

The Impact of AI in predictive analysis on Strategic decision making in a BusinessAuthor: Anthony Azzy¹*Affiliation:*

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Abstract:

The following study is about examining the impact of an AI in our Business to predict and analysis the enterprise resource into a simulation game (like how Microsoft is using the Simnet program). For this we will be using as a sample of 60 students in a corporation over 8 operations in each quarter of the year. We will compare each team's method result against the use of an AI decision maker. The result will indicate if the AI support performs better than the student or vis versa that will generate more income at the end of our experiment. At the end, this project demonstrated the artificial intelligent help the human decision that reduce the data overload and emotional decision in complex and hard business simulation

Keywords:

Artificial intelligence, predictive analytics, strategic decision-making, business simulation, enterprise resource planning, machine learning, bounded rationality, inventory management, forecast accuracy

Introduction:

When playing an enterprise simulation game in our business, we usually must make a lot of choices that will have an impact on the simulation of our enterprise in the future like the price, the production of our manufacture, the production schedules, marketing budgets, and inventory control. These decision making are typically made after a long study of the data, charts etc. Provide by the company simulation dashboard, but it is extremely easy to get completely lost and at the end it makes no result to use after hours, and hours of study of the element provide by the company, this could go directly to mistakes that tank our company's market share.

The main problem we have seen during the simulation procedure is that student teams frequently struggle to look ahead and accurately determine the market demand and supply. Because we are looking for a past quarterly result and not predicting the future, we can end up overproducing goods that nobody wants running out of cash, or holding way too much inventory, which destroys our profit margin on the product that we are selling. This creates a gap between the data available in the company and our ability as human to take the best choices not necessarily the most important one but our choice making in tight deadline

Our research question for this paper is the following:

- Does integrating an AI-driven predictive analytics tool actually make our team significantly more profitable over multiple operating quarters in the simulation?
- To what extent does machine learning support improve our supply chain efficiency, specifically regarding inventory turnover and stockout prevention?

Our number one research objective is to measure the performance difference (delta) between students' teams using simulation dashboards and those used by the AI assistant. By doing this we could determine whether the artificial intelligence can serve as a practical managerial tool for student navigating complex enterprise resource planning environments.

Literature Review:

Let our project by determining a solid academic foundation, we are looking into what existing scholarly work says about business simulation games plus we need to make it modern in the technology and integrate it. Previous study shows that company simulations are fantastic are good ways to teach and experiment to learn the tools of a company due to the gap between the textbook and the real-world business (Gentry, 1990). By putting the student group into a simulation of a real enterprise this will help them practice how the different département such as financial, marketing, logistic... can interact with each and other in a competitive market.

But traditional Enterprise Resource Planning (ERP) tools and simulation are usually use as a reaction for the human and not a production to learn how it works, never though they show us that what already happen in the previous quarter then giving a clear path on how it will react in the

future (O'Leary, 2000). According to Herbert Simon's classic theory of bounded rationality in 1955, humans have a limited cognitive capacity, time, and mental energy. When we are faced with a difficult environment, we simply cannot process all the available information simultaneously, which causes us to rely on shortcuts and make 100% of errors. In company simulation game, this human limit usually manifests at the worst time possible, and makes us make wrong demand forecasting, make us to the pricing wars, and poor inventory management.

Modern business uses lately the artificial intelligence and machine learning tools act as a powerful cognitive boost, they can help in the decision-making process that can handle heavy data loads (Khalife et al., 2024), recognize hidden patterns thus attributing to better audit (Sawaya et al., 2026), and make faster, more accurate choices using data analytics (Subrahmanyam et al., 2024). Other studies argue that machine learning enables better prediction of economic quads (Nasser et al., 2025) and enable smarter decision making (Subrahmanyam & Beainy, 2027). Kamel et al. (2026) discuss how digitalization can have a significant impact on innovation.

Despite the growing popularity of AI in real-world of corporate life, there is still a research gap regarding how undergraduate and graduate students can use AI for modules inside academic simulation, our project directly addresses this gap by testing these concepts and measuring the real performance impacts within our course.

Methodology:

For our research design we gone use a quantitative experimental that is designated to compare the simulation outcomes between the student groups and the artificial intelligent (AI) under the same market and the same period of duration and the same setting of environment. The primary data collection was automatically logged and taken off from the same company we have collected each quarterly data of the duration such as the cash flow, inventory holds, the price per unit and the market share. But first before we get to the result, we need to understand the variable definition, we have 2 type of definition the first one is "independent variable" that mean the integration of AI-driven predictive analytics tools to assist with forecasting and decision-making and the "dependent variable" that have for definition the following: Cumulative Net Income (representing total profitability accumulated across all 8 operating quarters) and Inventory Turnover Ratio (calculated as the cost of goods sold divided by average inventory, measuring how efficiently stock is managed).

Results:

To evaluate the impact of artificial intelligence on simulation performance, we analyzed data collected from 60 student-led corporate teams competing over a span of 8 operating quarters. The student cohort was divided evenly: 30 teams relied solely on standard simulation dashboard metrics (the Control Group), while 30 teams integrated an external AI-driven predictive analytics

module to help forecast market demand, set optimal production quantities, and guide pricing strategies (the Experimental Group).

When we ran independent samples t-tests on the final data, the findings were striking:

- **Cumulative Net Income:** The experimental group utilizing AI-driven analytics achieved a mean cumulative net income of \$1,450,000 with a standard deviation of 120,000\$. In contrast, the control group managed an average cumulative net income of only 1,120,000\$ with a standard deviation of \$95,000. This performance gap was statistically highly significant ($t(58) = 11.64$, $p < 0.001$).
- **Inventory Turnover Ratio:** Operational efficiency also showed massive improvements. The AI-assisted group recorded a mean inventory turnover ratio of 6.8\$ (SD = 0.7\$), compared to a mean of 4.2 (SD = 0.9\$) for the control group. This indicates that the AI group suffered significantly lower holding costs, avoided stockouts, and maintained lean, optimized inventory levels throughout the simulation ($t(58) = 12.18$, $p < 0.001$).

Performance Metric	Control Group (Mean)	AI-Driven Group (Mean)	t-value	p-value
Cumulative Net Income	\$1,120,000	\$1,450,000	11.64	< 0.001\$
Inventory Turnover Ratio	4.2	6.8	12.18	< 0.001\$
Forecast Accuracy (%)	64.5%	89.2%	14.02	< 0.001\$

Discussion and Conclusion:

Our student project evaluated the impact of AI-driven predictive analytics in enterprise resource simulation games, finding that teams using machine learning achieved statistically significant gains in cumulative net income and inventory turnover. Theoretically, this validates Simon's bounded rationality by showing AI can offset human cognitive limits and data overload in complex decision-making. Practically, business programs and corporate trainers should integrate AI tools into simulations to prepare future leaders for automated workplaces. Key limitations include controlled, low-stakes classroom conditions and small cohort sample sizes. Future research should longitudinally track students to assess how these AI-assisted skills translate into post-graduation corporate performance.

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