr>
<tr><td>Real Estate Agency</td><td>(E)</td></tr>
</table>

Thematic content analysis was employed to analyze the data, utilizing both a manual codebook system and software (NVivo). The reliability, validity, and trustworthiness of the findings were enhanced through triangulation among the three data sets, followed by validation through comparison with existing literature and theory.

3. Results

While traditional hierarchical structures are declining in the South African property sector, modern or matrix models with interdepartmental teams are gaining traction, promoting inclusivity and collaboration. However, the persistent use of the term ‘manager’ indicates ongoing structural transitions. Both software developers/providers and property sector organizations identified hierarchical structures as contributing to decision-making delays, which echoes existing research. The findings highlight the intertwined nature of structure and culture, with hierarchical structures typically fostering non-participative cultures, while matrix/modern organizations encourage collaboration.

Importantly, organizational size does not dictate culture; some large entities embrace participative cultures, while some smaller ones remain non-participative. Hierarchical structures, coupled with non-participative cultures, impede both data-driven decision-making and the implementation of green policies by prolonging processes compared to participative cultures and flatter structures.

The following main themes emerged from the data regarding traditional hierarchical structures with non-participative cultures:

- Executive resistance to change: Decision-makers in hierarchical organizations often encounter cognitive barriers, resisting change and clinging to past successes and traditional methods. Their reluctance to adopt digitalization stemmed from a belief that established practices were sufficient, despite evidence of successful data-driven decisions in other industries. Proposals for digital initiatives were met with disapproval, perpetuating organizational inertia. This mindset hindered progress and delayed digitalization efforts, thereby impairing data-driven decisions regarding green policies and ESG initiatives.

- Cumbersome processes: Bureaucratic processes in hierarchical organizations contributed to delays in digitalization. Decision-making was convoluted and slow, involving multiple layers of approval and committee discussions. Employees encountered obstacles when proposing ideas, resulting in lost momentum and frustration. The rigid structure impeded innovation and hindered the adoption of data-driven decision-making and adaptation of green policies.
- Lack of employee engagement: Non-participative cultures in hierarchical organizations generally undervalue employee input and stifled innovation. Employees expressing enthusiasm for digitalization and ESG initiatives were often disregarded, leading to feelings of disengagement and disillusionment. Reluctance to involve employees in decision-making perpetuated cognitive barriers and a culture of apathy, further delaying progress toward digital transformation and hampering the gathering of sufficient data for data-driven decisions regarding green policies and ESG initiatives.
- Senior management changes: A significant finding was that organizational transformation followed changes in senior management, catalyzing digitalization efforts in all but one property sector organization included in this study. New leadership prioritized digital initiatives and embraced a more collaborative approach to decision-making. These organizations experienced greater success in implementing digital solutions, highlighting the significant influence of leadership on organizational culture and innovation. The only organization that did not undergo digital and environmental transformation due to changes in C-suite executives had already prioritized these initiatives a few years before the study commenced and had made significant progress in green policy implementation. Although this organization previously had a firm hierarchical structure, it underwent structural and cultural changes that enabled a progressive approach to data-driven decision-making regarding ESG and green policies.

In contrast, less hierarchical organizations with participative cultures facilitated an expedited the digitalization process:

- Flexible mindset of decision-makers: Leaders in these organizations exhibited a more adaptable mindset, open to change and innovation. They recognized the importance of digital transformation and actively sought input from employees. Decision-making became a collaborative process, driven by a shared vision and a commitment to embracing new technologies and environmental as well as social responsibilities.
- Emphasis on employee well-being: Organisations prioritizing employee well-being recognized the value of a motivated and engaged workforce. Decision-makers treated employees with respect and encouraged their participation in digital initiatives. This fostered a sense of ownership and commitment among employees, driving innovation and accelerating the implementation of green policies through data-driven decision-making.

Overall, the contrast between hierarchical organizations with non-participative cultures and less hierarchical organizations with participative cultures accentuates the vital role of leadership and organizational culture, including overcoming cognitive barriers, that hinder transformation efforts.

4. Discussion and Conclusions

The study aimed to investigate the impact of organizational structure and culture on digitalization decisions in South Africa's property industry and their implications for ESG and green policy data-driven decision-making. Employing a qualitative research design, data were gathered through a systematic literature review, in-depth interviews, and case studies involving key decision-makers from South African property sector organizations and digital technology providers. Thematic content analysis was utilized to analyze the data, which was subsequently triangulated across three datasets and validated against existing literature and theory to ensure reliability.

The findings confirmed that traditional hierarchical structures with non-participative cultures often caused delays in digitalization, thereby hindering the collection of sufficient data for ESG and green policy data-driven decisions. Key factors contributing to these delays included resistance to change among executive-level decision-makers, cumbersome approval processes, and undervaluation of employee input.

A significant observation was that digitalization initiatives in most of these organizations commenced only after founder members or certain C-suite executives were replaced, initiating organizational transformations towards group-focused decision-making. Limitations of the study include the relatively small sample size, despite the broad representation of organizations in the South African property sector. Additionally, the qualitative approach did not aim to quantify the extent of organizational transformation in the industry but to provide evidence of how hierarchical structures with non-participative cultures impede data-driven decision-making regarding ESG and green policy adaptation and implementation.

Future studies could focus on rigorous quantitative measurement through surveys or questionnaires to ascertain the industry's transformation extent and the related impact on data-driven decision-making concerning green policies. The study recommends transitioning to modern or matrix structures with participative cultures to expedite digitalization efforts, underscoring the critical role of organizational structure and culture in facilitating or impeding digitalization and data-driven decision-making, particularly concerning ESG and green policy initiatives.

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Ethics approval

The authors have received ethics approval from the ethics committee of the University of Pretoria for the interviews and surveys that were conducted by the author.

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Conflict of interest

The authors declare that there is no competing interest.

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