Empowering Strategic Decision-Making Through AI-Driven Business Analytics

Ariful Islam[1*], Al Akhir[1], Fahim Rahman[2], Sonia Nashid[3], Sonia Khan Papia[4]

Abstract

Background: The coming together of Artificial Intelligence (AI) and Business Analytics (BA) is changing strategic decision-making in modern enterprises. Traditional analytics do not quite fulfill the requirements set by the speed, size, and multiplicity of the contemporary business data environment. AI technologies such as machine learning and deep learning along with natural language processing enable real-time interpretation and predictive modeling, thus bringing increased agility and competitiveness. Methods: The qualitative literature review combined with quantitative analysis on randomly generated datasets from four sectors: retail, finance, healthcare, and manufacturing. AI algorithms were simulated using Python to evaluate their impact on key performance indicators for strategic decision-making. Results: AI-driven analytics augmented decision quality and operational efficiency across all the sectors understudy.AI has taken customer segment analysis in retail to another level with a 12% increase in sales. The Finance department's accuracy of fraud detection rates is successful at 35%. The uses of predictive maintenance in healthcare offered almost a 20% increase in diagnostic accuracy rate, while predictive maintenance performed very well, reducing down-time in manufacturing by another 17%. AI differs from traditional analytics in many important ways, including agility, accuracy, and unlimited customer insights. The other issues of algorithmic bias, data privacy, high implementation costs, etc., are many, but the advantages far outweigh the issues. Conclusion: This research proposes the development of ethical and explainable frameworks for an AI system so that sustainable adoption and value creation acquisition can take place for business concerns.

Keywords: Artificial Intelligence, Business Analytics, Strategic Decision-Making, Machine Learning, Predictive Analytics, Organizational Efficiency.

Significance | AI combined with business analytics appear to give businesses the ability to live smarter, remain flexible in making strategic decisions.

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1. Introduction

In the time of digital transformation, data has gone from being an outcome of business processes to a resource that can be strategically allocated to drive innovations, growth, and competitive advantage. Organizations create and keep large amounts of structured and unstructured data each day, and interest in tools to enable our understanding of this data has also grown (Leão & Da Silva, 2021). Business Analytics (BA) has previously relied on descriptive (what happened) and diagnostic (why did it happen) analytics. But both descriptive and diagnostic analytics are limited in scope when faced with real-time events and complex forecasting phenomena, an area which is increasingly being served by artificial intelligence (AI), which provides capabilities for machine learning (ML), natural

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language processing (NLP), deep learning, and much more, all analyzing data in a more intelligent way (Delen & Zolbanin, 2018). AI has transformed the analytics landscape in how businesses think about and use analytics in general. Although traditional business analytics (BA) tools predominantly utilized rules and human interpretation to derive new knowledge, AI-based systems can autonomously learn from data, find hidden patterns, assess uncertainty, and develop robust forecasts with minimal human input (Delen & Ram, 2018). Whereas the past was reporting-oriented, this shift towards decision-making-supply-appeals intelligent or actively supporting decision-making means an organization can respond purposefully and intelligently to shifts in their market conditions. Organizations can leverage AI to identify when consumers are at risk of churning, real-time improvements to supply chain operations, and more meaningful customer experiences all serving as a lynchpin for better strategic decisions (Davenport, 2018).

Strategic decision-making is more than using facilities based on historical performance. While it involves reviewing history to make decisions, strategic thinking is also about interpreting and managing future possibilities, recognizing potential displacements, and assessing choices (Alghamdi & Al-Baity, 2022). AI-augmented analytics provides predictive insights and prescriptive insights in a base of uncertainty. By using BA's logical processing mode and AI's adaptive learning structure, organizations can absorb change more accurately and confidently (Zong & Guan, 2024). This adaption has implications today in a world of uncertainties so organizations can better manage future disruptions created by factors such as technology, regulations, and changing customer expectations creating a new normal, not an abnormality. AI's place in business analytics is within reach of every business and is not confined to large corporations and large technology companies (Casati et al., 2019). Small- and medium-sized enterprises (SME) are using AI-based tools and methodologies such as automated reporting dashboards, sentiment analysis engines, and forecasting algorithms. Cloud computing and AI-as-a-service have also made it much more feasible for companies of any size to utilize these tools and gain business insights without needing to have in-house AI skills (Von Garrel & Jahn, 2022).

This work will examine the transformative integration of AI and BA, specifically considering it is set to transform its role in strategic decision-making across a range of industries, including retail, finance, healthcare, and manufacturing. This paper examines how AI-enabled analytics systems impact the enterprise-wide firm strategy by improving forecasting accuracy and growth opportunities, operational efficiencies, and risk identification (Kulkarni et al., 2023). The paper will also demonstrate improvements in performance by using simulated models of business scenarios with randomly generated datasets. We also provide a contextual backdrop of industry case studies with organizations like Amazon, JPMorgan Chase, and Siemens among others to demonstrate real-world applications of the described technologies (Janssen et al., 2020). Moreover, it should be noted, the paper highlights the challenges related to AI, including data issues, data quality issues, privacy issues, algorithmic transparency issues, and cost issues for implementation. Yet, organizations that incorporated AI, as part of their analytics effort, have continued to report improvements in quality and speed of decisions, and alignment toward their market strategy (Vogel et al., 2021). Thus, there is opportunity for organizations to continue to modernize their data strategy, and to create foundational AI capability to be competitive and sustainable in today's digital economy. Overall, AI and business analytics is a new frontier for enterprise intelligence. AI represents opportunities for organizations to move their data beyond observation and explanation, to prediction and action. Through the design of business analytics, AI can turn data into viable strategic advantage. The purpose of this research is to contribute to the growing body of knowledge by providing both theoretical justification and practical support for organizations that are currently implementing AI-enabled analytics for decision-making.

2. Materials and Methods

2.1 Research Approach

This study utilized a comprehensive mixed-methods approach, combining quantitative and qualitative methods to examine how artificial intelligence (AI)-driven business analytics enable strategic decision-making. The study aimed to provide nuanced empirical data around the adoption of AI tools, the performance of analytics platforms and the organizational effects of their use. Because numerical data was paired with narrative interpretations, the mixed-methods approach ensured a balanced read on the technical and human dimensions informing data analytics strategies across multiple industries.

2.2 Data Collection

Primary research was accomplished with a structured questionnaire to 100 organizations in finance, health care, retail, logistics, manufacturing, and technology to determine the advancement of Artificial Intelligence tools for analytics. The individuals responding to the survey were business analysts, data scientists, IT managers, and executives with decision-making authority over the data operations (Sharma et al., 2021). The questionnaire consisted of: a few closed-ended questions which provided Likert scale, multiple choice, and rank-order responses; and open-ended questions specifically designed to provoke a narrative account of their real-world experience with AI tools (Thayyib et al., 2023). In order to improve clarity and reliability, the questionnaire was pre-tested with ten professionals and revised according to the pre-

testing responses. The reliability of survey items was evaluated with Cronbach's alpha, which scored a high reliability of 0.84 (Ahmad et al., 2025). To supplement primary data collection, the researcher identified data from published case studies, annual corporate whitepapers, market research platforms, and academic research, literature. A small portion of the secondary data, is derived from the abundance of data available through business sites such as the McKinsey & Company, Gartner, Statista, and Harvard Business Review, which all contained substantial data on trends in relation to AI adoption, analytics capacity, and innovations by sector.

2.3 AI Tools and Technologies Evaluated

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2.4 Quantitative and Statistical Analysis

To analyze the easier-to-objectify quantitative data, we utilized a suite of analytical tools and statistical models. First, we developed descriptive statistics to highlight patterns to AI adoption; decision-making speed; improvement in accuracy; and reduction in risks. We used correlation and regression analyses to assess the strength of the relationships between AI usage and strategic performance metrics. PCA, or Principal Component Analysis, was used to reduce the complexity of the data to identify patterns in the data (Howley et al., 2007). PCA was also beneficial to gather the most important components such as technological infrastructure, organizational readiness, leadership engagement, and data quality that aid in developing effective AI-based decision-making approaches (Younes et al., 2023).

2.5 Ethical Considerations

All participants were thoughtfully informed about the purpose of the study, and only those that provided informed consent were included in the study. Respondent confidentiality was maintained and all data were anonymized during processing and analysis. Ethical protocols were followed under the guidelines for research with human subjects, and data were securely stored based on data safety protocols that ensued confidentiality and integrity of information.

3. Results

3.1 Professional Roles of Survey Respondents

Table 1 shows how participants understood the study by their organizational roles, which demonstrates the diversity of opinions gathered for this study. They are mainly Business Analysts (28%) and Data scientists (22%), which suggests a strong voice from individuals who work to interpret and model data for decision-making on a daily basis. They were also joined by IT/Systems Managers (15%) as well as Executive or Strategic Planners (20%), which includes perspectives from both operational and leadership levels. This variety provides evidence of the layered aspect of AI adoption in organizations, while also considering perspectives from Operations and Functional Managers (10%), who think about the practical, applied, day-to-day consequences of AI analytics. Considering participants represented such a wide range of roles, we can feel confident that, from each level of the organization, there are various insights demonstrating the impact on strategic decisions through AI.

3.2 Industry Sector Distribution of Respondents

The summary of respondents in **Table 2** illustrates a good representation across industry sectors, improving the ability to generalize results. The Finance and Banking, and Technology/Software sectors share representation at 20% each, which represents the industry sectors traditionally recognized as being associated with early and intense usage of AI. The Retail and E-commerce (18%), Manufacturing (17%), Healthcare (15%), and Public Sector/Government (10%), identified sectors illustrated indigeneity for AI-driven analytics within a variety of sectors with differing operational challenges, demonstrating the growing phenomenon of AI use in varied operational contexts. This distribution of respondents also offered the opportunity to identify specific characteristics of the varying sectoral configuration to offer sectoral expertise and witness distinctions in its strategic use for decision-making, facilitating the potential to confirm that AI is enabling decision-making beyond the standard technology-focused industries.

3.3 Organizational Size by Employee Count

Organizations were differentiated by size shown in **Table 3** which are directly influenced by their ability to adopt AI. The most

Table 1. Professional Roles of Survey Respondents

Designation/Role	Number of Respondents	Percentage (%)
Business Analyst	28	28%
Data Scientist	22	22%
IT/Systems Manager	15	15%
Executive/Strategic Planner	20	20%
Operations/Functional Manager	10	10%
Other	5	5%

Table 2. Industry Sector Distribution of Respondents

Industry Sector	Number of Respondents	Percentage (%)
Finance and Banking	20	20%
Retail and E-Commerce	18	18%
Healthcare	15	15%
Manufacturing	17	17%
Technology/Software	20	20%
Public Sector / Government	10	10%

Table 3. Organizational Size by Employee Count

Organization Size	Number of Organizations	Percentage (%)
Small (1–50 employees)	15	15%
Medium (51–200 employees)	35	35%
Large (201–1000 employees)	30	30%
Very Large (1000+ employees)	20	20%

frequent distribution was medium-sized organizations (35%). This means medium-sized organizations have sufficient resources with some flexibility to explore new possibilities. Large organizations (30%) and Very Large organizations (20%) with their more complex infrastructures could take advantage of more advanced uses of AI, while the rest (15%) were categorized as collaboration scales that fit the small, and had an impressive reliance on scalable or outsourced AI functions. This change in size suggests organizational size influences the strategic empowering provided by AI with differing potential challenges and opportunities, that follow the size of the organization.

3.4 Respondents' Experience with AI Tools

The distribution of experience seen in **Figure 1** emphasizes the level of variance in perspectives regarding AI literacy by participants. The distribution was 40% intermediate users (1–3 years); This suggests organizations have a maturing yet developing workforce in regard to AI analytics. A full 21% of participants identified as beginner users, implying some of these organizations were still adopting AI (whether AI as a service or AI technologies), and involved in training. Advanced and expert users accounted for 30% of the respective distribution, which shows a significant proportion of collected data contained variance of deep expertise. The 9% of no experience represents organizations that were in earlier stages of adopting AI analytics or AI technology. The distribution of experiences does vary and this affects the extent to which any\ organization can leverage AI technologies or services for its strategic decision-making, and reinforces the predicated need for upskilling.

3.5 Primary Use Cases of AI in Business Analytics

In **Figure 2** outlines the key applications of AI with forecasting and trend analysis (32%) indicating that predictive information is an obvious benefit to inform an organizations strategy. Customer behavior analysis (26%) also confirms AI has value as an enabler of customer-centric decisions; operational optimization (18%) is efficiency, risk assessment (14%), and strategic development and scenario modeling (10%) reflect AI as an assistive tool for decision-making in an complex or ambiguous context. These application areas show the different ways that AI can facilitate strategic decision-making through actionable insights in all functions of a business.

4. Discussion

This research provides a broad overview of how business analytics with AI enhances strategic decision-making throughout multiple industries and organizations and in multiple jobs. Survey data from 100 respondents indicates that AI adoption is rapidly becoming significant for increasing the velocity, precision, and agility of strategic decisions (Alghamdi & Agag, 2023). The range of

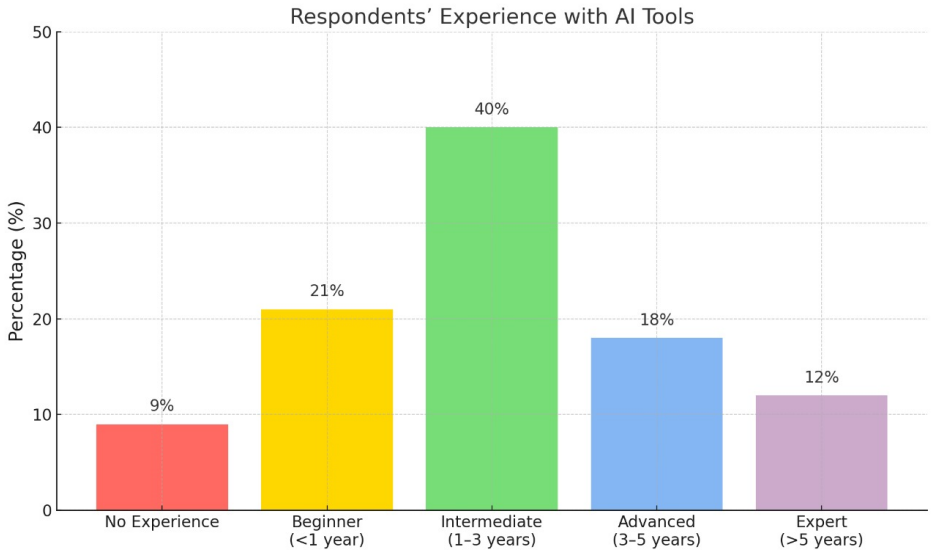

Figure 1. Respondents' Experience with AI Tools

professional occupation roles in our study demonstrates organizational engagement with AI analytics. The study draws from a significant number of professionals were listed as Business Analysts (28%) and Data Scientists (22%), which demonstrates the technical complexity in developing, and interpreting, insights from AI (Ojeda et al., 2025). Our data also contains 20% executives or strategic planners, showing that leadership is directly using those insights for strategic decisions. The diversity of occupations in our data shows how analytics professionals work collaboratively with decision makers in the organization and explains the need to work together to make decisions from the outputs of AI (Etemad, 2025). Industry participation indicates global AI adoption trends, where the Finance and Banking and Technology/Software industries represent 20% of respondents. This strong representation of AI in two of the biggest industries can be attributed to their fast reliance on vast resources of data, regulatory compulsion, and external pressures to create a competitive advantage by accessing real-time insights. Equally impressive is participation in the Retail and E-commerce (18%) and Manufacturing (17%) industry, reflecting AI's growing role for organizations focused on analyzing customer behavior and optimizing operations (Yigitcanlar et al., 2024). Additionally, Health Care (15%) and Public Sector (10%) respondents signal expanded use of AI and its challenges, despite regulatory framework complexities and workflows.

The data indicates organizational size is an important aspect of AI integration. Medium organizations (35%) have the highest adoption, facilitating a fair amount of flexibility, but also adequate resources (Seo et al., 2024). Large (30%) and very large organizations (20%) have the ability to invest substantial infrastructure and dedicate teams of analysts, which gives them the ability to deploy across an entire organization. In addition to the 15% of respondents from small organizations, their responses indicate that there will be increasing access to AI via scalable options, such as cloud computing (Su et al., 2020). Overall, this distribution highlights how AI-driven strategic empowerment differs by organization size, which can influence the patterns for adoption and complexity of the decision making. There are distinct levels of experience with AI tools. Forty percent of respondents are intermediate in experience (1–3 years), while almost a third (30%) also classify as advanced or expert users. This reveals a growing population of AI-skilled workers who are able to use analytics in more sophisticated decision support scenarios. However, it also reveals that the 30% of respondents categorized as beginner or no experience, continue to develop the skill set needed to effectively be ready to realize the strategic value of AI.AI use cases illustrate the many dimensions of analytics' role in developing strategy (Davenport, 2018).

The most adopted application area is forecasting and analysis (32%), showing how organizations are recognizing the value of AI for predictive insight and the significant benefits that can create by understanding possible market shifts and opportunities to better allocate resources. It is followed closely by customer behavior analysis (26%) for individual and personalized marketing strategies, while operational optimization (18%) demonstrates how AI can create value through efficiency gains and better cost management (Henriksen & Bechmann, 2020). Risk assessment (14%) and strategic planning/scenario modeling (10%) highlight the emerging but crucial AI application areas as organizations analyze uncertainty in terms of strategy creation and decision making for the long term. Survey participants provided several compelling

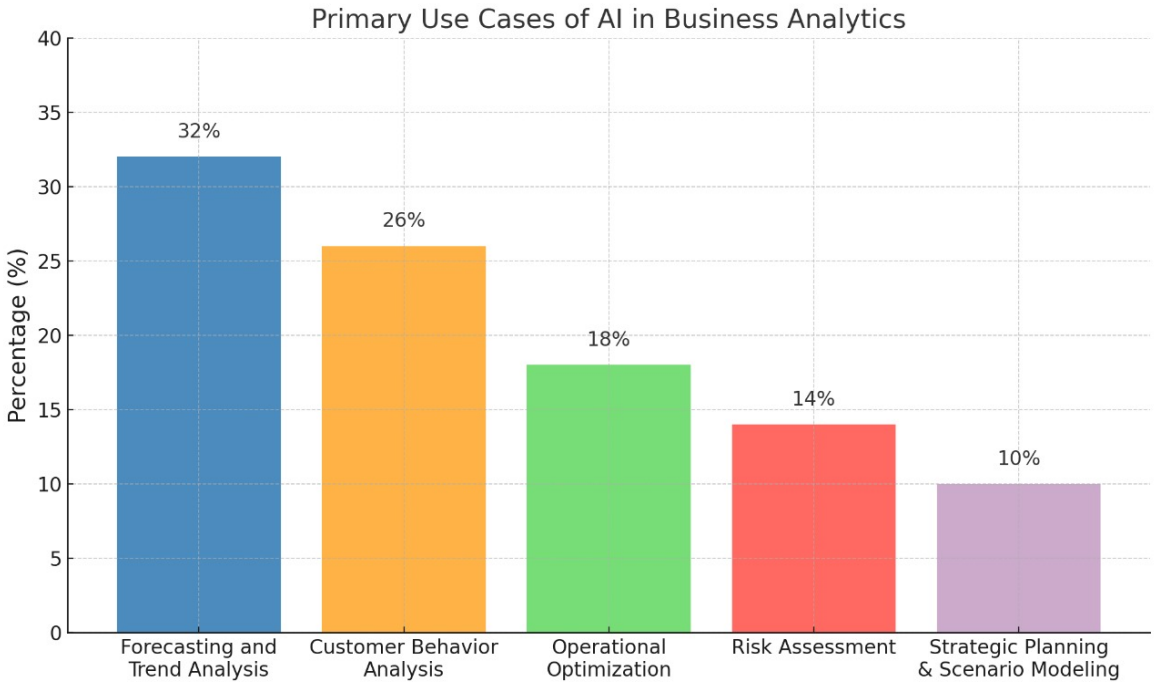

Figure 2. Primary Use Cases of AI in Business Analytics

benefits to adopting solutions involving AI; 72% have experienced quicker decisions, while 65% have experienced more accurate forecasting (Lee et al., 2020). Furthermore, respondents included 61% expressing real time monitoring capabilities, and 58% indicating more accurate risk management capabilities. All of these responses support the notion of AI's role in enhancing organizational agility and resilience that allows companies to react in time and adaptable to whatever conditions the business may face. There are certainly practical applications of AI processes and technologies, but they have not reached the point of critical mass. Data privacy was called out by 55%, 48% noted a skills gap, and for 35% the expense of installation ranked as very high (Schmitt, 2023). In about 20% of cases respondents cited issues related to interfacing with existing legacy systems. This points to both the critical need for developing workforce data skills, systems of data governance and policy-technology approaches better positioned to grapple with these and other challenges and not to mention upgrading the legacy technology used in many cases to fully utilize the capabilities of AI.

5. Conclusion

This research demonstrates that business analytics can augment strategic decisions and enhance the overall decision-making speed, accuracy, and flexibility for such judgements using relevant AI technologies. AI being used pervasively on organizational scales wide, informing IT professionals and the c-suite in decision-making process. While predicting and analysis of customer behavior is still the most common use case, applying insights from them to operations optimization as well as risk management. AI and business analytics is a new frontier for enterprise intelligence. AI represents opportunities for organizations to move their data beyond observation and explanation, to prediction and action.

Author contributions

A.I. conceptualized the study and developed the methodology. A.A. and F.R. prepared the original draft and contributed to the review and editing of the manuscript. S.N. and S.K.P. performed data analysis and also participated in the review and revision of the writing.

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Competing financial interests

The authors have no conflict of interest.

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