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BIG IDEA

Future of Finance and Supply Chain Processes

Moving From Transactional Silos to Infinite
Ambient Orchestration



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Produced exclusively for Constellation Research clients

TABLE OF CONTENTS

- Executive Summary 3
- Modern Finance and Supply Chain Processes Remain Mired in Legacy Hell.....4
- Finance and Supply Chain Leaders Must Meet Dual Mandates for Revenue and Growth While Achieving Operational Efficiency9
- Modern Finance and Supply Chain Platforms Will Evolve From Transactional Systems to Autonomous Systems 11
- Infinite Ambient Orchestration Powers All Future Finance and Supply Chain Processes 12
- Start by Unifying Workflows and Orchestrating Finance and Supply Processes at Scale to Achieve Exponential Outcomes 15
- The Bottom Line: Focus on a Maturity Model of Outcomes That Lead to Situational Awareness.... 16
- Analyst Bio..... 18
- About Constellation Research 19



EXECUTIVE SUMMARY

For most organizations, existing systems in finance and supply chain were implemented in the last century. Although very valuable and, in many cases, irreplaceable, these legacy systems hamper an enterprise's ability to adapt to change and deliver new offerings with speed. Leaders face tremendous pressure to both grow the business and achieve operational efficiencies amid tough market conditions. The advent of new technologies in cloud computing, analytics, automation, and artificial intelligence (AI) provides opportunities to move from transactional systems to autonomous systems. This report shows how the drive toward situational awareness will require technologies that unify workflows, facilitate smart orchestration, and improve automation of finance and supply chain processes.

BUSINESS THEMES



New C-Suite



Future of Work



Technology
Optimization

MODERN FINANCE AND SUPPLY CHAIN PROCESSES REMAIN MIRED IN LEGACY HELL

Despite significant improvements in business process efficiency and advanced research on best practices in finance and supply chain processes, numerous legacy forces continue to hamper an organization's success. Constellation's conversations with more than 100 CxOs revealed three megathemes that impact most enterprises: uber forces including inflation and inventory, technical debt that stymies transformation, and outdated legacy systems.

A Confluence of Five Uber Forces Hampers Growth and Transformation

Five uber forces weigh heavily on all leaders across global markets:

1. **Inflation.** The International Monetary Fund (IMF) predicts an average of 8.7% inflation for developing countries and 5.7% inflation for developed nations over the next five years. Inflation has robbed any wage gains achieved during the Great Resignation and continues to impact poor and middle class populations around the world. Much of the blame arises from the cost of energy and the price of the accelerated green transition. Wage inflation continues to rise as the talent wars heat up, with two or even three times as many jobs as available workers.

Pragmatic leaders realize that the timeline for the green transition must be extended to inflict less pain on the populace, despite many idealistic objectives. Ambitious targets for green energy use and emission reduction will be challenged as no longer realistic. Carbon-based transition timelines must be shifted to avoid global poverty and economic downturns. Pragmatic environmental, social, and governance (ESG) approaches that consider total cost will emerge as the norm over the next five years.

2. **Interest rates.** The era of cheap money has ended. Rising interest rates, with the U.S. 10-year treasury note topping 3%, have compounded the effects of inflation and are creating a drag on

economic growth. The unexpectedly strong dollar is creating chaos for world leaders as they accommodate new exchange rates.

The death of modern monetary theory (MMT) is near as nations grapple with rising public debt. A return to rational monetary theory is imminent, and government leaders who continue to overspend will be punished by investors and world banks. We have shifted from a culture of abundance to a self-inflicted culture of scarcity.

- 3. Inventory.** Supply chain and logistic challenges continue to hamper growth in every market. Tight labor markets, coupled with an embattled Chinese domestic market, have left global markets vulnerable and brittle. The impact of COVID-19 lockdowns in China has compounded inflation, especially for reopened economies. Simultaneously, the real estate crisis in China and a move toward business resilience of supply chains are causing global trade to come to a standstill as that country's factories sit idle.

The push by business leaders and governments for deglobalization to ensure both supply chain resilience and national security has had an impact. Expect more efforts to encourage the creation of in-region jobs rather than the massive supply chains of decades past. Such repatriation of manufacturing will hamper inventory at first but will create resilience when fully implemented.

- 4. Infection.** Although the threat from new COVID-19 variants remains low, the costs of infection have taken a toll. With more than six million reported deaths and an estimated 25 million-plus unreported deaths, the impact of the pandemic has been broad and deep. Lockdowns have decreased mortality rates, increased mental health issues, raised suicide rates, impacted the education of a generation, increased the wealth divide, and bankrupted many businesses.

Corporations and organizations will shift to a caring economy as the need to address the welfare of employees rises in priority amid a shortage of workers. The impact on society will run deep and impact reskilling, training, and workforce readiness. In some cases, infection has accelerated not only digitization but also automation.

5. **Invasion.** The Russian invasion of Ukraine has created a refugee crisis in Europe and driven up food prices. Fertilizer production, wheat yields, sunflower oil production, and an energy crunch from Russian oil sanctions have created massive ripple effects. Food security in Africa is threatened, and overall food costs have risen as carbon-based energy prices have tripled, driving up inventory and logistics costs. War is never beneficial for the populace, although it may be beneficial for a few powers that be.

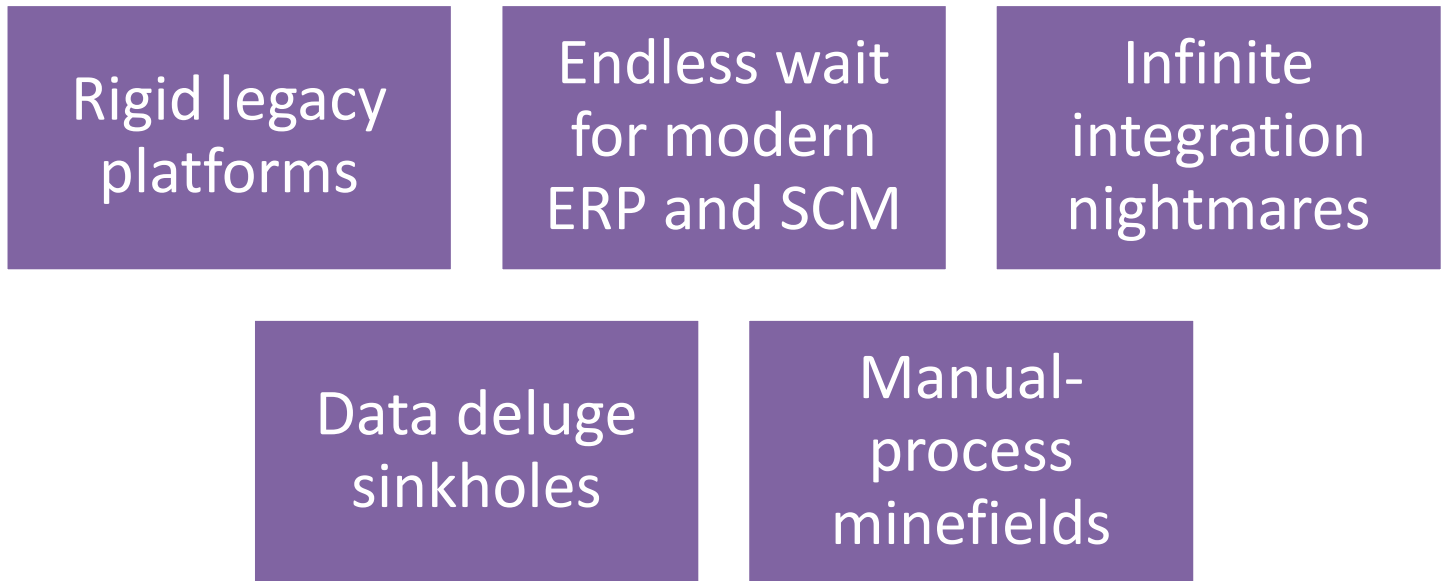
Global leaders must band together with economic, diplomatic, military, political, and cultural strategies to keep bad actors at bay. Preventing an invasion of Taiwan by China, nuclear war on the Korean peninsula, annihilation of Israel by Iran, state-sponsored terror, and Russian expansion will continue as top foreign policy priorities. A rise in defense spending for everything from cybersecurity to physical security will continue, creating a drag on investment in domestic programs.

Technical Debt Creates Quagmires for Business Transformation

Even the most resourceful and well-led organizations eventually hit a brick wall in achieving progress in their transformation initiatives. For organizations with legacy systems and no way out, Constellation's Executive Network members cite five common barriers that need to be overcome (see Figure 1):

1. **Rigid legacy monolithic platforms.** Innovative leaders have extracted data from legacy systems, designed workflows outside of transactional systems, and built orchestration layers for user experience to work around brittle legacy software. These efforts require considerable time and expense to design for change.
2. **Endless wait for modern ERP and SCM upgrades.** Customers have been waiting for their legacy enterprise resource planning (ERP) and supply chain management (SCM) vendors to not only move to the cloud but also to deliver flexible platforms to extend their core functionality. Most vendors of on-premises ERP and SCM systems have spent the past decade moving into the cloud and failing to

Figure 1. Five Common Barriers to Finance and Supply Chain Transformation Success



Source: Constellation Research, Inc.

add much-needed functionality and flexibility in workflows and processes. The lack of support for a digital and AI future is evident in the preference for financial engineering over functionality.

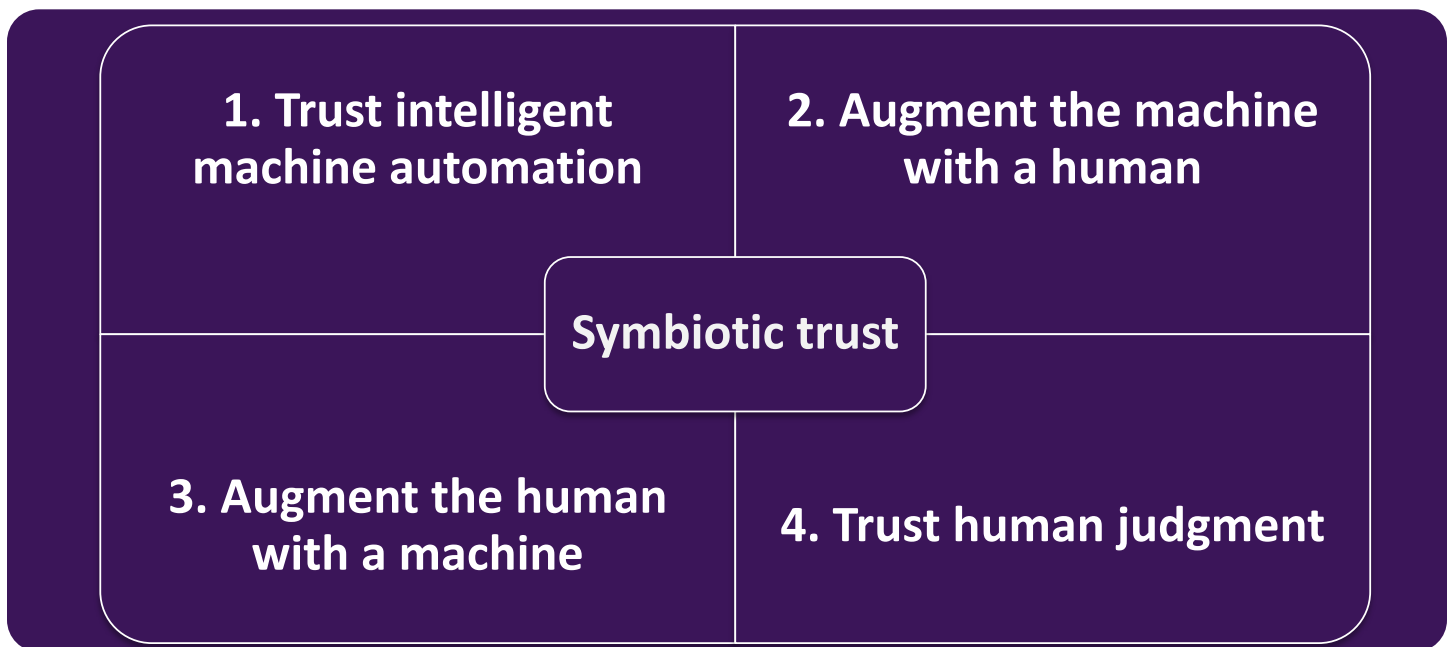
3. **Infinite integration nightmares.** Constellation estimates that the average Global 2000 company must bring at least 47 different systems into the enterprise to address end-to-end processes such as source-to-pay and order-to-cash. Most leaders cannot dedicate the resources to manually manage the updates to 47 systems and the integration points between them.
4. **Data deluge sinkholes.** The digitization of finance and supply chain processes comes with exponentially more datasets to consume, process, analyze, assimilate, and incorporate into existing systems. These systems cannot handle streaming datasets and the requirements for an AI-first business. Moreover, these systems were designed for human scale, not machine scale.
5. **Manual process minefields.** From classics such as swivel chair integration to manual processes across multiple systems, innumerable failure points exist and are exacerbated as complexity increases. The shift to digitization is halted by the sheer lack of automation at scale. Without automation, these systems will fall behind.

Organizations Remain Ill-Prepared for a Future of Business Networks and Marketplaces

Enterprises must prepare for a world interconnected with external business networks and marketplaces, yet today's organizational structures and outdated technology often reflect a more insular and closed world, because legacy systems present the following challenges:

- **Force-fit functional fiefdoms that inhibit unification of people, process, and technology.** Finance and supply chain information often remains in silos, segregated by department and function. Most systems fail to support human-centric end-to-end workflows and processes. Moreover, when these systems support end-to-end processes, they don't account for the creation of new processes or the support of ad hoc processes without expensive customization and configuration.
- **Stifled decision velocity for a world beyond static reporting and analytics.** Legacy finance and supply chain systems focus on transactional integrity instead of engagement, experiences, or relevance. These systems from decades past focus on storing data and limiting how data is shared across organizations in a shift from data to information flows, to insight, and then to action. The burden of moving from data to decision hinders decision velocity.
- **Design for human scale in a world of machine-scale analytics, automation, and AI.** Although a human-centric approach is key to usability, the world must prepare for scenarios where machines will interact with other machines. In almost every process, organizations must determine when they will fully intelligently automate, augment machines with humans, augment humans with machines, or apply human interaction (see Figure 2).

Figure 2. The Four Big Decision Points Every Organization Must Consider for Every Process



Source: Constellation Research, Inc.

FINANCE AND SUPPLY CHAIN LEADERS MUST MEET DUAL MANDATES FOR REVENUE AND GROWTH WHILE ACHIEVING OPERATIONAL EFFICIENCY

Beginning in early 2023, a new era of automation and productivity has emerged via generative AI technologies. The impacts are becoming clear: The need for digital tool adoption, AI skills training, and data privacy has never been greater. CxOs share excitement and optimism about this new frontier but are trying to find a balance between proactive investment and waiting for certainty on the capabilities and trustworthiness of these new tools.

Enterprise Optimism Continues to Rise as Pandemic Fears Fade to the Background

Constellation's 2023 H1 "CxO Business Confidence Survey" measured business, technology, and economic sentiment among senior-level executives as well as the current market conditions for business and technology investment among Constellation's client and membership base. The results identified top business issues that respondents' organizations currently face; the state of

investment in emerging digital technologies; which services, software, and vendors are top of mind for enterprises; and the overall business outlook for the remainder of 2023.

With many technology companies facing significant layoffs and organizational restructuring over the past six months, labor availability and quality remain the leading business issue facing organizations, according to 44% of the respondents. Operational challenges were listed as the next-biggest concern, with 35% of the respondents, and the need for innovation took the third-place spot, cited by 29% of the respondents as an important enterprise concern. Despite the interest rate hikes in the U.S., fears of recession have mostly subsided in North America, the Middle East, and India.

Even with the continued shortage of skilled workers, CxOs remain certain that they will be able to secure the best people for the job in this environment. Respondents ranked their confidence level as 64% for finding the right talent.

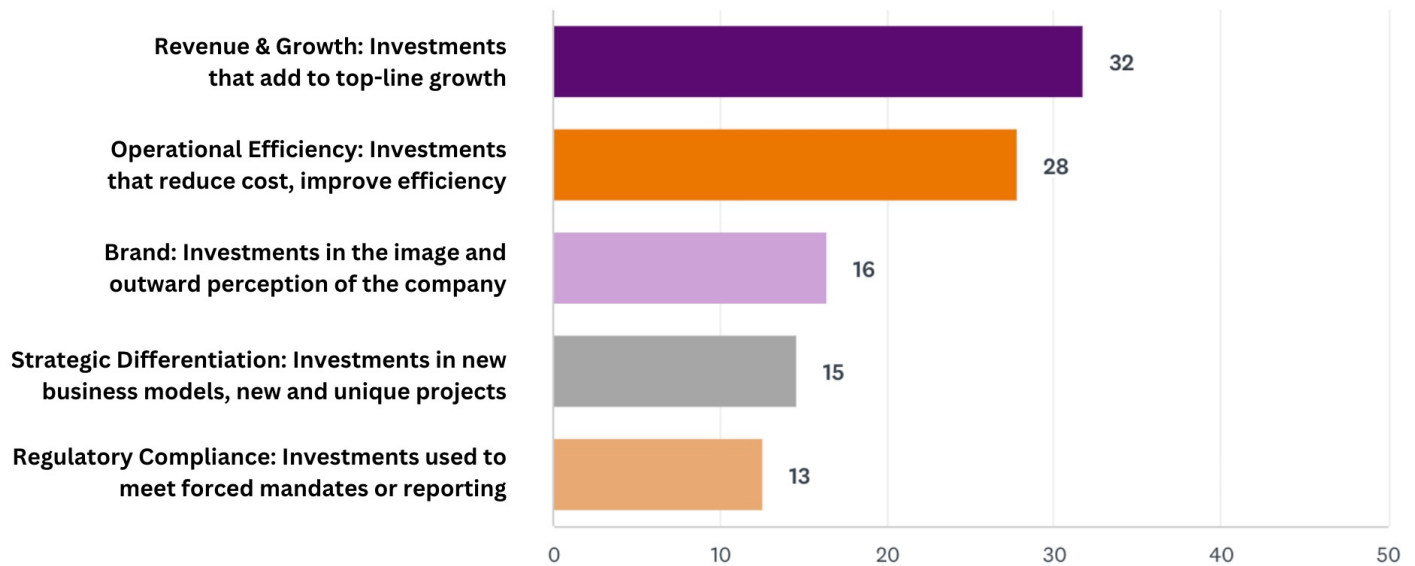
CxO expectations and projections for the future remain positive. More than 50% of the respondents expect to moderately increase the revenue, profits, and hiring for their enterprise over the next six months.

Revenue and Growth Drive Enterprise Budgets, Followed by Operational Challenges

Revenue and growth remain the top priority for CxOs. Enterprises are allocating budgets for revenue operations (RevOps) and chief revenue officers to utilize data and analytics for aligning revenue processes and systems. CxO respondents reported the largest area of technology investment (32%) to be revenue adding to top-line growth (see Figure 3).

Optimizing processes also has never been more important for both efficiency and innovation. The second-highest budget allotment was for operational investments to reduce costs and improve efficiency (see Figure 4). With the surge in automation technologies such as generative AI (e.g., ChatGPT), Constellation expects this investment in operations to only increase.

Figure 3. What Percentage of Your Budget Goes to the Following Areas?



Source: Constellation Research “CxO Business Confidence Survey,” H1 2023

Brand was the third-highest investment as organizations align their objectives with their image.

MODERN FINANCE AND SUPPLY CHAIN PLATFORMS WILL EVOLVE FROM TRANSACTIONAL SYSTEMS TO AUTONOMOUS SYSTEMS

Many of today’s finance and supply chain solutions reflect a transactional system design point. Enterprises cannot extend and expand these systems to meet today’s needs from both a technical and financial point of view. As systems evolve to have both an engagement and experiential systems design point, they gain the ability to use workflow, user experience, and journey orchestration to configure new capabilities and create market-leading differentiation.

Modern systems design for systems of relevance (see Figure 4). These ambient and intention-driven systems solve for massive individual scale and deliver personalized user experiences via contextual relevance. Imagine personalized finance and supply chain processes guided by contextual relevance. Consequently, finance and supply chain business flows such as source-to-pay, order-to-cash, idea-to-market, license-to-operate, and operate-to-retire improve with each interaction.

Figure 4. The Journey From Transactional to Autonomous Requires Infinite Ambient Orchestration

Elements	Transactional systems	Engagement systems	Experiential systems	Mass personalized systems	AI/ cognitive systems
Circa	1950s+	2000+	2005+	2010+	2015+
Design point	Continuous improvement	Sense and respond	Agile and flexible	Intention-driven	Decision-driven
Challenge	Massive computing scale	Massive social scale	Massive contextual scale	Massive individual scale	Massive decision scale
User experience	Computing- based	Interactive	Bionic	Personalized	Natural
Comm. style	Broadcast dictatorial	Conversational	Role-tailored	Sentient	Humanlike
Speed	Just in time	Real-time	Right time	Anticipatory	Space/time continuum
Impact and reach	Departmental/corporate silos	Interconnected	Segmented value chains	P2P networks	Virtual
Info mgmt.	Highly structured	Loosely structured knowledge	Immersive streams	Self-aware embedded knowledge	Continuous learning
Intelligence	Hard-coded	Deterministic business rules	Probabilistic-pattern-based	Predictive	Situational awareness
Examples	Payroll, ERP, CRM	Social and collaboration	Ad networks, gamification	Decision support, VRM	Augmented humanity

Source: Constellation Research, Inc.

On the journey to autonomous systems, existing platforms often are not replaced. In fact, organizations will build on top of these systems and abstract information into new ones. For example, in the airline and travel industry, many mobile apps abstract data from mainframe systems. This mobilizing of the mainframe occurs as designers build experiential systems that pull from a transactional system and an engagement system to craft new experiences. The shift from experiential systems to mass personalization will work in the same manner. Organizations will pull from experiential systems to add a layer of mass personalization on top of journeys. Over time, AI-driven systems will build from the learnings of these mass-personalized systems via machine learning (ML) and neural networks.

INFINITE AMBIENT ORCHESTRATION POWERS ALL FUTURE FINANCE AND SUPPLY CHAIN PROCESSES

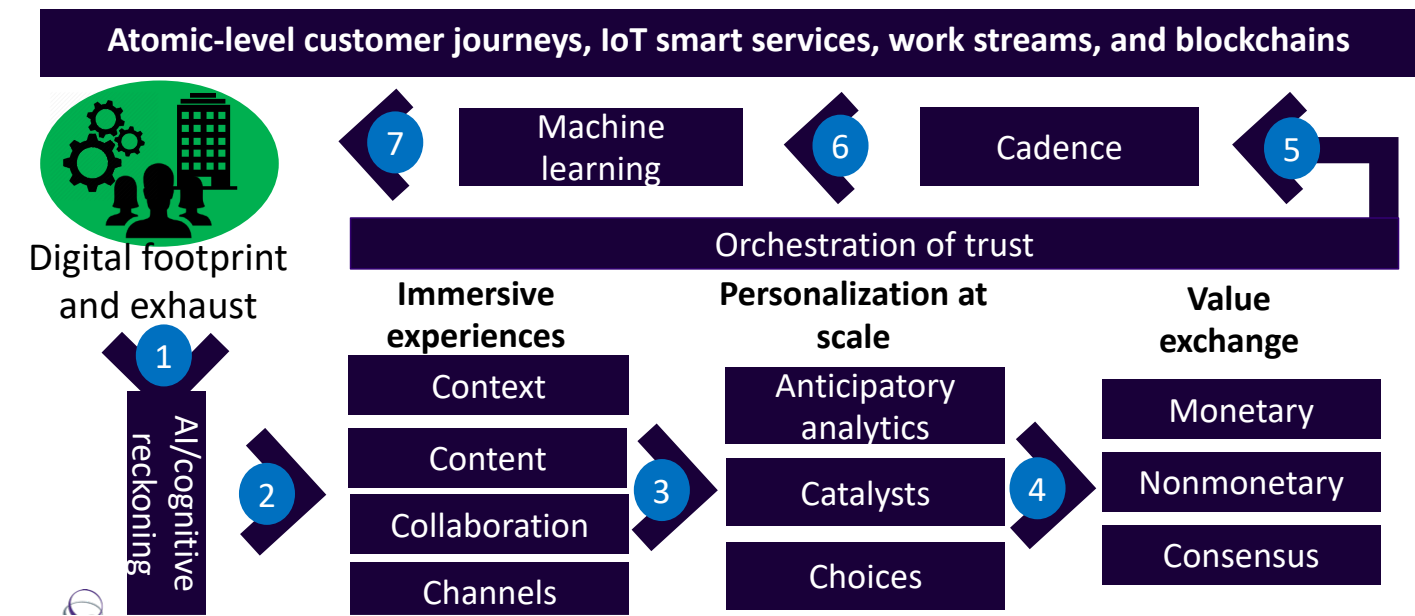
The quest for mass personalization at scale in an era of AI has led to new models of design for the future of applications. One design point for these new AI-driven smart apps is a concept called infinite ambient orchestration. The three components of this concept can be described as:

- **Infinite.** The design point should consider contextually relevant and relative journey design. These journeys have no beginning or end. Journeys deliver both stateful and stateless interactions.
- **Ambient.** Elements of AI provide contextual relevance. These capabilities make right-time recommendations to augment decision-making and, in many cases, power situational awareness.
- **Orchestration.** In an age of access rather than ownership, systems must orchestrate across insight, process, platforms, and ecosystems.

Digital transformation describes a shift in business models and approaches to engagement with customers, prospects, partners, employees, and suppliers. AI-driven smart services provide the backbone behind these business model transformations. Consequently, crafting AI-driven smart services requires a shift in thinking to atomic-driven smart services. These new AI-driven smart services rely on five key components (see Figure 5):

1. **Digital footprints and data exhaust use AI to build anonymous and explicit profiles.** Every individual, device, or network provides some information in the form of metadata or signals. That digital footprint or exhaust can come from facial analysis, a network IP address, or even one's walking gait. Using AI and cognitive reckoning, systems can start to analyze patterns and correlate identity, meaning that AI services will recognize and know individuals, devices, and systems across different contexts and take an intention-driven approach.
2. **Immersive experiences enable ambient delivery.** Context comes from time, location, weather, placement in the journey, sentiment, heart rate, facial expressions, and even gait analysis. Content can be surfaced from any source, including websites, product catalogs, media servers, Internet of Things (IoT) sensors, 5G arrays, and ad networks. Collaboration entails engagement with customers, employees, suppliers, and partners. Channels can come from a website, mixed-reality experience, phone, email, chat, in-person encounter, or mobile device.
3. **Mass personalization at scale delivers contextually relevant intention-driven digital services.** Anticipatory analytics, catalysts, and choices interact to power mass personalization at scale.

Figure 5. The Secret to Designing Atomic AI-Driven Ambient Services



Source: Constellation Research, Inc.

Anticipatory analytics enable customers to “skate where the puck will be.” Catalysts provide offers or triggers for response. Choices enable customers to make their own decisions. Each individual or machine will have its own experience in context, depending on identity, historical preferences, and needs at the time.

From choose-your-own-adventure journeys and context-driven offers to multivariate testing on available choices, AI systems offer statistically driven choices to incite action. With no real beginning or ending, these systems can be expected to work like a *Choose Your Own Adventure* book. Funnels fall aside as customers, partners, employees, and vendors jump in across processes, make their own decisions, and craft their own experiences on their own terms. Journey maps must account for infinite journeys and support customer-centric points of view.

4. **Value exchange completes the orchestration of trust.** Once an action occurs, value exchange cements the transaction. Monetary, nonmonetary, and consensus are three common forms of value exchange. Although monetary value exchange might be the most obvious, nonmonetary value exchange (including recognition, access, and influence) often provides a compelling form of value.

Meanwhile, a simple consensus or agreement can also deliver value exchange—for instance, on the veracity of a land title or the terms of a patient treatment protocol.

5. **Cadence identifies patterns.** Powered by ML and other AI tools, smart services consider the cadence of delivery: one-time, ad hoc, repetitive, subscription-based, or threshold-driven. Some interactions are truly random, ad hoc, or one-time affairs. Other interactions are not only repeatable but also predictable. In other cases, actions are dependent on other actions and certain steps create triggers and responses. Understanding cadence improves understanding of the business graph.
6. **AI/ML-powered feedback loops complete the learning cycle.** Via ML techniques, the system studies how smart services are delivered and applies this information to future interactions. This feedback loop enables ambient experiences to adapt and adjust as needed. Business graphs understand the interaction of a customer, employee, supplier, or partner with a request, invoice, order, or interaction.
7. **Ambient experiences are delivered and create digital feedback and exhaust.** By examining the context of those interactions, AI and ML enable the creation of a business graph and help the system get smarter over time so that ambient experiences can be served up to customers.

START BY UNIFYING WORKFLOWS AND ORCHESTRATING FINANCE AND SUPPLY PROCESSES AT SCALE TO ACHIEVE EXPONENTIAL OUTCOMES

Constellation recommends that organizations begin with the following steps:

- **Apply packaged workflows for standardization and differentiation.** Modify industry best practices and configure to the organization's needs. Determine when the organization will benefit from standardization and regulatory compliance and when the organization can monetize a differentiated approach. Focus on optimizing internal workflows while identifying external opportunities in areas

such as accounts payable operations, accounts receivable operations, sourcing and procurement operations, supplier lifecycle operations, and contract management.

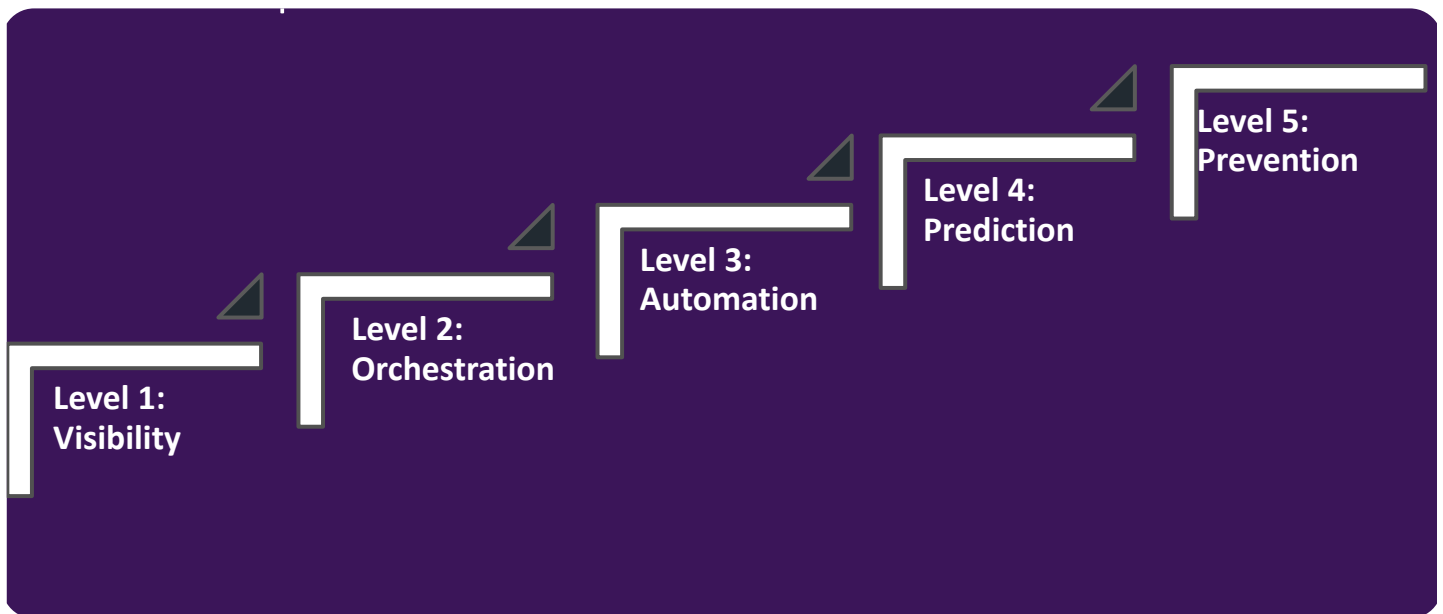
- **Begin low-code/no-code abstraction layers.** Simplify the ability to build last-mile workflows, integration, and user experience with out-of-the-box low-code/no-code development. Determine how stakeholders interact with their objects such as purchase orders (POs), assets, and inventory and what level of stakeholder personalization to achieve.
- **Consider how to modernize around existing ERP cores.** Understand that ERP and supply chain software development will lag behind that of other innovative software platforms. Design a plan to surround these legacy technologies and extract the key information needed to build on top of legacy systems and advance into a modern age.
- **Develop reusable and flexible integration frameworks.** Focus on repeatability, reliability, and reusability. Data, process, and user experience integration requires a strong command of how to orchestrate outcomes. Where possible, leverage existing integration platforms to mitigate risk.
- **Evaluate opportunities for automation and AI.** Every finance and supply chain process should be scrutinized for automation opportunities. Further, every process should take into consideration what data is collected and how AI can improve decision-making. Reevaluate opportunities to bring packaged and low-code capabilities into critical business processes such as source-to-pay, idea-to-market, order-to-cash, license-to-operate, and operate-to-retire.

THE BOTTOM LINE: FOCUS ON A MATURITY MODEL OF OUTCOMES THAT LEAD TO SITUATIONAL AWARENESS

The future of finance and supply chain processes can be realized with foundational goals. Although situational awareness is the ultimate outcome, leaders can focus on improving in areas that will build a foundation for the future. Given the business outcomes to be gained, Constellation Research suggests that leaders focus on the following five areas (see Figure 6):

- **Visibility.** Organizations gain a single-pane-of-glass view into finance and supply chain processes.
- **Orchestration.** Systems can centrally orchestrate both internal and external processes.
- **Automation.** The solution can intelligently route workflows and requests based on discrete conditions.
- **Prediction.** Using learnings from historical transactions in the business graph, the offering can model future scenarios for consideration.
- **Prevention.** Gaining sentience, the software builds scenarios in the business graph that rank risk versus reward to mitigate risk.

Figure 6. The Road to Situational Awareness



Source: Constellation Research, Inc.

ANALYST BIO

R “Ray” Wang

Founder and Principal Analyst

R “Ray” Wang is founder, chairman, and principal analyst of Constellation Research Inc. and the author of the popular enterprise software blog A Software Insider’s Point of View. He previously was a founding partner and research analyst for enterprise strategy at Altimeter Group.

A background in emerging business and technology trends, enterprise apps strategy, technology selection, and contract negotiations enables Wang to provide clients and readers with the bridge between business leadership and technology adoption. Wang has been recognized by the prestigious Institute of Industry Analyst Relations (IIAR) as Analyst of the Year, and in 2009 he was recognized as one of the most important analysts for enterprise, SMB, and software. In 2010 Wang was recognized on the ARInsights Power 100 List of Industry Analysts and named one of the top influential leaders in the CRM Magazine Market Awards.

Wang graduated from Johns Hopkins University with a B.A. in natural sciences and public health. His graduate training includes a master’s degree from Johns Hopkins University in health policy and management and health finance and management.

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Organizational Highlights

- Named Institute of Industry Analyst Relations (IIAR) New Analyst Firm of the Year in 2011 and #1 Independent Analyst Firm for 2014 and 2015.
- Experienced research team with an average of 25 years of practitioner, management, and industry experience.
- Organizers of the Constellation Connected Enterprise—an innovation summit and best practices knowledge-sharing retreat for business leaders.
- Founders of Constellation Executive Network, a membership organization for digital leaders seeking to learn from market leaders and fast followers.

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