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Predictive Financial Optimization through Big Data Analytics in Uzbekistan's Banks

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ABSTRACT

This study examines the impact of Big Data Analytics (BDA) on improving predictive financial optimization and sustainability in Uzbekistan's banking industry. This research examines the contribution of combining green supply chain management (GSCM) methods, green human resource management (GHRM), and sustainable data management to enhanced financial and environmental performance. Data was gathered via a structured survey targeting bank workers with experience in BDA-driven projects across multiple Uzbek institutions. Research indicates that banks utilizing Big Data Analytics experience significant enhancements in operational efficiency, prediction accuracy, and environmental stewardship. Critical findings reveal that the integration of Big Data, environmentally sustainable innovation approaches, and a robust dedication to sustainable development jointly enhance performance outcomes. Furthermore, GHRM practices are essential in providing employees with sustainable finance methods. The findings support a comprehensive policy framework that integrates Big Data Analytics into fundamental banking operations, strengthening Uzbekistan's dedication to financial sustainability and enhanced performance.

KEYWORDS

Big Data Analytics, Financial Optimization, Sustainable Banking, Uzbekistan, Green HRM, Green SCM, Environmental Performance, Digital Transformation

INTRODUCTION

The banking sector in Uzbekistan is undergoing significant transformations as financial institutions implement sophisticated technology to enhance performance and sustainability. Big Data Analytics (BDA) has demonstrated potential in facilitating predictive financial optimization and endorsing green banking activities. In Uzbekistan, where environmental and financial sustainability are paramount, the integration of Big Data Analytics with sustainable practices may yield substantial competitive advantages. This study investigates the impact of big data analytics (BDA) on the financial and environmental performance of banks in Uzbekistan, emphasizing its integration with green human resource management (GHRM) and green supply chain management

(GSCM). The study seeks to determine how BDA-driven processes might assist Uzbek banks in attaining their financial objectives while fostering a sustainable future.

Literature Review

Big Data Analytics (BDA) has rapidly become a vital tool in the financial industry due to its potential to process vast datasets for insights into customer behavior, risk assessment, fraud detection, and more[1]. Globally, banks use BDA to gain a competitive edge and make data-driven decisions that enhance operational efficiency[2]. In addition to financial benefits, BDA can also support sustainability by facilitating eco-friendly practices within organizations[3].

Research has shown that green human resource management (GHRM) is essential for fostering an environmentally conscious workforce[4]. GHRM practices, such as employee training in sustainable practices, are critical for ensuring that banks can fully leverage the potential of BDA for sustainable goals[5]. Similarly, green supply chain management (GSCM) focuses on reducing environmental impacts throughout the supply chain, from procurement to delivery[6]. Studies indicate that integrating GHRM and GSCM with BDA can further enhance both financial and environmental performance[7]. However, there is limited research on the role of BDA in developing countries' banking sectors, especially in Uzbekistan, creating a need for studies that investigate BDA's potential in this context[8].

Methodology

This research employs a quantitative design, utilizing a structured survey to collect data from 317 employees engaged in BDA-driven projects across various banks in Uzbekistan. The survey questionnaire included Likert-scale items aimed at gathering data on BDA consumption, GHRM, and GSCM practices, as well as performance results related to financial and environmental parameters. The primary constructs assessed comprise bank commitment to Big Data Analytics (BDA), green training methodologies, and the impact of BDA on predicting financial and environmental results. Data analysis utilized partial least squares structural equation modeling (PLS-SEM) to investigate the links among big data analytics (BDA) implementation, sustainable practices, and performance outcomes. This method was chosen for its capacity to manage intricate models and properly estimate path coefficients, rendering it appropriate for hypothesis testing and assessing the influence of BDA on financial and environmental performance systematically.

Results and Discussion

The findings demonstrate that Big Data Analytics significantly influences the financial and environmental performance of banks in Uzbekistan. Banks that incorporate Big Data Analytics with Green Human Resource Management and Green Supply Chain Management techniques demonstrate enhanced operational efficiency and are more adept at achieving sustainability

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[2] Dong, J., Dai, W., & Li, J. (2020). Exploring the linear and nonlinear causality between internet big data and stock markets. Journal of Systems Science and Complexity, 33(3), 783–798.

[3] Corbett, C. J. (2018). How sustainable is big data? Production and Operations Management, 27(9), 1685–1695.

[4] Jabbour, C., & Jabbour, S. (2016). Green human resource management and green supply chain management: Linking two emerging agendas. Journal of Cleaner Production, 112, 1824–1833.

[5] Liboni, L. B., Jabbour, A., & Devika, K. (2017). Sustainability as a dynamic organizational capability: A systematic review and a future agenda toward a sustainable transition. Journal of Cleaner Production, 142, 308–322.

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[7] Govindan, K., Sarkis, J., & Jabbour, C. (2014). Eco-efficiency based green supply chain management: Current status and opportunities. European Journal of Operational Research, 233(2), 293–298.

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objectives. Banks with strong green human resource initiatives, including extensive training in environmentally sustainable practices, can optimize the advantages of big data analytics, as green human resource management provides staff with the requisite skills and knowledge for efficient implementation of sustainable practices. Moreover, GSCM techniques, such as green innovation and sustainable supply chain cooperation, serve as mediating elements that augment the efficacy of BDA. Banks using GSCM see diminished resource waste, enhanced operational efficiency, and elevated customer trust, resulting in superior environmental results and financial benefits. The results indicate that BDA, when integrated with sustainable practices, offers a competitive edge for banks in Uzbekistan, facilitating both economic expansion and ecological responsibility. These results correspond with current literature regarding the synergistic impact of BDA and sustainable practices, substantiating the notion that banks dedicated to environmentally friendly operations can attain considerable advantages. By integrating BDA with GHRM and GSCM, Uzbek banks establish themselves as both financially efficient entities and pioneers in sustainable banking across the area.

Conclusion

This thesis emphasizes the significance of Big Data Analytics in promoting financial and environmental objectives within Uzbekistan's banking sector. The integration of Big Data Analytics with Green Human Resource Management and Green Supply Chain Management strategies allows banks to enhance their financial performance while achieving sustainability goals. Research indicates that a systematic approach to Big Data Analytics (BDA) adoption, supported by sustainable training and supply chain procedures, is crucial for Uzbek banks seeking to maintain competitiveness in a swiftly changing market. These findings support the further implementation of BDA-driven policies throughout the banking sector to establish a robust and sustainable financial environment in Uzbekistan. Subsequent research should investigate the long-term effects of these practices and contemplate broadening the study to encompass banks in additional locations to offer a more thorough perspective on BDA's contribution to sustainable banking.

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