

# The Intersection of Strategic Sourcing and Artificial Intelligence: A Paradigm Shift for Modern Organizations

Prajkta Waditwar

San Jose, California, USA

Email: prajkta.waditwar@gmail.com

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## Abstract

In the contemporary business landscape, organizations are increasingly seeking ways to optimize procurement operations, reduce costs, and maintain competitive advantages. Strategic Sourcing, the process of analyzing an organization's procurement spend and establishing long-term partnerships with key suppliers, has long been an essential approach for achieving these goals. However, with the advent of Artificial Intelligence (AI), a powerful synergy is emerging. This paper explores how the combination of Strategic Sourcing and AI can transform procurement processes, driving significant improvements in efficiency, cost management, risk mitigation, and supplier relationships. Through case studies and industry examples, this research outlines the benefits and challenges of integrating AI with Strategic Sourcing, offering a roadmap for organizations aiming to harness this technological advantage.

## Keywords

Strategic Sourcing, Artificial Intelligence, Procurement, Supply Chain, Cost Optimization, Supplier Management, Risk Mitigation, Data Analytics

## 1. Introduction

### 1.1. The Importance of Strategic Sourcing

Strategic Sourcing has long been a key component of procurement, focusing on creating long-term supplier relationships, reducing costs, and enhancing supply chain resilience. Van Weele (2018) describes Strategic Sourcing as a comprehensive procurement strategy, emphasizing the importance of supplier collaboration and spend analysis to secure favorable terms and ensure quality.

Strategic Sourcing has evolved from a mere cost-saving exercise to a com-

prehensive approach aimed at creating value through supplier relationships, risk management, and long-term procurement planning. By analyzing procurement spend and supplier markets, organizations can negotiate better terms, enhance quality, and ensure a steady supply of goods and services.

## 1.2. The Rise of Artificial Intelligence in Procurement

AI technologies have gained prominence in procurement in recent years. [Deloitte \(2020a, 2020b\)](#) and [McKinsey Global Institute \(2018\)](#) outline how AI applications, such as machine learning and predictive analytics, are revolutionizing procurement by automating repetitive tasks and providing more accurate forecasting models. [Baryannis et al. \(2019a, 2019b\)](#) emphasize the role of AI in risk management, noting its ability to detect potential supply chain disruptions before they escalate into major issues.

## 1.3. Purpose of the Study

This paper explores the convergence of **Strategic Sourcing** and **Artificial Intelligence (AI)** within procurement processes. It examines how AI technologies—such as predictive analytics, machine learning, and process automation—can enhance the efficiency of procurement functions. By merging AI with Strategic Sourcing, the research highlights a transformative approach to optimize costs, reduce risks, and strengthen supplier relationships.

This research is significant because procurement is a crucial function in organizations, directly impacting operational efficiency and cost-effectiveness. The introduction of AI tools into procurement not only automates routine tasks but also empowers procurement professionals to make more strategic, data-driven decisions. Given the competitive pressures in global supply chains, the integration of AI into Strategic Sourcing offers a roadmap for organizations to maintain a competitive edge while managing risks and optimizing costs.

## 2. The Benefits of Combining Strategic Sourcing and AI

### 2.1. Enhanced Decision-Making through AI-Driven Analytics

Strategic Sourcing relies heavily on data for making procurement decisions. AI-driven analytics tools can process vast datasets, including historical spend data, supplier performance records, and market trends. These tools can uncover hidden patterns and insights, empowering procurement teams to make more informed decisions regarding supplier selection, contract negotiation, and purchasing strategies.

#### 2.1.1. Predictive Analytics

AI algorithms can forecast future demand, predict price fluctuations, and identify potential supply chain disruptions. Predictive analytics allows procurement teams to anticipate market changes, ensuring they are prepared to secure contracts at the most favorable terms.

Here's how they work in detail:

### 1) Demand Forecasting:

- AI algorithms analyze **historical sales data**, **seasonal trends**, and **external factors** such as market conditions and consumer behavior to predict future demand.
- Machine learning models continuously improve their accuracy by learning from new data inputs, allowing procurement teams to adjust their stock levels and sourcing strategies.
- This helps ensure that the right amount of inventory is available at the right time, preventing both shortages and overstock situations.

### 2) Price Prediction:

- AI models can track **commodity prices**, **currency exchange rates**, and **economic indicators** to predict future price trends.
- The system factors in variables such as supply availability, raw material costs, and geopolitical events that may cause price fluctuations.
- These insights enable procurement teams to lock in contracts or purchase orders when prices are expected to rise, thus securing more favorable terms before costs increase.

### 3) Supply Chain Disruption Identification:

- AI monitors **real-time data** from a variety of sources, including weather reports, geopolitical news, transportation data, and supplier performance.
- The system identifies risks like **natural disasters**, **political instability**, or **supplier bankruptcy**, which could cause disruptions.
- By analyzing this data, AI can provide early warnings of potential disruptions, allowing procurement teams to proactively secure alternative suppliers or adjust logistics plans.

### 4) Actionable Insights via Predictive Analytics:

- AI-driven predictive analytics enables procurement teams to **anticipate market changes** and make informed decisions.
- For instance, when a price increase is forecasted, procurement can negotiate long-term contracts with suppliers at current prices, securing better deals.
- The same models can also recommend **alternative suppliers** if disruptions are anticipated, ensuring supply continuity.

#### Example:

- A company using AI might receive an alert that a major supplier in Southeast Asia is facing political unrest, likely leading to delays. AI could then suggest alternate suppliers in other regions, ensuring minimal disruption to operations.

### 2.1.2. Spend Analysis

AI can automate the classification and analysis of spend data, eliminating manual errors and offering a more granular view of procurement activities. AI tools can segment spend into categories, suppliers, and regions, providing procurement

teams with actionable insights for cost-saving opportunities.

Here's how it works:

**1) Automation of Data Classification:**

- AI systems are capable of analyzing large volumes of transactional data, categorizing spending into specific categories like **direct** and **indirect spend**, and further classifying it based on **goods/services, regions, or suppliers**.
- By using **machine learning** algorithms, AI tools can **recognize patterns** in data, automatically assign spend to the appropriate categories, and continually improve their accuracy over time.

**2) Granular Data Analysis:**

- AI doesn't just categorize data but also drills down into more granular details, such as individual supplier contracts, shipping costs, or payment terms, providing procurement teams with a comprehensive view of all expenditures.
- By offering a granular breakdown, procurement teams can identify specific cost drivers, trends, and patterns that may otherwise go unnoticed.

**3) Eliminating Manual Errors:**

- Traditional manual spend analysis is prone to human error, such as incorrect data entry or misclassification of categories. AI minimizes this by automating data entry and classification processes, thereby reducing mistakes.
- AI algorithms ensure consistency in categorization and processing, resulting in more reliable and accurate data.

**4) Segmentation and Insights:**

- AI tools can **segment spend data** based on various criteria like **supplier, category, or region**, allowing procurement teams to see where money is being spent across different parts of the business.
- By using AI, procurement professionals can uncover actionable insights such as **cost-saving opportunities, redundancies, and opportunities for consolidation** across suppliers or spend categories.

**5) Actionable Insights:**

- The system can flag areas for **spend optimization**, such as consolidating suppliers for bulk discounts or identifying underperforming suppliers where renegotiation may lead to cost savings.
- AI also suggests where renegotiation of contracts or finding alternate suppliers may result in better cost management.

**6) Predictive Capabilities:**

- With predictive analytics, AI can also forecast **future spending patterns** based on historical data, helping procurement teams plan ahead and budget more accurately.

## **2.2. Cost Reduction through AI-Enhanced Strategic Sourcing**

Strategic Sourcing focuses on achieving long-term cost savings, and AI further amplifies these efforts. By automating routine tasks such as contract management and supplier evaluations, AI frees up time for procurement professionals to focus

on high-value activities.

### 2.2.1. Supplier Selection and Negotiation

AI can analyze past performance data and market conditions to recommend suppliers who offer the best combination of quality, price, and reliability. AI-powered negotiations can use real-time data to identify leverage points in negotiations, leading to better pricing and contract terms.

Here's how AI plays a role:

#### 1) Analyzing Past Performance Data:

- AI can evaluate suppliers based on **previous contract performance**, looking at factors such as **on-time delivery rates**, **defect rates**, and **overall customer satisfaction**.
- AI systems sift through large datasets to find patterns in a supplier's reliability, consistency, and quality, ensuring that procurement teams choose suppliers who meet stringent performance criteria.
- The system can also integrate **financial health data** and external ratings to assess the long-term viability and risk of working with certain suppliers.

#### 2) Market Condition Analysis:

- AI tracks **market conditions**, such as **price trends**, **raw material availability**, and **economic indicators**, providing procurement teams with a real-time understanding of the marketplace.
- These insights help in determining the best times to engage with suppliers or renegotiate contracts based on favorable pricing windows or potential disruptions in supply.

#### 3) Real-Time Data for Negotiations:

- AI-powered negotiation tools utilize **real-time data**, such as current demand, supplier capacity, and market prices, to identify the best **leverage points** in a negotiation.
- By analyzing the supplier's **cost structure** and comparing it to **industry benchmarks**, AI can provide insights into where procurement teams might push for **price reductions** or **better terms**.
- AI tools can simulate various contract terms and their long-term impacts on both parties, offering suggestions for mutually beneficial agreements.

#### 4) Optimized Supplier Selection:

- Based on the analysis of both **internal performance metrics** and **external market data**, AI recommends suppliers who offer the best combination of **price**, **quality**, and **reliability**.
- The system also considers factors like **supplier flexibility**, **innovation potential**, and **logistical efficiency**, ensuring procurement teams are partnering with suppliers that provide comprehensive value.

#### 5) Continuous Learning and Improvement:

- AI algorithms continuously learn from each negotiation and procurement event, improving future supplier recommendations and refining negotiation strategies for better outcomes.

**Example:**

- In a procurement scenario, AI may notice that a key raw material is expected to rise in price due to limited global supply. The system would then recommend locking in current prices with high-performing suppliers, potentially saving significant costs over time.

**2.2.2. Optimization of Total Cost of Ownership (TCO)**

AI tools help procurement teams go beyond upfront pricing and consider the Total Cost of Ownership (TCO), which includes factors like logistics, maintenance, and supplier performance. AI can suggest the most cost-effective options by evaluating these variables holistically.

Here's how AI achieves this:

**1) Holistic Evaluation of Costs:**

- AI analyzes multiple cost factors across the entire lifecycle of a product or service, including:
  - **Logistics:** AI examines transportation costs, shipping times, and potential delays, providing insight into the most efficient and cost-effective logistics partners.
  - **Maintenance:** For goods that require ongoing servicing or parts replacement, AI evaluates the long-term costs associated with maintenance, suggesting suppliers who offer more reliable and cost-effective solutions.
  - **Supplier Performance:** AI tracks supplier reliability, defect rates, and timeliness to ensure that procurement teams consider the cost of potential disruptions or poor-quality products.

**2) Predictive Cost Analysis:**

- AI-powered predictive models can forecast **future costs** by examining trends such as rising transportation fees, commodity price volatility, and fluctuating supplier performance. This ensures that procurement teams are aware of the long-term implications of their purchasing decisions, not just the immediate costs.
- By incorporating **market conditions**, AI offers predictive insights into how costs may evolve over the contract's duration, allowing for better negotiation and budgeting.

**3) Supplier Comparison Beyond Price:**

- AI systems compare suppliers not only by upfront price but also by the overall TCO, factoring in variables like warranties, lead times, sustainability, and compliance with regulations. This holistic view helps identify the most **cost-effective suppliers** over the long term.
- AI also calculates **hidden costs**, such as the potential risks of working with a supplier prone to delays or poor quality, which might lead to additional expenditures in the future.

**4) Real-Time TCO Calculation:**

- AI continuously monitors supplier performance and cost variables to provide

**real-time updates** on the TCO of different suppliers and contracts. If a supplier's performance starts to slip, AI can adjust the TCO calculations accordingly and suggest renegotiation or finding alternative partners.

#### 5) Optimizing Procurement Decisions:

- AI suggests procurement strategies based on a **holistic evaluation of costs**, advising on decisions such as whether it's better to invest in slightly higher upfront costs for a supplier that offers lower maintenance and logistics costs, leading to a lower TCO.
- It also helps organizations optimize **inventory management** by reducing excess stock and unnecessary maintenance costs.

### 2.3. Improved Risk Management

Supplier risk is a critical concern in Strategic Sourcing. AI tools offer real-time monitoring of risk factors such as geopolitical events, economic instability, and supplier financial health. This allows organizations to anticipate disruptions and adjust sourcing strategies accordingly.

#### 2.3.1. Real-Time Supplier Monitoring

AI can continuously monitor supplier performance by analyzing external data sources such as news articles, financial reports, and social media feeds. Any sign of potential risks, such as bankruptcy or labor strikes, can be flagged, enabling procurement teams to take immediate action.

Here's how it works in practice:

##### 1) Data Collection:

AI tools are designed to scrape data from a vast range of publicly available sources. These sources include real-time news feeds, financial statements, and social media posts where companies or their employees might share insights about ongoing situations, like potential labor unrest.

##### 2) Natural Language Processing (NLP):

AI uses NLP to process text from these sources. It can identify key topics or red flags such as words related to bankruptcy, lawsuits, or strikes.

##### 3) Sentiment Analysis:

AI tools can perform sentiment analysis on social media or other reports to assess whether a company's financial health or employee satisfaction is deteriorating, which might indicate operational instability.

##### 4) Flagging Potential Risks:

AI algorithms set alerts when specific risk factors are identified. For example, if a supplier is mentioned in news articles related to financial instability, this information is flagged to the procurement team for review.

##### 5) Real-Time Alerts:

The AI system sends real-time notifications to procurement teams when a potential risk is identified, enabling them to take immediate action, such as looking for alternative suppliers or renegotiating terms.

### 2.3.2. Diversification of Supply Base

AI-driven risk analysis can also help in identifying alternative suppliers in different regions, promoting supplier diversification. This reduces dependency on a single supplier or region, thereby lowering the organization's overall risk exposure.

Here's how AI assists with this:

#### 1) Risk Monitoring:

- AI tools continuously monitor **global risks** such as geopolitical events, natural disasters, and economic fluctuations that might affect suppliers in specific regions.
- By analyzing data from sources such as **news reports, social media, economic indicators, and supply chain performance**, AI detects early signs of risks that may disrupt supplier operations.

#### 2) Identifying Alternative Suppliers:

- Based on risk analysis, AI identifies alternative suppliers from regions with lower risk exposure. For example, if a region is prone to frequent natural disasters or political unrest, AI will recommend suppliers from more stable regions.
- AI uses various metrics such as **financial stability, performance history, logistical capacity, and compliance** to rank these alternative suppliers, ensuring that the company's operational standards are maintained.

#### 3) Supplier Diversification Strategy:

- By analyzing data, AI helps procurement teams create a **supplier diversification strategy**. This involves spreading procurement across multiple suppliers in different regions to ensure that the supply chain remains resilient even in the face of regional disruptions.
- AI can simulate the potential impact of losing one supplier and show how alternative suppliers in other regions could fill the gap without causing delays or cost overruns.

#### 4) Scenario Planning and Predictive Analytics:

- AI-powered **scenario planning** helps procurement teams understand the possible outcomes of relying on a single supplier versus diversifying suppliers.
- Predictive analytics forecasts the likelihood of disruptions in certain regions, allowing procurement teams to proactively secure alternate suppliers before an issue arises.

#### 5) Mitigating Supply Chain Risk:

- Supplier diversification lowers the overall risk exposure of the organization by ensuring **redundancy and backup options**. This means that if one supplier or region faces disruptions, the company can quickly shift to another supplier without interrupting operations.

#### 6) Real-Time Risk Alerts:

- AI sends **real-time alerts** when there are potential risks with current suppliers, prompting the procurement team to explore alternative sources. This allows

businesses to stay ahead of issues and implement solutions before they become critical.

## 2.4. Strengthened Supplier Relationships

AI can facilitate stronger collaboration with suppliers by automating routine communications, performance tracking, and feedback mechanisms. This leaves more room for procurement professionals to engage in strategic discussions with suppliers, fostering innovation and long-term partnerships.

### 2.4.1. Supplier Scorecards and Automated Evaluations

AI can generate real-time supplier scorecards based on metrics such as delivery times, defect rates, and cost-effectiveness. These automated evaluations provide procurement teams with continuous insights into supplier performance, allowing for more constructive engagement during performance reviews.

Here's how the process works:

#### 1) Data Collection:

- AI gathers **real-time data** from systems such as Enterprise Resource Planning (ERP), Warehouse Management Systems (WMS), and customer feedback systems.
- Key performance indicators (KPIs) such as **delivery times**, **defect rates**, and **cost-effectiveness** are continuously monitored.

#### 2) Performance Metrics:

- **Delivery Times:** AI tracks how consistently a supplier delivers goods on or before the expected delivery date.
- **Defect Rates:** The system records instances where products do not meet quality standards, categorizing them as defects.
- **Cost-Effectiveness:** AI evaluates whether the supplier's pricing aligns with agreed-upon terms and compares it with industry benchmarks or other suppliers.

#### 3) Real-Time Scoring:

- Based on the collected data, AI calculates scores for each metric. For example, if a supplier frequently delivers late or has higher defect rates, the score for that supplier will be lower in those areas.
- These scores can be updated **in real time** as new data flows into the system, ensuring that procurement teams always have the most up-to-date evaluations.

#### 4) Automated Supplier Scorecard:

- AI compiles all these metrics into an automated **supplier scorecard**, which presents an overall rating. Procurement teams can see how each supplier is performing against different KPIs.
- The scorecard includes visualizations, such as graphs and trend lines, highlighting areas where a supplier is improving or declining over time.

#### 5) Continuous Insights:

- The scorecard provides **real-time alerts** if performance dips below a predefined threshold, allowing procurement teams to intervene immediately.

- AI can also suggest action items based on trends, such as renegotiating contracts with underperforming suppliers or rewarding high-performing ones.

#### 6) Constructive Engagement:

- Armed with real-time performance data, procurement teams can have **more productive discussions** with suppliers. They can provide concrete feedback backed by data, set more accurate performance targets, and work collaboratively on improvement strategies.

### 2.4.2. Supplier Innovation and Collaboration

Through the use of AI, procurement teams can analyze industry trends and supplier capabilities, enabling them to collaborate on innovation. AI can match suppliers' strengths with the organization's innovation needs, creating opportunities for joint development projects.

Here's how AI supports this process:

#### 1) Analyzing Industry Trends:

- AI tools scan and analyze vast amounts of data from industry reports, news articles, patents, and market trends. These insights help procurement teams identify **emerging technologies** and **market shifts** that may present opportunities for innovation.
- By staying updated on **competitive benchmarks** and technological advancements, procurement teams can determine where to focus their innovation efforts, aligning with cutting-edge trends in their industry.

#### 2) Assessing Supplier Capabilities:

- AI can evaluate a supplier's **core competencies**, **technological strengths**, and **R&D initiatives** by analyzing data such as financial reports, past performance, and innovation records.
- AI algorithms can rank suppliers based on their **innovation potential**, helping procurement teams identify partners that align with their own goals for product development or process improvement.

#### 3) Matching Strengths to Innovation Needs:

- AI tools match the **capabilities of suppliers** with an organization's **innovation objectives**. For instance, if a company is looking to develop a sustainable product, AI may suggest suppliers that specialize in eco-friendly materials or have experience with green technologies.
- This matching process accelerates the time-to-market for joint innovations, as procurement teams can quickly find suppliers who are not only reliable but also capable of pushing forward new ideas and technologies.

#### 4) Joint Development Projects:

- AI systems facilitate the creation of **joint development projects** by identifying mutual goals and opportunities where both parties can collaborate. Procurement teams can use AI to manage these partnerships, tracking milestones, sharing data securely, and ensuring compliance with intellectual property agreements.
- By continuously monitoring the **progress of innovation projects**, AI can

provide real-time feedback on the performance and contributions of suppliers, helping both parties refine their approach as the project evolves.

#### **5) Predicting Future Collaboration Opportunities:**

- Predictive analytics helps procurement teams **forecast industry changes**, such as new regulations or consumer preferences, and recommend which suppliers are best positioned to drive innovation in these areas.
- This forward-looking capability ensures procurement is not just reacting to industry trends but proactively engaging with suppliers to stay ahead of the curve.

### **3. Challenges in Implementing AI in Strategic Sourcing**

#### **3.1. Data Quality and Integration**

AI-driven tools require high-quality data to function effectively. Poor data quality or incomplete datasets can hinder the accuracy of AI insights, leading to suboptimal sourcing decisions. Additionally, integrating AI systems with existing procurement platforms can be a complex process, requiring significant time and resources.

#### **3.2. Skill Gaps and Change Management**

Introducing AI into the procurement function demands new skills, particularly in data science and AI tool management. Organizations must invest in training procurement professionals to work effectively with AI technologies. Moreover, overcoming resistance to change and aligning teams with AI-driven workflows are critical to ensuring successful implementation.

#### **3.3. Ethical and Regulatory Concerns**

As organizations rely more on AI, they must navigate ethical considerations, such as algorithmic bias and data privacy issues. Regulatory frameworks governing AI use in procurement are still evolving, and organizations must stay compliant with legal standards to avoid potential liabilities.

### **4. Case Studies: AI and Strategic Sourcing in Action**

The research employs a qualitative case study approach to evaluate the impact of AI on Strategic Sourcing. Two leading multinational companies, General Electric (GE) and Unilever, were selected for in-depth analysis due to their pioneering use of AI in procurement.

The case studies were developed through secondary data sources, including industry reports, financial statements, and research articles.

The study focuses on key procurement metrics, including cost reduction, risk mitigation, supplier performance, and Total Cost of Ownership (TCO) optimization. AI's contribution to these metrics was evaluated using a comparative analysis of pre- and post-AI adoption results in both companies.

#### **4.1. Case Study 1: General Electric (GE)**

General Electric adopted AI-driven procurement systems to manage its global supply chain (Hiner, 2024). By using predictive analytics and real-time supplier monitoring, GE was able to reduce costs by identifying high-performing suppliers and negotiating better contract terms. This integration also allowed GE to anticipate supply chain risks and avoid disruptions during global crises.

#### **4.2. Case Study 2: Unilever**

Unilever leveraged AI-powered tools to streamline its supplier evaluation process (Hye, 2024). The company's Strategic Sourcing team used AI to analyze supplier performance metrics in real time, leading to more effective negotiations and better supplier relationships. The automation of routine procurement tasks freed up time for Unilever's procurement team to focus on value-added activities, such as sustainability initiatives with suppliers.

#### **4.3. Practical Lessons from GE and Unilever**

**GE's Application:** GE's AI-driven procurement system has enhanced its ability to manage supplier performance, negotiate better contract terms, and anticipate supply chain disruptions. Organizations can learn from GE by adopting similar predictive analytics tools to improve long-term sourcing strategies and mitigate risk.

**Unilever's Application:** Unilever's AI implementation demonstrates how automating routine procurement tasks can free up time for strategic initiatives, such as sustainability and supplier collaboration. Organizations seeking to optimize their procurement operations can replicate Unilever's approach by adopting AI tools for data-driven supplier management and negotiation.

### **5. Future Outlook**

The combination of Strategic Sourcing and AI represents a profound shift in how organizations approach procurement. As AI technologies continue to evolve, we can expect further innovations, such as AI-powered contract negotiations and autonomous procurement systems. Organizations that embrace this convergence will be better equipped to navigate complex supply chains, reduce costs, and stay competitive in a rapidly changing business environment.

### **6. Conclusion**

The integration of AI with Strategic Sourcing presents a significant opportunity for organizations to enhance decision-making, reduce costs, and improve supplier relationships. While challenges such as data quality, skill gaps, and ethical concerns remain, the benefits of this technological synergy far outweigh the risks. Organizations that successfully implement AI-driven Strategic Sourcing will not only achieve operational efficiencies but also position themselves as leaders in a data-driven business world.

While substantial research exists on both Strategic Sourcing and AI in

procurement individually, there is a clear gap in studies exploring the **synergy** between the two. Many previous works have not focused on how AI can augment the Strategic Sourcing process holistically considering supplier selection, contract negotiation, and risk management. Additionally, there is limited empirical evidence on real-world applications of AI-enhanced Strategic Sourcing in multinational organizations, especially with in-depth case studies.

This research fills the identified gap by investigating how the integration of AI and Strategic Sourcing can drive procurement efficiencies. By analyzing case studies from GE and Unilever, the research provides practical insights into the benefits and challenges of adopting AI-driven procurement strategies.

## Conflicts of Interest

The author declares no conflicts of interest regarding the publication of this paper.

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