Strategic Integration of Artificial Intelligence and Total Quality Management for Sustainable Development Performance in the Philippine Real Estate Industry

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Abstract

This study examined the strategic integration of Artificial Intelligence (AI) Capability and Total Quality Management (TQM) for Sustainable Development Performance among real estate organizations in the Philippines. Specifically, it assessed the levels of AI Capability, TQM implementation, and Sustainable Development Performance; determined the significant relationships among the variables; examined the mediating role of TQM; and developed a structural model explaining Sustainable Development Performance. The study employed a quantitative research design utilizing Structural Equation Modeling (SEM) and involved 400 managerial, supervisory, professional, and executive personnel from selected real estate organizations in the Philippines. Data were collected using a validated survey questionnaire and analyzed through descriptive statistics and SEM. The findings revealed that AI Capability, TQM implementation, and Sustainable Development Performance were all rated at a high level. SEM results indicated that AI Capability significantly influenced Sustainable Development Performance ($\beta = 0.421$, $p = 0.000$), while TQM exerted a stronger significant effect ($\beta = 0.537$, $p = 0.000$). Furthermore, TQM significantly mediated the relationship between AI Capability and Sustainable Development Performance through partial mediation (indirect effect $\beta = 0.287$, $p = 0.000$). The study also developed an Empirically Validated Structural Model of Sustainable Development Performance, which demonstrated excellent model fit indices (CMIN/DF = 1.842, GFI = 0.931, AGFI = 0.912, CFI = 0.967, TLI = 0.958, RMSEA = 0.046, SRMR = 0.041). The findings conclude that the strategic integration of Artificial Intelligence Capability and Total Quality Management serves as an effective mechanism for enhancing economic, environmental, and social sustainability outcomes in the Philippine real estate industry.

Keywords: Artificial Intelligence Capability, Total Quality Management, Sustainable Development Performance, Structural Equation Modeling, Real Estate Industry, Digital Transformation, Sustainability.