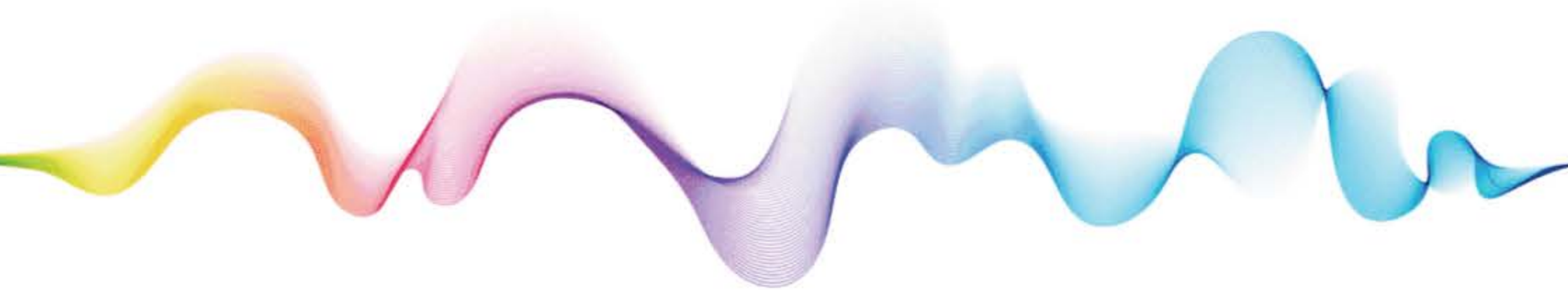


INSIGHT REPORT

OVERVIEW OF
ARTIFICIAL
INTELLIGENCE FOR
BUSINESS
OPERATIONS



TAG

ARTIFICIAL
INTELLIGENCE



An Overview of Artificial Intelligence for Business Operations

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Introduction

This TAG Insights Report on *Artificial Intelligence (AI) for Biotechnology* is intended to help companies, managers, practitioners, researchers, investors, and commercial vendors better understand current trends, issues, and market opportunities in this area. A list of representative commercial vendors working in various areas of AI for biotechnology is included. The five specific areas covered in this report include:

1. Smart Supply Chain Optimization
2. Intelligent Inventory Optimization
3. AI-Based Demand Forecasting
4. Intelligent Quality Control
5. Smart Contracts

This report is intended for general and unrestricted use, but interested readers are encouraged to connect with the TAG research and advisory team for more information on the private [TAG Research as a Service \(RaaS\)](#) community that covers, discusses, and shares information on these topics in more depth and includes a wider range of startups, vendors, and companies.

TAG Taxonomy for AI

Our advisory work at TAG is guided by our TAG AI Taxonomy which includes twenty different market categories, with one hundred associated subcategories – all developed consistent with our research into emerging and existing commercial offerings. Subscribers to TAG Research as a

Service (RaaS) have access to the more detailed specifics of the taxonomy and the full set of companies working in each area.

The taxonomy is intended to be interpreted as a market guide for commercial (and in some cases, open source) platform, tools, products, and services. The day-to-day tasks of any practitioners focused on AI will include many considerations such as dealing with regulators, addressing compliance issues, and keeping up with legislation that will not typically be represented in our taxonomy. We focus here on products and services.

TAG Artificial Intelligence (AI) Taxonomy V0.0

| | | | |
|---|--|--|--|
| 1 Agriculture and Farming 1.1 Precision Agriculture 1.2 Intelligent Predictive Maintenance 1.3 Advanced Yield Management 1.4 AI-Based Disease and Pest Control 1.5 Intelligent Livestock Monitoring | 6 Conversational AI 6.1 AI Chat Interfaces 6.2 AI Bots 6.3 Intelligent Text Analysis 6.4 Virtual Assistants 6.5 AI-Based Search | 11 Entertainment 11.1 AI-Based Sports Analysis 11.2 AI Support for On-Line Dating 11.3 AI-Generated Multimedia Content 11.4 AI-Based On-Line Gaming 11.5 AI Support for Gambling | 16 Manufacturing 16.1 AI-Based Predictive Maintenance 16.2 Advanced 3D Printing 16.3 Smart Robotic Assembly 16.4 AI-Based Factory Operations 16.5 AI-Assisted Product Design |
| 2 Autonomous Vehicles 2.1 Intelligent Fleet Management 2.2 Smart Manufacturing and Design 2.3 AI-Assisted Mobility Services 2.4 AI-Based Delivery Services 2.5 Next Generation Ride Sharing | 7 Core Technology 7.1 AI and Machine Learning Algorithms 7.2 Natural Language Processing 7.3 AI Software Platforms and Tools 7.4 Intelligent Computing Devices 7.5 Smart AR/VR Devices | 12 Finance 12.1 Intelligent Fintech 12.2 AI-Based Insurance Business 12.3 Smart Investment Support 12.4 AI-Assisted Loan Reviews 12.5 AI-Based Credit Process | 17 Marketing and Sales 17.1 AI-Assisted Advertising 17.2 Intelligent Support for Sales 17.3 AI-Based Marketing 17.4 Smart Social Media Marketing 17.5 Advanced Predictive Modeling |
| 3 Biotechnology 3.1 AI-Assisted Drug Discovery 3.2 Personalized Medicine 3.3 Intelligent Medical Diagnostics 3.4 AI-Based Health Analytics 3.5 Intelligent Clinical Trial Support | 8 Customer Service 8.1 Smart Help Desk 8.2 AI-Based Product Support 8.3 AI-Assisted Customer Success 8.4 Personalized Customer Support 8.5 Smart Customer Crowd Management | 13 Human Resources 13.1 Intelligent Career Support 13.2 AI-Based Personal Coaching 13.3 AI-Based Performance Reviews 13.4 Smart Recruiting and Workforce 13.5 AI-Based Compensation Management | 18 Military and Security 18.1 Advanced Surveillance 18.2 AI for Cybersecurity 18.3 AI-Based Law Enforcement 18.4 AI Support for Warfighter 18.5 AI-Based Weapons and Deep Fakes |
| 4 Business Operations 4.1 Smart Supply Chain Optimization 4.2 Intelligent Inventory Optimization 4.3 AI-Based Demand Forecasting 4.4 Intelligent Quality Control 4.5 Smart Contracts | 9 Data Analysis 9.1 AI-Based Predictive Modeling 9.2 AI-Based Business Intelligence 9.3 AI-Based Data Normalization 9.4 Intelligent Big Data Analytics 9.5 Smart Simulated Data Generation | 14 Information Technology 14.1 AI-Based IT Support 14.2 AI-Based IT Design 14.3 Advanced AI-Based Search 14.4 AI-Powered Apps 14.5 AI-Generated Websites | 19 Software Process 19.1 AI-Based Coding Support 19.2 Smart Software Lifecycle Support 19.3 AI-Based Software Quality 19.4 AI-Based Test Case Generation 19.5 Intelligent Software Test and Analysis |
| 5 Commerce 5.1 AI Support for Retail 5.2 AI Support for Warehousing 5.3 Intelligent Product Exchanges 5.4 Smart Auctions 5.5 AI-Based Professional Services | 10 Education 10.1 AI-Based Remote Learning 10.2 AI-Based Remote Teaching 10.3 Smart Tailored Education 10.4 Smart Learning Management 10.5 AI-Based Standardized Testing | 15 Machines 15.1 Next Generation Robots 15.2 Computer Vision 15.3 Computer Speech 15.4 Autonomous Internet of Things 15.5 Agricultural Robots | 20 Transportation 20.1 AI-Based Transportation Logistics 20.2 Personalized Transportation 20.3 Smart Mapping Tools 20.4 AI-Based Flight Operations 20.5 AI-Based Rail Operations |

Figure 1. TAG AI Taxonomy

Overview of AI for Business Operations

The following emerging global commercial opportunities involving AI for business operations are covered in this report, including the listing of several viable commercial entities providing solutions on the market today:

- AI-driven smart supply chain optimization leverages predictive analytics to dynamically adapt supply chains, ensuring resources are precisely allocated for maximal efficiency and timely deliveries.
- In intelligent inventory optimization, AI systems use real-time data to maintain optimal inventory levels, significantly reducing the risk of overstocking or stock shortages.
- AI-based demand forecasting applies complex algorithms to vast amounts of data to predict consumer behavior with high accuracy, streamlining the supply chain and reducing waste.

- Intelligent quality control utilizes AI to meticulously inspect products, leading to a marked decrease in defects and ensuring consistently high quality without the variability of human inspection.
- Smart contracts, powered by AI, automatically execute and enforce the terms of contracts upon the fulfillment of conditions, thereby increasing trust and efficiency in transactions while cutting down on legal and administrative costs.

Focus Area: Smart Supply Chain Optimization

AI plays a pivotal role in revolutionizing the landscape of smart supply chain optimization, enabling both established vendors and agile startups to thrive in this dynamic sector. One of the primary ways AI contributes to this transformation is through predictive analytics.

By harnessing vast amounts of historical and real-time data, AI algorithms can forecast demand, identify potential disruptions, and optimize inventory management with unparalleled accuracy. This not only reduces operational costs but also ensures better customer satisfaction through timely deliveries.

Furthermore, AI-powered automation streamlines routine tasks such as order processing, routing, and inventory replenishment, allowing human resources to focus on strategic decision-making and creative problem-solving. Startups benefit from this by entering the market with innovative solutions that leverage AI to disrupt traditional supply chain practices, gaining a competitive edge.

AI-driven insights also facilitate agile decision-making, enabling quick adaptations to market changes and unforeseen challenges. Vendors and startups alike can rapidly adjust supply chain strategies, enhancing their resilience and responsiveness. In summary, AI empowers vendors and startups in the smart supply chain optimization sector by delivering efficiency, agility, and competitive advantages, fostering innovation and growth in this critical domain.

Focus Area: Intelligent Inventory Optimization

AI has become a game-changer for vendors and startups operating in the realm of intelligent inventory optimization. This technology empowers them to make data-driven decisions, enhance operational efficiency, and ultimately improve their bottom line.

For vendors, AI enables more accurate demand forecasting, which minimizes the risk of overstocking or understocking inventory. This leads to reduced carrying costs, less waste, and better customer service. Additionally, AI-driven predictive analytics can identify trends and patterns that humans might overlook, helping vendors make strategic decisions to optimize their inventory.

Startups, often operating with limited resources, can benefit significantly from AI-based inventory optimization. These tools allow them to compete with larger competitors by maximizing their inventory turnover, minimizing holding costs, and ensuring product

availability. AI also provides real-time insights into inventory status, helping startups adapt to changing market conditions swiftly.

AI's role in intelligent inventory optimization empowers both vendors and startups to make smarter decisions, reduce costs, and stay competitive in today's fast-paced business environment. It represents a critical asset for achieving efficiency and success in supply chain management.

Focus Area: AI-Based Demand Forecasting

AI has transformed demand forecasting for vendors and startups, offering advanced capabilities that enhance accuracy and efficiency. For both established vendors and emerging startups, AI-based demand forecasting opens doors to improved supply chain management, customer satisfaction, and profitability.

AI leverages historical data, market trends, and external factors to create precise demand forecasts. This data-driven approach minimizes errors and reduces overstock or understock situations, leading to cost savings and increased revenue. Vendors can optimize inventory levels, streamline procurement, and ensure on-time deliveries, all crucial elements in the competitive market.

For startups, AI levels the playing field by providing access to powerful forecasting tools that were once the domain of large enterprises. This allows them to compete effectively and respond to market demands with agility. Moreover, AI enables continuous learning and adaptation, refining forecasts as new data becomes available.

AI-based demand forecasting empowers both vendors and startups in optimizing operations, reducing costs, and meeting customer needs more effectively. It's a transformative force that fuels growth and success in today's dynamic business landscape.

Focus Area: Intelligent Quality Control

AI is employed in business operations to enhance quality control processes. Through machine learning algorithms, AI systems can analyze large datasets, identify patterns, and detect anomalies in production lines and processes. This enables businesses to maintain consistent product quality and reduce defects.

In manufacturing, AI-powered vision systems can inspect products for defects with precision and speed, minimizing human error. AI can also predict equipment failures by analyzing sensor data, preventing costly downtime.

In customer service, AI chatbots and sentiment analysis tools assess customer interactions for quality assurance, ensuring a high standard of service delivery.

AI's data analytics capabilities enable businesses to optimize supply chain operations by forecasting demand and optimizing inventory levels, reducing overstock and stockouts.

Moreover, AI aids in financial auditing by analyzing financial data for accuracy and compliance, reducing the risk of errors and fraud.

AI plays a vital role in intelligent quality control across various business operations, enhancing efficiency and reducing costly errors.

Focus Area: Smart Contracts

AI is integrated into business operations to facilitate the execution and management of smart contracts. Smart contracts are self-executing agreements with predefined rules, and AI enhances their functionality. Modern blockchain technology typically plays an important role in such smart contract support.

AI systems can automate the monitoring of contract conditions and trigger actions based on real-time data. For instance, in supply chain management, AI-enabled smart contracts can automatically adjust orders or payments based on changes in inventory levels or delivery times.

In legal and financial sectors, AI-powered natural language processing can review and validate contract terms, ensuring compliance and reducing the risk of disputes. AI can also analyze historical contract data to inform future contract negotiations and decisions.

Furthermore, AI enhances security in smart contracts by detecting and preventing fraudulent or unauthorized activities through anomaly detection and authentication mechanisms. In conclusion, AI contributes to the efficiency and reliability of smart contracts in business operations by automating processes, ensuring compliance, and enhancing security.

Companies and Contributions

The companies listed below emerged as part of our research at TAG. Our goal in listing these fine firms is to provide a starting point for buyers, advocates, stakeholders, and researchers trying to make sense of the commercial landscape for artificial intelligence as a means for driving toward improved business operations.

Smart Supply Chain Optimization Vendors

1. [Antuit.ai](#): Antuit.ai specializes in AI-driven demand forecasting, inventory optimization, and supply chain planning solutions.
2. [BigBear.ai](#): Startup company focused on AI-based data analytics with capability in supply chain support with heavy customer base in Federal Government.
3. [Blue Yonder](#): Blue Yonder (formerly JDA Software) provides AI-driven supply chain planning and execution solutions to improve demand forecasting and inventory management.
4. [Coupa](#): Coupa (acquired Llamasoft) offers supply chain analytics software that uses AI and machine learning for network design and optimization.

5. [Elementum](#): Elementum provides real-time supply chain visibility and optimization solutions using AI and IoT technologies.
6. [FourKites](#): FourKites employs AI and machine learning for real-time visibility and predictive analytics in supply chain management.
7. [IBM](#): IBM Watson supply chain offers AI-powered supply chain solutions and demand forecasting solutions that enhance visibility, predict disruptions, and optimize operations.
8. [Kinaxis](#): Kinaxis offers supply chain planning and optimization solutions powered by AI and machine learning for real-time decision support.
9. [Project44](#): Project44 (acquired ClearMetal) leverages AI to provide end-to-end supply chain visibility and predictive analytics for shippers and logistics providers.
10. [ServiceNow](#): ServiceNow (acquired Element AI) provides supply chain optimization solutions that use AI algorithms to improve efficiency and reduce costs.
11. [WiseTech Global](#): WiseTech Global's CargoWise platform integrates AI for logistics and supply chain management, offering end-to-end solutions.

Intelligent Inventory Optimization Vendors

1. [Blue Ridge](#): Blue Ridge offers AI-driven supply chain planning and inventory optimization solutions for retailers and distributors.
2. [DELMIA Quintiq](#): DELMIA Quintiq offers AI-powered inventory optimization and supply chain planning solutions for various industries.
3. [E2open](#): E2open provides AI-driven supply chain solutions, including inventory optimization, to enhance visibility and reduce excess inventory.
4. [GMDH Streamline](#): GMDH Streamline offers AI-driven demand forecasting and inventory optimization solutions for businesses of all sizes.
5. [Logility](#): Logility which acquired Garvis provides AI-powered inventory optimization and demand planning software to improve supply chain performance.
6. [Netstock](#): Netstock provides cloud-based inventory optimization software with AI capabilities for SMEs.
7. [RELEX Solutions](#): RELEX Solutions offers retail and supply chain optimization software that uses AI for demand forecasting and inventory management.
8. [Right Sized Inventory](#): Right Sized Inventory leverages AI to optimize inventory levels and improve demand forecasting accuracy.
9. [Slimstock](#): Slimstock provides AI-based inventory optimization solutions for businesses looking to reduce costs and improve service levels.
10. [StockIQ](#): StockIQ offers intelligent inventory planning software that utilizes AI algorithms to optimize stock levels and reduce carrying costs.

11. [ToolsGroup](#): ToolsGroup offers multi-echelon inventory optimization software powered by AI for improved supply chain efficiency.
12. [Zap Inventory](#): Zap Inventory offers inventory management software that uses AI to optimize reorder points and prevent stockouts.

AI-Based Demand Forecasting Vendors

1. [Anaplan](#) - Anaplan offers AI-driven demand forecasting capabilities as part of its connected planning platform.
2. [Causal Nexus](#) - Causal Nexus offers AI-powered demand forecasting and inventory optimization solutions for retail and e-commerce.
3. [DataRobot](#) - DataRobot offers a platform for building and deploying AI models, including demand forecasting models.
4. [Fractal Analytics](#) - Fractal Analytics provides AI-driven analytics solutions, including demand forecasting and pricing optimization.
5. [GAINSystems](#) - GAINSystems uses AI and machine learning to offer demand forecasting and inventory optimization solutions.
6. [Infor](#) - Infor's demand forecasting software uses AI to help businesses optimize their supply chain and inventory management.
7. [Logility](#): Logility provides demand forecasting software with AI capabilities to help businesses make informed decisions.
8. [Microsoft](#) - Microsoft Azure provides AI and machine learning tools that businesses can use to build custom demand forecasting models.
9. [Noodle.ai](#) - Noodle.ai offers AI-based demand forecasting and supply chain optimization solutions for manufacturers and distributors.
10. [Numerator](#) - Numerator provides demand forecasting and consumer insights using AI and data analytics.
11. [Oracle](#) - Oracle's AI-driven applications for supply chain management include demand forecasting capabilities.
12. [Salesforce](#) - Salesforce offers AI-driven analytics and forecasting tools through its Einstein Analytics platform.
13. [SAP](#) - SAP's Integrated Business Planning (IBP) uses AI and machine learning to enhance demand forecasting accuracy.
14. [SAS](#) - SAS offers demand forecasting solutions that utilize AI and machine learning for improved accuracy.
15. [Wise Systems](#) - Wise Systems provides AI-driven routing and dispatching solutions that can improve demand forecasting for last-mile delivery operations.

Intelligent Quality Control Vendors

1. [AIBrain](#) - AIBrain offers AI-powered quality control solutions that use computer vision and deep learning algorithms.

2. [Apple](#): Acquired Xnor.ai to help focus on edge AI solutions for various applications, including quality control.
3. [Axiomtek](#) - Axiomtek offers AI-powered industrial computers and embedded systems for quality control and automation.
4. [Cognex](#) - Cognex provides AI-based machine vision solutions for quality control and inspection in manufacturing and logistics.
5. [Datalogic](#) - Datalogic specializes in automated data capture and quality control solutions using AI and machine vision.
6. [Element Analytics](#) - Element Analytics provides AI-powered software for quality control and process optimization in industrial operations.
7. [InspectAR](#) - InspectAR provides augmented reality and AI tools for quality control in electronics manufacturing.
8. [Inspekto](#) - Inspekto provides an AI-powered vision system for autonomous quality control in manufacturing.
9. [Neurala](#) - Neurala offers deep learning-based software for visual inspection and quality control in manufacturing.
10. [Oxipit](#) - Oxipit develops AI-powered medical imaging solutions for quality control and radiology.
11. [Percepto](#) - Percepto offers autonomous drone solutions with AI-based visual inspection capabilities for industrial sites.
12. [Platypus Technologies](#) - Platypus Technologies utilizes AI and nanotechnology for quality control in biomedical and semiconductor industries.
13. [Raven.ai](#) - Raven.ai provides AI-powered quality control and monitoring solutions for industrial operations.
14. [Resonance AI](#) - Resonance AI develops AI-based audio analytics for quality control and compliance monitoring in call centers.
15. [Sight Machine](#) - Sight Machine uses AI and machine learning for quality control and manufacturing analytics.
16. [Vence](#) - Vence focuses on AI-driven livestock management and quality control solutions for agriculture.
17. [Vicarious](#) - Vicarious focuses on AI research and applications, including intelligent quality control systems.
18. [Vispera](#) - Vispera specializes in AI-based computer vision solutions for retail and supply chain quality control.
19. [VividQ](#) - VividQ uses AI to enable high-quality 3D imaging and display technologies for various applications.

Smart Contracts Vendors

1. [Aergo](#) - Aergo is a blockchain protocol that aims to enhance smart contracts with AI capabilities for improved automation and adaptability.

2. [Algorand](#) - Algorand is a blockchain platform that has explored AI applications for smart contracts, focusing on scalability and security.
3. [Ava Labs](#) - Ava Labs, the team behind the Avalanche blockchain, is researching ways to integrate AI into smart contracts to improve their functionality.
4. [BlockCAT](#) - BlockCAT offers a platform for creating and deploying smart contracts, exploring AI enhancements for contract management.
5. [Chainlink](#) - Chainlink provides decentralized oracle networks that can be used to connect smart contracts with real-world data, enabling AI-powered contract execution.
6. [DAML](#) - Digital Asset's DAML (Digital Asset Modeling Language) is designed to simplify the development of smart contracts and explore AI integrations.
7. [Fetch.ai](#) - Fetch.ai focuses on developing autonomous economic agents that can interact with blockchain-based smart contracts, enabling more advanced and dynamic contracts.
8. [Iconic](#) (formerly known as Blockchain App Factory) - Iconic provides blockchain and smart contract development services and may explore AI integration for more intelligent contracts.
9. [Kryha](#) - Kryha is a blockchain consulting firm that has explored AI-based enhancements for smart contracts.
10. [Luna Foundation Guard](#) – Acquired Insolar to support working on blockchain solutions with AI integration for smart contract optimization.
11. [OpenLaw](#) - OpenLaw offers a platform for creating, managing, and executing legal agreements, including AI-powered smart contracts.
12. [Orion Protocol](#) - Orion Protocol aims to provide liquidity across multiple blockchains through AI-based algorithms and smart contract technology.
13. [R3 Corda](#) - R3 Corda is a blockchain platform for financial institutions that has explored AI integration to create more intelligent and efficient contracts.
14. [SingularityNET](#) - SingularityNET is a decentralized AI network that may explore smart contract applications for AI services and data exchange.
15. [Tezos](#) - Tezos is a blockchain platform that supports smart contracts and is exploring AI integration for more dynamic and self-improving contracts.

About TAG

TAG is a trusted research and advisory company that provides insights and recommendations in cybersecurity, artificial intelligence, and climate science to thousands of commercial solution providers and Fortune 500 enterprises. Founded in 2016 and headquartered in New York City, TAG bucks the trend of pay-for-play research by offering unbiased and in-depth guidance, market analysis, project consulting, and personalized content—all from a practitioner perspective.

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