

Adaptive Risk Management Strategies for Emerging Technologies

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Abstract

The rapid advancement of emerging technologies, such as AI, IoT, and blockchain, brings both opportunities and challenges for organizations. This dissertation explores effective risk management strategies that help successfully integrate these technologies into various industries. The study seeks to identify and analyze adaptive risk management practices focusing on proactive strategies, cybersecurity protocols, ethical considerations, and innovative approaches like the Functional Resonance Analysis Method (FRAM) and the System-Theoretic Accident Model and Processes (STAMP). A mixed-methods approach combined quantitative surveys and qualitative interviews with key stakeholders from different industries. The quantitative data were analyzed using statistical methods, including regression analysis and ANOVA, while the qualitative data underwent thematic analysis. The results show a significant correlation between proactive risk management strategies and successful technology integration. Robust cybersecurity measures and the incorporation of ethical considerations were found to enhance system resilience and security. Innovative approaches like FRAM and STAMP effectively identified and managed safety risks associated with emerging technologies. Therefore, the study emphasizes the importance of a multifaceted approach to risk management that integrates proactive strategies, robust cybersecurity, ethical considerations, and innovative methodologies. Organizations should adopt continuous risk assessment procedures, invest in advanced cybersecurity infrastructure, develop comprehensive ethical guidelines, and tailor innovative risk management frameworks to their needs. Future research should explore additional variables and longitudinal data further to understand the impact of these strategies on technology integration.

Keywords: Adaptive risk management, emerging technologies, engineering, Artificial Intelligence (AI), Internet of Things (IoT), blockchain