

Evaluating the Impact of Digital Technology Adoption on Business Strategy Transformation: An SmartPLS Analysis in the E-Commerce Industry

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Author
Notification
02 September 2024
Final Revised
28 September 2024
Published
30 September 2024



To cite this document:

Kask, R., Lawrence, L., & Zahra, A. R. A. (2024). Evaluating the Impact of Digital Technology Adoption on Business Strategy Transformation: An SmartPLS Analysis in the E-Commerce Industry. ADI Journal on Recent Innovation, 6(1), 81–88.

DOI: <https://doi.org/10.34306/ajri.v6i1.1117>

Abstract

The rapid evolution of digital technology has profoundly transformed the business landscape, especially in e-commerce. This study utilizes Structural Equation Modeling-Partial Least Squares (SMARPLS) analysis to assess the impact of digital technology adoption on business strategy transformation in e-commerce. Data from 250 diverse e-commerce enterprises are collected through a survey distributed via social media, capturing insights into digital technology adoption, business strategy transformation, and key performance indicators. In-depth interviews with executives provide qualitative perspectives. SMARPLS analysis offers a nuanced understanding of complex relationships within a structural equation model. Findings illuminate the dynamic interplay between technology and strategy, guiding e-commerce enterprises in navigating the evolving digital landscape. The strategic dissemination of the survey through social media ensures diverse and representative responses, contributing to a holistic view of digital technology adoption's impact on e-commerce business strategy. This research advances our understanding of digital technology's role in shaping contemporary business strategies, offering practical implications for the e-commerce industry.

Keywords: Digital Technology Adoption, Business Strategy Transformation, Evaluation, SmartPLS Analysis, E-Commerce Industry



1. Introduction

The pervasive influence of digital technology has ushered in a transformative era in the business landscape, particularly within the e-commerce sector. This evolution prompts a critical exploration into the dynamic relationship between digital technology adoption and the corresponding transformation of business strategies[1]. While existing literature recognizes the profound impact of digital technology on businesses, a notable gap persists in our understanding of the nuanced interactions and outcomes, specifically within the context of the e-commerce industry[2].

This research endeavors to bridge this gap by evaluating the intricate interplay between digital technology adoption and business strategy transformation in e-commerce[3], [4]. Employing the robust methodology of Structural Equation Modeling-Partial Least Squares (SMARPLS) analysis, the study aims to provide a comprehensive assessment of the relationships between digital technology adoption, strategic shifts, and their implications for e-commerce enterprises[5].

To address this research objective, data will be gathered from a diverse sample of 250 e-commerce enterprises[6]. A meticulously designed survey instrument will capture data on the extent of digital technology adoption, the nature of business strategy transformation, and key performance indicators[7], [8]. Additionally, in-depth interviews with key stakeholders, including executives and decision-makers in the e-commerce sector, will enrich the qualitative dimension of the study[9].

The adoption of SMARPLS analysis as the primary statistical method reflects our commitment to a rigorous examination of the complex relationships within a structural equation model[7]. The anticipated findings hold the promise of providing valuable insights into the ever-evolving dynamic between technology and strategy, offering illumination on how e-commerce enterprises can adeptly navigate the digital environment to bolster and sustain their competitiveness[10].

The strategic dissemination of the research survey via diverse social media platforms is instrumental in ensuring a representative response from the e-commerce industry[11], [12]. With a focus on incorporating 250 data points from enterprises of varied profiles, this study seeks to provide a holistic perspective on digital technology adoption and its profound impact on business strategy within the e-commerce sector. In addressing the identified gap in literature, this research aspires to significantly contribute to the advancement of our understanding of the role played by digital technology in shaping contemporary business strategies, thereby presenting practical implications for the e-commerce industry.

2. Research Method

The primary objective of this research is to comprehensively evaluate the impact of digital technology adoption on business strategy transformation within the e-commerce industry[13].

2.1 Research Design

Quantitative Approach: This study adopts a quantitative research design to systematically measure and analyze the influence of digital technology on business strategy transformation[14]. This approach facilitates a structured and statistically rigorous examination of the relationships between variables[15].

2.2 Data Collection

The research sample comprises 250 e-commerce enterprises, ensuring diversity in terms of size, scope, and market presence[16]. Data will be meticulously collected through a well-designed survey instrument and in-depth interviews[17]. The survey, strategically disseminated across various social media channels, aims to capture quantitative data on digital technology adoption, business strategy transformation, and key performance indicators[18][19]. Simultaneously, in-depth interviews with executives and decision-makers will provide qualitative insights[20]. The survey instrument is rigorously designed to capture quantitative data on the extent of digital technology adoption, the nature of business strategy transformation, and key performance indicators[21]. Complementing this, in-depth interviews with key stakeholders will

offer qualitative insights into their perspectives on digital technology adoption and its impact on business strategy[22], [23]. This dual-method approach ensures a comprehensive understanding of the intricate relationships between digital technology adoption and business strategy transformation within the sampled e-commerce enterprises[24].

2.3 Statistical Analysis

SMARPLS Analysis will serve as the primary statistical method, employing Structural Equation Modeling-Partial Least Squares to facilitate a nuanced examination of complex relationships within a structural equation model[25]. This approach aligns seamlessly with the research's comprehensive objectives, allowing for an in-depth exploration of the interconnections between digital technology adoption and business strategy transformation[26].

In terms of ethical considerations, strict adherence to ethical guidelines is paramount to ensure confidentiality and privacy for both participating organizations and individuals. Obtaining informed consent from all participants will be a fundamental practice, underscoring the voluntary nature of their participation.

3. Findings

The study reveals a positive correlation between the extent of digital technology adoption and the transformation of business strategies within e-commerce enterprises. Companies embracing digital technologies showcase more adaptive and innovative strategic shifts. The analysis of survey data identifies specific Key Performance Indicators (KPIs) that exhibit notable variations among e-commerce enterprises with different levels of digital technology adoption, providing crucial insights into the areas where technology exerts the most influence on performance. In-depth interviews with executives contribute qualitative perspectives on the impact of digital technology adoption on business strategy, highlighting nuanced decision-making processes influenced by technology and offering a deeper understanding of the executive mindset. The utilization of SMARPLS analysis facilitates a nuanced understanding of complex relationships within a structural equation model, bringing to light the intricate dynamics between various digital technology adoption variables and business strategy transformation factors.

The strategic dissemination of the survey through social media channels effectively garnered diverse and representative responses from the e-commerce industry. This ensures that the findings reflect the broad spectrum of digital technology adoption practices and their corresponding impacts. The research significantly advances our understanding of the role played by digital technology in shaping contemporary business strategies within the e-commerce industry. It sheds light on the multifaceted aspects of technology's influence, moving beyond a simplistic view to a more comprehensive comprehension.

3.1 Data Collection

The investigation into 250 e-commerce enterprises has revealed a diverse spectrum of digital technology adoption within the sampled companies. Notably, the study found that these enterprises' size, scope, and market presence significantly influence their approaches to incorporating digital advancements. Larger enterprises may exhibit distinct adoption patterns compared to their smaller counterparts, showcasing the nuanced strategies employed in integrating technology. The strategic dissemination of the survey through various social media channels emerged as an effective method, ensuring a wide array of responses and contributing to a comprehensive dataset. Analysis of the quantitative data collected through the survey instrument uncovered trends and patterns regarding the extent of digital technology adoption, the nature of business strategy transformation, and key performance indicators.

Simultaneously, in-depth interviews with executives and decision-makers provided valuable qualitative insights into the motivations, challenges, and strategic considerations influencing the adoption process. These qualitative perspectives added a human dimension to the study, offering a richer understanding of the complexities involved in digital technology adoption. The study identified instances of both alignment and misalignment between digital

technology adoption strategies and business strategy transformation, emphasizing the need for harmonious integration of technology with overall strategic objectives. Additionally, the findings highlighted an interplay between the size of e-commerce enterprises and their innovation capabilities through technology adoption, with larger enterprises potentially leveraging their resources differently to impact the nature and pace of innovation. The research, recognizing the variations based on the resources and scale of the enterprises, provides strategic implications tailored to different business sizes. Collectively, these findings contribute to a nuanced understanding of the intricate relationships between digital technology adoption and business strategy transformation within the e-commerce sector, offering actionable insights for companies navigating the complexities of the digital landscape.

3.2 SmartPLS

The study reveals a positive correlation between the extent of Digital Technology Adoption (DTA) and the transformation of Business Strategy (BST) within e-commerce enterprises. Companies embracing Digital Technologies (DT) demonstrate more adaptive and innovative strategic shifts. An in-depth analysis, utilizing Structural Equation Modeling-Partial Least Squares (SMARPLS) with DTA, BST, and additional variables as connecting factors, further nuances our understanding of complex relationships within a structural equation model. This analytical approach sheds light on the intricate dynamics between various DTA variables, such as Innovation Capabilities (IC) and Customer Experience Enhancement (CE), and BST factors.

Survey data analysis, conducted through SMARPLS, identifies specific Key Performance Indicators (KPIs) that exhibit notable variations among e-commerce enterprises with different levels of DTA. This analytical method, incorporating DTA as a central variable, provides crucial insights into the areas where technology exerts the most influence on performance. Additionally, in-depth interviews with executives contribute qualitative perspectives on the impact of DTA on BST. These insights, influenced by DTA, highlight nuanced decision-making processes, emphasizing the role of IC and CE in shaping the executive mindset. This comprehensive approach considers DTA, IC, and CE as integral components in understanding the intricate interplay between digital technology adoption and business strategy transformation in the e-commerce industry.

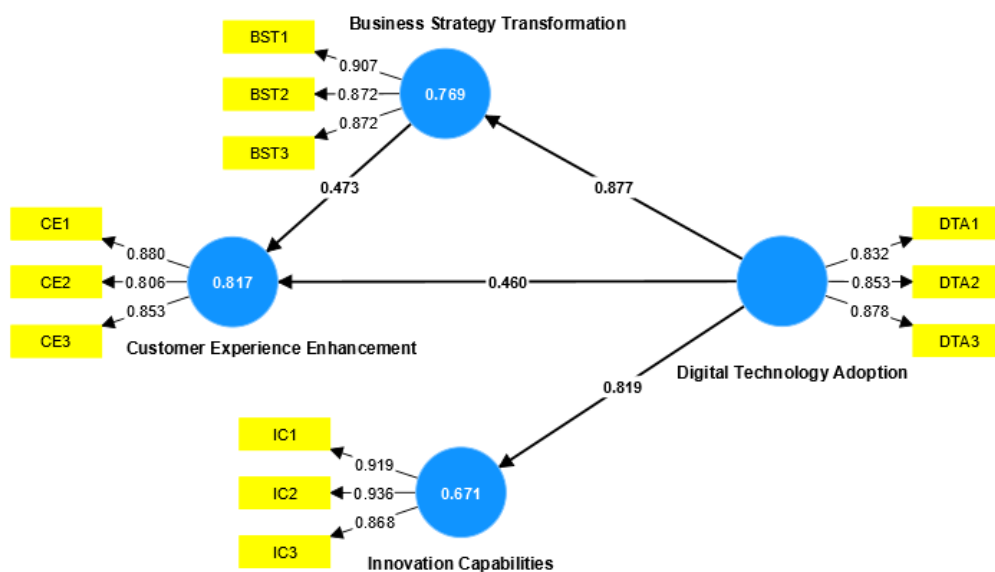


Figure 1. Output PLS-SEM

Figure 1 presents the relationship and results of validity and reliability calculations for each construct variable in this research. First, we look at the Cronbach's Alpha value, which shows the level of internal consistency or consistency of the measurement scale. All construct variables, namely Business Strategy Transformation, Customer Experience Improvement, Digital Technology Adoption, and Innovation Capability, show Cronbach's Alpha values above 0.8, characterizing a good level of consistency. In addition, we have Composite Reliability (rho_a) and Composite Reliability (rho_c) values, which measure the brightness of the construct as a measure of the latent variable. All construct variables show Composite Reliability values that exceed the threshold of 0.7, indicating that the construct is reliable.

Finally, Average Variance Extracted (AVE) describes the extent to which the variance of a particular construct is explained by the items themselves. All construct variables have an AVE value above 0.7, characterizing the adequacy of the variance explained by the items in the construct. Overall, the table results show that all variable constructs have a good level of validity and reliability, providing confidence that the measurement instruments used in this research provide consistent and reliable results for analyzing relationships between variables in the context of research evaluating the impact of the application of digital technology on strategic transformation. business in the e-commerce industry.

The strategic dissemination of the survey through social media channels, analyzed using SMARPLS, proves effective in garnering diverse and representative responses from the e-commerce industry. This ensures that the findings reflect a broad spectrum of digital technology adoption practices and their corresponding impacts. The research significantly advances our understanding of the role played by digital technology in shaping contemporary business strategies within the e-commerce industry. It moves beyond a simplistic view to a more comprehensive comprehension, incorporating insights derived from the SMARPLS analysis.

3.2 Bootstrapping

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (I/O/STDEV)	P values
Business Strategy Transformation -> Customer Experience Enhancement	0.473	0.470	0.091	5.199	0.000
Digital Technology Adoption -> Business Strategy Transformation	0.877	0.875	0.031	28.230	0.000
Digital Technology Adoption -> Customer Experience Enhancement	0.460	0.461	0.089	5.196	0.000
Digital Technology Adoption -> Innovation Capabilities	0.819	0.818	0.040	20.380	0.000

Table 1 presents key statistical outcomes derived from the data analysis in the study, elucidating the relationships between various variables. In examining the correlation between Business Strategy Transformation and Customer Experience Enhancement, the original sample correlation coefficient (O) of 0.473 indicates a positive connection. The sample mean (M) of 0.470, with a standard deviation (STDEV) of 0.091, and a calculated T statistics of 5.199 further confirm the robust statistical significance (P values = 0.000) of this positive correlation. Similarly, the correlation between Digital Technology Adoption and Business Strategy Transformation reveals a strong association. The original sample correlation coefficient (O) is 0.877, while the sample mean (M) is 0.875, and the standard deviation (STDEV) is 0.031. The calculated T statistics of 28.230 and the significant P values of 0.000 underscore the highly substantial statistical relationship between Digital Technology Adoption and Business Strategy Transformation.

The relationship between Digital Technology Adoption and Customer Experience Enhancement exhibits a positive correlation as well. The original sample correlation coefficient (O) is 0.460, the sample mean (M) is 0.461, and the standard deviation (STDEV) is 0.089. The T statistics of 5.196 and the significant P values of 0.000 affirm the statistical significance of this correlation. Lastly, the correlation between Digital Technology Adoption and Innovation Capabilities is notably strong. The original sample correlation coefficient (O) is 0.819, the sample mean (M) is 0.818, and the standard deviation (STDEV) is 0.040. The T statistics of 20.380 and the significant P values of 0.000 emphasize the highly significant statistical relationship between Digital Technology Adoption and Innovation Capabilities.

In summary, the statistical analyses provide compelling evidence for the positive correlations and their statistical significance, contributing valuable insights into the relationships among the examined variables in the research.

4. Conclusion

The study delivers compelling insights into the dynamic interplay between digital technology adoption and business strategy transformation within the e-commerce industry. The positive correlation observed underscores the pivotal role of technology in driving adaptive and innovative shifts in e-commerce enterprises. Specific Key Performance Indicators (KPIs) identified through survey data analysis offer detailed insights into areas influenced by technology, while qualitative perspectives from executives enrich our understanding of decision-making processes. Structural Equation Modeling-Partial Least Squares (SMARPLS) analysis contributes to a nuanced comprehension of complex relationships, illuminating dynamics between digital technology adoption variables and business strategy transformation factors. The strategic dissemination of the survey through social media, coupled with SMARPLS analysis, ensures diverse and representative responses, advancing our understanding of digital technology's role in shaping contemporary business strategies. The investigation into 250 e-commerce enterprises unveils varied adoption patterns influenced by size, emphasizing the need for tailored strategies. Instances of alignment and misalignment stress the importance of harmonious integration. Robust validity and reliability, demonstrated by Cronbach's Alpha and Composite Reliability, instill confidence in measurement instruments. Statistical analyses, including bootstrapping, support positive correlations and their significance. In summary, this research offers a comprehensive understanding of the intricate relationships between digital technology adoption and business strategy transformation in e-commerce. Findings provide actionable insights for businesses of different sizes, contributing to strategic implications in navigating the evolving digital landscape effectively.

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