Chapter 3
Efficiency and Sustainability in Co-Ownership:
Utilizing Both the Balanced Scorecard and Artificial Intelligence

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ABSTRACT

This study analyzes management performance in residential condominiums in Usaquén, Bogotá, comparing those using a Balanced Scorecard supported by artificial intelligence-A with those without AI. Using qualitative methods and data from 50 property managers through semi-structured interviews, results show that AI-enhanced BSCs improve financial liquidity, reduce delinquency, decrease social

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and operational incidents, and yield better management evaluations. AI enables real-time monitoring, enhances decision-making, and promotes sustainability by automating processes and anticipating potential issues. Findings suggest integrating AI into the BSC strengthens strategic alignment, transparency, and operational efficiency. Successful implementation requires digital literacy, ethical data use, and active resident engagement. The study recommends gradual digital transformation focusing on finance and maintenance. The AI-enabled BSC is a strategic tool for fostering sustainable, resilient, and efficient residential communities, highlighting opportunities for technology adoption in the sector.

INTRODUCTION

The Balanced Scorecard (BSC) is a strategic management methodology that harmonizes widely used financial performance metrics over time, with measures from three additional perspectives, such as: customers, internal processes, learning and growth, perspectives or aspects of management that are articulated with each other to provide a comprehensive view of performance (Mio et al., 2022). In this sense, management objectives develop cause-and-effect relationships, where the performance results of some impact the performance of others.

Since its introduction by Kaplan & Norton in (1992), the Balanced Scorecard has been widely adopted as a strategic management tool by organizations across various sectors. Its implementation has evolved from a model focused primarily on financial metrics to a more comprehensive approach that links organizational strategy with operational execution, resulting in significant impacts on organizational culture and performance measurement (Madsen, 2025).

The implementation of a BSC has a positive impact on decision making processes, reducing time, and increasing accuracy. This is especially valuable in volatile environments, characterized by constant change and high levels of uncertainty; however, it must be kept in mind that the BSC must be accurately formulated because it is not infallible, and, although it is very successful when created and managed correctly, high failure rates have also been estimated (Tawse and Tabesh, 2023).

An increasing number of organizations are acknowledging the need to integrate sustainability criteria into their strategic planning to promote sustainable development. In this context, the Balanced Scorecard has proven effective due to its ability to adapt to different organizations and environments. According to Mio, et al. (2022), one of its advanced variants is the sustainable Balanced Scorecard, which broadens traditional perspectives by integrating economic, environmental, social, and ethical dimensions. Some studies highlight its usefulness as a management and