Adoption of Artificial Intelligence and Its Impact on Business Sustainability & Enterprise Resilience

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Artificial Intelligence (AI) is no longer just an operational tool of company anymore, but it has also evolved into a fundamental aspect for companies looking to create sustainable business models. Artificial Intelligence, which used to be viewed as a peripheral aspect of Business to Business (B2B) strategy, has become central to helping firms manage uncertainties, improve long-term profits and make better decisions to preserve their competitive advantage. The adoption of artificial intelligence is not without its complexities. How it is adopted, whether ethically, strategically, or in alignment with internal organizational capabilities, determines whether it becomes a genuine source of advantage or an operational liability. It is within this context that business sustainability has gained renewed urgency. B2B firms must now navigate volatile external environments, intense competitive pressure, and shifting energy & trade landscapes, all while building the internal readiness needed to sustain long-term performance. The integrated effect of these forces on business sustainability and enterprise resilience in B2B contexts remains empirically underexplored. Despite growing interest in artificial intelligence adoption, empirical research of AI within B2B contexts remains limited. Most studies focus on the Business to Consumer (B2C) domain or treat artificial intelligence adoption as an end outcome, overlooking its downstream effects on business sustainability and enterprise resilience. The study therefore explored the integrated influence of environmental dynamism, competitive pressure, internal environment dynamism, ethical use of technology and AI adoption on B2B sustainability & enterprise resilience.

This empirical research employed a cross-sectional survey design. Using a purposive sampling strategy, data were collected from B2B firm employees with at least one year of artificial intelligence experience. Respondents represented diverse professional roles across B2B organizations, including IT managers, product managers, operations lead, and senior executives. Organizational demographics such as company size, employee count, and industry type were also captured. Moreover, the study employed multiple measuring items selected from previous studies to assess the study variables. Data were gathered from 393 respondents using

a hybrid survey method. To test all the proposed hypotheses, Partial Least Squares-Structural Equation Modeling (PLS-SEM) was used. Additionally, Artificial Neural Network (ANN) analysis was conducted within the SPSS environment to capture non-linear relationships among the study variables.

The PLS-SEM results confirmed significant positive relationships across nearly all hypothesized paths except one. Competitive pressure and internal environment dynamism were the strongest drivers of artificial intelligence adoption, while the ethical use of technology significantly influenced both adoption and business sustainability. Environmental dynamism showed no significant direct or indirect effect on any outcome, suggesting that external turbulence alone is insufficient to drive sustainable results in B2B firms without strong internal capabilities. Also, business sustainability emerged as a powerful mediator between the model's antecedents and enterprise resilience, with internal environment dynamism and competitive pressure showing strong indirect effects on resilience through this pathway. Moreover, the ANN analysis validated and extended these findings. The ethical use of technology ranked as the most influential predictor of business sustainability, followed by artificial intelligence adoption and competitive pressure, while environmental dynamism contributed the least, fully consistent with its non-significant paths in PLS-SEM.

Overall, the AI adoption has a strong role in business sustainability and making the enterprise a resilient one. By understanding the market change and aligning organization capability in a firm, managers can significantly enhance the AI adoption in B2B organizations. Additionally, artificial intelligence can help B2B firms achieve sustainable goals. This will allow them to stay in business for a long time, even in a volatile market environment. Businesses that link AI adoption with the Sustainable Development aims (SDGs) can ensure that their innovations improve long-term company sustainability and Enterprise resilience. Furthermore, this research can help managers in enhancing business growth, investor confidence, and long-term competitiveness in a thriving, sustainable global market.

Keywords: Artificial Intelligence Adoption, Business Sustainability, Enterprise Resilience, Environmental Dynamism, Competitive Pressure, Ethical Use of Technology.