International Journal of Scientific Research in Engineering and Management (IJSREM)
Volume: 05 Issue: 12 | Dec - 2021 SJIF Rating: 6.714 ISSN: 2582-3930

The Role of Artificial Intelligence in Enhancing Commodity Trading and Risk Management Solutions

Author – Manu Handa and Ridhima Arora

Abstract

This paper explores the transformative impact of Artificial Intelligence (AI) on commodity trading and risk management. It delves into how AI technologies can enhance the efficiency and effectiveness of front office, middle office, and back office operations. The paper discusses various applications of AI, including price forecasting, real-time market insights, risk assessment, fraud detection, and the generation of Business Intelligence (BI) reports and dashboards. Additionally, it examines how AI can automate reconciliation processes, simulate prices, and audit master and transactional data for compliance purposes. Real-life examples of AI-enhanced Commodity Trading and Risk Management (CTRM) software are provided to illustrate these benefits. The paper also addresses the challenges and future prospects of AI implementation in this sector.

Keywords

Artificial Intelligence, Commodity Trading, Risk Management, CTRM, Price Forecasting, Market Insights, Risk Assessment, Fraud Detection, Business Intelligence, Reconciliation, Price Simulation, Data Auditing, Compliance, Automation.

Introduction

Commodity trading involves the buying and selling of physical goods such as oil, metals, and agricultural products. This sector is characterized by high volatility and complexity, making effective risk management essential. Traditional methods of trading and risk management often rely on manual processes and historical data analysis, which can be time-consuming and prone to errors.

Artificial Intelligence (AI) offers a revolutionary approach to commodity trading and risk management by providing advanced analytical tools and automation capabilities. AI can process vast amounts of data in real-time, identify patterns and trends, and generate actionable insights. This enables traders and risk managers to make more informed decisions, optimize trading strategies, and mitigate risks more effectively.

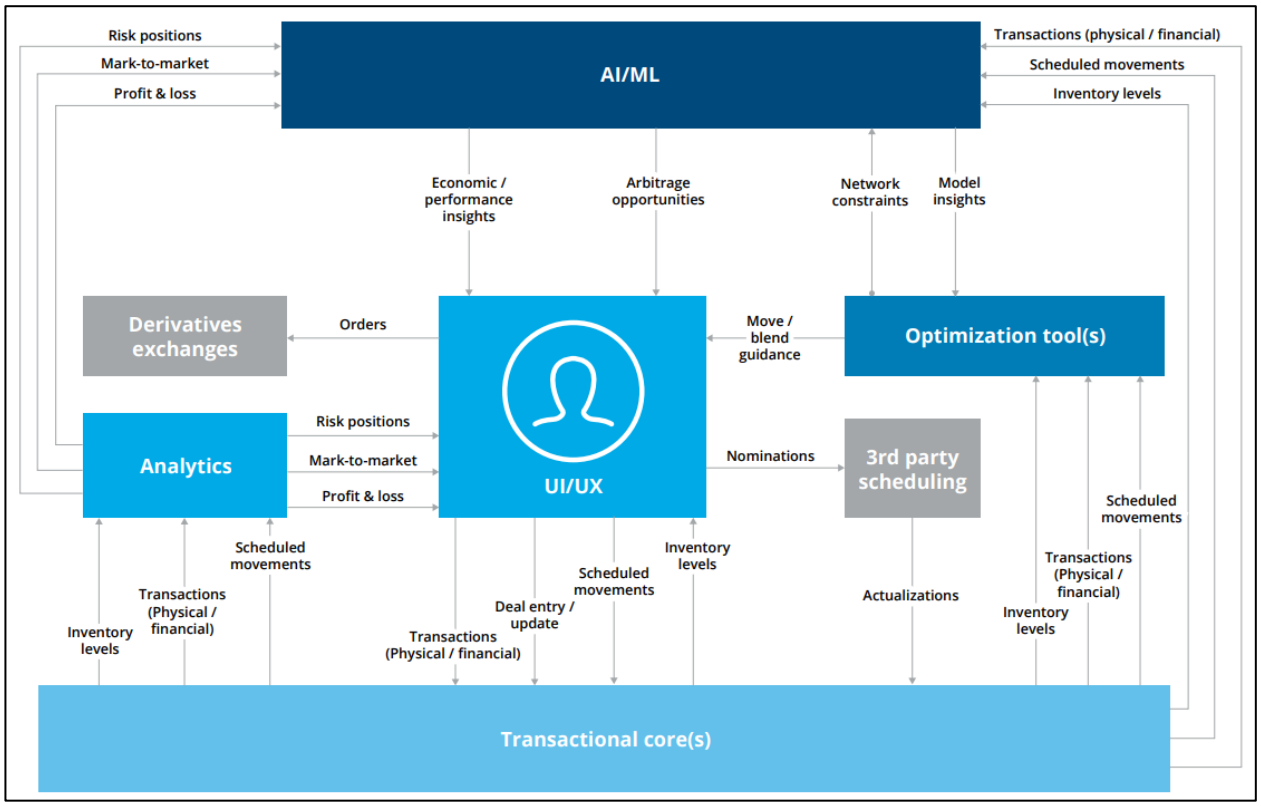

Figure 1: Next Gen Trading ecosystem [1]

This paper explores the various ways AI can enhance commodity trading and risk management solutions. It covers the impact of AI on front office, middle office, and back office operations, and provides real-life examples of AI-enhanced CTRM software. The paper also discusses the challenges and future prospects of AI implementation in this sector.

AI in Month-End Accounting Close

AI can significantly enhance the month-end accounting close process by comparing close positions with the Profit and Loss (P&L) report. For example, AI-powered platforms like Docyt use generative AI to automate data entry, reconcile accounts, and identify discrepancies between the accounting close positions and the P&L report. This reduces the time and effort required for manual reconciliation, minimizes errors, and ensures accurate financial reporting. AI can also predict anomalies and suggest corrections, making the month-end close process more efficient and reliable.

AI in Reconciling Clearing Broker Statements

AI can play a crucial role in reconciling clearing broker statements with CTRM-generated broker positions and P&L. This process involves matching the data from clearing broker statements with the internal records generated by the CTRM system to ensure consistency and accuracy.

Real-life Example: Validata and a Leading Commodity Trading Firm

A leading commodity trading firm uses **Validata**'s AI-powered reconciliation software to automate the reconciliation of clearing broker statements with their CTRM system. Validata's AI algorithms automatically match transactions and positions from broker statements with those recorded in the CTRM system, significantly reducing manual effort

and minimizing errors. The AI system also identifies discrepancies and anomalies, such as mismatches in trade volumes or prices, and flags them for further investigation. This real-time reconciliation ensures that any discrepancies are promptly addressed, improving the accuracy and reliability of the firm's financial reporting. [2]

Automated Data Matching

AI algorithms can automatically match transactions and positions from clearing broker statements with those recorded in the CTRM system. This reduces the manual effort required for reconciliation and minimizes the risk of errors.

Anomaly Detection

AI can identify discrepancies and anomalies between the broker statements and CTRM records. For instance, if there are mismatches in trade volumes, prices, or P&L figures, AI can flag these issues for further investigation.

Real-time Reconciliation

AI enables real-time reconciliation by continuously monitoring and comparing broker statements with CTRM data. This ensures that any discrepancies are identified and addressed promptly, improving the accuracy and reliability of financial reporting.

Enhanced Reporting

AI can generate detailed reconciliation reports that highlight discrepancies, provide explanations, and suggest corrective actions. This helps back office employees quickly resolve issues and maintain accurate records.

AI in Generating BI Reports and Dashboards

AI can significantly enhance the generation of Business Intelligence (BI) reports and dashboards by extracting and analyzing data from CTRM software. This process involves using AI to transform raw data into meaningful insights that can drive better decision-making.

Data Extraction and Integration

AI can automate the extraction of data from various sources within the CTRM system, ensuring that all relevant information is collected and integrated into a unified dataset. This reduces the time and effort required for manual data collection and ensures that the data is accurate and up-to-date.

Advanced Analytics

AI algorithms can analyze the extracted data to identify trends, patterns, and anomalies. This enables the generation of insightful BI reports that provide a comprehensive view of trading activities, market conditions, and risk exposures.

Real-time Dashboards

AI-powered BI tools can create real-time dashboards that display key performance indicators (KPIs) and other critical metrics. These dashboards provide traders, risk managers, and executives with instant access to important information, allowing them to make informed decisions quickly.

Customizable Reports

AI can generate customizable BI reports that cater to the specific needs of different users. For example, front office employees might need detailed market analysis reports, while back office employees might require reports on compliance and reconciliation. AI can tailor these reports to meet the unique requirements of each user group.

Predictive Insights

AI can provide predictive insights by analyzing historical data and forecasting future trends. This helps traders and risk managers anticipate market movements and adjust their strategies accordingly. [3]

Real-life Example: Domo and a Global Energy Trading Company

A global energy trading company uses Domo's AI-powered BI platform to generate real-time dashboards and reports from their CTRM system. Domo's AI capabilities allow the company to integrate data from various sources, including their CTRM software, and create comprehensive dashboards that display key performance indicators (KPIs) and market trends. The AI-driven analytics help the company identify patterns and anomalies, providing valuable insights for decision-making. This has enabled the company to optimize their trading strategies, improve risk management, and enhance overall operational efficiency. [4]

AI in Simulating Prices and Impact Analysis

AI can simulate commodity prices and analyze their effects on positions and Profit and Loss (P&L). This capability is crucial for traders and risk managers to understand potential market scenarios and their financial implications.

Price Simulation

AI algorithms can simulate various price scenarios based on historical data, market trends, and external factors. These simulations help traders anticipate potential price movements and prepare for different market conditions.

Impact on Positions

By simulating price changes, AI can show how different price scenarios affect trading positions. This includes analyzing the potential gains or losses for each position under various market conditions.

P&L Impact Analysis

AI can calculate the impact of simulated price changes on the overall P&L. This helps traders and risk managers understand the potential financial outcomes of different trading strategies and market scenarios.

Scenario Planning

AI enables scenario planning by allowing users to create and analyze multiple market scenarios. This helps in developing robust trading strategies and risk management plans that can withstand different market conditions.

Real-time Adjustments

AI can provide real-time adjustments to trading strategies based on simulated price changes. This ensures that traders can quickly adapt to changing market conditions and optimize their positions for maximum profitability.

Real-life Example: Sniffie and a Retail Company

A retail company uses **Sniffie**'s AI-powered price simulation tool to forecast and simulate prices. Sniffie's AI algorithms analyze historical data, market trends, and external factors to simulate various price scenarios. This helps the company understand the potential impact of price changes on their positions and P&L. By using Sniffie's price simulation tool, the company can make informed decisions about pricing strategies, optimize their inventory management, and maximize profitability. [5]

AI in Auditing Master Data and Transactional Data

AI can significantly enhance the auditing of master data and transactional data in CTRM systems for compliance and auditing purposes. This involves using AI to ensure data accuracy, integrity, and compliance with regulatory requirements. [3]

Data Validation

AI algorithms can automatically validate master data and transactional data to ensure accuracy and consistency. This includes checking for data completeness, correctness, and adherence to predefined standards.

Anomaly Detection

AI can identify anomalies and discrepancies in the data that may indicate errors or potential compliance issues. For example, AI can detect unusual patterns in transaction data that may suggest fraudulent activities or data entry errors.

Compliance Monitoring

AI can continuously monitor data for compliance with regulatory requirements. This includes checking that all transactions are properly recorded, documented, and compliant with relevant laws and regulations.

Automated Auditing

AI can automate the auditing process by generating audit trails and reports that highlight discrepancies, compliance issues, and areas that require further investigation. This reduces the manual effort required for auditing and ensures a more thorough and accurate audit process.

Real-life Example: IBM Watson and a Financial Services Firm

A financial services firm uses **IBM Watson**'s AI-powered auditing tools to audit master data and transactional data in their CTRM system. Watson's AI algorithms validate data accuracy, detect anomalies, and ensure compliance with regulatory requirements. The AI system generates detailed audit reports that highlight discrepancies and compliance issues, providing actionable insights for auditors. [6]

Real Examples of AI-Enhanced CTRM Software

Allegro Horizon

Allegro Horizon is a leading CTRM platform that integrates AI to improve decision-making and operational efficiency. AI-driven analytics in Allegro Horizon help traders predict market trends, optimize trading strategies, and manage risks more effectively. The platform's AI capabilities also assist in automating routine tasks, reducing human error, and enhancing overall productivity.

Enuit's Entrade

Entrade by Enuit is another advanced CTRM solution that utilizes AI to streamline commodity trading processes. AI in Entrade helps in real-time data analysis, providing traders with actionable insights and predictive analytics. This enables better risk management and more informed trading decisions. Additionally, AI-powered automation in Entrade reduces manual workload and improves accuracy in reporting and compliance.

Brady Technologies

Brady Technologies offers a suite of CTRM solutions that incorporate AI to enhance trading and risk management. AI tools in Brady's software help in algorithmic trading, energy trade execution, and market analysis. These tools

provide traders with real-time insights and predictive analytics, enabling them to respond swiftly to market changes and optimize their trading strategies.

Openlink Endur

Openlink Endur is a comprehensive CTRM platform that leverages AI to improve efficiency and decision-making. AI in Endur helps in analyzing large datasets to identify market trends and risks. It also automates complex trading processes, reducing the likelihood of errors and enhancing operational efficiency. The platform's AI capabilities support better risk assessment and mitigation strategies.

AspectCTRM

AspectCTRM integrates AI to provide advanced analytics and real-time market insights. AI in AspectCTRM helps traders forecast prices, manage risks, and optimize their portfolios. The platform's AI-driven tools also assist in automating compliance and reporting tasks, ensuring accuracy and reducing the administrative burden on employees.

TriplePoint

TriplePoint is another notable CTRM software that leverages AI to enhance its capabilities. AI in TriplePoint helps in automating data analysis, providing real-time market insights, and optimizing trading strategies. The platform's AI-driven tools assist in risk management, compliance, and reporting, ensuring that traders and risk managers have access to accurate and timely information. TriplePoint's AI capabilities also help in automating routine tasks, reducing manual effort, and minimizing errors.

Challenges and Future Prospects

While AI offers numerous benefits, its implementation in commodity trading and risk management also presents challenges. These include the need for significant investment in technology and talent, data privacy concerns, and the potential for job displacement. However, with the right strategies and policies, these challenges can be managed, and the benefits of AI can be fully realized.

Conclusion

AI has the potential to significantly enhance commodity trading and risk management solutions. By improving price forecasting, providing real-time market insights, and minimizing human error, AI can help traders and risk managers make better decisions. Additionally, AI can streamline operations across the front office, middle office, and back office, leading to greater efficiency and effectiveness.

Bibliography

[1] "Charting the commodity markets with new-age CTRM solutions," Deloitte, 2021. [Online]. Available: https://www2.deloitte.com/us/en/pages/financial-advisory/articles/advanced-tech-ecosystems-strategic-approach-to-commodities-markets.html. [Accessed 10 December 2021].

[2] "Reconciling Every Type of Financial Data with Automated Reconciliation Software," SAFEBOOKS AI, 17 November 2021. [Online]. Available: https://www.safebooks.ai/resources/financial-data-governance/reconciling-every-type-of-financial-data-with-automated-reconciliation-software/. [Accessed 25 November 2021].

[3] "How Artificial Intelligence is Impacting Commodity Trading," hermes, 2021. [Online]. Available: https://www.hermestech.io/en/blog/Commodity%20Trading/how-artificial-intelligence-is-impacting-commodity-trading. [Accessed 25 November 2021].

[4] F. v. Bulow, "Citi transforms critical internal audit with machine learning, NLP and AI," IBM, 14 July 2021. [Online]. Available: https://www.ibm.com/blog/citi-transforms-critical-internal-audit-with-machine-learning-nlp-and-ai/. [Accessed 05 November 2021].

[5] B. Schaefer, "KPMG's Marisa Ferrara Boston embraces auditing disruption with Watson," IBM, 12 January 2021. [Online]. Available: https://www.ibm.com/blog/kpmgs-marisa-ferrara-boston-embraces-auditing-disruption-with-watson/. [Accessed 05 November 2021].

[6] M. Macaulay, "How KPMG uses AI to Empower their auditors," IBM, 30 April 2018. [Online]. Available: https://newsroom.ibm.com/IBM-watson?item=30461. [Accessed 10 November 2021].