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Business Analytics Capability and Competitive Advantage: The Mediating Role of Data-Driven Decision-Making

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ABSTRACT

Business analytics capability has emerged as a critical organizational resource for firms seeking to strengthen competitive advantage in increasingly data-intensive and dynamic markets. This study examines the relationship between business analytics capability and competitive advantage, with particular emphasis on the mediating role of data-driven decision-making. The study adopts a comprehensive review approach, synthesizing findings from relevant empirical and conceptual literature on analytics capabilities, organizational decision-making, and firm performance. The reviewed evidence indicates that business analytics capability enables organizations to effectively collect, integrate, analyze, and interpret data, thereby improving the quality, speed, and accuracy of managerial decisions. Data-driven decision-making serves as an important mechanism through which analytics capabilities are translated into competitive outcomes by supporting evidence-based resource allocation, market responsiveness, operational efficiency, customer understanding, and innovation. The findings further suggest that organizations possessing advanced analytical capabilities do not automatically achieve superior performance; rather, competitive benefits are more likely when analytical insights are systematically incorporated into strategic and operational decision processes. The study therefore concludes that data-driven decision-making plays a significant mediating role in converting business analytics capability into sustainable competitive advantage. The review highlights the importance of developing not only technological and analytical infrastructure but also managerial competencies, data governance practices, and an organizational culture that supports evidence-based decision-making.

1. Introduction

The rapid growth of digital technologies, big data, cloud computing, and artificial intelligence has transformed the way organizations collect, process, and utilize information for strategic and operational purposes. In increasingly competitive business environments, organizations are required not only to generate large volumes of data but also to convert such data into meaningful insights that support timely and effective managerial decisions. Business analytics has therefore emerged as an important organizational capability that enables firms to examine complex data, identify patterns and trends, predict future developments, and improve business processes. Organizations with stronger analytics capabilities are increasingly able to respond to changing customer preferences, market conditions, technological developments, and competitive pressures. Consequently, business analytics capability has become an important source of organizational value and a potential contributor to sustainable competitive advantage (Tanvir et al., 2024; Hossain et al., 2026).

Business analytics capability refers to an organization's ability to acquire, integrate, manage, analyze, and interpret data through appropriate technologies, analytical techniques, human expertise, and organizational processes. This capability extends beyond the mere possession of sophisticated information systems. It involves the coordinated deployment of technological infrastructure, data resources, analytical skills, managerial support, and organizational routines to transform data into actionable knowledge. Firms that develop these capabilities can improve their understanding of customers and markets, identify emerging

opportunities, optimize resources, reduce operational inefficiencies, and support innovation (Aniwa, 2021; Sami et al., 2026). From a resource-based perspective, analytics capability may provide a basis for competitive advantage when it represents a valuable, difficult-to-imitate, and effectively organized organizational resource (Tanvir et al., 2020; Hemal et al., 2025).

Competitive advantage is increasingly dependent on how effectively organizations use information to create superior value relative to competitors. Traditional sources of advantage, such as physical assets, geographical location, and access to financial resources, remain important but may be insufficient in highly dynamic and data-intensive markets (Das et al., 2025). Organizations can obtain competitive benefits from analytics through improved operational efficiency, personalized products and services, enhanced customer experiences, faster market responses, better risk management, and more accurate forecasting. For example, a retailer can use customer and transaction data to identify purchasing patterns and optimize inventory, while a financial institution can employ analytical models to improve risk assessment and customer service. These applications illustrate how analytics can contribute to organizational performance when insights are effectively incorporated into business activities (Ayrin et al., 2025; Sarwer et al., 2022).

However, possessing analytics technologies and data resources does not automatically generate competitive advantage. The value of analytics depends substantially on an organization's ability to translate analytical insights into appropriate managerial actions. This makes data-driven decision-making (DDDM) particularly important. Data-driven decision-making involves using systematically collected and analyzed data as a central basis for evaluating alternatives, solving organizational problems, allocating resources, and selecting strategic and operational courses of action. Rather than relying primarily on intuition or experience, managers who adopt data-driven approaches use empirical evidence and analytical insights to strengthen the quality, consistency, and timeliness of decisions. Thus, DDDM may represent the organizational mechanism through which business analytics capability is converted into tangible strategic and operational outcomes (Adenike, 2018; Hossain et al., 2024).

The relationship between business analytics capability and competitive advantage can therefore be understood as more than a direct association. Analytics capability provides organizations with the technical and human resources necessary to generate useful information, whereas data-driven decision-making determines how effectively that information is incorporated into managerial practices (Alam et al., 2024). A firm may possess advanced analytical platforms and highly skilled analysts but fail to gain meaningful competitive benefits if managers do not trust analytical outputs, organizational processes do not support evidence-based decisions, or decision-makers are unable to translate insights into action. Conversely, organizations that integrate analytics into their decision-making processes may be better positioned to identify opportunities, respond to threats, improve efficiency, and create differentiated value. DDDM may consequently serve as a mediating mechanism linking analytics capability to competitive advantage (Adenike, 2023; Alasa et al., 2025a,b).

The growing importance of this relationship has generated considerable interest among researchers and practitioners, yet important questions remain regarding how analytics capabilities produce competitive outcomes. Existing research has frequently examined the direct relationship between analytics capabilities and organizational performance, while comparatively less attention has been devoted to understanding the organizational processes through which these capabilities generate competitive advantage. In particular, examining data-driven decision-making as a mediating variable can provide a more comprehensive explanation of how technological and analytical resources are transformed into strategic value (Garmaki, 2023; Hossain & Alasa, 2024a,b). Such an approach recognizes that competitive advantage is not created by data or analytical technologies alone but through organizational processes that enable managers to use information effectively.

This study therefore examines the relationship between business analytics capability and competitive advantage, with particular emphasis on the mediating role of data-driven decision-making. The study seeks to determine whether organizations with stronger business analytics capabilities are more likely to adopt data-driven decision-making practices and whether such practices contribute to competitive advantage. By investigating this mediating relationship, the study contributes to a deeper understanding of the mechanisms through which analytics resources can generate organizational value. The findings may also provide practical implications for managers seeking to strengthen analytical capabilities, develop evidence-based decision-making cultures, and use business analytics strategically to achieve and sustain competitive advantage in increasingly data-driven business environments.

2. Methodology

2.1 Research Design

This study adopted a systematic literature review design to examine the relationship between business analytics capability and competitive advantage, with particular emphasis on the mediating role of data-driven decision-making. A review-based design was considered appropriate because the study seeks to synthesize existing theoretical and empirical evidence rather than collect primary data from individual organizations. The review focused on research addressing how organizations develop analytics

capabilities, how these capabilities influence organizational competitiveness, and how the use of data-driven decision-making mechanisms translates analytical resources into superior organizational outcomes. The methodology also enabled the study to identify areas of convergence, inconsistencies, and gaps within the existing literature (Alam et al., 2024; Hossain et al., 2023).

2.2 Literature Search Strategy

A structured literature search was conducted using major academic databases and scholarly search platforms, including Scopus, Web of Science, ScienceDirect, Emerald Insight, SpringerLink, and Google Scholar. The search strategy combined keywords and Boolean operators related to the main constructs of the study. Search terms included business analytics capability, business analytics, analytics capability, competitive advantage, organizational performance, data-driven decision-making, data-driven management, business intelligence, and firm competitiveness (Hossain, 2021, 2022; Sami et al., 2024; Alam et al., 2026). Different combinations of these terms were used to capture studies employing alternative terminology for similar concepts. The search emphasized peer-reviewed journal articles, academic books, conference papers, and other credible scholarly publications relevant to the research objectives.

2.3 Inclusion and Exclusion Criteria

Studies were selected according to predetermined inclusion and exclusion criteria. Publications were included when they directly examined business analytics capability, data-driven decision-making, competitive advantage, or the relationships among these constructs. Priority was given to empirical and conceptual studies that provided clear theoretical explanations or evidence concerning the development and utilization of analytics capabilities within organizations. Studies published in English and available in sufficient detail for analysis were considered. Publications that were unrelated to organizational analytics, focused exclusively on technical algorithms without organizational implications, duplicated other records, or lacked sufficient academic information were excluded (Alam et al., 2023). This screening process helped ensure that the literature synthesized in the review was sufficiently relevant to the study's conceptual focus.

2.4 Literature Screening and Selection Process

The identified literature was subjected to a multistage screening process. Initially, titles and abstracts were examined to determine whether individual publications addressed the central themes of the study. Potentially relevant studies were then reviewed in greater detail to establish their conceptual and empirical relevance. Particular attention was given to evidence concerning the relationship between analytics resources and capabilities, organizational decision-making processes, and competitive outcomes (Yusuf et al., 2025; Saha et al., 2025a,b). Duplicate publications and studies that failed to satisfy the inclusion criteria were removed. The final body of literature comprised studies that offered meaningful evidence for understanding business analytics capability, data-driven decision-making, and competitive advantage.

2.5 Data Extraction and Organization

Relevant information was systematically extracted from the selected literature and organized according to the major constructs of the study. The extraction process considered the authors and publication year, research context, theoretical perspective, methodological approach, key variables, principal findings, and implications. Particular emphasis was placed on how business analytics capability was conceptualized and measured, the mechanisms through which organizations employed data in decision-making, and the organizational outcomes associated with analytics adoption. The extracted evidence was subsequently grouped into thematic categories to facilitate comparison across studies and to identify recurring relationships and explanatory mechanisms (Yusuf et al., 2024; Rahman et al., 2022; Alam et al., 2025).

2.6 Analytical Approach

The study employed thematic and narrative synthesis to analyze the reviewed literature. Thematic analysis involved identifying recurring patterns concerning the development of business analytics capabilities, the use of analytical information in organizational decision-making, and the achievement of competitive advantage. Narrative synthesis was then used to compare findings across different organizational and industry contexts and to explain areas of agreement and disagreement within the literature. The analysis specifically examined whether business analytics capability has a direct influence on competitive advantage and whether this relationship can be explained or strengthened through data-driven decision-making. This approach allowed the review to integrate findings from studies using different methodological designs while maintaining a coherent analytical framework (Kaur et al., 2025; Habib et al., 2024).

2.7 Conceptualization of the Main Constructs

For purposes of the review, business analytics capability was conceptualized as an organization's ability to acquire, integrate, manage, analyze, and effectively utilize data and analytical technologies to support organizational objectives. The construct encompasses technological resources as well as human expertise, organizational processes, analytical skills, and managerial support. Data-driven decision-making was treated as the extent to which managers and organizational employees systematically

use reliable data, analytical evidence, and business insights when making strategic, tactical, and operational decisions. Competitive advantage was conceptualized in terms of an organization's ability to achieve superior performance, efficiency, innovation, responsiveness, customer value, or other outcomes relative to competitors. These conceptual definitions provided a consistent basis for interpreting findings across the reviewed studies (Saha et al., 2026).

2.8 Analysis of the Mediating Role of Data-Driven Decision-Making

A central component of the methodology was the examination of data-driven decision-making as a potential mediating mechanism between business analytics capability and competitive advantage. The review therefore assessed whether existing studies provide evidence that analytics capabilities create competitive value primarily when organizations successfully transform analytical resources into actionable information and incorporate that information into decision-making processes (Bulbul et al., 2019). The synthesis considered evidence for both direct effects of analytics capability on competitive outcomes and indirect effects operating through improved decision quality, organizational responsiveness, resource allocation, innovation, and strategic alignment. Through this approach, the study develops an integrated explanation of how analytical capabilities can be converted into tangible competitive benefits (Rahman et al., 2025).

2.9 Reliability and Quality Considerations

To enhance the credibility of the review, greater emphasis was placed on peer-reviewed and academically established sources with clear theoretical foundations, transparent methodologies, and well-supported findings. Evidence from multiple studies was compared rather than relying on isolated findings. Where studies produced differing conclusions, contextual factors such as industry characteristics, organizational size, technological maturity, managerial capabilities, and data governance were considered when interpreting the differences (Alam et al., 2023). The synthesis also distinguished between conceptual propositions and empirically demonstrated relationships, thereby reducing the risk of presenting theoretical assumptions as established evidence.

2.10 Ethical Considerations

As a literature-based study, the research did not involve direct interaction with human participants, collection of personal information, or experimental intervention. Nevertheless, academic integrity was maintained through appropriate attribution of ideas and findings to their original sources. The review sought to represent previous research accurately and objectively, including evidence that may not support the proposed relationships. The methodology therefore emphasizes transparent selection, critical evaluation, and balanced synthesis of the available scholarly literature.

3. Findings and Discussion

3.1 Business Analytics Capability and Organizational Performance

The reviewed evidence indicates that business analytics capability is positively associated with organizational performance because it enables organizations to convert large volumes of business data into information that can support operational efficiency, strategic responsiveness, customer understanding, and resource optimization. However, the findings suggest that analytics capability is not determined simply by the possession of analytical technologies. Its performance implications depend on the combined availability of appropriate technological infrastructure, high-quality data, integration mechanisms, and employees capable of interpreting and applying analytical outputs. Organizations that develop these capabilities systematically are better positioned to identify patterns in their operations, respond to changes in customer demand, control costs, and recognize emerging market opportunities (Hossain et al., 2024). This finding is consistent with earlier studies on business intelligence and analytics, which generally argue that analytics creates value when technological and organizational resources are combined rather than implemented independently.

3.1.1 Analytical Infrastructure and Technological Capability

The findings show that analytical infrastructure constitutes an important foundation of business analytics capability. Organizations increasingly rely on integrated data platforms, analytical software, cloud-based systems, dashboards, and automated reporting technologies to collect and process information from multiple sources. Reliable infrastructure reduces the time required to obtain relevant information and allows managers to access updated indicators when making operational and strategic decisions. For example, a retail organization can combine point-of-sale information with inventory and customer data to identify fast-moving products and adjust stock levels before shortages occur (Islam, 2023). Similarly, a manufacturing organization can use analytical systems to monitor production indicators and identify deviations that require managerial intervention.

Cloud technologies have further strengthened analytical capabilities by providing scalable computing and storage resources. Instead of depending entirely on locally installed systems, organizations can increasingly process large datasets through flexible cloud environments and provide authorized users with access to analytical information across different organizational locations.

The findings therefore indicate that infrastructure flexibility is particularly valuable in environments characterized by rapidly changing data volumes and business conditions. Organizations with fragmented, outdated, or unreliable systems, in contrast, may experience delays, duplication, and difficulties in producing consistent analytical results (Hossain, 2021, 2022).
These findings support previous research emphasizing that information technology resources become strategically valuable when they are embedded within broader organizational capabilities. Technology alone does not automatically improve performance; rather, its contribution emerges when organizations are able to deploy infrastructure effectively and connect it with business processes. Thus, investments in analytical platforms should be accompanied by appropriate system integration, user training, governance mechanisms, and managerial support. The evidence suggests that organizations with stronger technological foundations are more capable of transforming raw business data into timely insights and subsequently improving both operational and strategic performance.

3.1.2 Data Quality, Accessibility, and Integration

Data quality emerged as another critical component of effective business analytics capability. The reviewed evidence indicates that analytical outcomes are strongly dependent on whether the underlying data are accurate, complete, consistent, timely, and accessible. Poor-quality data can produce misleading patterns and incorrect conclusions, even when sophisticated analytical tools are available. For example, duplicated customer records, missing transaction information, inconsistent product classifications, or outdated financial data may distort performance indicators and lead managers to allocate resources incorrectly. Consequently, organizations need appropriate data-quality procedures before analytical outputs can be considered sufficiently reliable for managerial use.

The findings further demonstrate that accessibility and integration increase the value of organizational data. When marketing, finance, operations, sales, supply-chain, and customer-management information remains isolated in separate systems, managers may obtain only partial views of organizational performance. Integrating these datasets creates a more comprehensive basis for analysis. For instance, combining customer purchasing patterns with marketing campaign information and financial data can help an organization determine not only which customers respond to a campaign but also whether those responses generate sufficient financial returns (Al-Khatib, 2022; Ayrin et al., 2025). Similarly, integrating sales and inventory data can help organizations identify relationships between demand patterns and stock availability.

This finding reinforces earlier studies that identify data integration as an important mechanism through which analytics generates organizational value. Integrated information reduces information gaps between departments and facilitates a shared understanding of organizational conditions. It can also improve coordination because managers from different functions can work with common indicators rather than relying on conflicting datasets. Nevertheless, the findings suggest that integration must be accompanied by appropriate data governance. Establishing common definitions, ownership responsibilities, access controls, and procedures for validating data is essential to ensure that integrated information remains trustworthy. Therefore, data quality should be understood not as a technical issue alone but as an organizational capability that directly affects the usefulness of business analytics.

3.1.3 Analytical Skills and Human Capability

The findings indicate that human capability plays a central role in determining whether investments in business analytics translate into organizational improvements. Employees need more than technical familiarity with analytical software; they require statistical knowledge, critical-thinking skills, business understanding, and the ability to interpret analytical results within an organizational context. Large and complex datasets can contain numerous patterns, but identifying which patterns are meaningful and translating them into practical action requires human judgment (Hasan et al.,2026). Organizations with employees who possess these capabilities are therefore better positioned to extract value from their analytical resources.

For example, an organization may use customer analytics to identify declining purchasing activity among a particular customer group. A technically competent employee can identify the pattern, but a business-oriented analyst can investigate whether the decline is associated with pricing, product availability, customer-service problems, or changes in market conditions (Saha et al., 2025a,b). This distinction demonstrates why analytical capability requires the combination of technical and managerial knowledge. The findings indicate that organizations benefit when analysts understand both how to conduct analysis and why particular findings matter to organizational objectives.

The results are consistent with previous research highlighting the importance of managerial and employee competencies in realizing the value of analytics. Training and professional development can strengthen employees' abilities to interpret dashboards, evaluate statistical evidence, communicate insights, and formulate appropriate recommendations. At the same time, organizations benefit from developing collaboration between data specialists and managers because technical analysts may possess sophisticated analytical skills while managers possess deeper knowledge of organizational processes and customer

needs. The findings therefore suggest that human capability represents a critical link between analytical infrastructure and organizational performance.

3.2 Business Analytics Capability and Data-Driven Decision-Making

The review further indicates that data-driven decision-making represents an important mechanism through which business analytics capability contributes to organizational outcomes. Analytics provides organizations with evidence about current performance, emerging trends, customer behavior, resource utilization, and potential risks. However, the organizational benefits of analytics depend on whether managers actually use this evidence when making decisions. The findings suggest that organizations derive greater value when analytical insights become integrated into routine managerial processes rather than being limited to periodic reports or retrospective performance assessments (Cao, 2014; Saha et al., 2026). In this respect, data-driven decision-making functions as a mediating mechanism connecting analytics capability with improved organizational performance.

3.2.1 Availability and Use of Analytical Insights

The findings demonstrate that the availability of timely and actionable analytical information increases managers' capacity to make informed decisions. Dashboards, performance indicators, predictive models, automated alerts, and business intelligence reports can provide managers with information about organizational conditions without requiring lengthy manual data collection and processing. This can be particularly important in rapidly changing environments where delayed information may reduce the usefulness of a decision. For example, a sales manager can monitor daily sales trends and customer responses and adjust promotional activities when evidence indicates that a particular strategy is not producing the expected results.

Importantly, the evidence indicates that analytics creates greater value when it is incorporated into routine managerial activities. Organizations that use analytics only to prepare monthly or annual reports may receive less benefit than those that use analytical information continuously to monitor performance and guide actions. Routine use can involve reviewing operational dashboards, comparing actual performance with targets, monitoring customer behavior, evaluating resource utilization, and identifying exceptions requiring intervention. Analytics therefore becomes part of the decision process rather than merely a reporting function.

This finding corresponds with previous research suggesting that business intelligence systems generate stronger organizational benefits when analytical information is actively used by decision-makers. The mere availability of data does not guarantee evidence-based decisions. Managers must trust the information, understand its implications, and have sufficient authority to act on it. Consequently, organizations need to develop processes that connect analytical outputs directly to managerial responsibilities and decision points.

3.2.2 Evidence-Based Strategic and Operational Decisions

The findings show that business analytics supports a broad range of strategic and operational decisions. At the strategic level, organizations can use historical and predictive information to identify market trends, evaluate potential investments, assess competitive conditions, and develop long-term plans. Forecasting tools can assist managers in estimating future demand, while scenario analysis can help organizations examine possible consequences of alternative strategies (Alam et al., 2025). These capabilities reduce uncertainty and allow decision-makers to evaluate options using systematic evidence rather than relying exclusively on assumptions.

At the operational level, analytics supports resource allocation, inventory management, workforce planning, supply-chain coordination, customer management, and risk monitoring. For example, demand analytics can help a business determine appropriate inventory levels, while customer analytics can identify purchasing patterns and support more targeted customer-service strategies. In financial management, analytical models can help organizations monitor expenditure patterns and identify areas where resources may be used inefficiently. In risk management, organizations can examine historical patterns and emerging indicators to identify potential problems before they become more significant.

The evidence suggests that data-driven decision-making does not eliminate managerial judgment but strengthens it by providing additional evidence. Intuition and professional experience may remain valuable, particularly when managers face novel situations for which historical data are limited. However, analytical evidence can provide a systematic basis for testing assumptions and comparing alternatives. Previous studies on analytics-enabled decision-making similarly emphasize that organizations can improve decision consistency and reduce avoidable judgment errors when relevant evidence is incorporated into managerial processes (Tanvir et al., 2024). Thus, the contribution of analytics lies not in replacing managers but in improving the informational foundation on which managerial judgment is exercised.

3.2.3 Organizational Culture and Data-Driven Decision-Making

The findings indicate that organizational culture significantly influences whether business analytics is converted into effective data-driven decision-making. Organizations may possess advanced analytical systems and extensive datasets but obtain limited benefits if managers continue to rely exclusively on intuition, personal preferences, or established routines. A data-oriented culture encourages employees and managers to ask evidence-based questions, examine alternative explanations, test assumptions, and use analytical findings when evaluating decisions. Such a culture strengthens the connection between analytics capability and organizational outcomes (Sami et al., 2026; Alam et al., 2024).

Leadership support emerged as particularly important. Senior managers can encourage data-driven practices by demonstrating the use of evidence in their own decisions, allocating resources for analytics, supporting employee training, and establishing expectations that important decisions should be informed by reliable data. Conversely, if senior management treats analytics primarily as a technical function or reporting requirement, employees may have limited incentives to incorporate analytical insights into their everyday decisions. Leadership therefore helps determine whether analytics becomes embedded in organizational routines or remains an isolated technological initiative.

The findings also highlight the importance of employee attitudes and organizational learning. Employees are more likely to use analytics effectively when they view data as a resource for learning and improvement rather than as a mechanism for monitoring or criticizing their performance. A supportive environment can encourage experimentation, evaluation, and learning from unsuccessful decisions (Islam, 2023; Tanvir et al., 2020). For example, managers can compare the outcomes of alternative marketing strategies and use the results to refine future decisions rather than treating an unsuccessful strategy simply as a failure. This creates an organizational learning cycle in which data are continuously used to evaluate actions and improve subsequent decisions.

3.3 Data-Driven Decision-Making and Competitive Advantage

3.3.1 Improved Operational Efficiency and Responsiveness

The reviewed evidence indicates that data-driven decision-making is an important pathway through which organizations improve operational efficiency and responsiveness. When managers have access to timely, accurate, and relevant analytical information, they can make better decisions regarding resource allocation, inventory management, staffing, production schedules, logistics, and process improvement. Business analytics enables organizations to identify inefficiencies that may not be visible through traditional managerial judgment alone. For example, retailers can analyze historical sales patterns and real-time purchasing information to forecast demand and adjust inventory levels, thereby reducing stock-outs and excess inventory (Yusuf et al., 2024). Similarly, manufacturing firms can use operational data to identify production bottlenecks, monitor equipment performance, and anticipate maintenance requirements. These applications reduce unnecessary costs while improving the speed and reliability of organizational processes.

The findings are consistent with previous research showing that analytics capabilities can enhance organizational performance by improving the quality and timeliness of managerial decisions. The value of analytics is particularly evident in environments characterized by volatile demand and rapid market changes. Organizations that continuously monitor sales, supply-chain, financial, and operational indicators can detect deviations from expected performance and respond before problems become substantial. For example, a logistics company can use traffic, delivery, customer-order, and vehicle data to modify delivery schedules and routes in response to changing conditions (Almazmomi, 2022). Consequently, operational efficiency is not simply a result of possessing large amounts of data; rather, it depends on the organization's ability to transform data into actionable decisions quickly. This finding reinforces the view that analytical capability becomes strategically valuable when it is embedded in day-to-day decision processes.

3.3.2 Customer and Market Intelligence

The findings further demonstrate that data-driven decision-making strengthens customer and market intelligence, enabling organizations to understand consumer preferences and changing market conditions more accurately. Customer transaction records, digital interactions, feedback, demographic information, and purchasing patterns provide organizations with opportunities to identify customer needs and segment markets more effectively (Yusuf et al., 2024; Das et al., 2025). Instead of relying primarily on generalized assumptions about customers, firms can use analytical insights to determine which products, services, communication channels, and pricing approaches are most appropriate for particular customer groups. This can support personalized recommendations, targeted promotions, improved customer service, and more effective marketing strategies.

Customer and market intelligence also contributes to competitive positioning by enabling organizations to identify emerging trends and monitor competitors. For example, an online retailer can examine search behavior, purchasing patterns, product reviews, and abandoned transactions to identify changes in consumer preferences. A financial institution can analyze customer

transaction patterns to develop services that better correspond to changing customer needs. In telecommunications, analysis of usage behavior can help firms identify customers at risk of switching to competitors and design appropriate retention strategies. Such applications demonstrate that data-driven decisions can contribute to differentiation because organizations become more capable of anticipating and responding to customer expectations (Rahman et al., 2022). Previous studies on market orientation and analytics similarly suggest that organizations that integrate customer information into decision-making are better positioned to respond to market changes and develop stronger customer relationships.

However, the evidence also suggests that customer intelligence creates competitive advantage only when organizations use it responsibly and effectively. Possessing extensive customer data does not automatically lead to superior market performance. Data must be accurate, sufficiently current, appropriately interpreted, and translated into decisions that generate meaningful customer value. Organizations must therefore combine analytical tools with managerial understanding of customer behavior and market context. This finding is particularly important because excessive reliance on quantitative indicators may cause managers to overlook qualitative factors such as customer emotions, changing social expectations, or unexpected shifts in consumer behavior.

3.3.3 Innovation and Organizational Agility

Data-driven decision-making also emerges as an important contributor to organizational innovation and agility. Analytical insights allow firms to identify unmet customer needs, evaluate new opportunities, test alternative strategies, and monitor the performance of new products or services. Organizations can use historical and real-time data to identify patterns that indicate opportunities for product development or process redesign. For instance, a digital service provider can analyze customer usage patterns to identify features that should be improved or newly developed. Similarly, a manufacturer can use production and quality data to redesign processes, reduce defects, and develop more efficient production methods.

The findings suggest that analytics can also reduce uncertainty surrounding innovation. Rather than introducing products or strategic initiatives solely on the basis of managerial intuition, organizations can use experiments, predictive models, customer feedback, and performance metrics to evaluate alternatives. This creates a learning cycle in which decisions are tested, results are observed, and strategies are subsequently adjusted. Such an approach is particularly valuable in rapidly changing industries where competitive advantages may become obsolete quickly (Kaur et al., 2025). Previous research on dynamic capabilities has similarly emphasized the importance of sensing environmental changes, seizing opportunities, and reconfiguring organizational resources. Data-driven decision-making supports these processes by providing information that helps managers recognize changes and determine how organizational resources should be redirected.

Nevertheless, the relationship between analytics and innovation is not necessarily automatic. Excessive dependence on existing data may reinforce established patterns and discourage experimentation with unfamiliar opportunities. Consequently, organizations require a balance between evidence-based decision-making and managerial creativity. Data can identify opportunities and reduce uncertainty, but human judgment remains important in interpreting ambiguous signals and pursuing opportunities for which limited historical data exist (AL-Shboul, 2024). The strongest organizations are therefore likely to be those that use analytics as an enabler of experimentation and learning rather than as a rigid substitute for strategic judgment.

3.4 Mediating Role of Data-Driven Decision-Making

3.4.1 Direct Relationship Between Business Analytics Capability and Competitive Advantage

The reviewed findings indicate that business analytics capability has a direct relationship with competitive advantage. Organizations possessing strong analytical infrastructure, skilled personnel, high-quality data resources, and appropriate analytical processes are generally better positioned to process information, forecast future conditions, allocate resources, control costs, and identify strategic opportunities. Analytics capability can therefore contribute directly to competitive advantage by enabling organizations to understand their internal operations and external environment more effectively than competitors with weaker information-processing capabilities. For example, an organization with advanced forecasting capabilities may anticipate changes in customer demand earlier than competitors and adjust production or inventory accordingly. Similarly, firms with sophisticated performance analytics can identify inefficient processes and redirect resources toward higher-value activities. These capabilities can improve cost efficiency, responsiveness, and strategic planning. Previous studies of business intelligence and analytics have generally reported positive relationships between analytical capability and organizational performance, supporting the argument that analytics constitutes a valuable organizational resource.

However, the findings also indicate that analytics capability alone is unlikely to guarantee sustainable competitive advantage. Two organizations may possess similar analytical technologies but achieve substantially different results because of differences in managerial competence, organizational culture, data quality, and the extent to which analytical information influences actual

decisions. Technology provides the capacity to generate insights, but competitive value depends on how those insights are interpreted and acted upon. Thus, the direct effect of analytics capability should be understood as important but incomplete.

3.4.2 Data-Driven Decision-Making as a Mediating Mechanism

A central finding of the review is that data-driven decision-making provides a mechanism through which business analytics capability is translated into competitive advantage. Business analytics capability represents the organization's capacity to collect, integrate, analyze, and interpret information, whereas data-driven decision-making represents the actual use of that information in managerial and organizational choices. The distinction is important because analytical resources do not create substantial value unless decision-makers incorporate analytical evidence into their actions.

The mediating relationship can therefore be understood as a three-stage process. First, organizations develop analytical resources, including technologies, data infrastructure, analytical expertise, and processes. Second, these resources generate information and insights concerning customers, operations, markets, risks, and opportunities. Third, managers and employees use those insights to make and implement decisions that improve efficiency, responsiveness, innovation, or customer value. Competitive advantage emerges primarily when the final stage occurs successfully (Islam, 2025). For example, a retailer may possess sophisticated demand-forecasting technology, but the technology creates value only when managers use the forecasts to adjust procurement and inventory decisions. This interpretation extends previous research that has treated analytics capability as a direct predictor of organizational performance. The findings suggest that the relationship is more accurately understood as partly behavioral and managerial. Analytics becomes valuable because it changes how organizations make decisions. In this sense, data-driven decision-making converts potential analytical value into realized organizational value. The mediating role is therefore central to explaining why organizations with comparable analytical investments can experience different levels of competitive performance.

3.4.3 Conditions Strengthening the Mediating Relationship

The strength of the mediating relationship is influenced by several organizational conditions. Leadership commitment is particularly important because senior managers determine whether analytical evidence is genuinely incorporated into strategic and operational decisions. When leaders actively support evidence-based management, allocate resources to analytics, and demonstrate confidence in analytical insights, employees are more likely to use data in their daily activities. Conversely, when senior managers rely predominantly on intuition or organizational politics, sophisticated analytical systems may remain underutilized. Analytical skills and employee acceptance represent additional conditions. Organizations need employees who can interpret analytical outputs and understand their relevance to particular business problems. Technical specialists may produce sophisticated models, but managers must also be capable of translating those outputs into practical decisions. Data governance is equally important because inaccurate, inconsistent, incomplete, or poorly managed data can undermine analytical conclusions. Technological readiness, including appropriate infrastructure, system integration, and access to reliable data, further determines whether analytics can be applied effectively.

Organizational culture may either strengthen or weaken the relationship. A data-oriented culture encourages questioning assumptions, evaluating evidence, learning from outcomes, and using performance information to guide action. In contrast, resistance to change, departmental data silos, fear of transparency, and preference for established decision-making routines can prevent analytical insights from influencing organizational behavior. Employee acceptance is consequently critical. Firms with similar analytical capabilities may achieve different competitive outcomes because one organization has developed the organizational conditions necessary to convert analytical information into action while another has not.

3.5 Integrated Findings and Theoretical Implications

3.5.1 Synthesis of the Business Analytics–Decision-Making–Competitive Advantage Relationship

Taken together, the findings establish an interconnected relationship among business analytics capability, data-driven decision-making, and competitive advantage. Business analytics capability provides the technological, informational, human, and organizational foundation for generating useful insights (Islam, 2025). Data-driven decision-making then functions as the conversion mechanism through which these insights influence operational and strategic actions. Competitive advantage is subsequently reflected in improved efficiency, responsiveness, customer intelligence, innovation, and organizational agility.

The overall pattern can therefore be represented as analytics resources → analytical insights → data-driven decisions → organizational actions → competitive advantage. This sequence explains why investments in analytics may produce different outcomes across organizations. An organization may possess sophisticated analytical systems but fail to obtain competitive benefits if managers do not trust the information, employees lack the skills to interpret it, or organizational processes prevent rapid action. Conversely, organizations that successfully integrate analytics into decision-making can transform information into tangible improvements in performance and market positioning. The findings also indicate that competitive advantage should not

be viewed exclusively as a technological outcome. The strategic value of analytics depends on the interaction between technology, people, processes, and managerial practices. Consequently, organizations should regard business analytics as an organizational capability rather than merely an information technology investment.

3.5.2 Comparison with Previous Studies

The reviewed findings are broadly consistent with previous empirical and theoretical studies that identify business intelligence, analytics capabilities, information quality, and data-based management practices as important contributors to organizational performance and competitive advantage. Earlier research has frequently demonstrated that organizations with stronger analytical capabilities can improve decision quality, operational efficiency, customer responsiveness, and strategic planning (Vafaei-Zadeh, 2024). The present synthesis reinforces these conclusions while placing greater emphasis on the decision-making process as the link between analytical capability and organizational outcomes.

At the same time, the findings extend previous research by explaining why the strength of the analytics-performance relationship varies across organizations. Studies that focus primarily on technology may imply that investment in advanced analytical systems is sufficient to generate superior performance. The reviewed evidence challenges this assumption by demonstrating that organizational culture, leadership, skills, governance, and employee acceptance influence the extent to which analytics produces value. Differences across industries may also explain variations in outcomes. Data-intensive sectors such as finance, retail, telecommunications, logistics, and digital services may derive benefits more rapidly because they generate large volumes of continuously updated information. Smaller organizations or firms with limited technological infrastructure may face greater constraints in developing equivalent capabilities. Geographical and institutional contexts may further influence the relationship. Organizations operating in environments characterized by limited digital infrastructure, shortages of analytical expertise, weak data governance, or fragmented information systems may experience greater difficulties in converting analytics into competitive outcomes. Thus, differences identified across previous studies should not necessarily be interpreted as contradictions. They may reflect variations in organizational maturity, industry characteristics, technological readiness, institutional conditions, and the specific ways analytics is integrated into decision-making.

3.5.3 Implications for Theory and Practice

The principal theoretical implication of the findings is that competitive advantage from business analytics is better explained through a capability-and-action perspective than through a technology-only perspective. Business analytics capability constitutes an important strategic resource, but data-driven decision-making explains how that resource is transformed into organizational value. The mediating perspective therefore connects resource-based explanations of competitive advantage with behavioral and organizational theories of decision-making (Zhang, 2024). It emphasizes that valuable technological and analytical resources generate superior outcomes when organizations possess the complementary capabilities required to deploy them effectively. For managers, the findings imply that investment in analytical software and infrastructure should be accompanied by investment in people, processes, and organizational culture. Organizations should develop employees' analytical literacy, establish strong data governance practices, integrate data across relevant departments, and ensure that managers understand how analytical outputs relate to strategic objectives. Senior leadership should actively promote evidence-based decision-making and create an environment in which employees can use data without excessive organizational barriers. Firms should also establish mechanisms for evaluating whether analytical insights are actually influencing decisions and whether those decisions generate measurable improvements.

4. Conclusion

This study concludes that business analytics capability plays a significant role in strengthening competitive advantage by enabling organizations to transform data into timely, accurate, and strategically relevant insights. The findings indicate that organizations with strong capabilities in data infrastructure, analytical technologies, skilled human resources, and analytical processes are better positioned to improve operational efficiency, identify market opportunities, understand customer needs, and respond effectively to changing competitive conditions. Importantly, data-driven decision-making emerges as a key mediating mechanism through which business analytics capability contributes to competitive advantage, as analytics resources generate greater value when managers systematically use evidence and analytical insights to guide strategic and operational decisions. The study therefore highlights that investing in analytics technologies alone is insufficient; organizations must also develop analytical skills, data-quality practices, managerial support, and a culture that encourages evidence-based decision-making. Overall, integrating business analytics capability with effective data-driven decision-making can help organizations achieve greater responsiveness, innovation, efficiency, and sustainable competitive advantage in increasingly data-intensive business environments.

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References

[1] Adenike, A. (2018). Strengthening Financial Market Infrastructure in Emerging Economies: Lessons From Central Banking Operations. SAMRIDDHI: A Journal of Physical Sciences, Engineering and Technology, 10(02), 177-182. https://doi.org/10.18090/samriddhi.v10i02.12

[2] Adenike, A. (2023). Cashless Policy Transitions and Currency Substitution: Nigeria's 2012-2022 Evolution Compared with Sweden, China, South Korea, and US Instant Payments Via Fednow. Research Journal in Business and Economics, 1(1), 236-247. https://doi.org/10.61424/rjbe.v1i1.925

[3] Alam, M. I., Hemal, M. A. K. P., Sami, M. A., & Rahman, M. L. (2024). Robust and interpretable crop recommendation. European Journal of Ecology, Biology and Agriculture, 1(5), 168–184. https://doi.org/10.59324/ejeba.2024.1%285%29.14.

[4] Alam, M. I., Sami, M. A., Al Masud, A., Ahmed, H., & Hossain, F. (2025). AI-driven big data analytics for personalized cancer treatment. Journal of Computer Science and Technology Studies, 7(11), 428–441. https://doi.org/10.32996/jcsts.2025.7.11.40.

[5] Alam, M. I., Sami, M. A., Hemal, M. A. K. P., & Rahman, M. L. (2023). Predictive analytics and decision intelligence for climate-resilient agritech systems, 2(1), 44–56. https://doi.org/10.32996/agjcsts.2023.2.1.4.

[6] Alam, M. I., Sikder, T. R., Sami, M. A., Rahman, M. L., et al. (2026). A robust and explainable approach to crop recommendation. Journal of Environmental and Agricultural Studies, 7(3), 1–15. https://doi.org/10.32996/jeas.2026.7.3.1.

[7] Alasa, D. K., Hossain, D., Jiyane, G., Sarwer, M. H., & Saha, T. R. (2025b). AI-Driven Personalization in E-Commerce: The Case of Amazon and Shopify's Impact on Consumer Behavior. Voice of the Publisher, 11(1), 104-116.https://doi.org/10.4236/vp.2025.111009

[8] Alasa, D.K., Hossain, D., Jiyane, G. (2025a). Hydrogen Economy in GTL: Exploring the role of hydrogen-rich GTL processes in advancing a hydrogen-based economy. International Journal of Communication Networks and Information Security (IJCNIS), 17(1), 81–91. Retrieved from https://www.ijcnis.org/index.php/ijcnis/article/view/8021

[9] Al-Khatib, A. W. (2022). Can big data analytics capabilities promote a competitive advantage? Green radical innovation, green incremental innovation and data-driven culture in a moderated mediation model. Business Process Management Journal, 28(4), 1025-1046.

[10] Almazmomi, N., Ilmudeen, A., & Qaffas, A. A. (2022). The impact of business analytics capability on data-driven culture and exploration: achieving a competitive advantage. Benchmarking: An International Journal, 29(4), 1264-1283.

[11] AL-Shboul, M. D. A. (2024). Do reliable big and cloud data analytics capabilities in manufacturing firms' supply chain boosting unique comparative advantage? A moderated-mediation model of data-driven competitive sustainability, green product innovation and green process innovation at North Africa region. International Journal of Productivity and Performance Management, 73(8), 2598-2628.

[12] Aniwa S.C. (2021). Impact of Supply Chain Integration on Operational Performance: Insights from Manufacturing Firms in Emerging Economies. Iconic Research And Engineering Journals, 5(4).

[13] Ayrin, F. J., Rahman, M. M., Quader, M. A., Dass, A., Khondaker, M. M. H., & Chakraborty, M. (2025). MentalLLM: A transformer-based large language model framework for depression detection. In 2025 IEEE International Women in Engineering (WIE) Conference on Electrical and Computer Engineering (WIECON-ECE). https://doi.org/10.1109/WIECON-ECE69386.2025.11525902

[14] Bulbul, I. J., Zahir, Z., Ahmed, T., & Alam, P. (2019). Comparative study of the antimicrobial, minimum inhibitory concentrations (MIC), cytotoxic and antioxidant activity of methanolic extract of different parts of Phyllanthus acidus (L.) Skeels (family: Euphorbiaceae). World Journal of Pharmacy and Pharmaceutical Sciences, 8(1), 12–57. https://doi.org/10.20959/wjpps20191-10735

[15] Cao, G., & Duan, Y. (2014). A path model linking business analytics, data-driven culture, and competitive advantage.

[16] Das, K., Tanvir, A., Rani, S., & Aminuzzaman, F. M. (2025). Revolutionizing agro-food waste management: Real-time solutions through IoT and big data integration. Voice of the Publisher, 11(1), 17–36. https://doi.org/10.4236/vp.2025.111003

[17] Garmaki, M., Gharib, R. K., & Boughzala, I. (2023). Big data analytics capability and contribution to firm performance: the mediating effect of organizational learning on firm performance. Journal of Enterprise Information Management, 36(5), 1161-1184.

[18] Habib, M. R., Yusuf, M. A., Warnasuriya, W. M. H. N., Sunny, K., Rahaman, M. M., & Khan, M. R. K. (2024). A comprehensive review on the advancement of home automation system. In 2024 Second International Conference on Intelligent Cyber Physical Systems and Internet of Things (ICoICI) (pp. 638–642). IEEE. https://doi.org/10.1109/ICoICI62503.2024.10696135

[19] Hasan, M. M., Alam, M. I., Chowdhury, M. A. H., & Anwar, M. M. (2026). AI-driven big data analytics for precision medicine and healthcare intelligence. Frontiers in Computer Science and Artificial Intelligence, 5(2), 41–62. https://doi.org/10.32996/jcsts.2026.5.1.5.

[20] Hemal, M. A. K. P., Sayeed, N., Sami, M. A., Alam, M. I., Sikder, T. R., Dipa, S. A., & Rahman, M. L. (2025). Leveraging data analytics to strengthen public health and global economic sustainability. European Journal of Medical and Health Research, 3(4), 253–263. https://doi.org/10.59324/ejmhr.2025.3%284%29.37.

[21] Hossain D., Alasa D.K, Jiyane G. (2023). Water-based fire suppression and structural fire protection: strategies for effective fire control. International Journal of Communication Networks and Information Security (IJCNIS). 15(4):485-94. Available from: https://ijcnis.org/index.php/ijcnis/article/view/7982.

[22] Hossain D., Alasa D.K. (2024a). Numerical modeling of fire growth and smoke propagation in enclosure. Journal of Management World. (5):186-96. https://doi.org/10.53935/jomw.v2024i4.1051.

[23] Hossain D., Alasa D.K. (2024b). Fire detection in gas-to-liquids processing facilities: challenges and innovations in early warning systems. International Journal of Biological, Physical and Chemical Studies. 6(2):7-13.https://doi.org/10.32996/ijbpcs.2024.6.2.2

[24] Hossain, D. (2022). Fire dynamics and heat transfer: advances in flame spread analysis. Open Access Res J Sci Technol. 2022;6(2):70-5. https://doi.org/10.53022/oarjst.2022.6.2.0061.

[25] Hossain, D. (2025). Water Efficient Suppression Material Fire Behaviour and AI Driven Safety in Future Fire Protection Research. EJSMT, 1(5), 62–76. https://doi.org/10.59324/ejsmt.2025.1(5).07

[26] Hossain, D.(2021). A fire protection life safety analysis of multipurpose building. Available from: https://digitalcommons.calpoly.edu/fpe_rpt/135/.
[27] Hossain, D., Asrafuzzaman, M., Dash, S., & Rani, S. (2024). Multi-Scale Fire Dynamics Modeling: Integrating Predictive Algorithms for Synthetic Material Combustion in Compartment Fires. Journal of Management World. (5): 363-374.https://doi.org/10.53935/jomw.v2024i4.1133
[28] Hossain, M. J., Bakhsh, M. M., Sami, M. A., Alam, M. I., Melon, M. M. H., & Manik, M. M. T. G. (2026). Self-adaptive artificial intelligence systems for large-scale data-driven decision making. In 2026 IEEE I3CTCON (pp. 1–8). https://doi.org/10.1109/I3CTCON68242.2026.11507252.
[29] Islam, A., & Jantan, A. H. B. (2023). The mediation effect of affective organizational commitment on the relationship between HRM practices and turnover intention in the RMG industry. Research Journal in Business and Economics, 1(1), 24-38.
[30] Islam, A., Jantan, A. H. B., Khalifa, G. S., Islam, A., Islam, B., & Hossian, A. (2023). Effects of Decision Making and Work-life Balance on Productivity of Female Employees in the RMG Industry of Bangladesh. The Mediating Role of Work Motivation. Research Journal in Business and Economics, 1(1), 48-59.
[31] Islam, M. A., & Sinniah, S. (2025). Exploring customer relationship management factors, customer trust, and innovation capacity: A quantitative study on customer retention. Accountancy Business and the Public Interest, 41(10), 12-29.
[32] Islam, M. A., Islam, M. A., Amin, M. B., Hossain, M. M., Hassan, M. S., Afrin, S., & Oláh, J. (2025). Enhancing academic's performance: Exploring the interaction of innovative work behavior, intrinsic motivation, and self-efficacy in public universities. Social Sciences & Humanities Open, 12, 102210.
[33] Kaur, J., Prabha, M., Samiun, M., Hasan, S. N., Hasan, R., Esa, H., et al. (2025). Comparative analysis of transformer and LSTM architectures for cybersecurity threat detection. EAI Endorsed Transactions on AI and Robotics, 4. https://publications.eai.eu/index.php/airo/article/view/9759.
[34] Rahman, M. M., Juie, B. J. A., Tisha, N. T., & Tanvir, A. (2022). Harnessing predictive analytics and machine learning in drug discovery, disease surveillance, and fungal research. Eurasia Journal of Science and Technology, 4(2), 28-35. https://doi.org/10.61784/ejst3099
[35] Rahman, M. M., Rahman, M. S., Islam, S., Khan, S. I., Ashik, A. A. M., Hossain, E., & Tanvir, A. (2025). Integrating data analytics into health informatics: Advancing equity, pharmaceutical outcomes, and public health decision-making. Eurasian Journal of Medicine and Oncology, 9(4), 284–295. https://doi.org/10.36922/EJMO025300319.
[36] Rahman, M. M., Rahman, M. S., Islam, S., Khan, S. I., Ashik, A. A. M., Hossain, E., & Tanvir, A. (2025). Integrating data analytics into health informatics: Advancing equity, pharmaceutical outcomes, and public health decision-making. Eurasian Journal of Medicine and Oncology, 9(4), 284–295. https://doi.org/10.36922/EJMO025300319
[37] Saha, P. P., Paul, R., Khan, M. R. K., Siddique, N. A. S., & Sarker, B. D. (2026). AI-driven modernization of Medicare and Medicaid enterprise systems: Interoperability, claims analytics, and fraud detection frameworks. Journal of Intelligent Decision Making and Information Science, 3(5s), 827–866. https://doi.org/10.59543/jidmis.v3.1223
[38] Saha, P. P., Rahaman, M. M., Islam, M. T., & Chowdhury, N. I. (2025b). Advancing lung cancer diagnosis: A hybrid feature fusion approach with attention mechanisms and vision transformer. In 2025 2nd International Conference on Intelligent Systems for Cybersecurity (ISCS) (pp. 1–7). IEEE. https://doi.org/10.1109/ISCS69371.2025.11386016
[39] Saha, P. P., Rone, P. D., Sarkar, D., Yusuf, M. A., Hossan, M. I., & Mazumder, M. S. J. (2025a). Advancing carbon emission prediction through machine learning: The impact of fossil, nuclear, and renewable energies. In 2025 International Conference on Emerging Smart Computing and Informatics (ESCI) (pp. 1–7). IEEE. https://doi.org/10.1109/ESCI63694.2025.10988213
[40] Sami, M. A., Hemal, M. A. K. P., Alam, M. I., & Rahman, M. L. (2024). Data governance and analytics infrastructure for scalable decision-making. European Journal of Applied Science, Engineering and Technology, 2(2), 388–403. https://doi.org/10.59324/ejaset.2024.2%282%29.28.
[41] Sami, M. A., Rahman, M. L., Tanni, Z. A., Munmun, Z. S., Nusrat, S., & Biswas, B. (2026). Artificial intelligence and big data for precision medicine. Frontiers in Computer Science and Artificial Intelligence, 5(6), 36–43. https://doi.org/10.32996/fcsai.2026.5.6.7.
[42] Sarwer, M. H., Saha, T. R., & Hossain, D. (2022). Driving Business Innovation with Artificial Intelligence, Machine Learning and Blockchain Technology. Journal of Business and Management Studies, 4(3), 221-230. https://doi.org/10.32996/jbms.2022.4.3.21
[43] Tanvir A, Jo J, Park SM. Targeting Glucose Metabolism: A Novel Therapeutic Approach for Parkinson's Disease. Cells. 2024 Nov 13;13(22):1876. doi: 10.3390/cells13221876. PMID: 39594624; PMCID: PMC11592965.
[44] Tanvir, A., Juie, B. J. A., Tisha, N. T., & Rahman, M. M. (2020). Synergizing big data and biotechnology for innovation in healthcare, pharmaceutical development, and fungal research. International Journal of Biological, Physical and Chemical Studies, 2(2), 23–32. https://doi.org/10.32996/ijbpcs.2020.2.2.4
[45] Vafaei-Zadeh, A., Madhuri, J., Hanifah, H., & Thurasamy, R. (2024). The interactive effects of capabilities and data-driven culture on sustained competitive advantage. IEEE Transactions on Engineering Management, 71, 8444-8458.
[46] Yusuf, M. A., Chowdhury, N. M., Rone, P. D., Saha, P. P., Hossan, M. I., Sarkar, D., Paul, R., Hossain, M. R., & Chakraborty, M. (2025). Advancing Public Safety with Real-Time Life Jacket Detection and Demographic Profiling Using YOLOv8 and Age Classification. EAI Endorsed Trans AI Robotics. 4.1-12. https://doi.org/10.4108/airo.9785. Available from: https://publications.eai.eu/index.php/airo/article/view/978z5
[47] Yusuf, M. A., Khan, M. R. K., Saha, P. P., & Rahaman, M. M. (2024). Data fusion of semantic and depth information in the context of object detection. In 2024 Second International Conference on Intelligent Cyber Physical Systems and Internet of Things (ICoICI) (pp. 1124–1129). IEEE. https://doi.org/10.1109/ICoICI62503.2024.10696627.
[48] Zhang, P., & Thurasamy, R. (2024). Bridging big data analytics capability and competitive advantage in China's agribusiness: The mediator of absorptive capacity. Systems, 13(1), 3.