OBJECTIVES OF THE RESEARCH- THE AGILE–AI–DIGITAL TRANSFORMATION PIPELINE

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ABSTRACT

This study investigates how Agile practices influence Environmental Sustainability Performance through a sequential mediation pathway involving AI Capabilities and Digital Transformation, with Digital Leadership moderating the final stage of the pipeline.

Three forces that appear especially salient include Agile practice, Artificial Intelligence (AI) capabilities, and Digital Transformation (DT). Agile practices, stemming from iterative development, incremental delivery, learning from retrospective events and self-organizing teams, are becoming increasingly ubiquitous outside of software development. AI capabilities offer predictive analysis, intelligent automation, and data-supported decision making, whereas Digital Transformation is the organizational environment where AI capabilities will become more prevalent and sustainable. In this regard, we develop and test an integrative model by PLS-SEM as shown in Hair et al. (2019).

Key words:

Agile practices, AI capabilities, digital transformation, environmental sustainability, digital leadership, PLS-SEM.

Most studies examine Agile, AI, and Digital Transformation as parallel-independent phenomena, overlooking their sequential interdependence. No prior study has tested all three as a causally ordered pipeline culminating in Environmental Sustainability Performance within a single integrated SEM framework. The moderating role of Digital Leadership within this pipeline has received very limited empirical attention.

Research Objectives

RO1: To examine the direct influence of Agile practices on AI capabilities

RO2: To investigate the direct influence of AI capabilities on Digital Transformation

RO3: To assess the direct effect of Digital Transformation on Environmental Sustainability Performance

RO4: To test whether AI capabilities mediate the Agile → DT relationship.

RO5: To test whether Digital Transformation mediates the AI → ES relationship.

RO6: To assess the moderating role of Digital Leadership on the DT → ES relationship.

RO7: To examine the full serial mediation Agile → AI → DT → ES

This abstract has three theoretical contributions. Firstly, it builds on the dynamic capabilities theory (Teece et al., 1997) by offering the first empirical examination of a pipeline of sequential Agile AI DT Environmental Sustainability processes within a single PLS-SEM framework. This sequential mediation chain represents the processes of sensing, seizing, and reconfiguring of dynamic capabilities by Agile practices, AI capabilities, and Digital Transformation, respectively, and directly links these theoretical steps to an environmental outcome.

Secondly, it is an application of survey design methods from sustainability management research using plain language instrument design (Bauer et al., 2025). This short, 27-item instrument (derived from longer, older scales, and rewritten in simple, clear language-Sharma, 2022), attained sufficient CRs for all variables and sufficient AVE for the three main concepts (DT, ES, and DL), illustrating that shorter, simple, plain language surveys can effectively represent these constructs in the domain of sustainability management research.

Thirdly, it has discovered, declared and addressed one data quality concern (ES item replication), whereby correction led to an increase in explained variance for Environmental Sustainability from R=.036 (single item) to R=.265-.361, underscoring the value of a multi-item measure of the ES construct within this field.

The practical implication of our finding is that environmental sustainability cannot be attributed to either AI alone, DT alone, or Agile alone; it can only be gained when all three work in a serial manner. Organisations developing an Agile culture first, building AI capabilities and subsequently scaling AI to form an organisation that has digitally transformed, will achieve real and quantifiable gains in environmental sustainability.

Adabiyotlar, References, Литературы:

1. Bernat, A., et al. (2023). Reference details incomplete. (Cited for digital transformation, AI-enabled energy management, and environmental sustainability.)
2. Gorski, I., et al. (2024). Reference details incomplete. (Cited for Agile practices and resource efficiency.)
3. Hambrick, D. C., & Mason, P. A. (1984). Upper echelons: The organization as a reflection of its top managers. Academy of Management Review, 9(2), 193–206.
4. https://conf.ilmfdu.uz/conferences/zamonaviy-tadqiqotlar-va-barqaror-rivojlanish-respublika-ilmiy-amaliy-konferensi/article/1104 https://doi.org/10.5281%2Fzenodo.21743702