

# Why AI Cannot Replace Business Intelligence, A/B Testing, and Human-Driven Insights Across Industries

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**Abstract:** *Artificial intelligence (AI) has made the wave of data analytics extremely fast in processing and interpreting huge datasets. AI can help with automated parts of data collection and initial analysis, but strategic decisions made during A/B testing need human judgment and experience. The paper will touch upon analyzing current trends and challenges and investigate case studies, the complementary relationship between AI technologies and human expertise, and, hence, the need for an approach that optically intermingles the strength of both to reach informed and effective decision-making. Businesses and industries worldwide use split testing or A/B testing as their main research method to check how separate web page designs work against each other. Business case studies confirm that AI improves all industries by handling complex datasets to find important details beyond BI systems. The case results show what AI and other analytical tools can do well and poorly in making business choices. Using AI technology together with BI tools as part of a human-led system creates the best solution for businesses to use data effectively while keeping decisions traceable.*

**Keywords:** AI, A/B Testing and Human Driven Insights

## 1. Introduction

Artificial intelligence (AI) has made the wave of data analytics extremely fast in processing and interpreting huge datasets. In 2024, roughly 72% of companies had implemented some branch of AI into at least one business function, which surpasses the number a year prior at 55% [1]. First, this surge highlights the rising dependence on the use of AI-driven solutions that would increase efficiency and decision-making processes. At the same time, the practice of A/B testing has become the basis of data-driven decision-making. It is worth noting that 77% of firms across the globe do A/B testing of the website, which is a critical factor that plays an essential role in optimizing user experience and business outcomes [2]. Such AI-based methods help organizations optimize their digital interfaces and thereby influence the customers' interaction and level of satisfaction.

Although AI can do a lot, it is not quite ready yet to replace the human brain in developing complex methodologies like BI methods, running A/B tests, or other hands-on strategies. AI is good at processing huge amounts of data and interpreting patterns but not as good at the philosophical interpretation and contextual understanding of human analysts. For instance, data analysis done by AI can be swift, yet it overlooks finer details that necessitate going deeper into the workings of a business. There are still nuances to address for which human insight is indispensable for analytical outcomes to resonate with business objectives. Furthermore, there are challenges involved with AI's application in data analytics. Research by the Boston Research Group [3] shows that 74% of companies cite difficulties in gaining and scaling value from their AI initiatives. Usually, these challenges arise from the difficulty of AI integration into an existing workflow and the necessity of extensive human oversight to exploit the outputs of AI effectively.

A further example of how a human-driven approach remains essential even to this day is A/B testing. It is a method that compares two versions of a webpage or app to see which one is better but depends on human expertise in the design of experiments, information processing, and intervention [4]. AI can help with automated parts of data collection and initial analysis, but strategic decisions made during A/B testing need human judgment and experience. Keeping these points in mind, this paper seeks to probe the evolution of data analytics and experimentation case by case and reasons why AI cannot substitute BI, A/B testing, and other human insights in any field. The paper will touch upon analyzing current trends and challenges and look into case studies, the complementary relationship between AI technologies and human expertise, and, hence, the need for an approach that merges the strength of both to reach informed and effective decision-making.

## 2. Related Work (Literature Review)

Organizations now use Business Intelligence as their basic decision-making platform because it combines data analysis with everyday business strategies. Studies confirm that organizations taking advantage of BI tools see better decision performance because they turn raw data into valuable knowledge. The BI market is thriving worldwide, and Gartner predicts further growth because real-time analytics offers powerful strategic benefits, according to their research [5]. The ability to track KPI performance instantly helps top managers find developing trends and foreseeable threats sooner. With predictive analytics in the BI framework, organizations can better predict what customers and markets will do before it happens. Retail businesses use BI-based information to redesign their stock systems and personalize marketing plans, which generates higher profits while lowering operational expenses.

New research proves that data analysis methods change how companies use BI systems. The Journal of Business Analytics

proves in its research that advanced data analytics makes it easier to detect hidden relationships that were previously undetectable with basic statistics. Financial organizations use advanced analytics to enhance their risk evaluation models and investment methods, decreasing waste and giving customers better service. The McKinsey studies show a 4.4 trillion increase in higher productivity from decisions based on data evidence [6]. BI still plays an essential part today, and its merger with new analysis techniques gives businesses a strong solution to handle present issues and develop an organization driven by insights.

Businesses and industries worldwide use split testing or A/B testing as their main research method to check how separate web page designs work against each other. Organizations use tested methods to change webpage aspects before using statistical results to boost user engagement and website performance. Companies can increase their landing page conversions through split testing of their page design and text elements. The example shows that digital assets get better at meeting user needs when A/B testing proves effective.

For online stores, A/B tests play a vital role in improving how users interact with websites and achieving sales growth. As a leading online fashion retailer, Zalora tested the influence of having one consistent button on all pages to trigger users' actions. Their standardized CTA buttons created 12.3% more customers who checked out [7]. The test example shows that small design changes with evidence from A/B testing can make a big difference in how well customers move through their journey and increase revenue numbers. Companies conduct tests to monitor digital interface upgrades before making changes to confirm user satisfaction.

Artificial Intelligence plays a central part in data analysis by letting businesses perform massive data processing and handle information swiftly. AI systems quickly review all kinds of data to give companies instant insights for better performance. AI technology tools help retail companies examine sales data right away so they can alter their stock and price plans quickly to match what is happening in the market now. Businesses have faster response times to market trends to improve service quality for their customers.

Research demonstrates AI's analysis problems that human analysts can avoid. The system may display wrong information, and the users may excessively follow AI results without proper analysis. AI systems discover it is challenging to read between the lines and grasp complete meanings in data, which creates possible mistakes. One of the main challenges of creating an AI system is that they do not have the same critical faculties in examining data input provided by people as a human does.

Previous studies on AI's data analytics features mostly ignore their weaknesses when applied to Business Intelligence and A/B testing purposes. Human analysts provide valuable contextual knowledge while making ethical judgments and strategy decisions, which AI systems cannot match in Business Intelligence and experimentation work [8]. Research findings need improvement because they cannot properly address problems around biased data and AI model interpretation. The solution requires both AI computing

power and human ethical knowledge to make effective decisions in decision-making processes.

### 3. Methodology

The research design uses a real-world comparison of AI and BI with A/B concept testing from various businesses. Our research method uses documented case studies to study many real-world examples of companies using AI decision systems and checks how well AI functions alongside traditional BI and experimentation tools. Our research will inspect AI's impact on business choice-making across multiple businesses in the finance, e-commerce, and retail industries. Our method bases the evaluation on real-world applications to show what AI can and cannot do in place of human analytics work.

Three criteria will determine whether AI performs better than BI and A/B testing systems. AI analytics accuracy will show if the system estimates business future results better than normal approaches. The evaluation method for AI insight assessment checks if business leaders can understand and use the findings generated by AI systems because these systems often work without clear logic. The final evaluation standard will measure how AI implements benefits for daily business practices, such as revenue growth and enhanced customer relationships alongside data processing enhancements. The research will use this set of evaluation standards to study AI use in multiple organizations and demonstrate when human experts remain essential to AI performance.

### 4. Experimentation & Case Studies

#### *Case Study 1: AI vs. Traditional BI in Financial Decision-Making*

Financial organizations today use Artificial Intelligence to help them make better business decisions. European bank UniCredit used the DealSync AI tool to find merger and acquisition opportunities across small businesses in the SME market. The bank developed DealSync as an effective method to generate more M&A deals using existing staff. Through DealSync, the company got 2,000 viable leads and closed 500 small mandates separately valued under €50 million. The new approach helped UniCredit find more deals while making the task easier and better than what Business Intelligence did alone. DealSync proves that AI systems can handle many data sets to reveal business intelligence, which enhances standard financial decision-making methods.

#### *Case Study 2: A/B Testing vs. AI-Based Personalization in E-Commerce*

Optimizing customer experiences in e-commerce business requires companies to find the right alignment between A/B testing and AI personalization methods. Through Adeleke et al. [9] research, companies can use A/B testing to pick winning webpage versions yet also customize user experiences through personalization based on user actions and preferences. The research found that personalization tools do not replace A/B testing since these techniques work differently yet combine perfectly to boost performance [9]. The personalization feature shows customized offerings to customer groups, while A/B testing proves the changes' effects. Both strategies help online businesses engage more customers and make more sales at the same time.

**Case Study 3: AI Recommendations vs. Human Insights in Retail**

Retail stores use more artificial intelligence features to make shopping easier for customers and run their activities better. Chadstone Shopping Centre in Melbourne is an appropriate case study in this study, using AI technology to help shoppers find meals and necessary ingredients. This system lets customers get expert-recommended meal ideas while finding needed products in their shopping area to save time and reduce what goes to waste. The organization can use the AI tool to get better outcomes, but it is up to the operators to verify its performance and whether this actually fulfils their needs. The system shows how AI helps retail by providing tailored service, and it still depends on human judgment to keep results on track.

**Key Observations & Insights**

Business case studies confirm that AI improves all industries by handling complex datasets to find important details beyond BI systems. AI functions best when team members work alongside its capabilities. AI tools from UniCredit, such as DealSync, can recognize new market opportunities in a short amount of time, but human judgment remains vital for situations and business strategy development. E-commerce businesses enhance their products by using A/B testing with AI to test changes while delivering personalized market value for effective results. The Food Concierge service at Chadstone needs human supervision to verify that AI suggestions provide accurate and appropriate guidance to customers. Both artificial intelligence and human expertise need to work together because this method helps businesses succeed best in every industry mentioned.

**5. Results & Discussion**

The case results show what AI and other analytical tools can do well and poorly in making business choices. AI tools DealSync from UniCredit shows better data-processing skills by finding business opportunities that basic business intelligence tools miss. AI helps online stores display targeted customer experiences, and AI product suggestions boost the effectiveness of retail operations. These useful benefits face specific limits and restrictions. AI systems produce data insights that business leaders cannot understand easily because of their lack of transparency. AI systems generate wrong findings when trained using unbalanced and incomplete databases, which results in poor executive decisions. Companies use BI and A/B testing methods to verify their decisions, which makes results more dependable than AI-generated insights. Human judgment keeps its important role because AI recommendations need interpretation within specific settings and ethical evaluation.

The best results come from mixing automated and human decision-making. AI can analyze large datasets to find relationships and replace manual tasks, which benefits companies in planning future finances while improving marketing strategies and work procedures. AI automation needs more work because society does not trust it yet, and the system requires better visibility. Employers need to supervise AI financial market activities because computers make unpredictable decisions without human control. Online shopping personalization technology has the unintended

effect of making users buy products based on standard group behavior. Retail AI tools fail to suit individual customer tastes because of available data restrictions. Organizations should make sure their AI systems provide clear and traceable results since this remains a vital organization requirement. A mixture of human specialists working with AI systems helps reduce risks and improve business results.

**6. Future Directions & Industry Implications**

Business leaders should use AI to boost the abilities of BI and A/B testing systems instead of trying to replace them. AI can process all types of information to add speed and agility to the structured reports that BI produces. By analyzing data, AI improves A/B testing results to let companies perfect their business strategies more rapidly. AI technology works best when humans keep the final decision-making power because its systems need validation from human analyzers. AI technology will cooperate with people to help them make better business decisions rather than completely replacing their decision-making role. These procedures enable companies to use AI at top speed while experts monitor business strategy.

Research shows that AI-augmented analytics will develop further as the focus on explainable AI (XAI) technology increases and its visibility problems are solved. BI based on NLP makes it easier for business leaders to explore data by allowing them to explore data more comprehensively. Parallel AI learning platforms and distributed AI systems can better protect data security when making business decisions. Companies encounter major problems when adding AI to their systems, such as expensive setup costs, algorithm bias problems, and rules made by industry groups. Businesses must adopt AI tools that serve their performance targets and ethical standards through the hurdles they face. A summative table and analytical summary of results from the study are presented in Appendix A.

**7. Conclusion**

The research demonstrates that AI technology needs additional skills for practical business intelligence and experimental work. AI performs best at handling data tasks, helping companies tailor products to customers, and achieving better money predictions. AI experiences problems while showing unclear inner workings, raising important moral and data usage questions requiring human teams to supervise its operations. BI and A/B testing systems must remain active since they produce reliable structured data that AI systems can't generate by themselves. Using AI technology together with BI tools as part of a human-led system creates the best solution for businesses to use data effectively while keeping decisions traceable. Research on specific AI adoption methods across industries should help companies make the most of AI tools while building structures that show all technical process details in their businesses.

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### Appendices

**Analytical Summary Table: Results & Discussion**

Criteria	AI vs. BI in Financial Decision-Making	A/B Testing vs. AI Personalization in E-Commerce	AI vs. Human Insights in Retail
AI Strengths	AI tools like DealSync quickly find M&A opportunities.	AI personalization boosts customer engagement.	AI recommendations save shoppers time.
BI & A/B Testing Strengths	BI provides clear, structured financial insights.	A/B testing validates changes before AI personalization.	Human judgment ensures AI relevance.
AI Weaknesses	AI lacks transparency, making decisions hard to explain.	AI alone doesn't measure user engagement like A/B testing.	AI suggestions may not fit individual needs.
Where AI Excels	AI processes financial data faster than BI.	AI improves targeting and content delivery.	AI assistants simplify product searches.
Where AI Fails	AI insights can be misleading if data is biased.	AI over-personalization may limit choices.	AI needs human oversight for context.
Challenges in AI Adoption	AI's lack of explainability reduces trust in finance.	AI needs A/B testing to validate personalization.	AI tools need human validation to stay accurate.
Ethical & Transparency Issues	AI decisions must be monitored for bias.	AI personalization can manipulate consumer behavior.	AI logic needs more visibility to ensure accuracy.

**This table highlights AI's advantages in speed and automation but also its reliance on human oversight, BI, and A/B testing for accuracy and trust.**