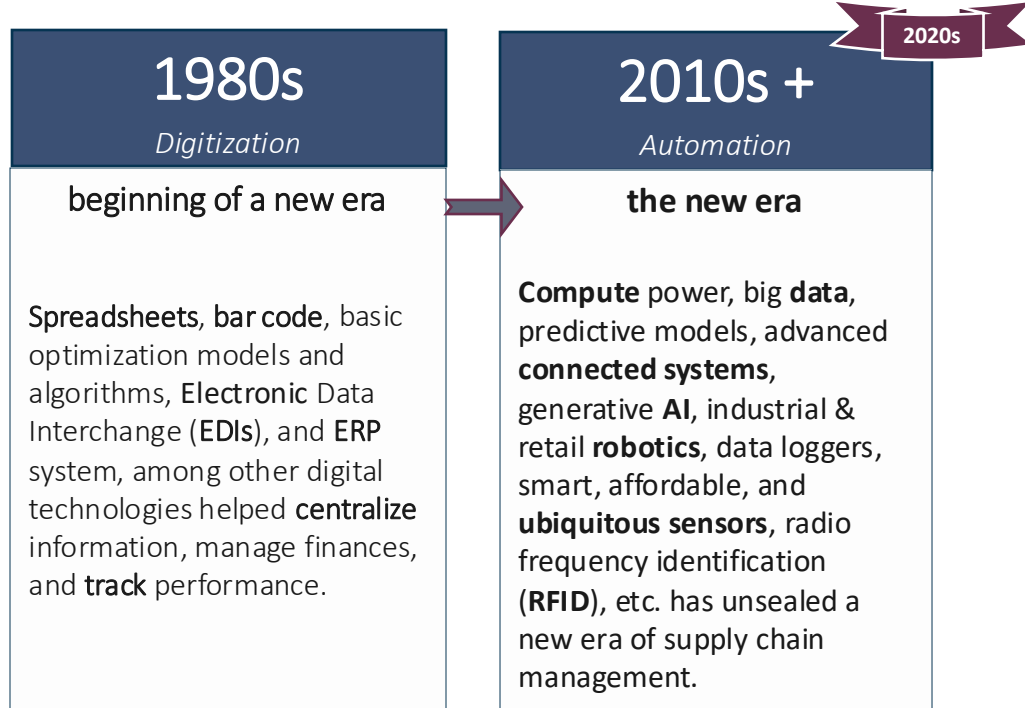
A faint, stylized map graphic in the background, showing a network of roads and a river. The map is composed of light blue and green lines on a white background, with some areas highlighted in light pink and light blue.

Supply Chain Intelligence (SCI),
Transportation Mgmt. System (TMS),
Warehouse Mgmt. System (WMS)
& 3rd Party Logistics (3PL)

Primed for AI Agentic revolution.

History & Context

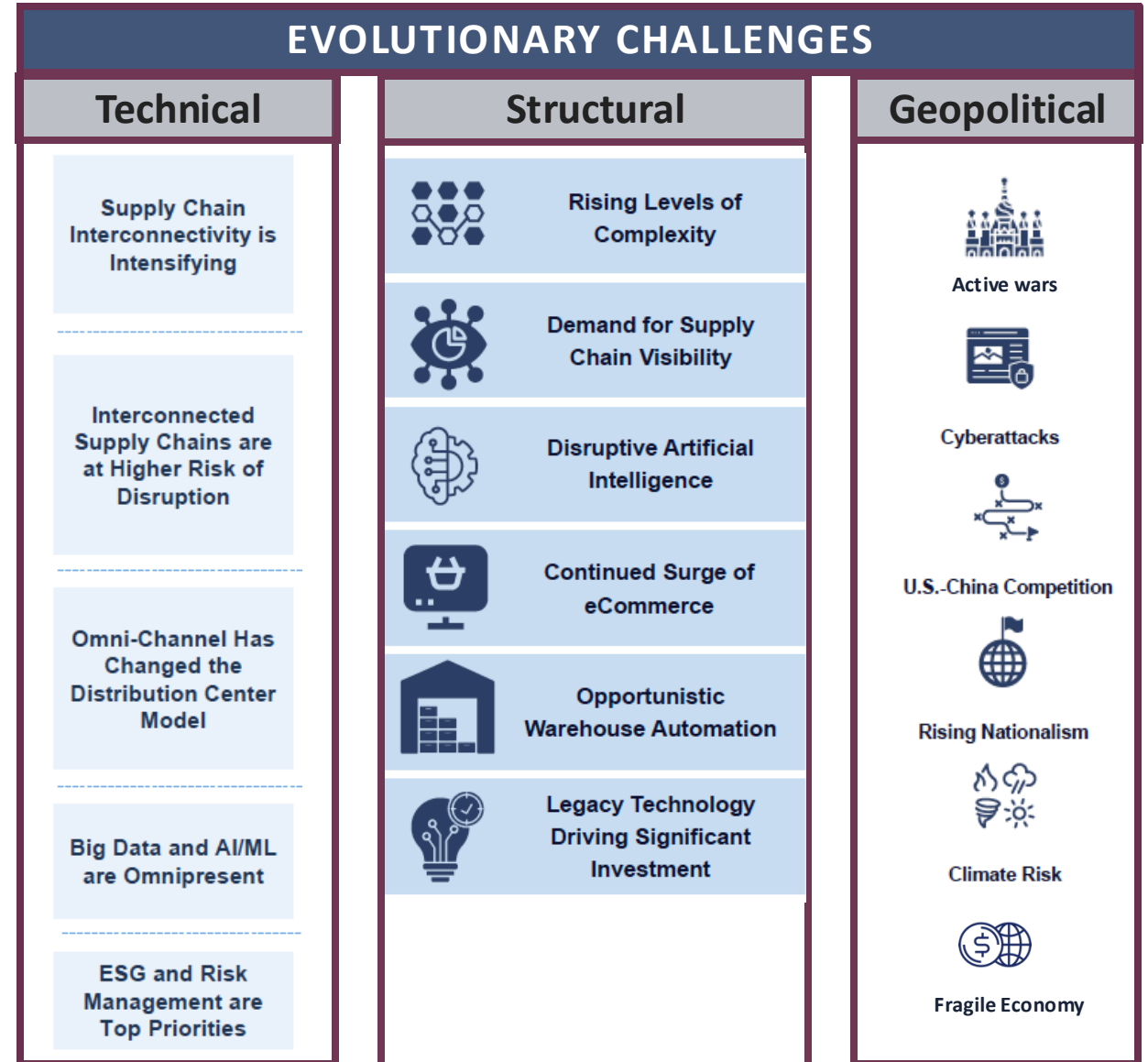


Market originated in 1970s-80s with mainframe systems from IBM, evolving from basic digitization of paper workflows

Adoption grew from 15% in 2005 to 61% currently among logistics professionals

Initial focus was on enterprise shippers, with three distinct evolutionary waves:

- Original SCM vendors (1970s): E2Open, Descartes
- Enterprise software expansion (1980s-90s): SAP, Oracle
- Cloud-native providers (2000s): MercuryGate, Manhattan Associates



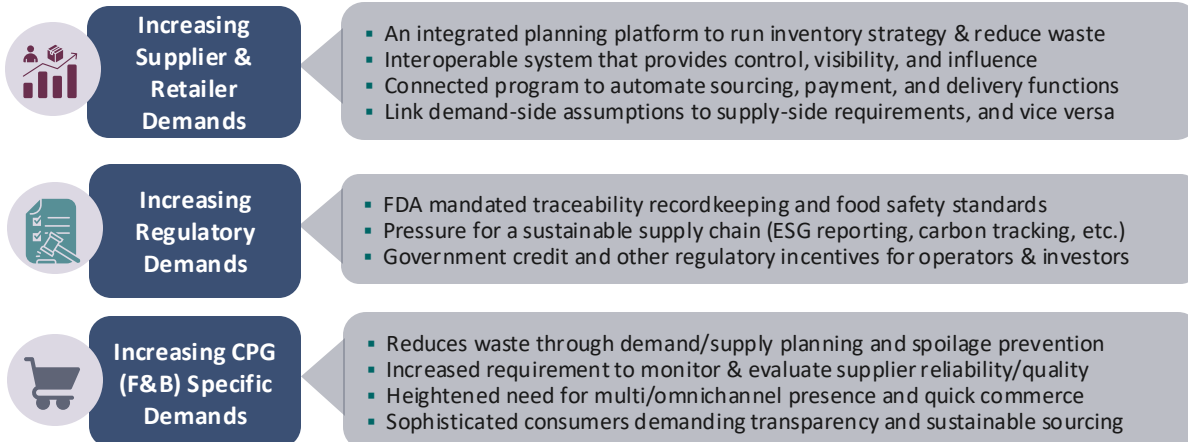
Supply Chain Intelligence (SCI) Overview

SCI includes all enterprise supply chain software except ERP and asset tracking. It's an attractive investment market, with tailwinds from tech adoption in agriculture, manufacturing, and retail. The industry is poised to leverage decades of data from its fragmented systems and shift to intelligent, integrated platforms.

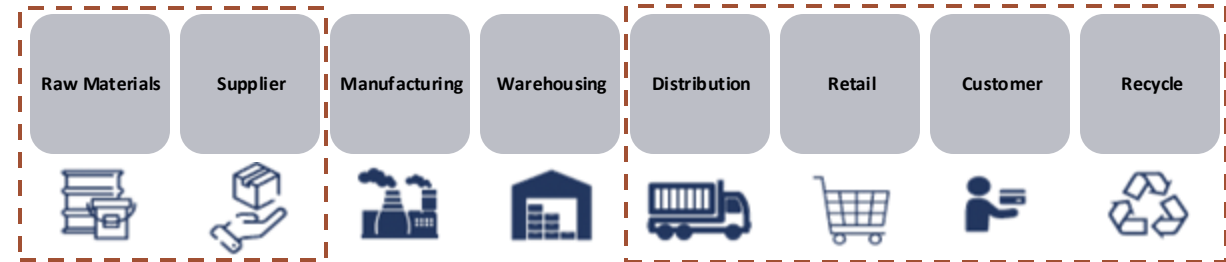
CATEGORY OVERVIEW & HISTORY

- The Supply Chain Intelligence (SCI) market is mature yet rapidly evolving, **outpacing** the growth of **S&P 500** and **performing 5x – 7x the US GDP** in last 20 years, including during recessions.
- Supply Chain Management ecosystem is **\$11 Trillion market** with Software quickly becoming an increasingly critical part of the ecosystem, currently standing at **\$21.93 Billion market**.
- SCI grew at **CAGR of 11% from 2014-2023** and it is expected to grow at **15.4% CAGR from 2024-2027**. Publicly traded Supply Chain software overall had a **38% increase in share price** performance in 2023 (7% 2024 YTD).
- Integrated Point solutions have capitalized on the need for intelligent end-to-end planning, accurate demand/supply forecasts, automated procurement, etc. – taking share from large ERP vendors' dated modules and **creating new segments** (digital twin, omnichannel mgmt., etc.)
- These dynamics have allowed new entrants and small vendors to succeed in a previously consolidated, saturated, and incumbent-dominated SCI market.
- The M&A and financing market is active and balanced, with nearly **\$17 billion raised** in the past three years while trading at a higher multiple and less volatility against public SaaS comparables.
- Strategic acquirers are interested in adding capabilities to their technology stacks and PE investors look to pursue high-growth platform opportunities.

KEY TRENDS & RELEVANT TOPICS



SUPPLY CHAIN SOFTWARE ECOSYSTEM AND CATEGORIES



Enterprise SCM	Freight Tech	Last Mile Delivery	Warehousing Tech
ERP & Inventory Mgmt.	Autonomous Trucks & Middle Mile	Autonomous Delivery	Augmented Reality
Asset Tracking & Mgmt.	Other Freight	Delivery Services	Other Warehousing
Procurement & Sourcing	Marine/Air/Rail/Freight	Drone & eVTOL Logistics	Sustainable Packaging
Supply Chain Finance & Payments	Fleet Management	Other Delivery	Warehouse Automation
Planning & Traceability (Simulation, visibility, etc.)	Trucking Logistics	Reverse Logistics	Warehousing & Fulfillment
D2C + Customer & (Omni)Channel Management	Marine, Rail & Port Logistics	Ultrafast Delivery	

Best positioned to build/acquire AI Agentic solutions and deploy at a relatively faster rate.


Mixed-TMS Overview

Transportation management systems (TMS) enable the planning, execution, and optimization of goods movement across supply chains. However, distinctions between TMS, Warehouse Management Systems (WMS), and Third-Party Logistics (3PL) are increasingly blurred as vendors offer integrated solutions. For this analysis, we define these converged solutions as "mixed-TMS," a market rapidly transforming with AI-driven platforms to enhance visibility, efficiency, control, and cost optimization.

CATEGORY OVERVIEW & HISTORY


- Mixed-TMS market is mature yet rapidly evolving, **outpacing** the growth of **S&P 500** and **performing 5x – 7x the US GDP** in last 20 years, including during recessions.
- Supply Chain ecosystem is **\$11 Trillion market** with Software (and now AI) quickly becoming an increasingly critical part of the ecosystem. Mixed-TMS is currently standing at **\$16.47B in market size in the US and \$34.56B globally**.
- Mixed-TMS is expected to grow at **16.5% CAGR in the US and 17.3% CAGR globally** (mostly driven by growth in Asia) from 2024-2030. Publicly traded Supply Chain software overall had a **38% increase in share price** performance in 2023 (7% 2024 YTD).
- The Mixed-TMS market is poised for rapid disruption, driven by AI and IoT. This evolution reflects the broader industry trend toward unified supply chain platforms that can address the increasingly complex needs of modern logistics operations.
- Mixed-TMS and supply chain technology M&A activity has increased by 32%, with strategic buyers making up 79% of transactions.
- Over the past three years, nearly \$17 billion has been raised, as private equity and strategic investors benefit from higher multiples and less volatility compared to public SaaS benchmarks.

COMPELLING DATA & RELEVANT TOPICS




Adoption Issues

- On-premise TMS holds 54.9% market share, while cloud solutions are growing rapidly, projected to reach \$15.41B by 2034
- TMS adoption: 25% small businesses, 48% mid-sized, and 75% large enterprises
- 35% of shippers, carriers, and transportation companies do not use a TMS



AI for the Win

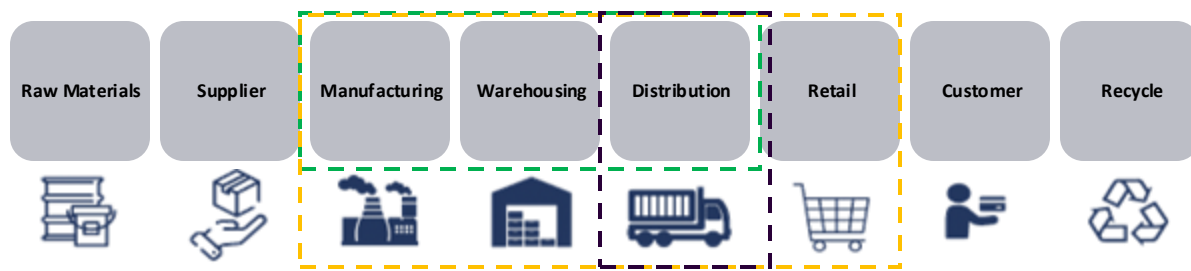
- AI/ML integration reduces transportation costs by 15% through route optimization
- Real-time tracking improves delivery accuracy by 35%
- Blockchain adoption in TMS reduces freight tracking errors by 50%
- Automation increases order fulfillment speed by 40%
- Load optimization increasing vehicle utilization by 28%




Incumbent's Patch & Pseudo-AI


- 42% provide predictive analytics services
- 71% of providers offer AI-enabled services
- 67% provide web-based customer portals
- And yet, none of them are harnessing the power of transformer-based AI solutions


SUPPLY CHAIN SOFTWARE ECOSYSTEM AND CATEGORIES



Enterprise SCM	Freight Tech	Last Mile Delivery	Warehousing Tech
ERP & Inventory Mgmt.	Autonomous Trucks & Middle Mile	Autonomous Delivery	Augmented Reality
Asset Tracking & Mgmt.	Other Freight	Delivery Services	Other Warehousing
Procurement & Sourcing	Marine/Air/Rail/Freight	Drone & eVTOL Logistics	Sustainable Packaging
Supply Chain Finance & Payments	Fleet Management	Other Delivery	Warehouse Automation
Planning & Traceability (Simulation, visibility, etc.)	Trucking Logistics	Reverse Logistics	Warehousing & Fulfillment
D2C + Customer & (Omni)Channel Management	Marine, Rail & Port Logistics	Ultrafast Delivery	

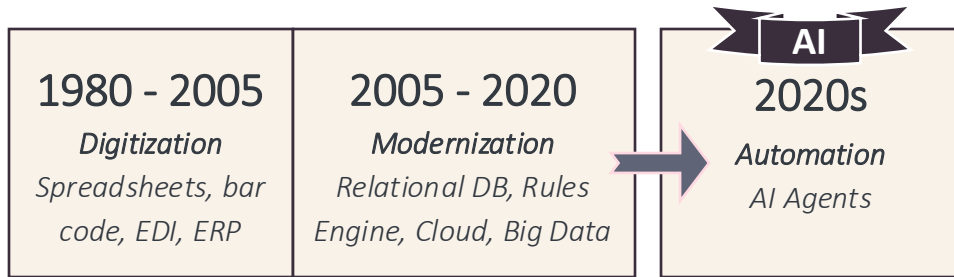
 Mixed-TMS

 Traditional TMS

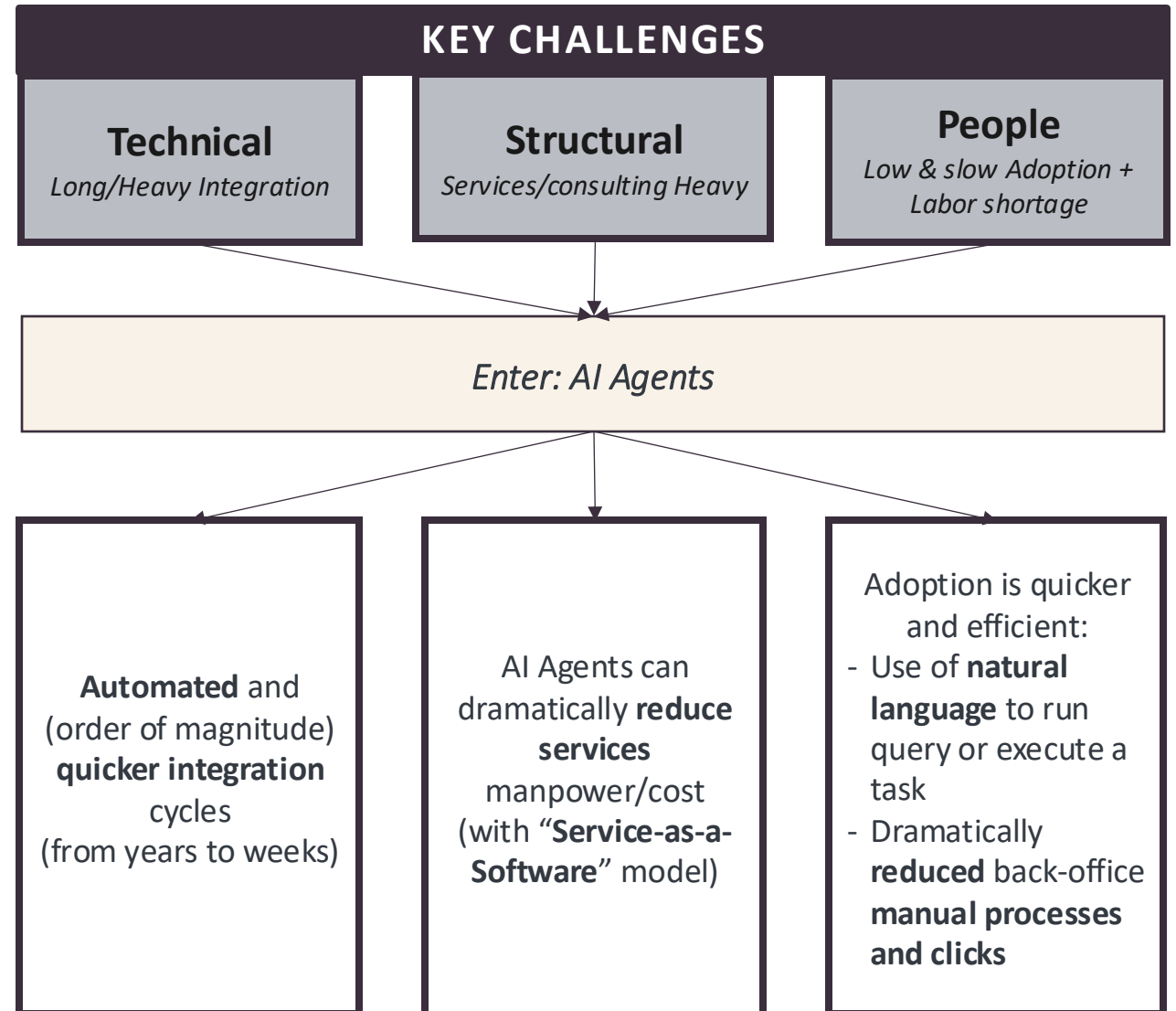
 Traditional WMS

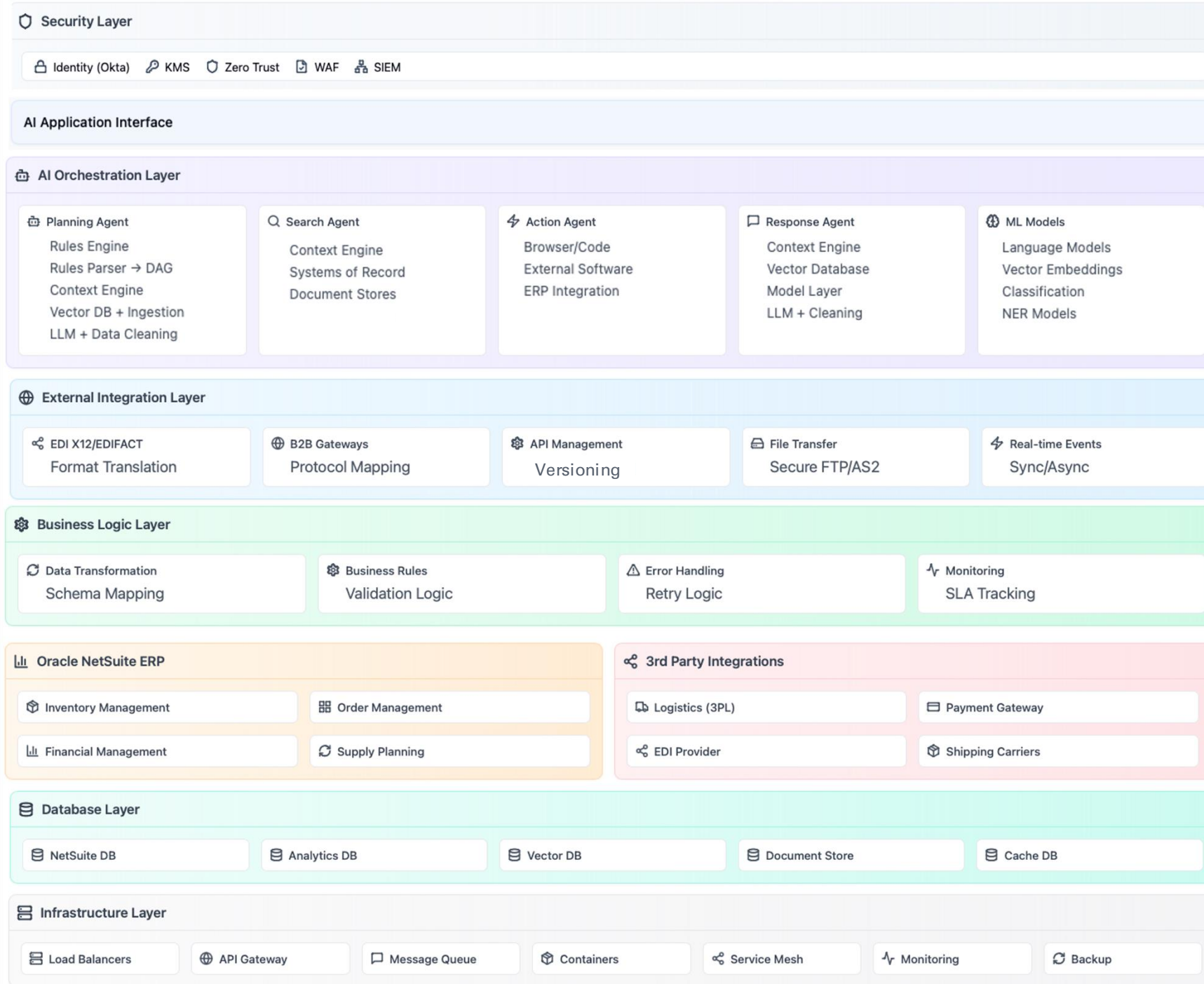
Why Now?

Supply chain intelligence along with D2C & Customer channel management markets add up to a \$20B+ target market size growing at 10-15% across the board. TMS, WMS, and 3PL markets add up to additional **\$252.7B in the US** & **\$1.1T in global market size**, growing at an average of 15.22% across the board.



1. For the first time since ERP/TMS' inception, startups and new entrants can truly capitalize on their lack of technical debt. Advances in AI and agentic solutions now give them a real shot at overcoming technical, structural, and adoption challenges to unseat the goliath incumbents (Google vs. OpenAI/Perplexity).
2. TMS and the broader supply chain can leapfrog the "landline" cloud migration phase, moving directly to "smartphone" agentic systems powered by AI—boosting adoption while drastically reducing implementation time, effort, cost, and pain points.
 - With 54.9% of TMS software still on-premise (\$6.03B in revenue) and 35% of shippers, carriers, and transportation companies lacking a TMS solution, this shift unlocks transformative potential.
3. High-touch consulting services can now be replaced by low-touch, mostly self-serve, customized Service-as-a-Software AI agents—ushering efficiencies, efficacy, and speed previously unimaginable.
 - The services segment accounted for more than 80% in WMS expenses in 2023





AI Agents in Action

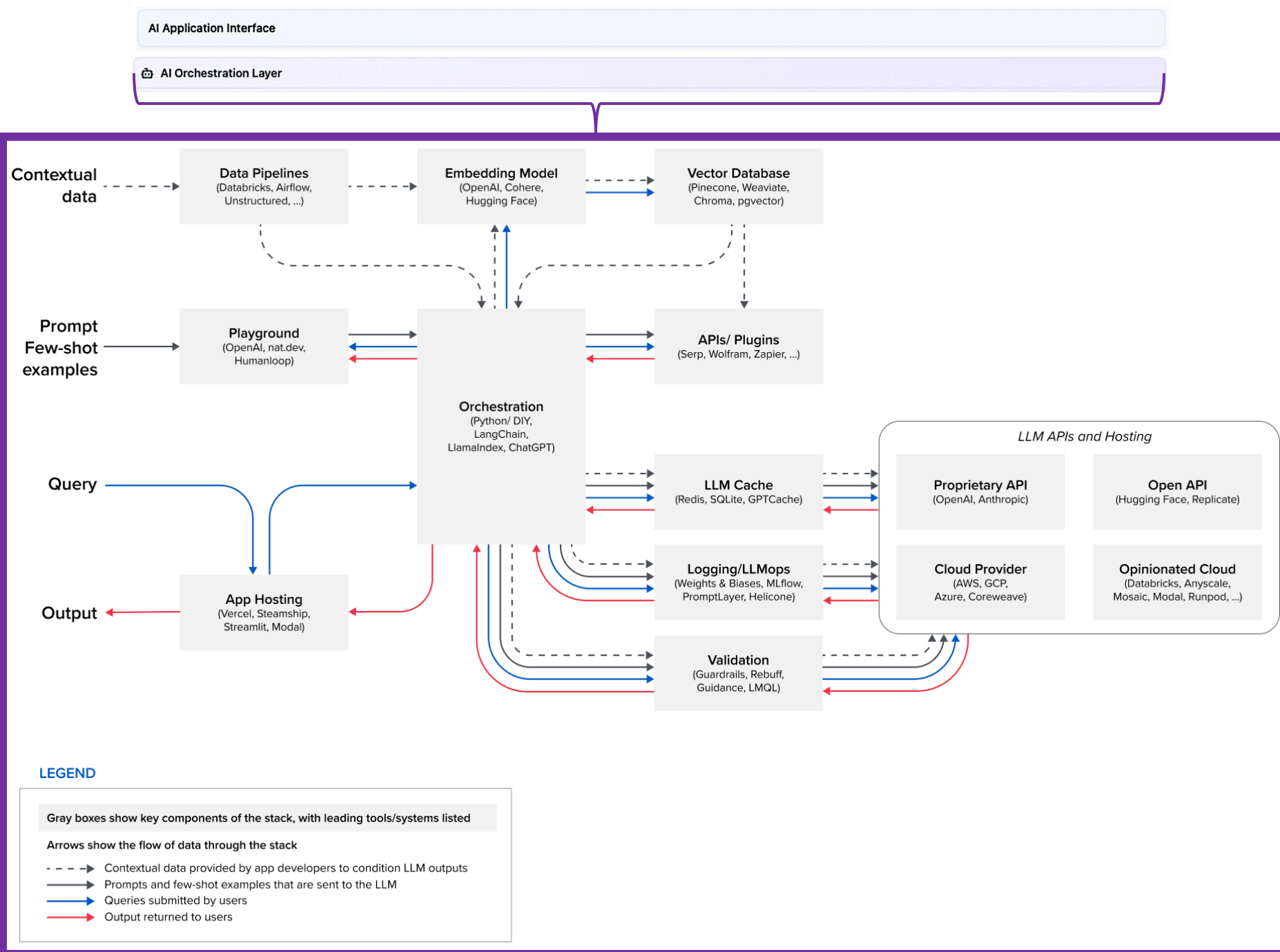
An AI Agent integrates with the ERP databases and uses all historical data as a context to respond to user queries.

Agents on rails are AI systems tasked with high-level objectives and flexibility in approach yet constrained by procedural guidelines and safety checks to ensure they act within organizational standards.. Below are some use cases of the AI Agents on rails:

- Handle repetitive tasks like accounts payable, expenses, budgeting, forecasting, reconciliations, etc.: ***“reconcile this invoice with the general ledger”***
- Demand and supply planning via a simple natural language search: ***“give me the optimal inventory by days and create the purchase order and get bids from existing approved and high performing vendors, send it to me for a final review and approval and then queue it up to get reviewed and signed off by all parties – contracts by legal, budget by finance, etc.”***

AI Agents for SCI & Mixed-TMS Workflow

SCI & mixed-TMS can, to a greater extent, use the standard Agentic architecture as a part of its AI Orchestration layer. The enterprise app stack diagram, drawn from a16z's paper on LLM Architecture, is adaptable for other transformer-based use cases.



AI Agents Stack for SCI & Mixed-TMS

Comprehensive AI agents stack and market map: Outlining key layers and capabilities for seamlessly adopting and integrating agentic solutions into SCI and mixed-TMS (source: a16z, Menlo Ventures, Letta).

DATA PIPELINES	EMBEDDING MODEL	VECTOR DATABASE	LLM CACHE
Databricks	OpenAI	Pinecone	Redis
Airflow	Cohere	Weaviate	SQLite
Indexify	Hugging Face	ChromaDB	GPTCache
Lexy	Pinecone	pgvector	Weaviate

PLAYGROUND	ORCHESTRATION	APIS/PLUGINS	FINETUNING + RLHF	Training
OpenAI	Langchain	Serp	Lamini	Modular
nat.dev	LlamaIndex	Wolfram	Predibase	Lightning
Humanloop	Radiant	Zapier	Arcee.ai	OctoML

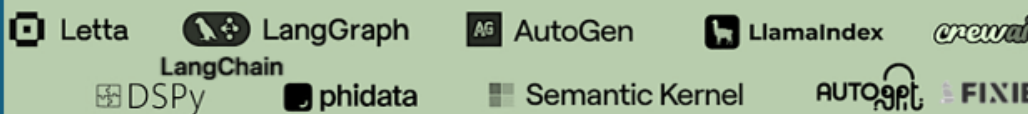
LOGGING / LLMOPS	VALIDATION	APP HOSTING	OPINIONATED CLOUDS
Weights & Biases	Guardrails	Vercel	Databricks
MLflow	Rebuff	Steamship	Anyscale
PromptLayer	Microsoft Guidance	Streamlit	Mosaic
Helicone	LMQL	Modal	Modal
Galileo.ai	TruEra	Anyscale	RunPod

LLM APIS (PROPRIETARY)	LLM APIS (OPEN)	CLOUD PROVIDERS	DEPLOYMENT + INFERENCE	DATABASES
OpenAI	Hugging Face	AWS	Baseten	Databricks
Anthropic	Replicate	GCP	Modal	Pinecone
Gemini	Llama 2	Azure	Clarifai	Momento
Mistral	Stability AI	CoreWeave	Substrate	WarpStream

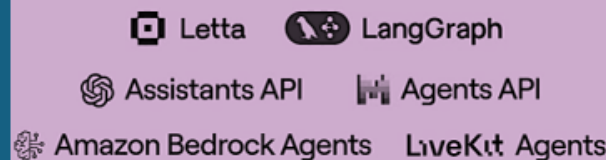
VERTICAL AGENTS



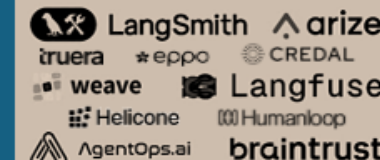
AGENT FRAMEWORKS



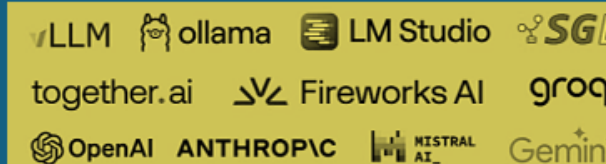
AGENT HOSTING & SERVING



OBSERVABILITY



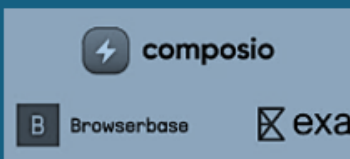
MODEL SERVING



MEMORY (& DATA PRE-PROCESSING)



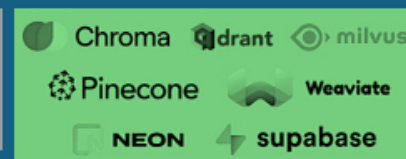
TOOL LIBRARIES



SANDBOXES



STORAGE



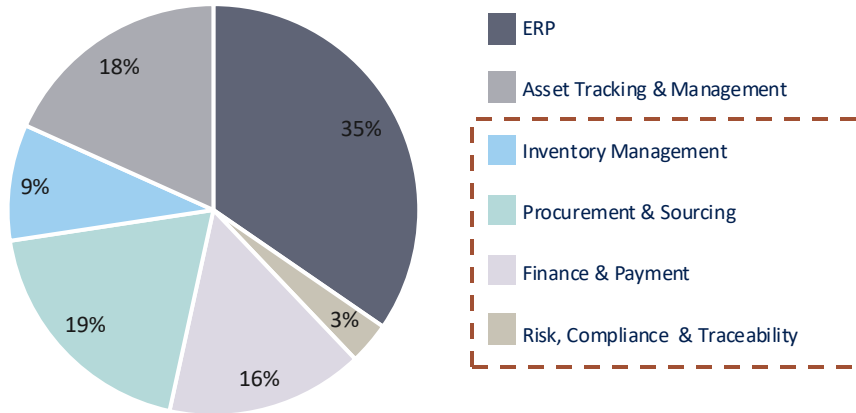
SCI: Market Map & Key Segments



SCI: Market Size and Growth by Category

Supply chain intelligence along with D2C & Customer channel management markets add up to a \$20B+ target market size growing at 10-15% across the board.

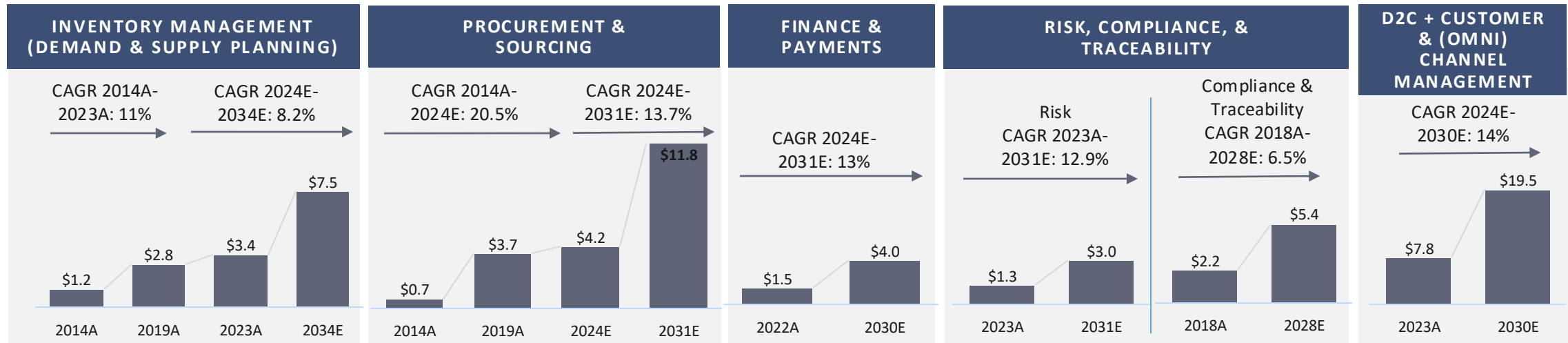
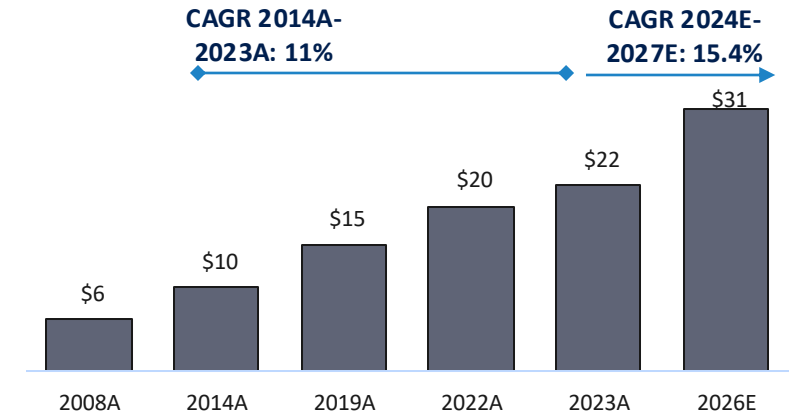
SCI CATEGORY SEGMENTATION



Global Supply Chain Software market had a total revenue of **~\$22B** in 2023, expecting to grow at a **15%+ CAGR** through 2026

Non-ERP & Non-Asset Tracking Software comprise **60%+** of the total market

SUPPLY CHAIN MANAGEMENT SOFTWARE EVOLUTION



Note: All figures in \$B

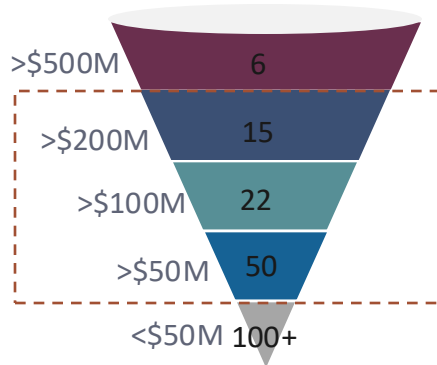
Source: Houlihan Lokey, Frost & Sullivan, Pitchbook, IBIS World

Primary Opportunity Areas

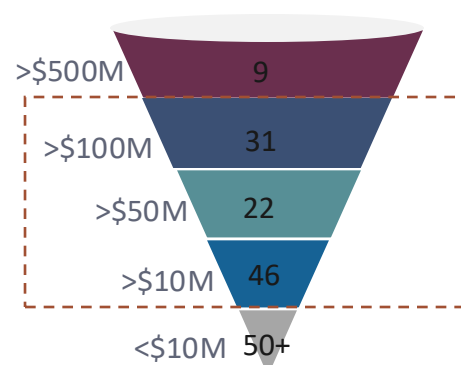
SCI: Fragmented Landscape

Given the fragmented landscape, slow to adapt incumbents, AI-first growth startups capturing market share, and increasing demand for modern connected systems, SCI market is primed for M&A. Long tail of hundreds of M&A ripe companies under \$50M in invested capital (mostly founder-owned).

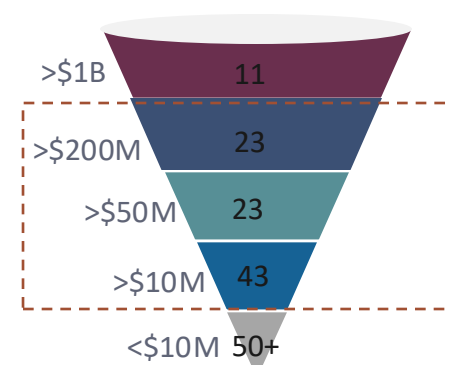
INVENTORY MANAGEMENT (DEMAND & SUPPLY PLANNING)



PROCUREMENT & SOURCING



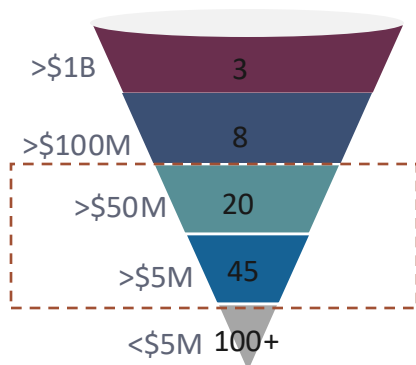
DATA MANAGEMENT



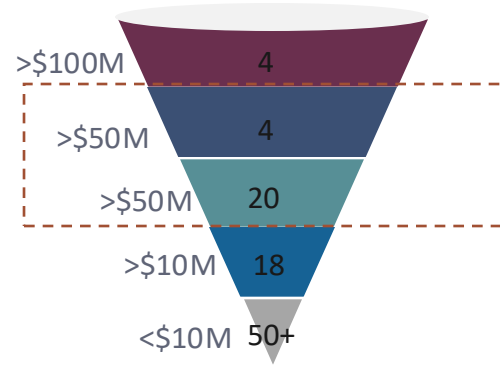
KEY INSIGHTS

- The inventory management sub-sector is the most feature-rich and revenue-heavy within SCI, but it's crowded with competitors. Opportunities lie in shifting through the noise and identifying top candidates that can build or acquire Agentic solutions to deploy in their current customer base.
- Procurement & sourcing is a “newer” SCI sub-sector, traditionally covered by ERPs. Automated, feature-rich point solutions are now displacing ERP modules as buyers seek integrated & automated platforms. ERPs are in response buying out the successful point solutions. Opportunities exist in ripe to acquire candidates and exploit AI Agents in current integration.
- While data management is broadly covered by incumbents, with data being crucial for automation, new vendors are emerging to target specific markets like F&B. Vertical specific AI Agents provides speed, agility, and focus.
- Most Finance & Payments products have their own lending arms that leverage customer data and financials on the platform to offer customized lending solutions and terms. Further integrating Finance & Payment solutions to procurement, compliance, and channel management introduces new opportunities to leverage AI Agents.
- Suppliers, manufacturers, and retailers are focusing on solutions that automate compliance and regulatory reporting, benchmark and track ESG metrics, and mitigate supply chain risks. This shift is driving M&A activity in vendors specializing in integrated compliance, risk management, and supply chain transparency solutions.

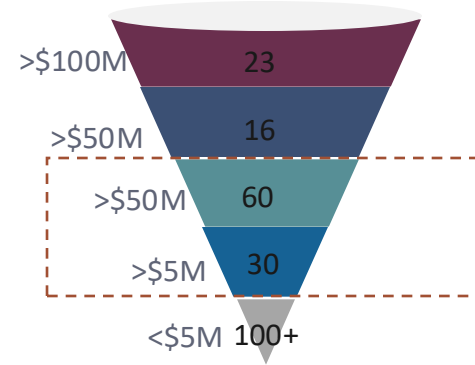
FINANCE & PAYMENTS



RISK, COMPLIANCE, & TRACEABILITY



D2C + CUSTOMER & (OMNI) CHANNEL MANAGEMENT

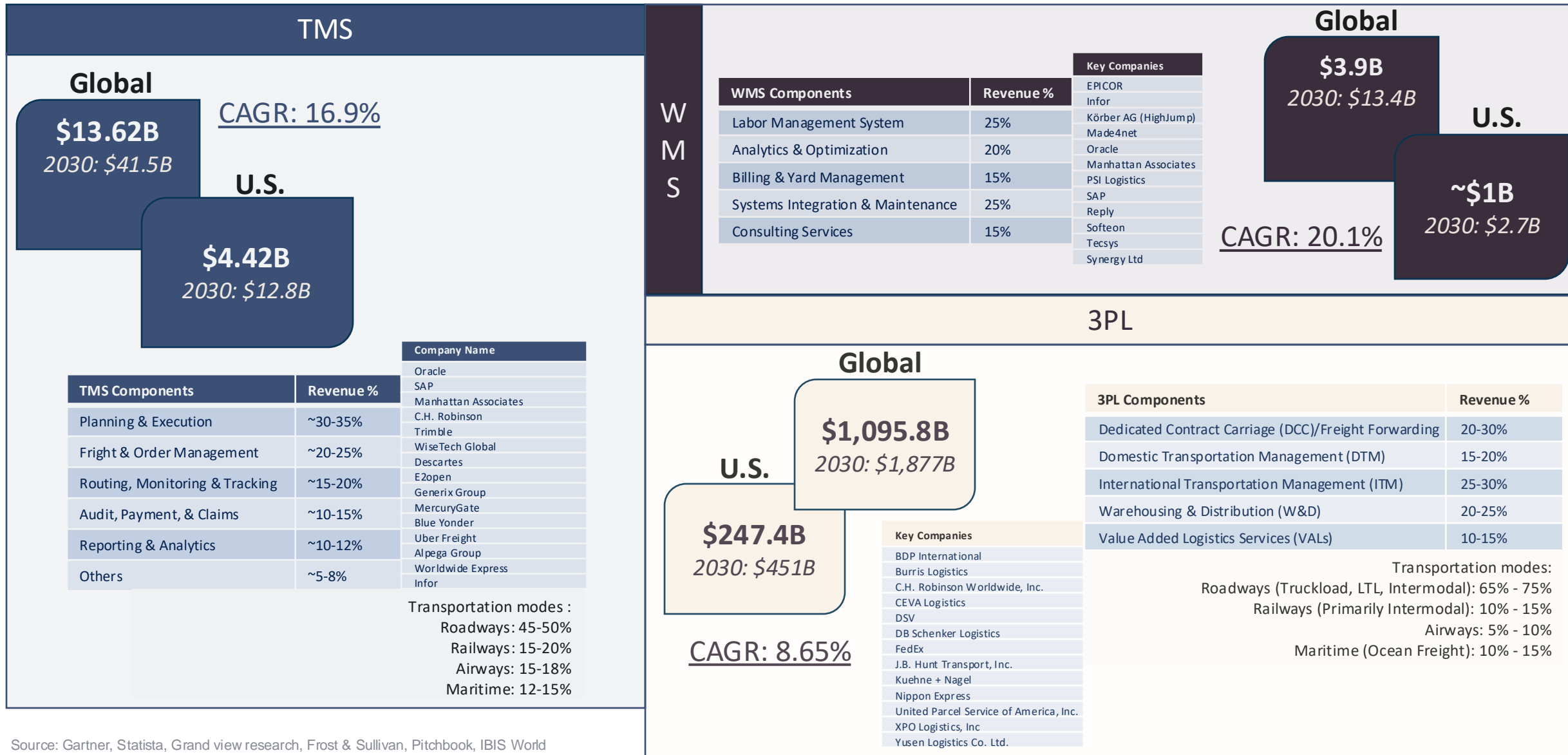


Best positioned to build/acquire AI Agentic solutions and deploy at a relatively faster rate.

Filtered by Invested Capital

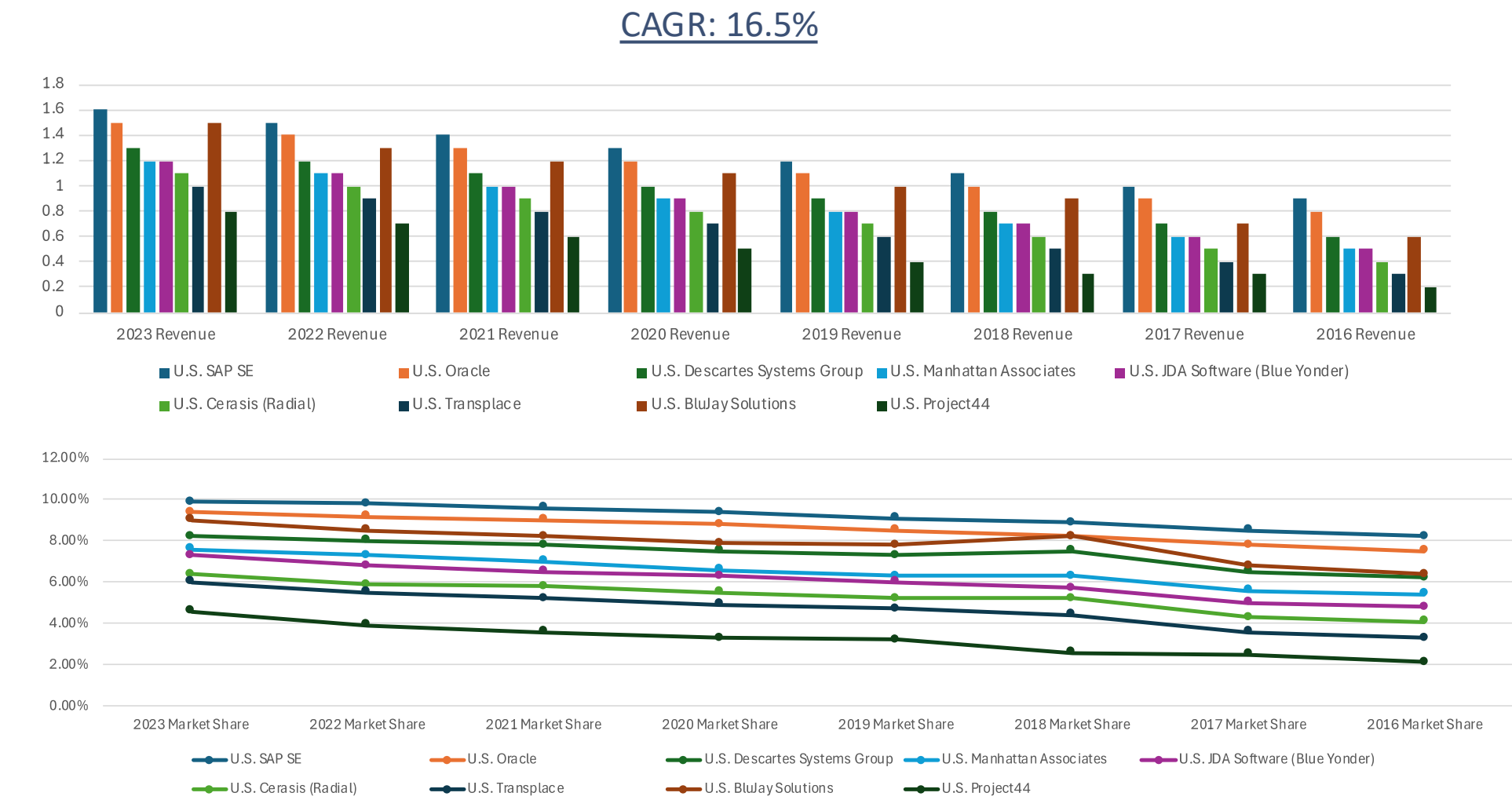
TAM: TMS, WMS & 3PL

Currently, TMS, WMS & 3PL markets add up to a **\$252.7B in the US & \$1.1T in global market size**, growing at an average of 15.22% across the board.



Deep Dive: “Mixed-TMS” TAM in the US

Top 9 companies offering a variety of TMS, WMS, 3PL, and other related services comprise of ~\$11.2B in the US revenue and that adds up to about 68% in market share, taking the total TAM for mixed TMS-related revenue to \$16.47B (100%) .



Mixed-TMS TAM
\$16.47B (US)

Company Name	Country
Oracle	US
SAP	Germany
Manhattan Associates	US
C.H. Robinson	US
Trimble	US
WiseTech Global	Australia
Descartes	Canada
E2open	US
Generix Group	France
MercuryGate	US
Blue Yonder	US
Uber Freight	US
Alpega Group	Belgium
Worldwide Express	US
Infor	US
Kinaxis	Canada
Shipwell	US
3T Logistics & Technology Group	UK
RatelineX	US
oTMS	China
nShift	UK
BlueRock TMS	Netherlands
Elemica	US
TESISQUARE	Italy
vTradEx	China
Shiptify	France
GlobalTranz	US
InMotion Global	US
Logistically	US
One Network Enterprises	US
IntelliTrans	US
Allotrac	Australia
Revenova	US
Princeton TMX	US
CTSI Global	US
PCS Software	US
Shipsy	India

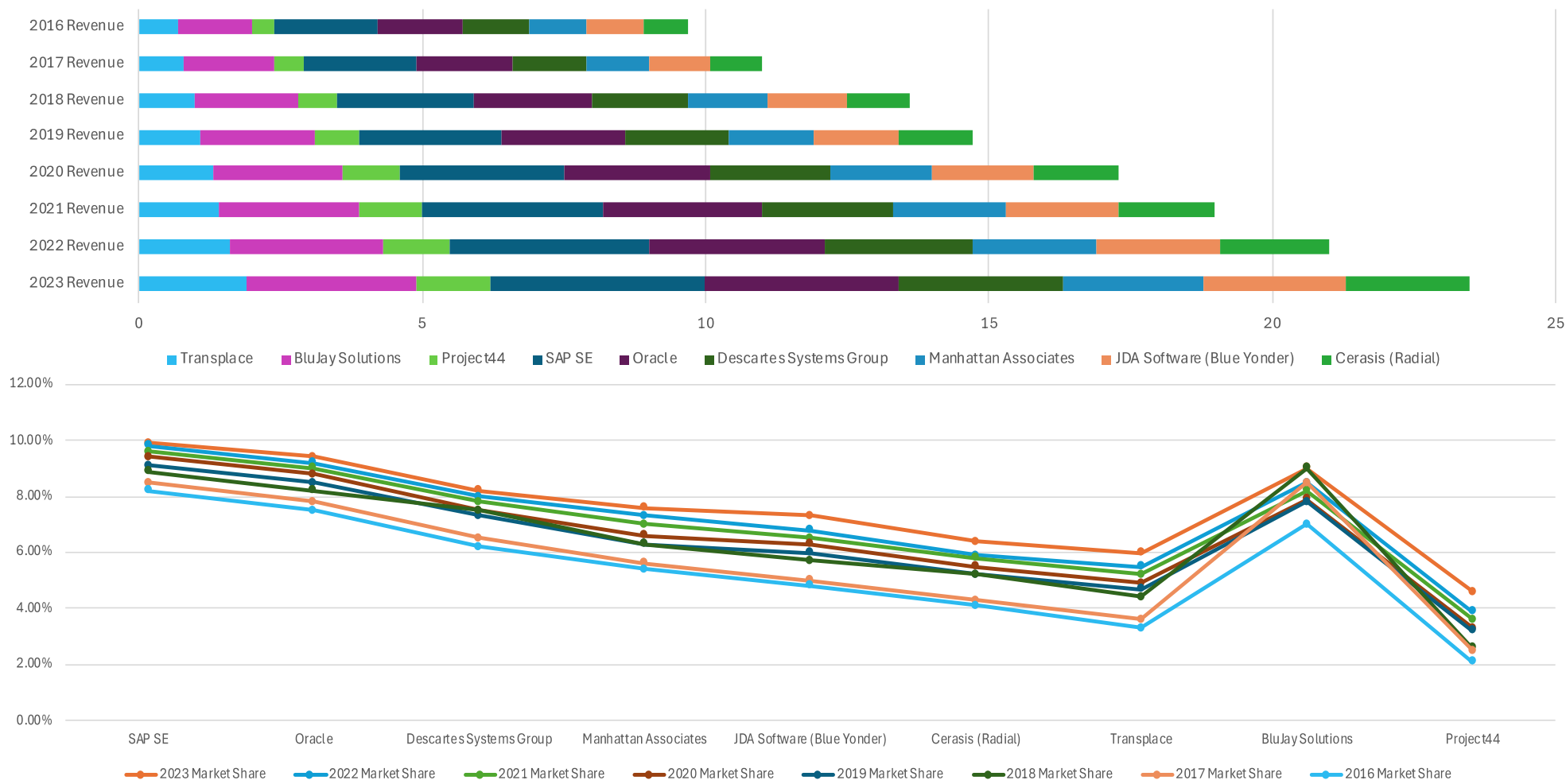
Manufacturing: 38%
Transportation & Logistics: >25%
Retail & E-commerce: 15-20%
Others: ~17%

Source: Gartner, Frost & Sullivan, Pitchbook, IBIS World

Deep Dive: “Mixed-TMS” Global TAM

Top 9 companies offering a variety of TMS, WMS, 3PL, and other related services comprise of ~\$23.5B in Global revenue and that adds up to about 68% in market share, taking the total TAM for mixed TMS-related revenue to \$34.56B (100%) .

CAGR: 17.3%



Mixed-TMS TAM
\$34.56B (Global)

Company Name	Country
Oracle	US
SAP	Germany
Manhattan Associates	US
C.H. Robinson	US
Trimble	US
WiseTech Global	Australia
Descartes	Canada
E2open	US
Generix Group	France
MercuryGate	US
Blue Yonder	US
Uber Freight	US
Alpega Group	Belgium
Worldwide Express	US
Infor	US
Kinaxis	Canada
Shipwell	US
3T Logistics & Technology Group	UK
RatelineX	US
oTMS	China
nShift	UK
BlueRock TMS	Netherlands
Elemica	US
TESISQUARE	Italy
vTradEx	China
Shiptify	France
GlobalTranz	US
InMotion Global	US
Logistically	US
One Network Enterprises	US
IntelliTrans	US
Allotrac	Australia
Revenova	US
Princeton TMX	US
CTSI Global	US
PCS Software	US
Shipsy	India

Manufacturing: 38%
Transportation & Logistics: >25%
Retail & E-commerce: 15-20%
Others: ~17%

Mixed-TMS: Merits & Considerations

Merits













- Large and rapidly growing market with a potential for strong adoption rates
- High growth potential in emerging markets, particularly Asia-Pacific
- AI-based solutions offering scalability, speed, and lower upfront costs
- Strong demand for integrated visibility and optimization capabilities
- Increasing need for automation and AI-driven decision making
- Opportunity for consolidation and M&A activity
- Rising demand for specialized vertical solutions
- Potential for high margins and recurring revenue streams
- Measured outcomes and benefits:
 - Automation of manual processes leads to a 40% increase in order fulfillment speed and a 20% reduction in IT costs
 - Mixed-TMS implementations can reduce transportation costs by up to 30% through optimized route planning and carrier selection
 - 46% of companies report improved customer service after implementing a TMS

Considerations













- **Technology & Implementation**
 - High initial investment costs for comprehensive solutions
 - Integration challenges with legacy systems
 - Data quality and standardization issues
 - Cybersecurity and data privacy concerns
 - Need for continuous innovation and R&D investment
- **Market & Competition**
 - Highly fragmented market with numerous players
 - Strong incumbent presence with established relationships
 - Incumbents could easily catch up although a major overhaul of their systems might be necessary
 - They have data advantage
 - Regional variations in adoption and requirements
 - Regulatory compliance challenges across jurisdictions
 - Need for specialized industry knowledge
- **Operational**
 - Complex implementation and training requirements
 - Change management challenges
 - Resource-intensive customer support needs
 - Long sales cycles, particularly for enterprise customers
 - Need for robust partner ecosystem

Recent M&A and sponsor Activities by segment

INVENTORY MANAGEMENT (DEMAND & SUPPLY PLANNING)			
Strategic		Sponsor	
Company → Acquirer	Company → Sponsor		
 (2024)		 (2024)	
 (2024)		 (2023)	
 (2024)		 (2023)	
 (2024)			
 (2024)		 (2023)	
 (2024)		 (2023)	
 (2022)		 (2023)	
 (2021)			

PROCUREMENT & SOURCING			
Strategic		Sponsor	
Company → Acquirer	Company → Sponsor		
 (2024)		 (2023)	
 (2022)		 (2023)	
 (2021)		 (2022)	

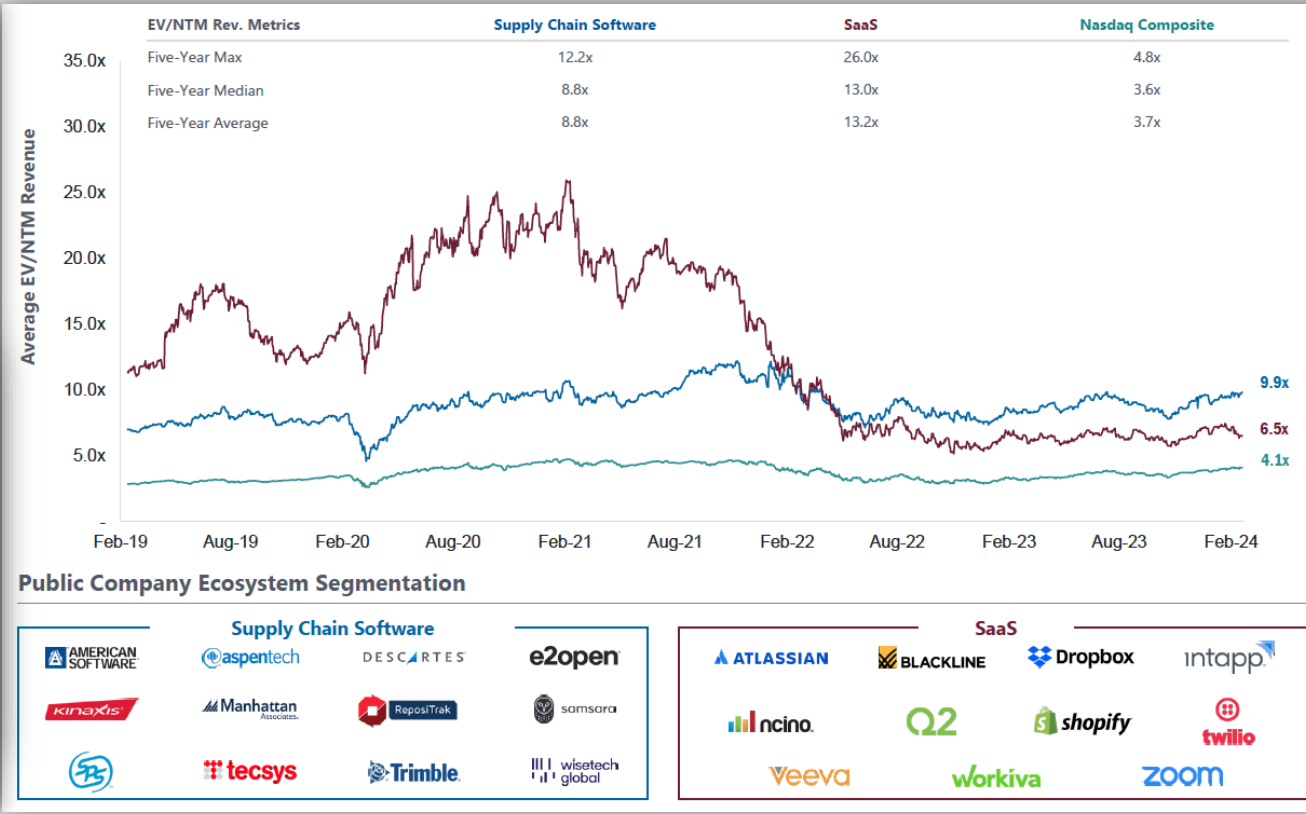
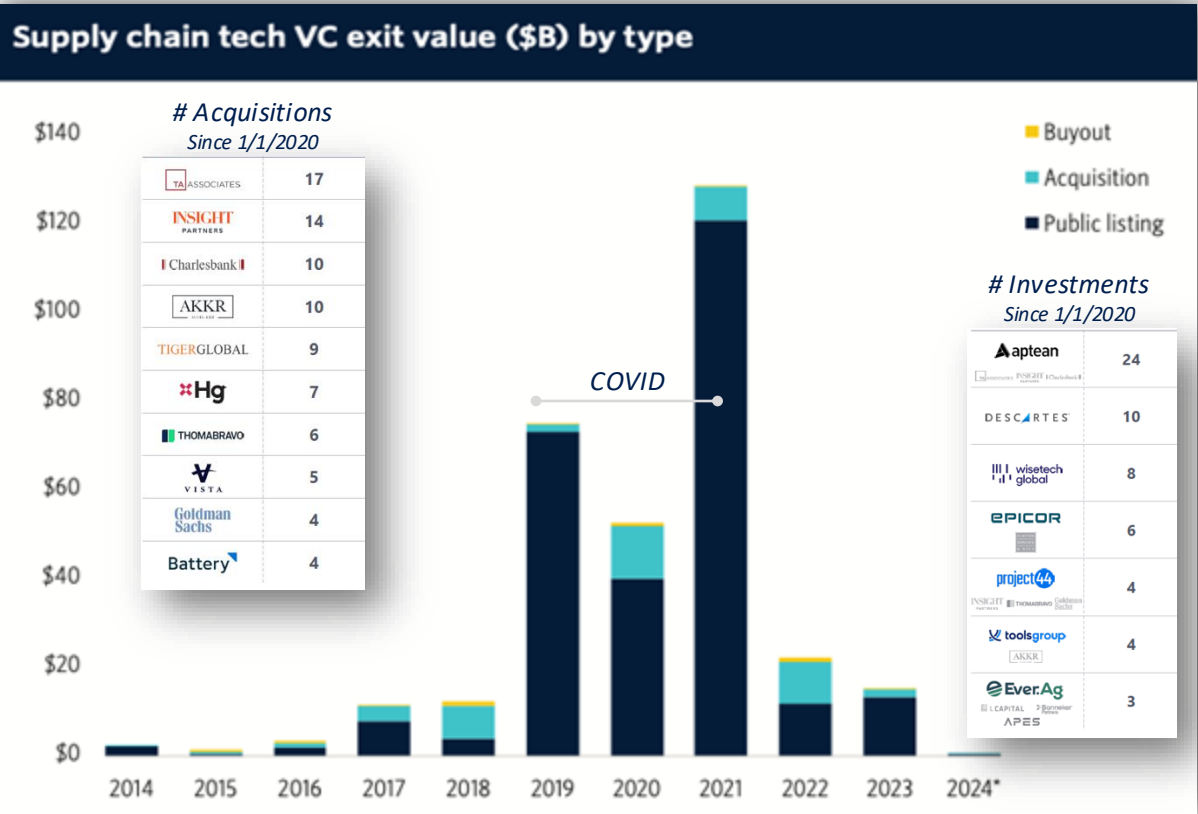
RISK, COMPLIANCE, & TRACEABILITY			
Strategic		Sponsor	
Company → Acquirer	Company → Sponsor		
 (2022)		 (2023)	
 (2022)		 (2022)	
 (2021)	 (2021)	 (2024)	

FINANCE & PAYMENTS			
Strategic		Sponsor	
Company → Acquirer	Company → Sponsor		
 (2023)		 (2024)	
 (2022)		 (2022)	
 (2022)		 (2022)	

D2C + CUSTOMER & (OMNI) CHANNEL MANAGEMENT			
Strategic			
Company → Acquirer	Company → Investor		
 (2023)	 (2023)	 (2023)	
 (2022)	 (2022)	 (2022)	
 (2022)	 (2022)	 (2021)	

Private & Public Market Trading Activities

Supply chain software has traded with lower volatility and at a higher multiple than SaaS comparables across both public and private markets. In 2023, publicly traded supply chain management software saw a 38% increase in share price performance (7% 2024 YTD).



Key Insights from M&A Activity

Trends: Consolidation, focus of expanding tech stack and exposure, horizontal & vertical integration, and unprecedented flexibility in investment capital

- **Increased Consolidation:** There is a clear trend of consolidation within the sector, with both strategic acquirers and financial sponsors aggressively acquiring or investing in companies to expand their presence in the industry.
 - Project44 acquiring Ocean Insights in February 2021 for \$45 million to enhance its ocean freight visibility capabilities
 - Trimble's \$2.1B acquisition of Transporeon in April 2023
 - Maersk's acquisition of Visible SCM and B2C Europe (2021) to expand its capabilities in Europe and North America
- **Focus on Technology Stack Expansion:** Strategic acquirers are targeting companies that offer specialized solutions – especially in automation and cloud-based platforms. Companies like o9 Solutions and Made4Net are receiving substantial investments, highlighting the industry's shift towards automation and cloud solutions that offer scalability, flexibility, end to end integration, and advanced analytics.
 - Coupa Software's acquisition of LLamasoft for \$1.5 billion in November 2020 to enhance its AI-driven platform for supply chain design and planning, enabling companies to predict and respond to disruptions more effectively. This bet later paid off as Coupa built on this capability to dominate the market and get acquired for \$8B in 2023.
 - Aptean has been highly active, with 24 acquisitions since January 2020 – horizontal and vertical integrations across the chain
 - Descartes Systems Group's made 10 acquisitions in the space since 2020 – including GroundCloud in February 2023 for \$138M
 - Trimble's acquisition of Kuebix in 2020 allowed it to integrate transportation management systems (TMS) into its existing supply chain solutions
 - SAP acquired Signavio in 2021 for EUR 949M to expand its modeling and intelligence capabilities
- **Increase in PE interest and check size:** Private equity firms are increasingly active, acquiring stakes in scalable and innovative SCM software companies. The investors seem generally open to both large and small stake investments, typically aimed at scaling the companies' operations, accelerating product development, and expanding market reach:
 - 10 funds made 86 investments since 2020 (TA Associates: 17, Insight Partners: 14, AKKR:10, Charles Bank: 10, Tiger Global: 9), creating a portfolio of SCI companies
 - KKR & General Atlantic's \$116M paid premium to follow on invest in o9 Solutions (July 2023) at \$3.7B valuation. Its worth noting that KKR also sold Epicor Software Corporation in 2020 at \$4.7B, after improving its performance. Today, Epicor is in talks for another buyout but at a reduced price of \$4B.
 - Bain Capital Ventures led an investment round of \$200M in ShipBob (June 2021) at over \$1B valuation, ShipBob filed to go public in April 2024 at \$4B valuation
 - Thoma Bravo's acquired Coupa Software (Feb 2023) for \$8B, taking the company private
 - Resilinc received a growth investment (undisclosed amount) from Vista Equity Partners (May 5, 2023)
- **Diverse Acquisition Strategies:** The M&A activities show a mix of both horizontal and vertical acquisitions. Companies like Apten and Descartes are not just expanding within their existing service offerings but are also acquiring complementary technologies that allow them to enter new market segments.
 - E2open's acquisition of BluJay Solutions (\$1.7B, 2021) - integrate transportation, global trade, and logistics management under one roof
 - FedEx's \$200M acquisition of ShopRunner (2020) - integrating e-commerce and delivery services
 - Transflo's acquisition of Assured Telematics in May 2023 – a vertical integration by adding end-to-end fleet management capabilities to their portfolio