



Business Intelligence Case Study Analysis

● powered by  AI

 MBAN Team 4



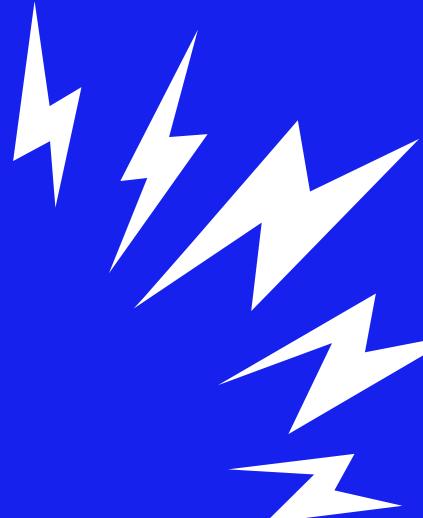
Have you ever seen a product go viral on social media, only to find it out of stock everywhere when you try to buy it?

Why do so many online shoppers abandon their carts before completing a purchase, and what can businesses do to turn those missed opportunities into actual sales?

How can real-time data analytics help businesses stay ahead of trends and avoid stock shortages or overstock issues?

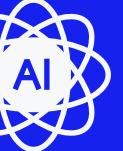
What happens to businesses when they fail to predict sudden spikes in demand—do they lose sales or end up with too much inventory?

How can real-time data analytics help businesses stay ahead of trends and avoid stock shortages or overstock issues?

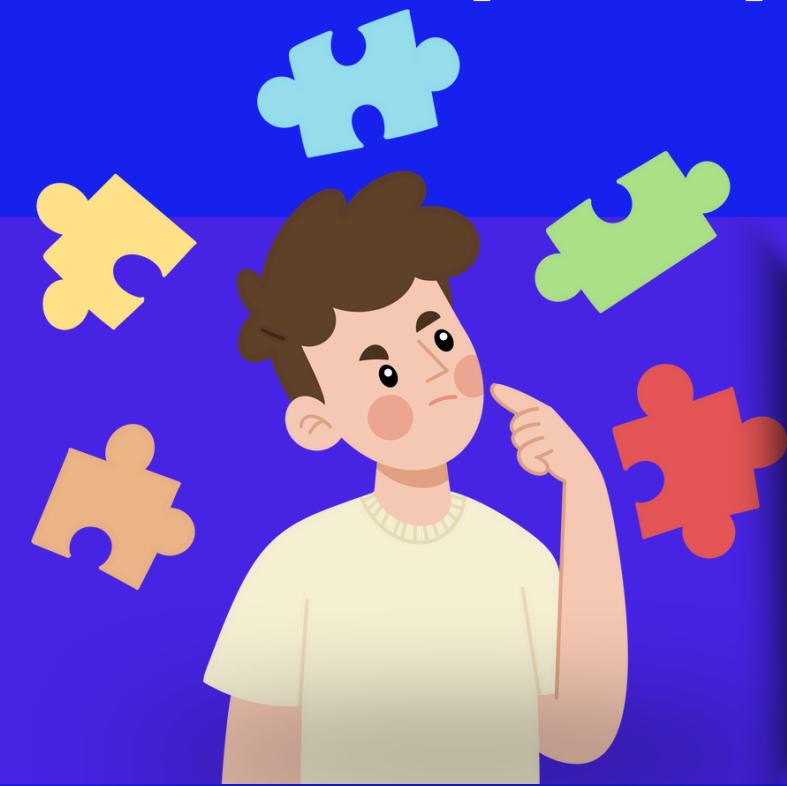


MBAN Team 4

Business Intelligence Case Study Analysis

● powered by 

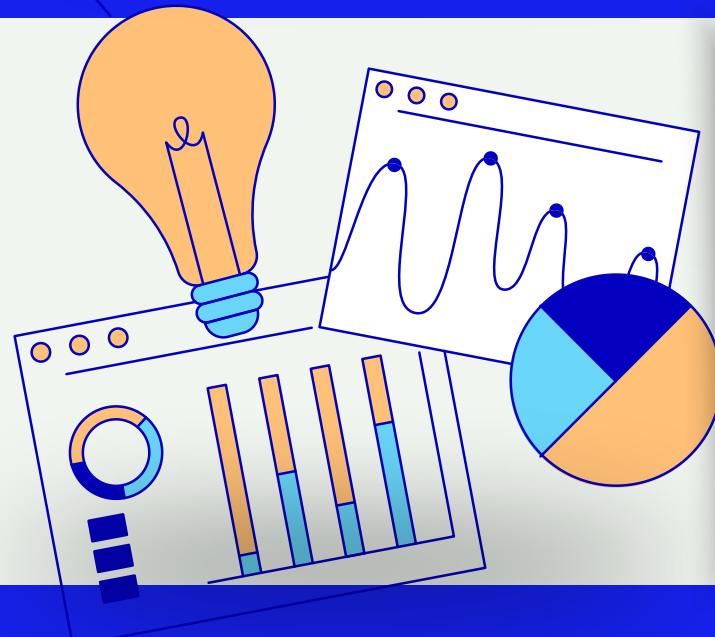
Business Problem



Comparison



Visual Mockup



Impact and Benefits



MBAN Team 4

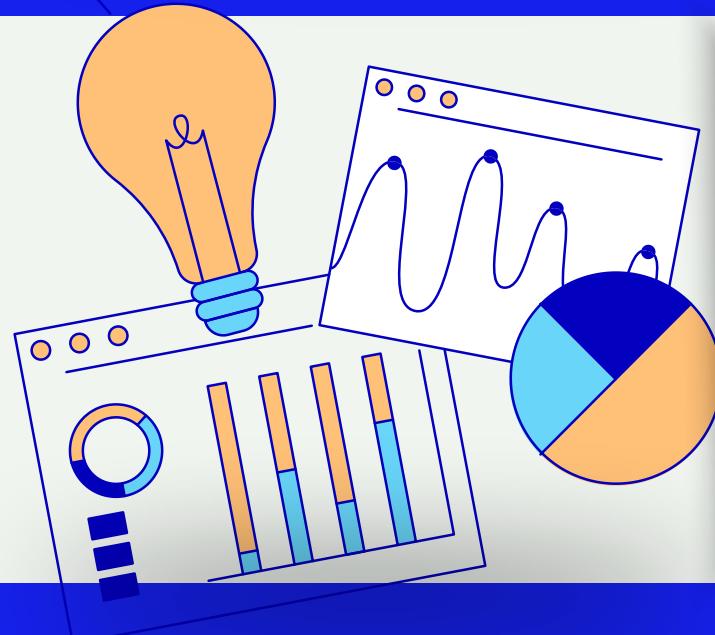
Business Intelligence Case Study Analysis

● powered by 

Business Problem



Visual Mockup



Comparison



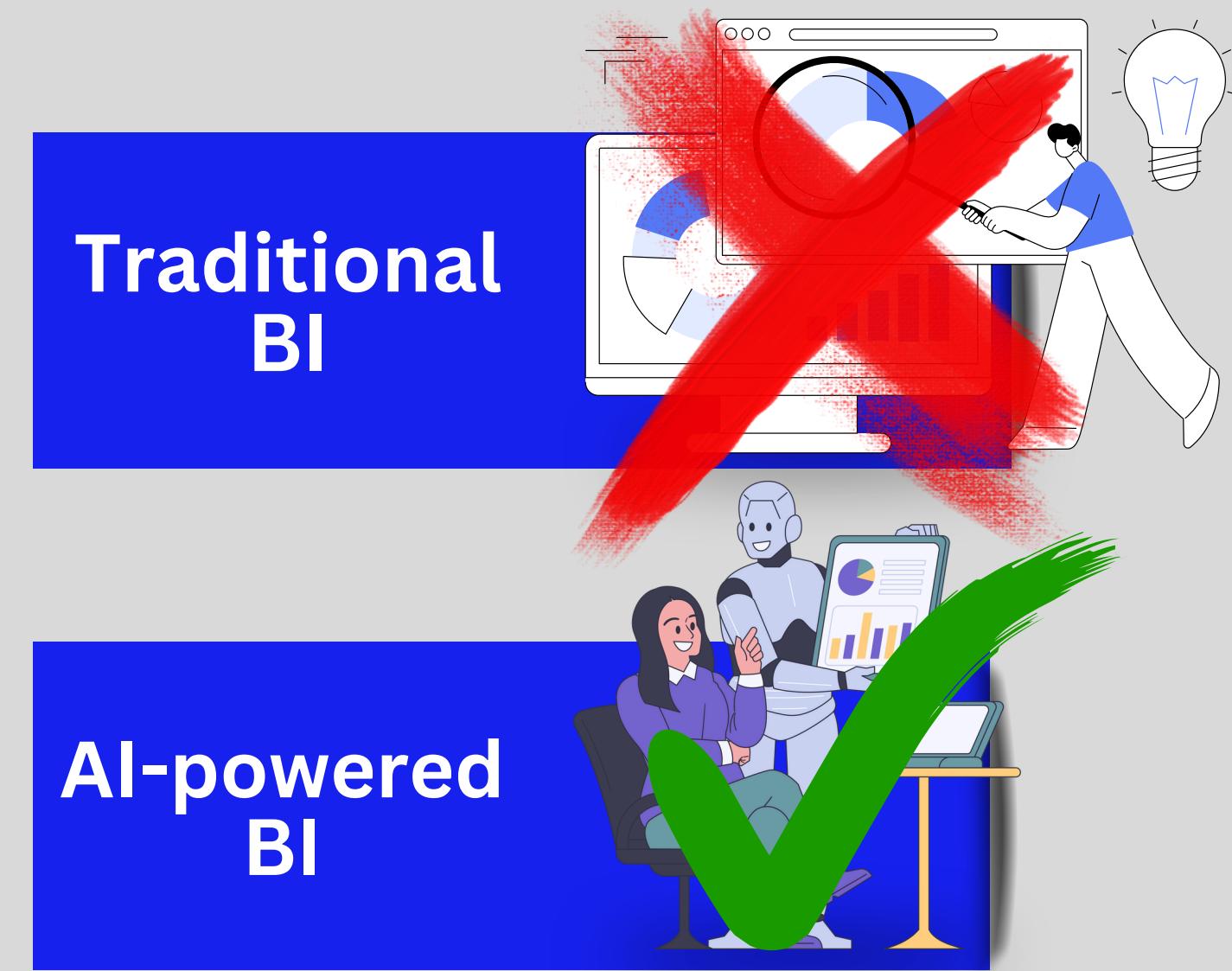
Impact and Benefits





Traditional BI

AI-powered BI

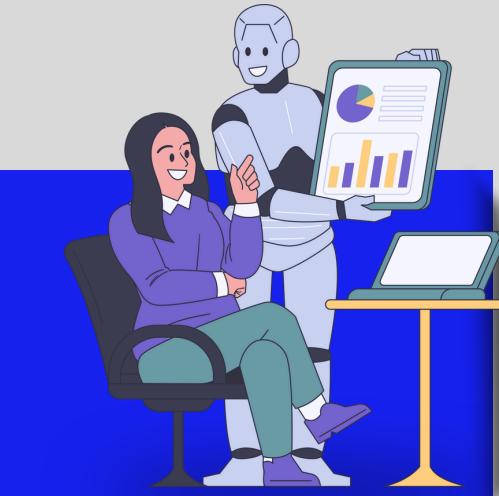




Traditional BI



AI-powered BI



Data Processing	<i>Manual ETL (Extract, Transform, Load) required</i>	<i>Automated data processing with AI/ML</i>
Data Sources	<i>Structured data from relational databases</i>	<i>Structured, semi-structured, and unstructured data from text, images, IoT</i>
Data Analysis	<i>Descriptive analytics, historical trends</i>	<i>Predictive and prescriptive analytics with ML</i>
Complexity of Insights	<i>Human-driven, descriptive, and diagnostic insights</i>	<i>Advanced insights using NLP and deep learning</i>
Reporting	<i>Predefined, static dashboards and scheduled reports</i>	<i>Dynamic, auto-generated, real-time insights</i>



Traditional BI



AI-powered BI



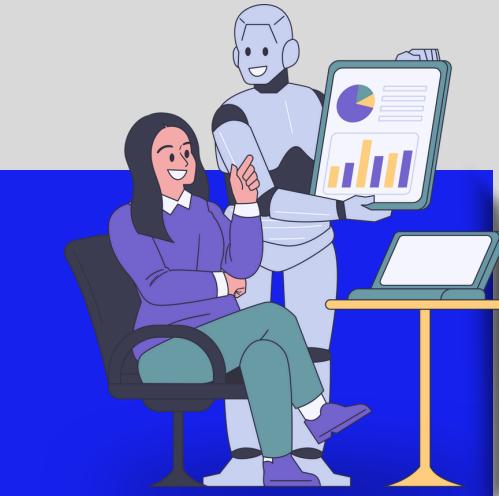
Decision-Making	<i>Relies on human interpretation of reports</i>	<i>AI-driven recommendations and automated decisions</i>
Speed of Decision-Making	<i>Manual report generation, human review required</i>	<i>Fast and automated decision-making using AI</i>
Real-Time Analysis	<i>Batch processing with delayed insights</i>	<i>Real-time data processing with instant insights</i>
Customization	<i>Limited customization, predefined queries/dashboards</i>	<i>Self-service analytics with adaptive AI models</i>



Traditional BI



AI-powered BI



Scalability	<i>Limited by database performance and processing power</i>	<i>Scalable with cloud-based AI solutions</i>
Flexibility	<i>Rigid data models, slow adaptation to new needs</i>	<i>Adaptive learning models with continuous AI training</i>
User Skill Requirement	<i>Requires SQL and BI tool expertise</i>	<i>Requires AI/ML knowledge (mostly for customization)</i>
Cost of Implementation	<i>Lower initial cost but higher maintenance expenses</i>	<i>High initial investment but long-term efficiency</i>

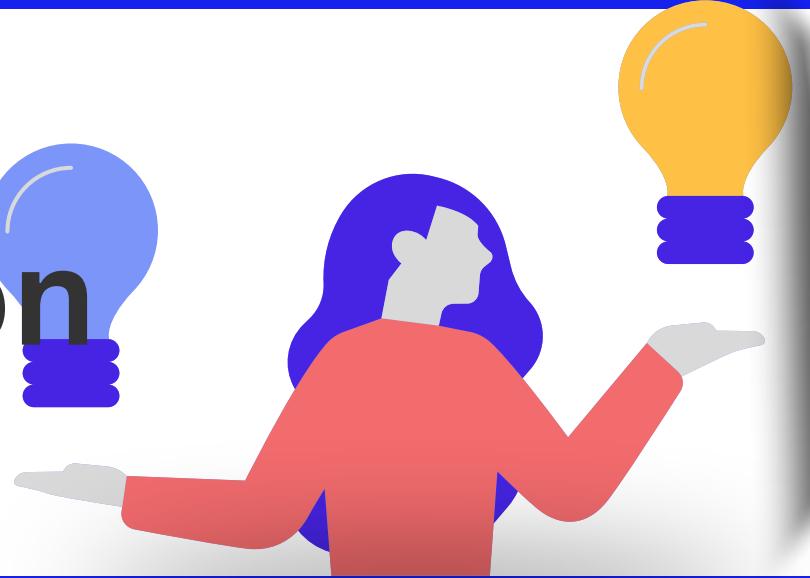
Business Intelligence Case Study Analysis

● powered by 

Business Problem



Comparison



Visual Mockup



Impact and Benefits



Business Problem

Comparison

Visual Mockup

Impact and Benefits

MBAN Team 4



DynamicPrice AI

Strategic View Tactical Dashboard Data Architecture

Real-Time Dynamic Pricing Dashboard

Last updated: Today at 15:02:40 (updating in real-time)

Active Visitors: 24,872 (+12%)

Revenue Today: \$238,492 (+8%)

Avg. Cart Value: \$94.28 (+3%)

Time Range: Last 6 Hours Product Category: All Categories Competitors: All Competitors Region: All Regions

Real-Time Sales vs Competitor Pricing

Live data streaming via Apache Kafka

Updating live

Time Point	Sales Volume (K)
1	750
2	745
3	755
4	750
5	755
6	760
7	765
8	770

<https://ermisetto.github.io/ai-dashboard/>

Business Intelligence Case Study Analysis

● powered by 

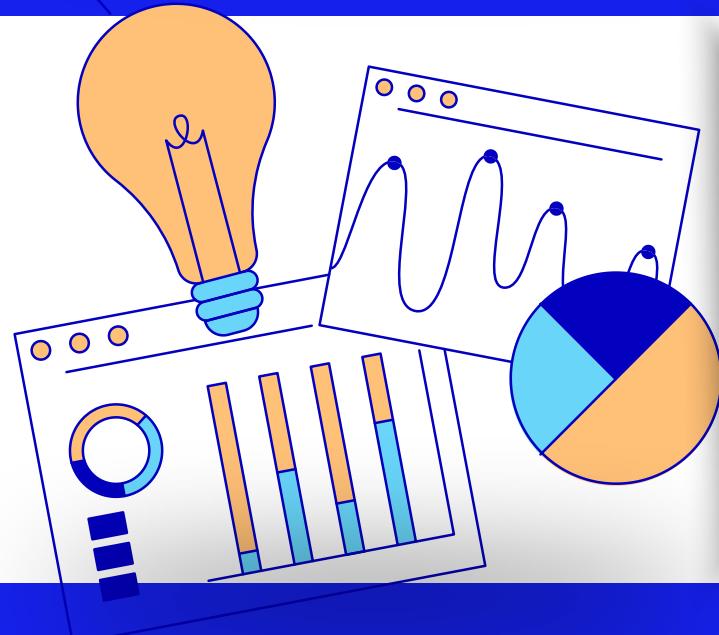
Business Problem



Comparison



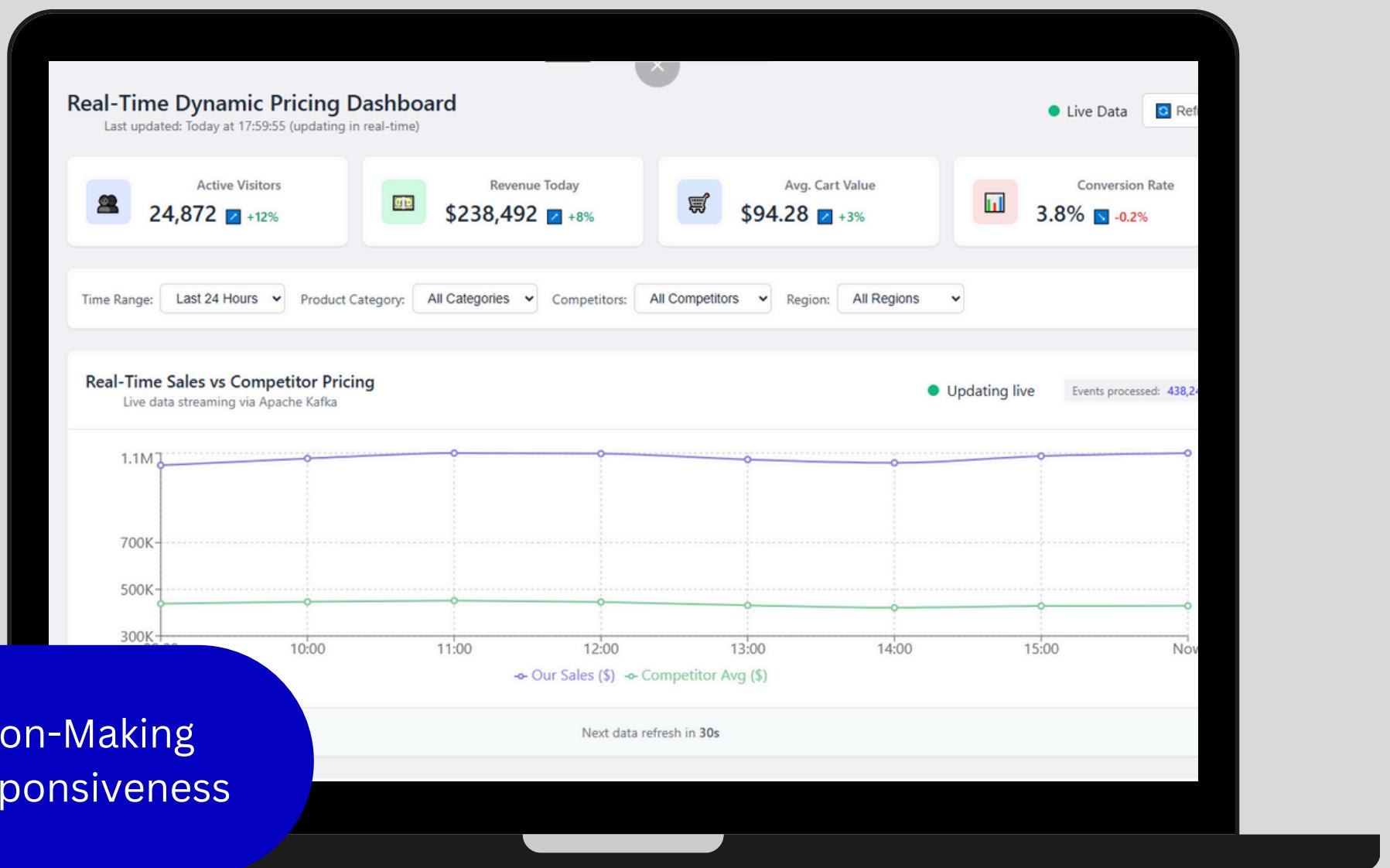
Visual Mockup



Impact and Benefits →



MBAN Team 4



Screenshot from DynamicPrice AI Tactical Dashboard:
Real-Time Dynamic Pricing Dashboard

- AI-powered BI can identify real time trends via Apache Kafka & ML models.
- AI automated engines can manage minute-to-minute price changes for days like Black Friday.
- 70% of revenue loss is shopping cart abandonment



The screenshot shows a mobile application interface titled "AI-Generated Pricing Recommendations". At the top, there's a search bar with placeholder text "Try asking:" and several buttons: "How are competitor prices affecting our conversion rate?", "Predict sales for the next 4 hours", "Which products should we consider for a flash sale?", and "What's driving the current trend in the Electronics category?". Below the search bar is a slider labeled "Automation Level" with a midpoint at "Semi-Auto". The main content area displays a table of product recommendations:

PRODUCT	CATEGORY	CURRENT PRICE	RECOMMENDED	REASON
Wireless Headphones XB-900	Electronics	\$149.99	\$134.99	Competitor price drop detected, 3 competitors now at \$139.99
Ultra HD Smart TV 55"	Electronics	\$699.99	\$749.99	Trending on social media, demand spiking +218% in last hour
Premium Bluetooth Speaker	Electronics	\$89.99	\$79.99	High cart abandonment rate (47%) in last 30 minutes
Smart Home Hub Pro	Electronics	\$129.99	\$119.99	Similar products trending on Amazon, potential market shift
Designer Handbag - Luxury Collection	Fashion	\$299.99	\$329.99	Celebrity endorsement detected on Instagram, 15% engagement increase
Smart Fitness Watch	Electronics	\$179.99	\$169.99	Competitor launching new model next week, preemptive discount advised

At the bottom of the screen, a message reads "Automation Status: Awaiting manual approval for all price changes". A red circular badge with the number "2" is visible in the top-left corner of the screen.

Depth &
Complexity of Insights

- AI-powered → descriptive, prescriptive, predictive and confidence scoring
- Traditional BI → descriptive analytics

*Screenshot from DynamicPrice AI Tactical Dashboard:
AI-Generated Pricing Recommendations*



Strategic Pricing Analysis
Last updated: Today at 17:47:45 (updating in real-time)

Market Trends Analysis
AI-detected trends based on market signals

ML-Powered

Actual Sales (blue line with circles), Competitor Avg (green line with circles), ML Forecast (orange dashed line)

AI Insight: Peak demand forecasted at 19:00 (1,360,000 units), consider optimizing pricing now

Category Performance
Profitability analysis by product category

Live Data Refresh

NLP Analysis

Category	Percentage
Electronics	42%
Home	15%
Beauty	10%
Fashion	12%
Other	8%
n	28%

AI-Generated Insights

- Electronics**: Price elasticity -0.87 (relatively inelastic). Opportunity to increase margins by 4-7%.
- Fashion**: Price elasticity -1.62 (highly elastic). Consider flash sale for inventory reduction.
- Home**: Price elasticity -1.05 (elastic). Stable pricing recommended.

Competitive Pricing Analysis
Competitor monitoring and response strategy

AI Strategy

Competitors Price Changes

-3.8%

AI-Generated Strategy Recommendations

Electronics Category
Competitor TechGiant appears to be running a seasonal sale. Recommended matching...

3

Data Integration & Scope

Screenshot from DynamicPrice AI Strategic View:
Strategic Pricing Analysis

- Traditional BI → structured data, manual ETL, and periodic reports
- AI-powered BI → structured, unstructured & external data in real time.
- Enables 360° business visibility.



A screenshot of a computer monitor displaying the DynamicPrice AI Tactical Dashboard. The interface includes a header with 'Next data refresh in 30s', a section titled 'Ask AI Assistant' with the subtext 'Natural language queries powered by NLP', and a search bar containing the question 'Which product category is most profitable right now?'. Below the search bar is a chart titled 'Response:' showing profit margins for various categories: Electronics (42%), Fashion (28%), Home (15%), Beauty (10%), and Other (5%). A text box below the chart states: 'Electronics is currently your most profitable category with a 42% profit margin, followed by Fashion at 28%. Based on real-time sales data, the "Wireless Headphones XB-900" product has the highest individual profit contribution.' At the bottom of the dashboard, there is a 'Recommendations' section with a table showing 'Pending suggestions' and an 'Automation Level' slider set to 'Semi-Auto'. A large blue speech bubble in the foreground contains the text 'Democratization of Data Access' and a red circle with the number '4'.

*Screenshot from DynamicPrice AI Tactical Dashboard:
Ask AI Assistant*

- NLP in BI allows for non-technical staff to access real-time insights by asking questions in **plain language**.
- Companies like Walmart use NLP tools to react quickly to sales trends, cart abandonment, and demand shifts.
- Reduces delays in decision-making, boosting agility, efficiency, and revenue.

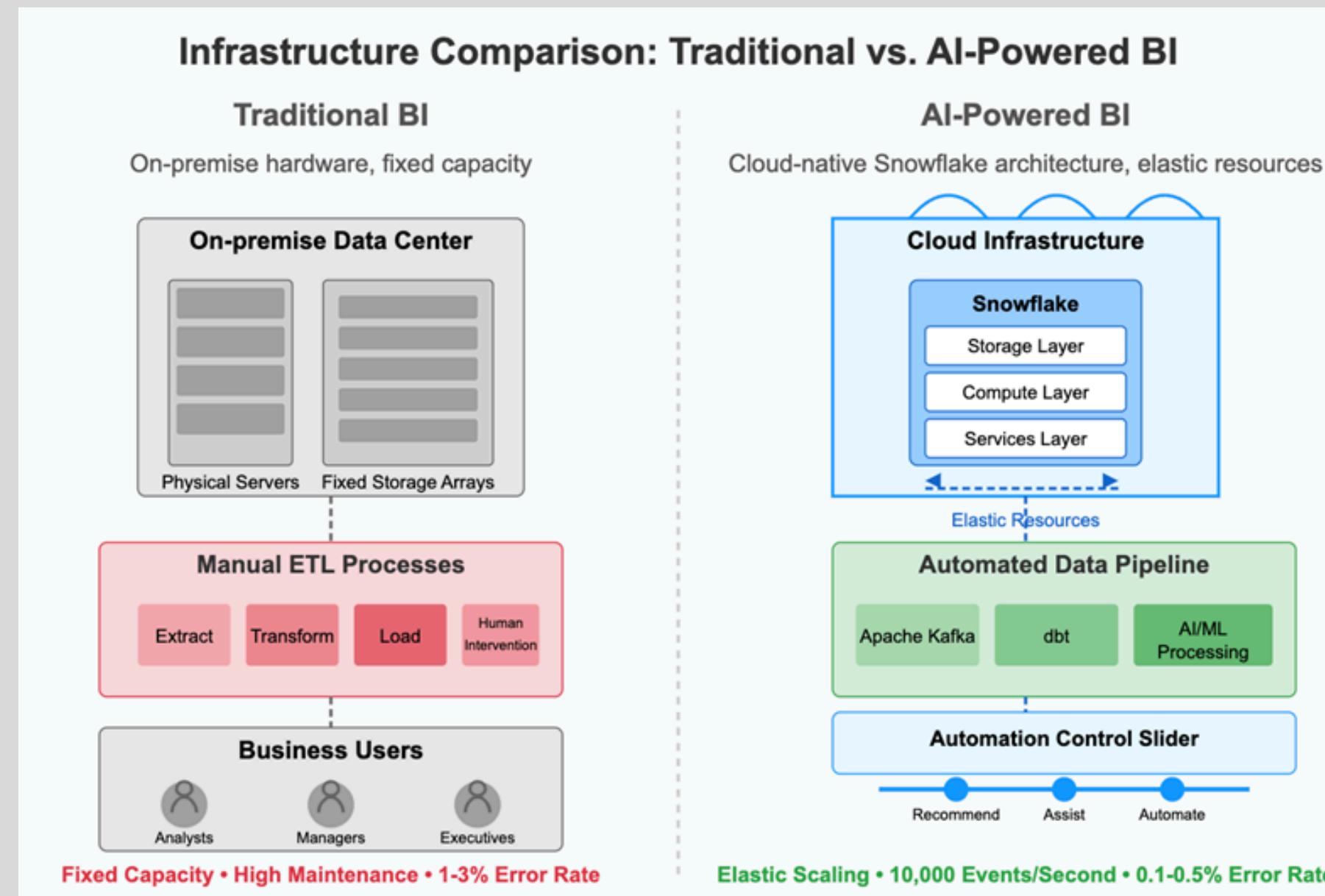


Figure 1. Infrastructure Comparison Diagram

- Automated data pipelines with Kafka and data build tool, reducing deployment time
- System features an automation control slider allowing adoption
- 1-10-100 rule: preventing a data error, correcting it during validation, fixing it during analysis
- Reducing error 3% to just 0.5%, eliminating costs

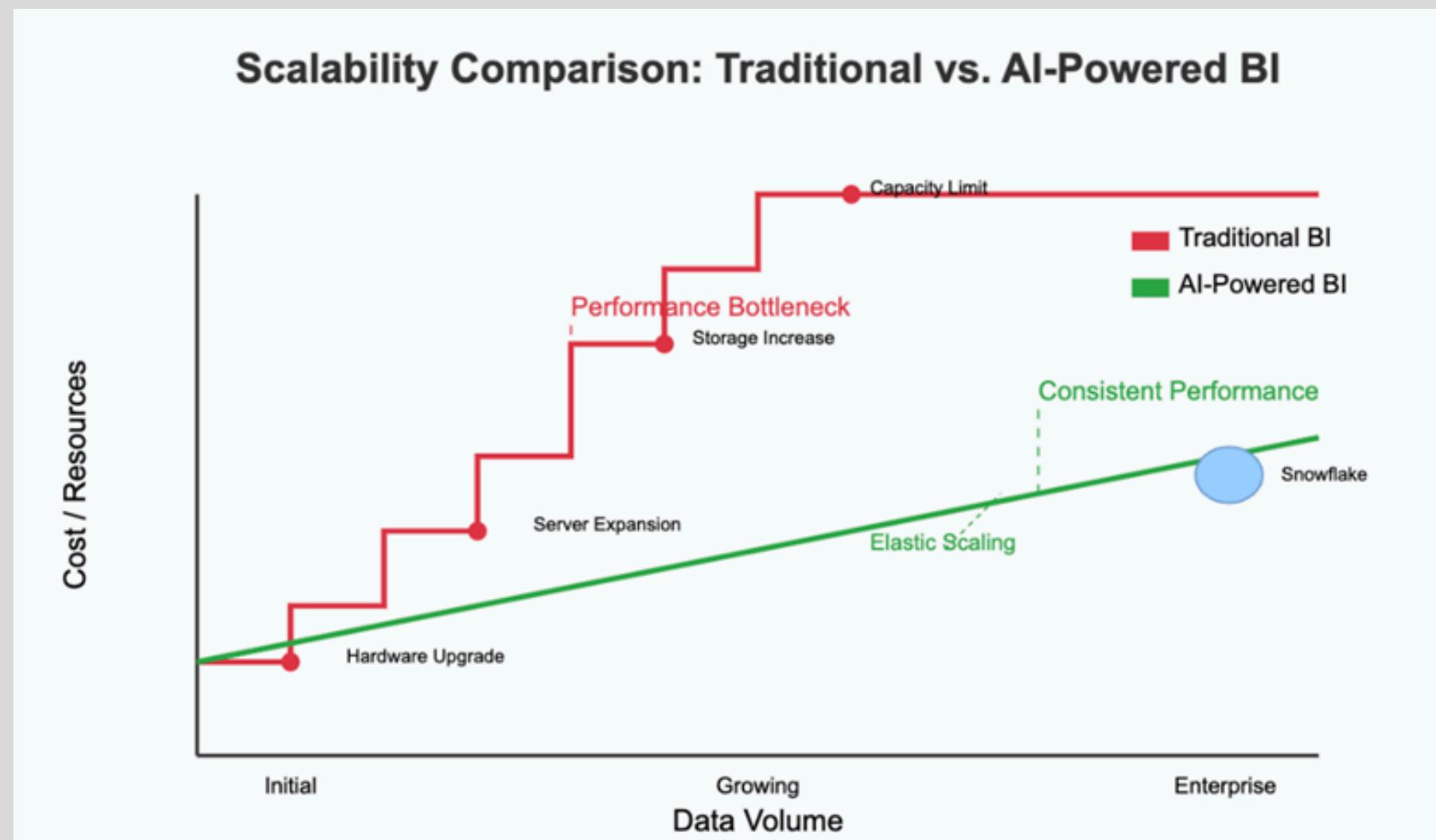


Figure 2. Scalability Comparison: Traditional vs. Proposed AI-Powered BI

- Bottlenecks require expensive hardware upgrades & performance degrading
- Our AI powered solution uses Snowflake / scales elastically with demand
- Organizations moving to cloud-based solutions see a 40-65% reduction in total ownership costs over three years

Business Intelligence Case Study Analysis

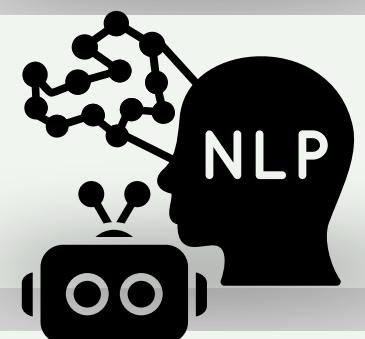
Real-time processing reduces reaction time from days to seconds & predictive analytics with confidence scoring



Solution integrates all data types, completing a 360-degree view of operations



Natural Language Processing allows non-technical staff to query systems



Cloud-based delivers 40-65% lower total cost of ownership through elastic scalability



Demonstrates that the advantages are achievable through system design today



Business Intelligence Case Study Analysis

 MBAN Team 4

Mattia Bianchi

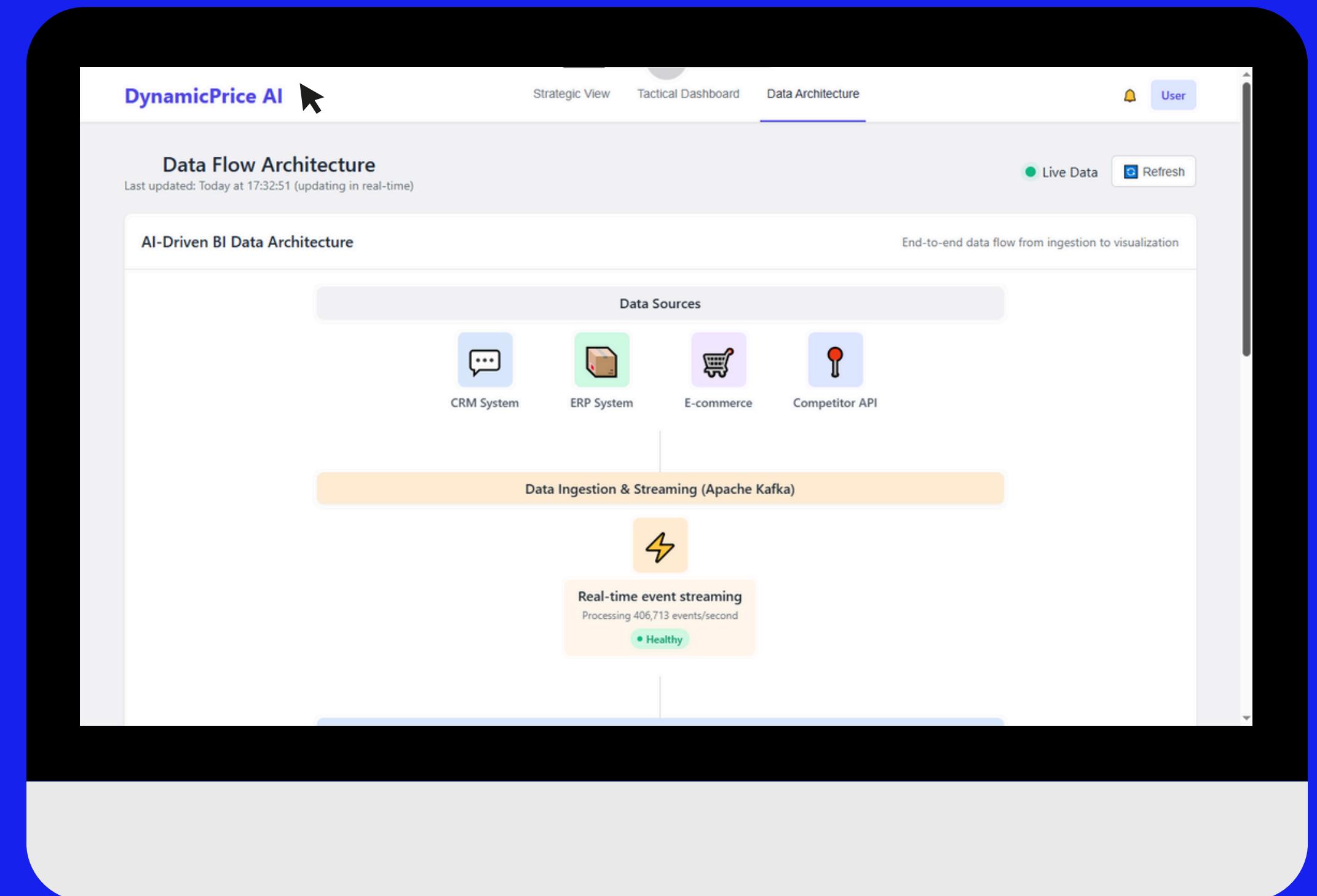
Karla Esmeralda Felipe Chavarria

Mateo Franco

Angel Lanto

Pearl Soderberg

Phani Teja Venigalla



References

- Adewusi, A. O., Okoli, U. I., Adaga, E., Olorunsogo, T., Asuzu, O. F., & Daraojimba, D. O. (2024). BUSINESS INTELLIGENCE IN THE ERA OF BIG DATA: A REVIEW OF ANALYTICAL TOOLS AND COMPETITIVE ADVANTAGE. Computer Science & IT Research Journal, 5(2), 415–431. <https://doi.org/10.51594/csitrj.v5i2.791>
- Briggs, F. (2023, November 28). Record-breaking Black Friday, Cyber Monday weekend with Shopify merchants reaching \$9.3 billion sales globally, and London being a top-selling city. Retail Times. <https://retailtimes.co.uk/record-breaking-black-friday-cyber-monday-weekend-with-shopify-merchants-reaching-9-3-billion-sales-globally-and-london-being-a-top-selling-city/>
- gowranga. (2025, January 7). Business Intelligence vs Artificial Intelligence: Know the Differences [2025] - CCSLA Learning Academy. CCSLA Learning Academy. <https://www.ccslearningacademy.com/business-intelligence-vs-artificial-intelligence/>
- Laoudai, O. (2024, July 17). Business Intelligence in the AI Era: Modernizing BI. Infomineo. <https://infomineo.com/business-research/business-intelligence-in-the-ai-era-modernizing-bi/>
- Sheppard, B., Sarrazin, H., Kouyoumjian, G., & Dore, F. (2018, October 25). The business value of design. McKinsey & Company. <https://www.mckinsey.com/capabilities/mckinsey-digital/our-insights/the-business-value-of-design>
- Stef. (2024, October 17). Bridging the Gap Between Business Intelligence and AI - AI. Distributed Analytics. <https://distributedanalytics.co.uk/bi-ai-bridging-gap/>
- Team ThoughtSpot. (2024, October 29). What is modern BI? How is it different from traditional BI? ThoughtSpot. <https://www.thoughtspot.com/data-trends/business-intelligence/modern-bi>
- Vineetha, K. R., Resmi, K. R., Amrutha, K., & Omanakuttan, M. (2024). Future Directions and Trends in AI-Powered Business Intelligence. Advances in Business Information Systems and Analytics, 283–308. <https://doi.org/10.4018/979-8-3693-8844-0.ch012>
- Wolfgang Faisst. (2022, March 22). Total Cost of Ownership comparison: Traditional BI project vs. ValueWorks - ValueWorks. ValueWorks. <https://valueworks.ai/total-cost-of-ownership-comparison/>
- McKinsey & Company. (2020). Harnessing Revenue Growth Management for Sustainable Success. McKinsey & Company <https://www.mckinsey.com/capabilities/growth-marketing-and-sales/our-insights/harnessing-revenue-growth-management-for-sustainable-success?utm>
- AmazonScience.(2022).ChallengesandResearchOpportunitiesineCommerceSearchandRecommendations.AmazonScience <https://assets.amazon.science/23/86/ca2f1a034fa084d524962af2fdा/challenges-and-research-opportunities-in-commerce-search-and-recommendations.pdf?utm>
- Statista. (2023). Global Online Shopping Cart Abandonment Rate 2006-2025. Statista <https://www.statista.com/statistics/477804/online-shopping-cart-abandonment-rate-worldwide/>
- Walmart Global Tech. (2022). Walmart Reveals Plan for Scaling Artificial Intelligence, Generative AI, Augmented Reality, and Immersive Commerce Experiences. <https://corporate.walmart.com/news/2024/10/09/walmart-reveals-plan-for-scaling-artificial-intelligence-generative-ai-augmented-reality-and-immersive-commerce-experiences?utm>



Business Intelligence Case Study Analysis

● powered by  AI

 MBAN Team 4