



Impact of Converging Disruptive Technology with Business Strategies for Improved Effectiveness: An Empirical Study

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Abstract

The convergence of disruptive technologies with business strategies has significant implications for improving organizational effectiveness. In the contemporary, swiftly progressing electronic terrain, enterprises are ceaselessly searching for ground-breaking methodologies to employ disruptive technologies to procure a competitive edge. The process of digital transformation (DX) has transformed into an omnipresent phrase that exceeds the boundaries of information technology aficionados and has garnered extensive recognition. It is not merely a fleeting subject confined to online search engines; rather, it is a phenomenon that will persist until a majority of IT companies embrace the technologies capable of liberating them from the confines of legacy IT systems. Two key technologies driving the actualization of digital transformation are convergence technology and disruptive technology. Authentic digital transformation entails a comprehensive shift in processes, transcending isolated departments and embracing enterprise-wide platforms to enhance customer experiences. In essence, true transformation necessitates the convergence of people, processes, and technology, leading to a holistic and profound change from within the organization. It is crucial to recognize that digital transformation goes beyond surface-level changes and superficial advancements. Organizations seeking a successful digital transformation must undertake a fundamental reconceptualization of their business operations. This requires the seamless integration of innovative technologies into all facets of the organization, fostering an environment that promotes agility, innovation, and customer-centricity. To accomplish this goal, businesses must overcome entrenched, traditional silos and embrace a more cross-functional approach. This means aligning personnel, streamlining processes, and leveraging advanced technologies to effectuate meaningful change, ultimately leading to new opportunities for growth and a competitive advantage.

Keywords- Business Cross-Functional Approach, Business Digital Transformation.

Introduction

The business landscape is an ever-shifting realm, characterized by constant change and turbulence. According to Lee and Trimi (2021), in today's digital age, the rate and magnitude of these changes have reached unprecedented levels, driven by factors such as the global pandemic of COVID-19. This dire situation has been particularly injurious to small and medium-sized businesses, which must now contend not with strategic long-term planning, but rather with the pressing need to formulate survival tactics for the upcoming quarter or even just the forthcoming months. The amalgamation of sundry monumental trends such as globalization, technological advancements, environmental anxieties, shifting demographics, urbanization, and the ongoing worldwide health crisis has contributed to the unpredictability that engulfs the commercial sphere.

According to Christensen, McDonald, Altman, and Palmer (2018), these enormous trends are progressing at an increasingly accelerated pace, resulting in a greater level of intricacy. To illustrate, the concept of globalization, previously characterized exclusively by trade conflicts and nationalist ideologies, is presently undergoing significant transformations. Emerging economies such as China and India have established robust domestic markets, diminishing their reliance on global trade.

According to Evans (2020), the coronavirus crisis has had a significant impact on the technology sector. With the advent of the coronavirus pandemic crisis, geopolitical divisions have deepened, supply chains have been severely disrupted, and many are questioning whether this marks the end of globalization as we know it. For example, advanced digital technologies have been extensively employed in COVID-19 testing, contact tracing, and treatment efforts, enabling the swift restructuring of disrupted supply chains, facilitating telework and remote education, and providing innovative solutions for the faltering economic and social structures. The ongoing pandemic has thrust organizations into a state of urgency, pushing them to innovate rapidly, repurpose their businesses, products, and materials, and deploy groundbreaking solutions to combat the virus's spread, alleviate material shortages, support vulnerable populations, and safely revive the economy. The competition among organizations is tough and unpredictable.

Semerikov et al., (2020) creating sustainable innovation has become a crucial requirement for all sectors, including businesses, government, and non-profit organizations, as they strive to develop flexible, adaptable, enduring, and swift capabilities. To confront emerging technologies and market conditions, organizations must adopt a comprehensive strategy that involves planning, system integration, and a culture that fosters innovation. This strategy should start with the recognition that digital transformation is not an add-on or a separate project but a necessity that permeates every aspect of the organization.

This means investing in technological infrastructure, promoting digital skills among employees, and cultivating a mindset that is receptive to change and experimentation. Furthermore, organizations must break down barriers and adopt an interdisciplinary approach that promotes cooperation and synergy among various departments. This collaborative ethos extends beyond internal stakeholders, as partnerships and ecosystems with external entities, such as startups, research institutions, and industry consortia, become crucial in leveraging emerging technologies and harnessing collective intelligence.

Literature Review

In the realm of information technology strategy, the prevalent viewpoint has traditionally held that it is a functional-level strategy that requires alignment with a company's overall business strategy. According to Bharadwaj, El Sawy, Pavlou, and Venkatraman (2013), digital business strategy is heading towards a new era of insights. even within this alignment view, the direction was established by the business strategy, with IT strategy following suit. In the last decade, the business landscape has shifted significantly as it has progressed into a digital infrastructure marked by amplified interconnectivity between products, processes, and services. Digital technologies, including information, computing, communication, and connectivity, have become the driving force behind the transformation of business strategies, processes, capabilities, products, services, and the relationships that exist between firms in vast extended business networks. In light of these developments, contend that the moment has come to reconsider the role of IT strategy.

Rather than considering it merely as a functional-level strategy subservient to the overarching business strategy, it should now be seen as a fusion between IT strategy and business strategy. This merger as "digital business strategy." To navigate this new paradigm, we suggest four essential themes that will steer our exploration of digital business strategy and assist in defining the next generation of insights. These themes encompass the magnitude, extent, rapidity, and origins of business value creation and capture within digital business strategy. In recent years, firms have been facing an increasing challenge known as "Big Data," which has emerged as a promising frontier for productivity and opportunity. The potentiality of the profound realm of Big Data analytics (BDAC) is widely acknowledged as a revolutionary impetus in the modus operandi of enterprises.

According to Akter, Wamba, Gunasekaran, Dubey, and Childe (2016), the study emphasizes the significance of enhancing firm performance through the alignment of big data analytics capability and business strategy. It is posited that Big Data analytics shall redefine the competitive terrain of industries in the forthcoming triennium, and an astonishing 89% of enterprises harbor apprehension that their failure to embrace a Big Data analytics strategy within the ensuing year may precipitate a depletion of market share and momentum. The notion of 'big data' has accrued substantial acclaim on a global scale. An exploration conducted via the Google search engine in mid-August 2014, employing the terms "big data" and "analytics," yielded an astounding 822 million and 154 million results, respectively. This

unequivocally underscores the colossal fascination and momentousness enshrouding this domain.

To estimate the constructs of BDAC, the study employs the repeated indicator approach, which allows for the simultaneous estimation of all constructs instead of separate estimates for lower-order and higher-order dimensions. The study clarifies that the measurement mode is reflective, as the first-order dimensions reflect the higher-order dimensions. Additionally, the model follows a reflective approach because the theoretical direction of causality is from constructs to items. To develop a comprehensive theory of BDAC strategy, outlining how the dimensions and sub-dimensions of BDAC can be leveraged to establish an overall BDAC climate within organizations. While previous studies have emphasized the importance of management, technology, and talent capabilities in a big data environment, this work sheds light on the role of Resource-Based Theory (RBT) and the entanglement view in proposing an integrated BDAC model and assessing its overall impact on firm performance. As the interest in the application of business analytics continues to burgeon across diverse industries, it is becoming increasingly crucial for organizations to comprehend and proficiently harness the potency of Big Data analytics. By doing so, businesses can maximize the immense potential provided by this field and attain an advantageous position in the ever-evolving business terrain.

Business models and technological innovations are intimately linked, yet a business model can be discerned from the technology itself. According to Baden-Fuller and Haefliger (2013), the relationship between business models and technological innovation is a crucial factor to consider of a business model centers on a system crafted to tackle the challenge of identifying and engaging with customers, meeting their needs, providing satisfaction, and monetizing the value derived from these interactions. In essence, the choice of a business model directly impacts how technology is monetized and the profitability of relevant firms.

Moreover, the mindset of managers, entrepreneurs, and developers regarding the business model plays a pivotal role in shaping technology development, underscoring the immense impact of these interconnections. This symbiotic relationship between business model choice and technology is intricate, multifaceted, and understudied. It is also crucial to note that technology from various domains, including information technology, can significantly impact business model creation and adaptation.

A prime example is mobile phone applications that act as process innovations for gaming or navigation purposes. Companies like Waze and Zynga heavily leverage app technology. Waze solely relies on mobile phone applications, while Zynga necessitates dependable application technology for optimal performance on tablet computers like the Apple iPad series. If performance enhancements hinge on process innovation and business model modifications, revisiting the conventional S-curve in technology management becomes necessary.

The domain of synthetic intelligence (AI) boasts a robust legacy that spans a period exceeding six decades, characterized by intervals of AI winters and springs. However, recent

strides made in the sphere of supercomputing power and Big Data technologies have infused fresh vigor into the purview of AI, lending it a forceful impetus. The advent of AI in contemporary times has engendered a veritable flurry of both excitement and polemics. Ginni Rometty, IBM's CEO, is of the opinion that AI technologies function as tools that heighten human intelligence.

According to Duan, Edwards, and Dwivedi (2019), the increasing prevalence of artificial intelligence (AI) in the era of Big Data has raised significant research questions regarding its role in decision making envisages a future wherein human beings and machines will establish a collaborative partnership, facilitating the ascension to novel heights and harnessing our sui generis human capabilities. In light of the proliferation of Big Data, advanced algorithms, and substantial improvements in computing power and storage, AI systems have metamorphosed into an integral component of digital ecosystems. AI contributes to the knowledge management and makes this task easier, efficient and effective for the staff (Mittal, et al., 2023).

These systems exert a profound influence on human decision-making mechanisms. As a result, there is a burgeoning demand for information systems researchers to scrutinize the implications of AI on decision-making processes and contribute to the progression of both theory and practice in this realm. The burgeoning popularity and prevalence of AI necessitate an understanding of its ramifications on decision-making. Researchers are tasked with revealing the intricacies of AI's effects and probing how it can be exploited to augment decision-making processes. By plumbing the theoretical underpinnings of AI and studying its pragmatic implications, researchers can play a pivotal role in propelling the field forward and ensuring the successful assimilation of AI technologies into decision-making frameworks. Effective IT-business alignment encompasses various activities, including communication activities that foster mutual understanding between the business and IT, value analytics activities that involve the use of IT and business metrics, IT governance activities such as strategic planning, reporting, and budgeting, partnership activities aimed at maintaining a strong working relationship between the business and IT organizations, IT scoping activities that promote the creation of a flexible IT infrastructure, evaluation and application of emerging technologies, driving business process change, and delivering valuable customized solutions, as well as positioning and balancing business and IT skills.

According to Luftman, Lyytinen, and Zvi (2017), the measurement of information technology (IT) business alignment and its impact on company performance. These dimensions collectively contribute to IT-business alignment. Moreover, when expressed as a joint formative construct of these six alignment dimensions, the level of strategic alignment explains 15% of the overall company performance, indicating a statistically significant and reliable relationship.

While the model explains a proportion of the variability in response data, it is important to acknowledge that other factors not considered in the study, such as competition, the

effectiveness of other business activities (e.g., operations, marketing, research), likely contribute to the remaining 85% of company performance. Nonetheless, the research underscores the significance of IT-business alignment in enhancing company performance, particularly in an era where small profit margins are prevalent across industries.

By providing a comprehensive benchmark for assessing alignment status, executives can identify areas for improvement in IT-business relationships and overall performance. Evaluating alignment serves as a foundational step in formulating action plans aimed at harnessing the full potential of IT to deliver value to the business. Blockchain technology has arisen as a significant "disruptive innovation". This has seized the interest of scholars. With a multitude of disciplines. This technology serves as the bedrock for digital currencies such as Bitcoin. This technology has garnered plaudits from a diverse range of stakeholders. This includes developers, entrepreneurs, and technology enthusiasts. The capability of blockchain technology to transform the current economic, legal, political, and cultural terrain is immense. Virtual Communities connect people like never before (Kudeshia and Mittal, 2015).

Frizzo-Barker, Chow-White, Adams, Mentanko, Ha, and Green (2020) conducted a systematic review on the use of blockchain as a disruptive technology for business. this ground-breaking innovation presents a revolutionary means of storing, verifying, and transferring data that transcends traditional methods. With its decentralized architecture, the society has been lauded by these advocates. The surge of interest in this technology. This has forced business scholars to explore its impact and potential for disruption. The time period of global financial turbulence. With its enigmatic creator, Satoshi Nakamoto. Bitcoin focused to establish a decentralized digital currency. Which would circumvent the authority of governments, banks, and traditional financial institutions.

This revolutionary use of blockchain technology sparked inquisitiveness. This laid the groundwork for further exploration of its possibilities in business decisions. As researchers ventured into the realm of blockchain. Researcher discovered a landscap. The scholarly inquiry into blockchain merits attention, yet its examination remains in its incipient stage. The preponderance of ideational papers (83%) over experimental papers (17%) underscores the embryonic quality of the domain, a commonplace observation when scrutinizing unprecedented phenomena. Scholars are actively exploring various aspects of blockchain, including its potential as a disruptive force within society and its integration into the business literature. Although empirical research is still limited, the existing body of knowledge signifies the growing interest and eagerness to understand and analyze the implications of this emerging technology. Ever since the concept of disruptive technology was introduced, researchers and practitioners in the industrial business realm have been devoted to acquiring a more profound comprehension of the emergence and supremacy of these technologies.

According to Obal's (2017) disruptive technologies have been observed to conquer industries by offering novel and captivating features that set them apart from existing technologies, reminiscent of the personal computer's ascendance over minicomputers. Embracing a

disruptive technology at its early stages can present smaller firms with an opportunity to compete against larger competitors, while adhering to a declining technology can render a firm vulnerable and exposed to risks.

To ensure a comprehensive analysis, four control variables were examined in conjunction with the predictive variables of continuous adoption intention: the number of employees, buyer revenues, IT capabilities, and the length of the buyer-supplier relationship. It was hypothesized that an increase in the buying firm's efforts in searching for information would enhance the likelihood of the firm intending to persistently utilize their newly adopted disruptive technology. As anticipated, heightened searching efforts exhibited a positive influence on satisfaction.

intensified searching endeavors and a focus on efficiency-oriented motives proved to be effective drivers for sustaining intentions of continuous adoption of disruptive technology. These findings shed light on the importance of proactive information gathering and the strategic alignment of motives in facilitating the ongoing integration and utilization of disruptive technologies within organizations.

The advent of recent technological revolutions, such as social media, has ushered in an era of unprecedented data generation speed. According to Fan, Lau, and Zhao (2015), the authors examined the role of big data analytics in business intelligence, specifically focusing on marketing mix. concept of big data and its application in business intelligence has garnered significant attention in recent years, owing to its immense potential in generating profound business impacts. Big data is characterized as the volume of data that surpasses technology's capability to efficiently store, manage, and process. It encompasses three crucial dimensions: volume, velocity, and variety. In location-based advertising, customers are presented with timely advertisements or product recommendations based on their current or predicted future positions. This approach offers companies a new tool to attract more customers and enhance brand value. However, a key challenge in location-based advertising lies in accurately predicting customers' locations. This necessitates the consideration of both spatial and temporal data, including temporal moving pattern mining for location-based service.

The processing of large volumes of spatial and temporal data within a short timeframe. Before customers transition to new locations, poses a significant velocity-related challenge for location-based advertising. In light of these perspectives, the convergence of disruptive technology with business strategies presents an opportunity for improved effectiveness in leveraging the potential of big data and location-based advertising.

As disruptive technologies become increasingly prevalent, firms that possess such innovations face a strategic dilemma. Incumbent managers in established industries must grapple with the decision of whether to explore new disruptive business models or exploit existing models that have yielded past success.

According to Osiyevskyy and Dewald (2015), optimal response of contextual factors. The enthusiastic adoption of a disruptive approach can sometimes lead to detrimental consequences for incumbents. The combination of individual behavioral decision-making theories and studies on disruptive business model innovations contributes to the entrepreneurship and strategy literature by shedding light on the process of incumbent entrepreneurial adaptation to emerging industry disruptions. According to Sousa and Rocha (2019), proposed typology of responses can serve as a framework for further studies on business model evolution and disruptive innovations within descriptive and prescriptive theoretical models.

The success of strategic decision-making among UK senior managers was found to be heavily reliant on the knowledge base utilized. This knowledge base encompassed various forms of information available during a period when decision-related information was predominantly well-known, accessible through hard copy reports (explicit knowledge), or derived from managers' experience and judgment (implicit or tacit knowledge). The advent of big data, accompanied by an explosion of knowledge due to increased access, has significantly impacted how senior managers obtain and utilize information.

According to Merendino et al. (2018), the impact of big data on board level decision-making was explored the individual director level, a cognitive capability gap is identified, highlighting the need for organizations to possess the necessary cognitive abilities to effectively navigate big data. Failure to address this gap can lead to cognitive biases and information overload associated with big data. Furthermore, big data disrupts board cohesion, influencing the decision-making process itself. Directors face challenges in introducing changes within shortened timeframes brought about by big data. In terms of organizational functioning, efficient utilization of big data is contingent upon strong internal coordination, integration, and the cultivation of a shared big data culture among decision-makers. While some organizations exhibit inertia when confronted with the challenges posed by big data, there are also instances of proactive internal responses, such as building internal capabilities, and seeking external stakeholder collaborations to effectively leverage big data for decision-making processes.

Objective

To investigate the impact of converging disruptive technology with business strategies for improved effectiveness

Methodology

This research is a descriptive type that collected data from 185 participants, including CEOs, CTOs, CIOs, and other top-level executives who are responsible for making strategic decisions within their organizations. The data were analyzed using a checklist question, which required respondents to answer with either a "Yes" or a "No" for each question.

Data Analysis and Interpretations:

Table 1 Impact of Converging Disruptive Technology with Business Strategies for Improved Effectiveness

SL No.	Impact of Converging Disruptive Technology	Yes	% Yes	No	% No	Total
1	Converging disruptive technologies with business strategies can significantly improve effectiveness by enhancing efficiency and productivity.	165	89.19	20	10.81	185
2	Converging disruptive technologies with business strategies can foster accelerated innovation.	141	76.22	44	23.78	185
3	The convergence of disruptive technologies with business strategies can lead to an improved customer experience.	153	82.70	32	17.30	185
4	Converging disruptive technologies with business strategies empowers organizations with better decision-making capabilities.	173	93.51	12	6.49	185
5	Converging disruptive technologies with business strategies enables organizations to become more agile and adaptable in a rapidly changing business landscape.	137	74.05	48	25.95	185
6	The convergence of disruptive technologies with business strategies can provide organizations with a significant competitive advantage.	170	91.89	15	8.11	185

Table 1 shows the impact of converging disruptive technology with business strategies for improved effectiveness. It was found that around 93.5% respondents accept that converging disruptive technologies with business strategies empowers organizations with better decision-making capabilities. Additionally, the convergence of disruptive technologies with business strategies can provide organizations with a significant competitive advantage (91.8%). Moreover, converging disruptive technologies with business strategies can significantly improve effectiveness by enhancing efficiency and productivity (89.1%). The convergence of disruptive technologies with business strategies can lead to an improved customer experience (82.7%). However, converging disruptive technologies with business strategies can foster accelerated innovation (76.2%). Lastly, converging disruptive technologies with business strategies enables organizations to become more agile and adaptable in a rapidly changing business landscape (74.0%).

Conclusion

This empirical investigation has illuminated the consequences of merging disruptive technology with business strategies to enhance their efficacy. The outcomes have distinctly manifested that assimilating disruptive technologies, including artificial intelligence, blockchain, and the Internet of Things, into business strategies could significantly augment organizational performance.

The study has accentuated the significance of conforming business strategies with emerging technologies to exploit their transformative potential. Through adopting these disruptive technologies, entities can rationalize their operations, enrich customer experiences, and achieve a competitive advantage in the marketplace. Furthermore, the research has emphasized the necessity for proactive and strategic planning when amalgamating disruptive technologies. It is critical for enterprises to comprehend the implications, challenges, and opportunities associated with these technologies to leverage them efficiently and enhance their efficacy.

Additionally, the study has underscored the importance of an adaptable and collaborative organizational culture that embraces innovation and experimentation. Entities that cultivate an atmosphere of openness and promote cross-functional collaboration are in a better position to seamlessly execute and assimilate disruptive technologies into their business strategies.

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