## Constellation™
RESEARCH

OFFERING OVERVIEW

# Infosys Live Enterprise Delivers on the Autonomous Enterprise Vision

## Level 4 Autonomous Enterprise Capabilities Delivered in the Digital Platform

R "Ray" Wang
**Principal Analyst and Founder**

Copy Editor: Jim Donahue
Layout Editor: Elle Froze

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# EXECUTIVE SUMMARY

This Offering Overview examines the Infosys Live Enterprise Suite. The report describes the underlying market trends, introduces the vendor and presents key differentiators for the Infosys offering. The report outlines issues important to cognitive applications and positions the offering within the context of Constellation Research's vision of the five levels of autonomous enterprises. It includes an analysis of the offering's functional capabilities and target use cases. Technology buyers should use this report to evaluate the Infosys Live Enterprise Suite for implementation.

## Business Themes

| | | | |
|---|---|---|---|
| New C-Suite | Digital Marketing & Sales Effectiveness | Matrix Commerce | Technology Optimization |
| Data to Decisions | Future of Work | Next-Generation Customer Experience | Digital Safety and Privacy |

# ABOUT INFOSYS LIVE ENTERPRISE

## Overview

The global IT services giant Infosys, based out of Bengaluru, India, delivers cognitive apps through its flagship Live Enterprise Suite. The suite delivers a continuously evolving, learning and innovative software platform for business. Principles of Live Enterprise include reimagining experiences, reimagining business processes, assimilating artificial intelligence (AI), building a digital infrastructure, building a smart workplace, nurturing a smart workforce, enabling fluid operating models and driving organizational change.

The Infosys Live Enterprise Suite builds on six layers: interact, process, serve, intelligence, system of record and shared digital infrastructure. Many cognitive app components include sentient process, the Infosys Microservices Acceleration (MSA) platform, Infosys Digital Brain Solution, Infosys Knowledge Graph, Conversational AI and Text and Video Analytics. The many cognitive services include Infosys Knowledge Graph, Digital Brain Solution, AI services (for example, vision, text, speech, analytics), polycloud platform (which allows for all cloud deployment models) and Experience Configurator.

Early adopters are turning to the Infosys Live Enterprise Suite for continuously curating organizational knowledge and intelligence, delivering better visibility and insights by mapping information across organizational silos, and using the Knowledge Graph to deliver new contextual insights to users. Hyperpersonalized and cognitive user experiences can capture behavior and workforce sentiment using the Experience Configurator.

## Market Segment

Cognitive applications run mission-critical business systems in a continuous, self-driving, self-learning, auto-compliant, self-securing and self-healing approach. These AI-driven systems intelligently automate transactional systems and processes such as campaign to lead, order to cash, procure to

### Company Overview

- **Company:** Infosys
- **Headquarters:** Bengaluru, Karnataka, India
- **Founded:** July 1981
- **Type:** Public Health
- **2020 Revenue:** US$12.7 billion
- **No. of Employees:** 243,454
- **Website:** www.infosys.com
- **Twitter:** @infosys

pay, incident to resolution, concept to market and hire to retire. The goal of an autonomous enterprise is to continuously automate precision decisions at scale.

A convergence of solutions from robotic process automation, process mining, business process management (BPM), intelligent workflow, journey orchestration and microservices management attempt to address the growing need to automate and apply AI to enterprisewide capabilities. However, a new class of best-of-breed applications has emerged to address the market deficit. Constellation predicts that the total market for this autonomous enterprise market, including cognitive applications, will reach $10.35 billion by 2030.

Constellation sees the following trends emerging as enterprises approach cognitive automation:

- **Apply a design thinking approach to your future state.** Early adopters invest in upfront planning sessions. Sessions address the business goals through the lens of each stakeholder. Leaders take time to redesign outcomes and experiences with the goal of identifying new efficiencies or opportunities to improve quality of service. Future states are created imagining a spectrum of automation.

- **Take lessons learned from business process outsourcing (BPO).** Solicit input from existing BPO providers for opportunities to optimize manual processes. Engage BPO operations to design future state processes with automation in mind. Map and instrument existing BPO capabilities to software-driven approaches.

- **Design for infinite ambient orchestration.** Enable headless intention-driven microservices in an event-driven architecture. Provide data sources to support contextual decisions to support next best action. Orchestrate across data, processes, systems and networks.

- **Identify areas for human-machine interaction.** Improving precision decisions in the cognitive app will require pairing with humans to understand why exceptions are made and what nuances may be factored in decisions. Conversely, humans will want to understand how the cognitive app provides contextual decisions and identify any

potential errors. This paired training is key to long-term trust of the cognitive app and preserves human intuition.

- **Build for a future of data-driven digital networks.** Cognitive apps will be connected to larger data-driven digital networks to further improve precision. These data-driven digital networks will power the world's decision engines. As these systems ingest external data sources, self-securing and self-healing capabilities gain in importance in order to preserve the integrity of the existing system.

## FUNCTIONAL CAPABILITIES

The Infosys Digital Platform powers the Live Enterprise offering. The underlying concepts of Live Enterprise reflect a data-driven digital network approach. As interactions are captured into the Infosys Knowledge Graph, the platform enables all stakeholders of the network to interact and learn with each engagement, improving the ability to surface a next best action and build sentience over time.

Infosys believes the company can create a system that has the characteristics of a sentient organization—able to feel, think, act, learn and question. The more interactions, the faster the system exhibits the ability to learn and to protect the privacy of each stakeholder based on local norms, global regulations and mandated requirements. The more data and engagement, the more precise the system becomes.

Six distinct layers define the Infosys Live Enterprise architecture (see Figure 1).

### 1. Shared Layer Supports Common Converged Compute

The shared layer brings together compute and storage workloads across multicloud and hybrid cloud infrastructure. Key components include a polycloud orchestrator, governance and management, security and assurance, and workload migrator. Common converged compute capability brings together both the legacy and modern systems.

## Figure 1. The Six Layers of the Live Enterprise Suite
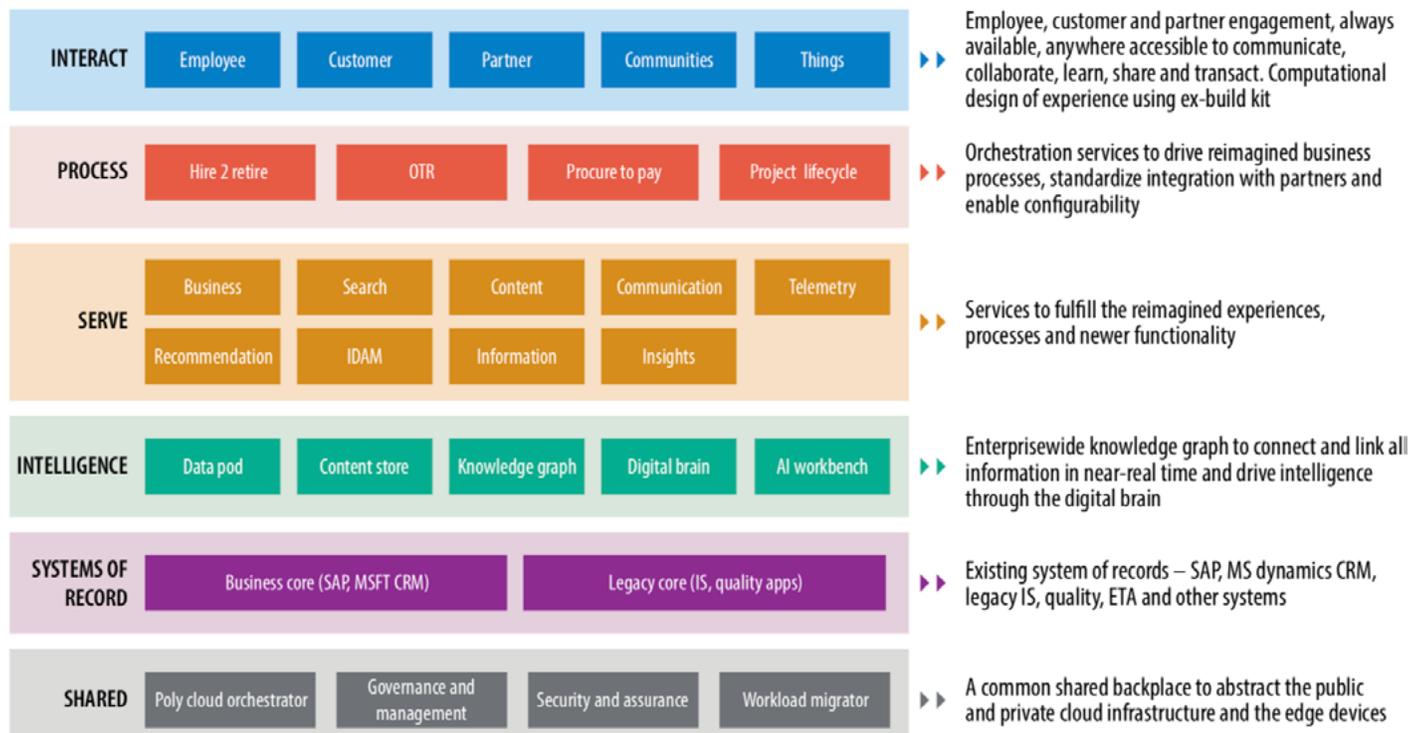


**Source:** Infosys

## 2. Systems of Record Deliver Data and Process Backbone

Transactional applications provide the core data and processes in most enterprises. These systems of record must be modernized or integrated to support the digital platform. Modernization may require refactoring legacy applications or updates of existing systems. In some cases, this requires the exposure of APIs and microservices.

## 3. Intelligence Employs an Enterprise Knowledge Graph to Power the Digital Brain

Data pods, content store, knowledge graph, digital brain and AI workbench make up the five components of the intelligence layer. Intelligence maps complex interactions among stakeholders, devices, networks and other systems. By capturing the aggregate behavior, the Live Enterprise provides reporting, analytics, insights and, ultimately, a level of sentience.

## 4. Serve Layer Applies Intention-Driven Microservices for Contextually Relevant Personalization

Newer capabilities are created as event-driven services that enable new processes, interactions and experiences. Live Enterprise's core services include business, content, communication, identity and access management, information, insights, recommendation, search and telemetry. These services enable context-relevant, intention-driven services that allow for mass personalization at scale.

## 5. Process Enables Orchestration

The Live Enterprise Suite brings the capabilities of journey orchestration, process management, integration and automation across key business processes. Customers can expect future road-map support for processes such as campaign to lead, order to cash, procure to pay, hire to retire and concept to commercialization. This layer delivers on Constellation's concept of infinite ambient orchestration.

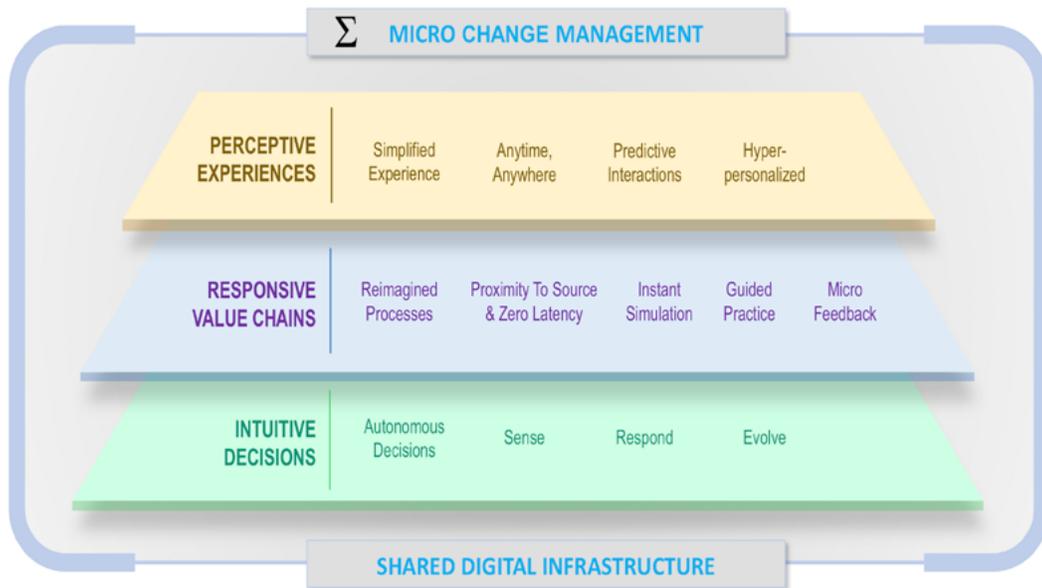## 6. Interact Brings Stakeholders and Channels Together

Stakeholders such as customers, employees, suppliers and partners will interact across all channels, including in-person, mobile, web, devices and networks. Future ambient experience technology will unify all channels into an immersive and seamless digital feedback loop. These digital feedback loops bring all the upstream data together and then distribute insights and analysis downstream. The Experience Configurator helps define and deliver a highly personalized experience too.

## USE CASES

### Application Use Cases

Infosys has several internal uses cases that show how it powers live experiences (see Figure 2). These use cases highlight a road to sentience, the ability for systems to have self-awareness.

**Figure 2. Three Key Capabilities Power Live Experiences**

## 1. Perspective Experiences

Applying the Live Enterprise approach to an internal project, Infosys was able to consolidate and reduce more than 100 employee apps to three mobile apps. These applications supported more than 200,000 employees for learning, more than 170,000 employees for productivity and more than 30,000 employees for onboarding. The result was an average of 35 minutes spent on additional learning and training. In addition, more than 45% of services were available anytime and anywhere. The result was the delivery of intelligent, hyperpersonalized and simplified experiences.

## 2. Responsive Value Chains

By emphasizing proximity-to-source and zero latency, the Infosys team reimagined processes that reduced IT project setup times by 1,200%. Process redesign and design thinking approaches eliminated over 1.2 million paper documents per year, improving sustainability. For onboarding processes and checks, the team achieved 40% shorter cycle times and a 50% reduction in effort. This resulted in the freeing up of 2,100-person-month capacity for billable hours.

## 3. Intuitive Decisions

On the path to autonomous enterprises, the Infosys team was able to create improved personalized learning programs. Live Enterprise delivered automated skill and project demand matches. This led to customized and personalized learning programs for employees for the supply side. On the demand side, Live Enterprise sensed client intent and demand to service new sales opportunities.

## Customer Use Cases

The following customer use cases reflect the potential scenarios for Live Enterprise:

## 1. Delivering Personalized Learning

At a large German global engineering company, Infosys worked with the organization to deliver a personalized learning and enterprise performance management approach using the Wingspan platform. The platform uses a knowledge graph to connect learners with skill information, and the recommendation engine uses this information to create a personalized learning path for each user. The recommendation engine also helps identify adjacent skills and courses that could be taken up by users to broaden their horizons. In addition, AI services such as a transcription API are used to make the content more accessible.

## 2. Applying the Graph and Digital Brain

For a global U.S.-based retailer, Live Enterprise applied the graph and digital brain capabilities to identify 10 to 12 reason codes across 54 distribution centers for over 1.2 million SKUs that incurred $585 million in lost sales. At another global consumer packaged goods concern, Live Enterprise delivered end-to-end traceability to meet regulatory requirements. The project delivered long-term brand security and compliance.

## 3. Running Management Operations

A U.S.-based healthcare provider was able to gain improved visibility. This visibility gave the organization a view into eight critical business processes. By identifying potential time-saving patterns, Live Enterprise improved claim reviewer productivity through business impact visibility and auto-healing. The entity can now process 250,000 claims per day.

## PRICING

The Live Enterprise Suite has a combination of software-as-a-service (SaaS) platforms (Wingspan and Experience Configurator) that are made available on a subscription basis. The pricing models are user-based enterprise licenses, depending on the customer need.

The other assets are available as intellectual property (IP) for which the clients are charged an IP licensing fee.

Support for these are covered as part of the SaaS/IP license.

## ANALYSIS AND OBSERVATIONS

Enterprises seeking cognitive applications face significant challenges in identifying a solution within their existing transactional systems for automation. Whether the topic is enterprise resource planning, customer relationship management or supply chain management, most buyers must make a strategic decision to augment existing transactional systems with a best-of-breed cognitive app solution. Why? Most existing transactional solution vendors haven't made the required investment to enable self-driving apps.

Constellation sees the following capabilities as part of the future of "cognitive apps":

- **Baseline ingestion at scale**
- **Model creation**
- **Skills and model workbenches**

- Algorithmic libraries
- Machine learning libraries
- Neural nets
- Journey orchestration
- Human-machine training models
- Next best action, contextual recommendations
- AI ethics frameworks
- Business context

## Strengths

Key strengths of the Live Enterprise Suite (see Figure 3) include:

- **Provides a go-forward modernization strategy.** Organizations seeking a blueprint to reduce technical debt, develop a go-forward strategy and modernize will find a logical and pragmatic approach.

- **Defines a modern event-driven microservices architecture.** The six components to the Infosys platform provide the most modern approach to delivering building blocks for automation, intelligence and sentience.

- **Designed for flywheel effects in machine learning and AI.** Incorporation of digital feedback loops delivers essential elements that support reinforcement learning, contextual relevancy and future neural networks.

- **Delivers on an autonomous enterprise vision.** The Live Enterprise approach aligns with Constellation's vision of the five levels of autonomous enterprises. The current approach achieves a Level 4 designation.

## Weaknesses

Weaknesses of the Live Enterprise Suite include:

- **Users need to invest for both short-term and long-term gain.** Prospects and clients must make a significant investment in time and resources to achieve the vision. Many prospects and clients seek prescriptive advice and a piecemeal approach.

- **Autonomous capabilities still require significant user training.** Full sentience, as in any cognitive application and platform, will require significant human-machine training. Most customers will need to create generative adversarial networks (GANs)—a method to create data in order to improve precision in training models—to make up for the lack of data.

### Figure 3. Infosys Live Enterprise Suite's Strengths and Weaknesses

| STRENGTHS | WEAKNESSES |
|---|---|
| · Provides a go-forward modernization strategy.<br>· Defines a modern event-driven microservices architecture.<br>· Designed for flywheel effects in machine learning and AI.<br>· Delivers on an autonomous enterprise vision. | · Users need to invest for both short- and long-term gain.<br>· Autonomous capabilities still require significant user training. |

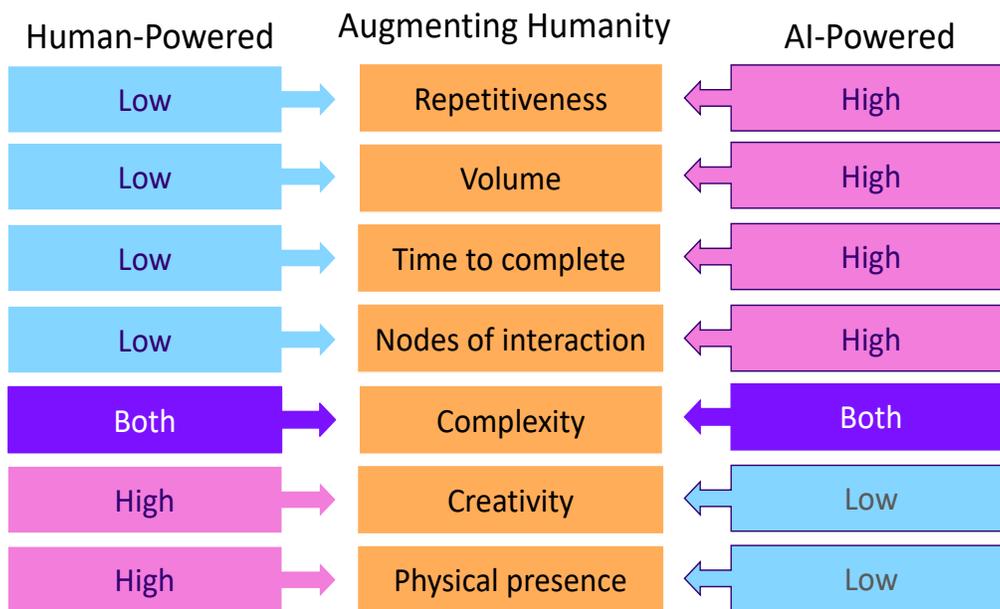**Source:** Constellation Research

# RECOMMENDATIONS

Early adopters prioritize business processes using the Constellation business hierarchy of needs. Align candidates to the five categories of regulatory compliance, operational efficiency, revenue growth, strategic differentiation and brand. Keep in mind that AI enablement requires a strong data strategy, deep data governance, mature business process optimization and a data-driven design point.

## Know When to Automate

Seven factors play a significant role in identifying which AI-driven smart services deliver the greatest opportunities (see Figure 4). Constellation sees the following:

1.  **Repetitiveness.** The greater the frequency that a process is repeated, the more likely the process should be AI-powered. One-offs and custom processes with minimal repetition are lower-priority candidates for AI.

## Figure 4. Candidates for AI-Driven Automation

| Human-Powered | Augmenting Humanity | AI-Powered |
|---|---|---|
| Low | Repetitiveness | High |
| Low | Volume | High |
| Low | Time to complete | High |
| Low | Nodes of interaction | High |
| Both | Complexity | Both |
| High | Creativity | Low |
| High | Physical presence | Low |

**Source:** Constellation Research

2. **Volume.** When the volume of transactions and interactions exceed human capacity, the smart service should be AI-powered. Volumes within human capacity will remain human-powered.

3. **Time to complete.** High time-to-market requirements favor AI-powered approaches. Lower time-to-completion requirements will remain human-powered.

4. **Nodes of interaction.** Simple interaction nodes will lean toward the human-powered option. AI serves best in complex and high-volume nodes of interaction.

5. **Complexity.** Good candidates for AI-powered uses include simple tasks that can be optimized by AI as well as ones exhibiting complexity beyond human comprehension.

6. **Creativity.** Today, the cognitive processes required for creativity mostly reside with humans, while higher creative powers are less likely to be AI-powered. However, with advancements in cognitive learning, one can expect creativity to improve with AI-powered approaches over the next decade.

7. **Physical presence.** Processes that require a heavy physical presence will most likely require human-powered capabilities. However, processes that put lives in jeopardy serve as great candidates for automated, AI-powered options. In general, low physical presence requirements play well to AI-powered approaches.

## Start with the Orchestration of Trust in Designing AI-Driven Smart Services for the Autonomous Enterprise

Crafting AI-driven smart services requires a shift in thinking to atomic-level smart services (see Figure 5). These new AI-driven smart services rely on these key components:

- **The applications of data exhaust and digital footprints use AI to build anonymous and explicit profiles.** Every individual, device or network provides some information. That digital footprint or data exhaust could 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. This means that AI services will recognize and know individuals across different contexts.

## Figure 5. Orchestration of Trust—Inside AI-Driven Smart Services
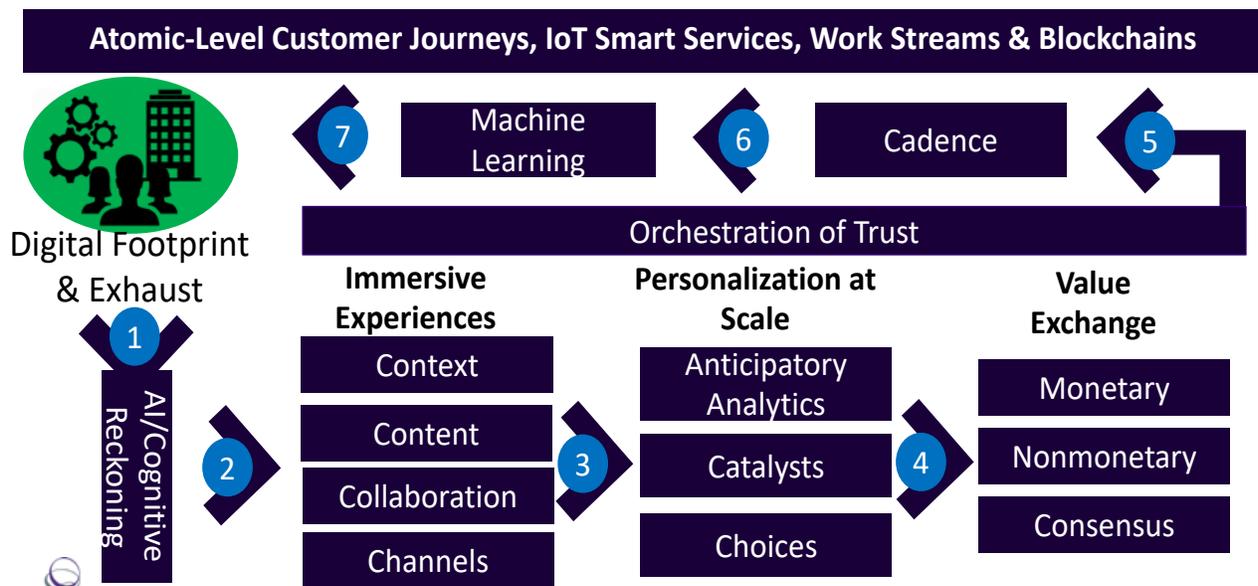


**Source:** Constellation Research

- **Immersive experiences enable a natural interaction.** Context, content, collaboration and channels come together to all AI-driven services to deliver immersive and unique experiences to each individual. The services will use context attributes such as geospatial location, time of day, weather, heart rate and even sentiment—combined with what the service knows of our identity and preferences—to improve relevance and deliver the appropriate content. Sense-and-respond mechanisms will enable collaboration among participants and machines through conversations and text dialogues. Channels include all interaction points, such as mobile, social media, kiosks and in-person. The goal is the creation of natural user experiences based on identity.

- **Mass personalization at scale delivers digital services.** Anticipatory analytics, catalysts and choices interact to power mass personalization at scale. Anticipatory analytics allow customers to "skate where the puck will be." Catalysts provide offers or triggers for response. Choices allow customers to make their own decisions. Each individual or machine will have their own experience in contexts depending on identity, historical preferences and needs at the time. From choose-your-own-

adventure journeys, context-driven offers and multivariable testing on available choices, the AI systems offer statistically driven choices to incite action.

- **Value exchange completes the orchestration of trust.** Once an action is taken, value exchange cements the transaction. Monetary, nonmonetary and consensus are three common forms of value exchange. While 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 on the veracity of, for example, a land title or agreement on a patient treatment protocol.

- **Cadence and feedback continue an AI-powered learning cycle.** Powered by ML and other AI tools, smart services consider the cadence of delivery, whether it is one time, ad hoc, repetitive, subscription-based or threshold-driven. Using ML feedback techniques, the system studies how the smart services are delivered and applies this to future interactions.

- **Machine learning delivers digital feedback loops and enable the autonomous enterprise.** The system learns from every transaction to understand how to improve the machine learning model. Paired with GANs, these neural networks start the self-learning process to reduce false positives and false negatives. As the systems improve, precision decisions take on autonomous characteristics such as found in continuous, auto-compliant, self-healing, autonomous and data-driven networks.

# RELATED RESEARCH

R "Ray" Wang, "Demystifying Artificial Intelligence," *Constellation Research, November 16, 2017.* https://www.constellationr.com/research/demystifying-artificial-intelligence

R "Ray" Wang, "Cognitive Apps Help Drive the Future of Autonomous Enterprises," *Constellation Research, March 31, 2020.* https://www.constellationr.com/research/cognitive-apps-help-drive-future-autonomous-enterprises

# 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 the 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 100 Market Awards.

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

🐦 **@rwang0**   💻 **constellationr.com/users/r-ray-wang**   in **linkedin.com/in/rwang0**

# ABOUT CONSTELLATION RESEARCH

Constellation Research is an award-winning, Silicon Valley-based research and advisory firm that helps organizations navigate the challenges of digital disruption through business models transformation and the judicious application of disruptive technologies. Unlike the legacy analyst firms, Constellation Research is disrupting how research is accessed, what topics are covered and how clients can partner with a research firm to achieve success. Over 350 clients have joined from an ecosystem of buyers, partners, solution providers, C-suite, boards of directors and vendor clients. Our mission is to identify, validate and share insights with our clients.

## 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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ℹ **info@ConstellationR.com**                             ❓ **sales@ConstellationR.com**

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