

Title: Exploring Key Factors in Predicting the Adoption of AI Technologies in E-Commerce Firms

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Abstract:

This study aims to explore the key factors influencing the adoption of artificial intelligence (AI) technologies in e-commerce firms in Bangladesh. Utilizing the Technology-Organization-Environment (TOE) framework, the research identifies the determinants such as perceived relative advantage, technological complexity, compatibility with existing systems, top management support, organizational readiness, employee expertise/training, and competitive pressure that affect AI adoption. A quantitative research approach was adopted, using a structured questionnaire distributed to 350 employees from various e-commerce firms in Bangladesh. The study employed convenience sampling and received 231 responses, out of which 215 were deemed valid for analysis. Structural equation modeling (SEM) was conducted using SmartPLS to test the hypotheses and validate the model. The results indicated that PRA, CES, TMS, OR, ET, and CP positively influence AI adoption in e-commerce firms, while TC showed a negative, though not statistically significant, impact. The R-square value of 0.73 demonstrates the model's robustness in explaining AI adoption variance. The findings provide valuable insights for e-commerce firms,

highlighting the importance of organizational support and readiness, as well as employee training, in facilitating AI adoption. The study underscores the role of AI in driving digital transformation and its potential to enhance business efficiency, contributing to economic development in emerging markets like Bangladesh. This research fills a gap in the literature by focusing on AI adoption in the context of Bangladeshi e-commerce, providing a nuanced understanding of the influencing factors using the TOE framework.

Author Keywords

- [AI adoption,](#)
- [E-commerce,](#)
- [TOE framework,](#)
- [Bangladesh,](#)
- [Structural equation modeling,](#)
- [Technological adoption](#)

IEEE Keywords

- [Training,](#)
- [Leadership,](#)
- [Numerical analysis,](#)
- [Companies,](#)
- [Mathematical models,](#)
- [Robustness,](#)
- [Complexity theory,](#)
- [Electronic commerce,](#)
- [Artificial intelligence,](#)

- [Information technology](#)

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