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# 100 Data and Analytics Predictions Through 2024

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The background of the slide features a stylized financial chart. It includes a candlestick chart with red and green bars, overlaid with a blue line graph and a green moving average line. The chart is set against a dark blue background with a light blue grid.

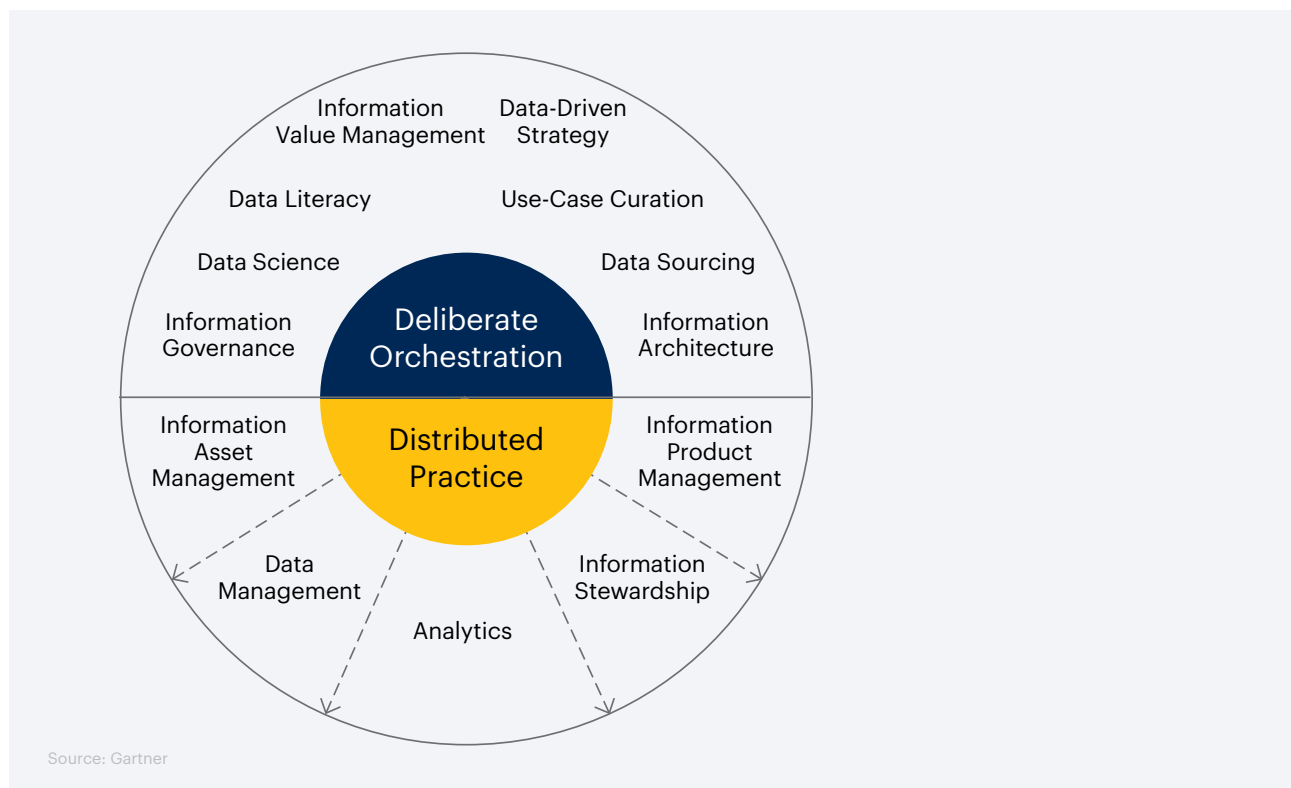
Gartner's annual predictions disclose the varied importance of data and analytics across an ever-widening range of business and IT initiatives. Data and analytics leaders must consider these strategic planning assumptions for enhancing their vision and plans.

# Analysis

The digital business future provides organizations with nearly unlimited possibilities to create business value. Increasingly, data and analytics has become a primary driver of business strategy and the potential for data-driven business strategies and information products is greater than ever. It is a part of everything that organizations do. Yet, for many, the ability to “think in data” is still difficult.

This transition to data-driven business requires data and analytics leaders, such as chief data officers (CDOs), CEOs and CIOs to elevate data and analytics strategies, advancing a new vision of business problem solving. It also profoundly impacts the work of a data and analytics organization and the enterprise competencies that must be built. It potentially changes the management ethos of the organization, such as the role of the centralized function (see Figure 1).

**Figure 1. Types of work in a data-driven organization**



As evidenced by its pervasiveness within Gartner's published Predicts 2020 research, data and analytics are increasingly critical elements across nearly all industries, business functions and IT disciplines in both the private and public sector. Most significantly, data and analytics are key to a successful digital business. This collection of more than 100 data-and-analytics-related strategic planning assumptions (SPAs) through 2024 summarizes predictions released in early 2020. Data and analytics leaders should include these in their planning for successful strategies.

# Research Highlights

## Core Data and Analytics Predictions

### Data and Analytics Strategy and Innovation

As domain data and analytics strategies mature, visible returns on data and analytics investments become more critical. However, to influence enterprise-level strategy for global impact, data and analytics leaders must adopt disciplines and technologies that optimize costs, solve data challenges and drive business value.

#### **“Predicts 2020: Data and Analytics Strategies — Invest, Influence and Impact”**

- By 2021, organizations that provision an augmented data catalog to data consumers will realize three times faster ROI from their data and analytics investments.
- By 2022, 70% of organizations will rigorously track data quality levels via metrics, increasing data quality by 60% to significantly reduce operational risks and costs.
- By 2023, 30% of organizations will exceed data and analytics ROI by governing the least amount of data that matters most to their strategic goals.
- By 2023, organizations using blockchain smart contracts will increase overall data quality by 50% but reduce data availability by 30%; conversely creating positive data and analytics ROI.
- By 2023, graph technologies will facilitate rapid contextualization for decision making in 30% of organizations worldwide.

### Advanced Analytics and Data Science

Over the next five years, the way analysis is produced, managed and delivered will change. Data and analytics leaders must ensure that an integrated governance program covers self-service, IoT and decentralized analytics programs.

#### **“Predicts 2020: Analytics and Business Intelligence Strategy”**

- By 2022, augmented analytics technology will be ubiquitous, but only 10% of analysts will use its full potential.

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#### **“Predicts 2020: Analytics and Business Intelligence Strategy” (continued)**

- By 2022, 40% of machine learning model development and scoring will be done in products that do not have machine learning as their primary goal.
- By 2023, 90% of the world's top 500 companies will have converged analytics governance into broader data and analytics governance initiatives.
- By 2025, 80% of consumer or industrial products containing electronics will perform analysis on the device.

### **Artificial Intelligence**

Most enterprises struggle to develop AI pilots into production, limiting their ability to realize AI's potential business value. IT leaders responsible for AI must nurture infrastructure strategies that enable the evolution of AI pilots into scalable production and, importantly, value realization.

#### **“Predicts 2020: Artificial Intelligence Core Technologies”**

- By 2022, containers will become integral to 85% of enterprise AI pipelines.
- By 2023, cloud-based AI will increase 5x from 2019, making AI one of the top cloud services.
- By 2023, more than 50% of all data analysis by deep neural networks (DNNs) will be at the point of capture in an edge system, which is a significant increase from less than 5% in 2019.

While many organizations have experimented with AI proofs of concept (POC), there are still major blockers to operationalizing its development. IT leaders must strive to move beyond the POC to ensure that more projects get to production and that they do so at scale to deliver business value.

#### **“Predicts 2020: Artificial Intelligence — the Road to Production”**

- Through 2021, 80% of line of business (LOB) leaders will override business decisions made by AI.
- By 2022, the number of application development engineers building machine learning (ML) models using automated ML (autoML) services will increase from 1% to 25%, reducing the need for data scientists.
- Through 2023, the ML engineer will be the fastest growing role in the AI/ML space, with open positions for ML engineers half (50%) that of data scientists, up from less than 10% in 2019.
- By 2023, 85% of AI solutions by vendors will focus on concrete domains and industry verticals.

### **“Predicts 2020: Artificial Intelligence — the Road to Production” (continued)**

- By 2024, companies using graphs and semantic approaches for natural language technology (NLT) projects will have 75% less AI technical debt than those that don't.

AI is transforming how we work and learn, what work we do and the ways we access employment. Application leaders focused on innovation and AI are now accountable for improving worker experience, developing worker skills and building organizational competency in responsible AI.

### **“Predicts 2020: AI and the Future of Work”**

- By 2023, the number of people with disabilities employed will triple due to AI and emerging technologies reducing barriers to access.
- 69% of what a manager currently does will be automated by 2024, requiring a complete overhaul of the role of the manager.
- By 2025, 47% of learning and development budgets will be wasted as AI eliminates 67% of on the job, task-based learning opportunities.
- By 2023, all personnel hired for AI development and training work will have to demonstrate expertise in responsible development of AI.

## **Data Management and Infrastructure**

Data and analytics leaders face complexity in their data landscape. Our data management solution predictions acknowledge key developments and growing demand for cloud capabilities, connected data architectures, metadata and the automation of routine and nonroutine tasks through application of AI.

### **“Predicts 2020: Data Management Solutions”**

- By 2022, all major communications service providers (CSPs) will eliminate egress fees due to competitive pressure for openness.
- By 2023, 25% of organizations will embrace a data and analytics solution from a single cloud provider for reduced overall costs.
- By 2022, 60% of organizations will leverage machine-learning-enabled data quality technology for suggestions to reduce manual tasks for data quality improvement.
- By 2023, cloud database management systems (DBMS) revenue will account for 50% of the total DBMS market revenue.
- By 2023, intercloud and hybrid environments will realign from primarily managing data stores to integration — reconfiguring \$60 billion annual spend for staffing and funding.

# IT Infrastructure Predictions

## Application Development and Integration

The shifting continuum of technology leadership, sometimes dominated by the business, sometimes by IT, is reaching an equilibrium of business-IT collaboration. Application leaders must examine these predictions to learn how this equilibrium will take shape in their organization.

### **“Predicts 2020: The Future of Application Architecture, Development, Integration and Platforms”**

- By 2024, low-code application development will be responsible for more than 65% of application development activity.
- By 2023, more than 50% of new integration technologies evaluated will include AI among key criteria for simplifying integration.
- By 2023, more than 50% of large enterprises will adopt more robotic process automation platform as a service (rpaPaaS) than on-premises RPA.

Business application experiences and architectures — as well as the entire business software landscape — will change drastically in the next five years. The ability of application leaders to realize their application visions for the future depends on the plans they put in place today.

### **“Predicts 2020: Application Leaders”**

- By 2023, 40% of professional workers will orchestrate their business application experiences and capabilities like they do their music streaming experience.
- By 2025, 40% of business capabilities will be delivered using aggregator platforms from multiple providers that automatically integrate functions from core ERP vendors.

## Blockchain

Blockchain technology will not only improve financial inclusion for the world's unbanked population, it could also help to combat fake news. Application leaders need to realize that the technology needs to mature, and that advances come with new risks.

### **“Predicts 2020: Blockchain Technology”**

- By 2023, up to 30% of world news and video content will be authenticated as real by blockchain technologies.
- By 2025, 50% of people that own a smartphone, but do not have access to a traditional bank account, will use a mobile-accessible cryptocurrency account.
- In 2023, multiple blockchain technical standards will enable mainstream decentralized application and smart contract development and deployment.

#### **“Predicts 2020: Blockchain Technology” (continued)**

- By 2023, costs will exceed returns for 30% of smart contracts.
- Through 2022, major cryptocurrency exchanges using multiparty computation (MPC) for signoff and private key protection will rise from 1% to 50%.

While their usefulness for enterprise is still evolving, decentralized authority models like blockchain have introduced alternative methods for tracking and managing customer data. Application leaders need to understand the direction of decentralized technologies or risk lagging behind competitors.

#### **“Predicts 2020: Blockchain Business”**

- By 2024, 20% of fiat currencies' liquidity worldwide will be enabled through digital representations to provide near-frictionless money movement.
- By 2023, 20% of organizations with production blockchain initiatives will source data from customer-driven alliances supported by blockchains.
- By 2024, customers will use blockchain licenses to secure 30% of their sensitive personal data.
- Through 2023, business issues will have stopped more blockchain projects than technology readiness.

### **Cloud Computing**

While cloud computing has firmly established itself as “the new normal” for enterprise IT, the cloud becomes more important to reach digital. Thus, CIOs at IT organizations must update their processes and upskill their staff to maintain the necessary control while the cloud rapidly proliferates.

#### **“Predicts 2020: Better Management of Cloud Costs, Skills and Provider Dependence Will Enable Further Cloud Proliferation”**

- Through 2024, nearly all legacy applications migrated to public cloud infrastructure as a service (IaaS) will require optimization to become more cost-effective.
- Through 2024, multicloud strategies will reduce vendor dependency for two-thirds of organizations but primarily not through application portability.
- Through 2022, insufficient cloud infrastructure as a service (IaaS) skills will delay half of enterprise IT organizations' migration to the cloud by two years or more.
- By 2023, the leading cloud service providers will have a distributed ATM-like presence to serve a subset of their services for low-latency application requirements.



## Internet of Things

As IoT implementations proliferate, evidence of IoT's increased maturity (and some growing pain) is emerging. Application leaders should factor these predictions regarding the evolving state of blockchain, digital twins and security into their IoT implementations.

### **“Predicts 2020: As IoT Use Proliferates, So Do Signs of Its Increasing Maturity and Growing Pains”**

- By 2024, 75% of combined blockchain and IoT projects will have been implemented to help achieve improved cost optimization.
- By 2024, over 100,000 digital twin models will be available via marketplaces.
- By 2023, IoT implementers will have to rearchitect their security solutions because 70% of current providers will have rebranded, repositioned, been bought, or disappeared.

## Mobile, Web and Personal Devices

End-user computing groups are converging into digital workplace teams that support mobile workforces accessing cloud services across endpoints. Infrastructure and operations (I&O) leaders will need to handle new constituents and tools, such as unified endpoint management and unified security apparatus.

### **“Predicts 2020: Mobile and Endpoint Technologies”**

- By 2023, 40% of frontline workers will use wearables as their primary compute devices, which is an increase from fewer than 10% in 2019.

## Enterprise Architecture

To achieve competitive advantage, organizations will create intelligent business and operating models underpinned by innovative technologies, data and analytics. Enterprise architecture (EA) and technology innovation leaders must develop services, methodologies and competencies to support their organizations.

### **“Predicts 2020: Enterprise Architecture Enables the Intelligent Organization”**

- By 2023, 65% of EA programs will refocus on information architecture, making it central to all digitalization initiatives.
- By 2023, 60% of EA practices will design intelligence into their business and operating models.
- By 2023, 60% of EA tools will become intelligent.



# Data Security and Privacy Predictions

## Security and Risk Management

Gartner is looking at trends in CIO missions, geopolitics, talent management and cyber-physical systems (CPSs). Security and risk management leaders should monitor such trends to be successful in the digital era.

### **“Predicts 2020: Security and Risk Management Programs”**

- By 2023, 30% of chief information security officers' (CISOs') effectiveness will be directly measured on the role's ability to create value for the business.
- By 2023, the financial impact of CPS attacks resulting in fatal casualties will reach over \$50 billion, 10 times higher than 2013 levels of data security breaches.

## Identity and Access Management

Identity and access management (IAM) tools continue to mature, and managing diverse identities has become an imperative. Security and risk management leaders must continue to develop technical skills and make technology investments to lower costs, enhance the user experience, improve service delivery and mitigate risks.

### **“Predicts 2020: Identity and Access Management”**

- By 2022, more than 50% of identity governance and administration (IGA) vendors will offer predictive, anticipatory and more autonomous governance engines supercharged by ML and AI identity analytics for mitigating identity risk more efficiently.

# Digital Business/Commerce and Business Function Predictions

## Digital Commerce

Business and architectural models for digital commerce continue to evolve. Application leaders responsible for digital commerce technologies must anticipate the changing landscape by adapting their strategies, practices and roadmaps.

### **“Predicts 2020: Marketplace Models, New Payment Expectations and Platform Evolution Drive Digital Commerce Opportunities”**

- By 2024, 80% of ordering and replenishment will be touchless for most organizations.

## Digital Workplace

Digital workplace applications play a crucial role in enabling digital dexterity and shaping employee experiences. Our 2020 predictions highlight new trends and technologies that application leaders responsible for the digital workplace should analyze as they optimize new work nucleus applications.

### **“Predicts 2020: Digital Workplace Applications Led by the New Work Nucleus”**

- By 2024, “everyday AI” services will be essential, but largely invisible in daily work activities.
- By 2024, 80% of newly created documents and correspondence will contain recycled content and content inserted through autocompletion.
- By 2025, SaaS-based knowledge graphs will boost workforce digital dexterity by delivering personalized content recommendations, insight into work patterns, and individual skills development guidance.

## CRM and Customer Experience

The rise of collaborative customer service, the “gig economy” and the digital-twin-enabled, outcome-based contract model is an opportunity and a challenge for customer service organizations. Application leaders must understand these trends and keep their technology roadmaps up to date.

### **“Predicts 2020: CRM Customer Service and Support”**

- By 2023, 30% of customer service organizations will deliver proactive customer services by using AI-enabled process orchestration and continuous intelligence.
- By 2025, over 50% of equipment manufacturers will offer outcome-based service contracts that rely on IoT-based connectivity, up from less than 15% in 2019.

## CRM Sales

Predictive and prescriptive AI technology disrupts traditional sales processes. But to realize the full potential of this new technology, application leaders must invest in more than new sales tools, looking at areas such as analytics, training and change management.

### **“Predicts 2020: AI for CRM Sales Technology Must Be Balanced With Analytics, Training and Change Management Considerations”**

- By 2025, 50% of all enterprise B2B sales technology implementations will use customer engagement analytics to optimize their sales processes.
- By 2025, over 90% of B2B enterprise sales organizations will continue to rely on intuition instead of advanced data analytics, resulting in inaccurate forecasts, sales pipelines and quota attainment.

### **“Predicts 2020: AI for CRM Sales Technology Must Be Balanced With Analytics, Training and Change Management Considerations” (continued)**

- By 2025, digital adoption solutions will be white-labeled in 50% of customer-facing SaaS applications, increasing customer satisfaction and loyalty.
- By 2025, 50% of B2B sales organizations' digital optimization projects will not meet initial user adoption expectations because of inadequate and short-lived change management approaches.

## **Enterprise Resource Planning**

The changing nature of enterprise resource planning (ERP) provides unprecedented opportunities for transformation and improvements in efficiency. Gains will only be realized if CIOs are prepared with appropriate expectations, sourcing strategies, technologies and skills.

### **“2020 ERP Predicts: Unprecedented Changes in ERP Enable Transformation”**

- By 2022, 60% of organizations will utilize packaged artificial intelligence to automate processes in multiple functional areas.
- Through 2025, 40% of ERP implementations will underachieve as a result of underinvestment in integration.
- By 2022, 65% of CIOs will incorporate artificial intelligence into their postmodern ERP strategies to gain competitive advantage.

## **Workforce and Human Capital Management**

Organizations worldwide are investing in processes and enabling technologies to improve employee and organizational agility. Application leaders transforming human capital management (HCM) must prioritize investments in experience, learning, upskilling and AI to meet these agility objectives in an era of continuous change.

### **“Predicts 2020: HCM Technology Transformation”**

- By 2023, 10 industry- and job-specific AI-enabled skills assessment and training platforms will have emerged.
- By 2023, nearly half of HR-related AI pilot projects conducted since 2019 will progress to full enterprise deployments.

## **Supply Chain Planning and Operations**

Autonomous supply chain management is overhyped as organizations face making difficult decisions faster and with less human intervention. To excel in today's complex and volatile world, supply chain technology leaders can use this research to understand where future risks and opportunities lie.

#### **“Predicts 2020: Supply Chain Technology”**

- By 2023, more than 30% of large enterprise supply chain organizations will have invested in at least one autonomous mobile robot.
- By 2024, 50% of workplace management systems (WMSs) vendors will embed machine learning capabilities to enhance workflows between automation and humans.
- By 2024, 50% of manufacturing execution systems (MES) solutions will include industrial IoT platforms.
- By 2024, 0% of companies will have achieved autonomous planning.

#### **IT Operations, Procurement and Asset Management**

In the face of digital transformation, infrastructure and operations' (I&O's) traditional approach to delivering business value is proving insufficient in many areas. I&O leaders must take the lead and proactively address the need for agile practices, new AI use cases and a more holistic approach to managing complex environments.

#### **“Predicts 2020: IT Operations”**

- By 2024, 30% of business leaders will rely on AIOps platforms for automated insights to drive business-related decisions, as compared to less than 3% today.

The use of hyperautomation, interconnected supplier networks, digital assistants and real-time information in procurement and sourcing applications will soon change how work is done. Application leaders should plan for these developments — or risk their organizations falling behind the competition.

#### **“Predicts 2020: Sourcing and Procurement Application Technology Disruptions”**

- By 2024, 25% of purchase orders will be created via voice or chat, thus increasing contract compliance and process adoption.
- By 2024, 50% of organizations will have near-real-time procurement analytics.
- By 2025, over half of procurement hyperautomation efforts will fail because of outdated, legacy ERP and finance applications.

Sourcing, procurement and vendor management leaders face escalating complexity in evaluating vendor options and offerings. Procurement teams must advise businesses by developing analytical capabilities supported by a foundation of efficient technology and processes that drive speed and agility.

### **“Predicts 2020: The Emergence of IT Sourcing and Procurement as a Digital Transformation Catalyst”**

- By 2023, 50% of large enterprise IT procurement teams will subscribe to three or more data services to expedite vendor risk assessments.
- By 2024, 40% of large enterprises will leverage AI capabilities in their sourcing process.

## **Communications Service Providers**

Evolving competitive landscape and new technologies will disrupt the business and operating models of communications service providers (CSPs). Product managers serving the CSP market must support that rapid transformation.

### **“Predicts 2020: 5 Key Trends for CSPs’ Digital Growth”**

- By 2025, 35% of successful CSP blockchain initiatives will uncover implementation issues during the POC phase.
- By 2025, CSPs using AI for business decisions will gain five percentage points in operating margin over peers due to a shorter time to market.

# **Industry Predictions**

## **Banking and Investment Services**

Ecosystems will enable end customers to engage with financial institutions and bank products both directly and indirectly through third parties. Financial services CIOs can use Gartner’s 2020 predictions to decide if their platform strategies will help them lead, compete or simply participate.

### **“Predicts 2020: Ecosystems Will Empower Banking Customers and Erode Banks’ Traditional Value Propositions”**

- By 2023, increased data availability caused by customers sharing their own personal ecosystems will compel 25% of financial institutions to use this data to create new revenue streams.
- By 2024, 10% of financial services institutions (FSIs) will open their vendors’ financial technology (fintech) ecosystem platforms to end clients, allowing customers to create their own customized solutions.
- By 2025, 25% of payment delivery channels will be led by nonincumbent, third-party digital ecosystems, forcing banks to participate or risk losing market share.
- By 2023, public or private cloud will each account for 5% of commercial off-the-shelf core banking installations.

## Education

Rapid changes to the world of work are reverberating throughout the education sector. Education CIOs must rapidly evolve their institutions' traditional approaches to skills acquisition and learning, course creation and key support functions in response to these changes.

### **“Predicts 2020: Education Needs to Brace for Changes to the World of Work”**

- By 2024, 80% of secondary schools will offer curriculum targeting specific digital skills (such as coding or cloud technology) designed for post-high-school jobs, or for jump-starting tertiary learning opportunities.
- By the end of 2024, 60% of K-12 organizations will be actively experimenting or fully implementing some level of adaptive learning solutions in their regular instructional offerings.

## Government

Government is pressured to transform in a fast-paced digital context while staying committed to traditional public service values. Facing these rising tensions, CIOs need to find the right balance between evolution and disruption to ensure public sector organizations stay effective.

### **“Predicts 2020: Governments Balancing Change and Continuity, Disruption and Evolution”**

- By 2023, at least 80% of government services that require authentication will support access through multiple digital identity providers.

## Healthcare

Healthcare disruptors are leveraging cross-industry partnerships and emerging technologies to create new digital business and operating models that color a compelling health landscape. Provider CIOs can use these predictions to inform strategic planning for the next five years.

### **“Predicts 2020: Healthcare Providers Must Strike a Balance for Digital Business Success”**

- By 2024, 50% of healthcare providers will integrate digital monitoring, diagnostics and care management into clinical workflows.
- By 2024, a claims denials and appeals bot war will break out between 25% of payers and providers due to competing automated claim transactions.
- By 2022, the citizen health record platform will be a core app on smartphones to which 75% of healthcare providers will contribute electronic health record (EHR) data.

Advanced technologies, including AI, will become commonplace among U.S. healthcare payers over the next five years. To compete for members' loyalty and spark growth, CIOs must strategically use technology to build trust as part of their business transformation plans.

**“Predicts 2020: U.S. Healthcare Payers Put Emerging Technologies at Center Stage”**

- By 2024, a U.S. healthcare payer will start — and subsequently stop — using facial analytics to assess the health risk of newly enrolled members.

## **Insurance**

While the insurance industry has been on the road to digital transformation for five years, few CIOs have reached high maturity levels. Insurance CIOs face tremendous internal and external challenges that have slowed down, and even prevented, innovation and success in digital transformation.

**“Predicts 2020: Digital Challenges Slow Down Insurance Industry Transformation”**

- Through 2023, only 30% of consumers will trust their insurer enough to permit the use of personal data to customize products and services.
- By 2023, fewer than 10% of insurers will be able to monetize their IoT data to generate new revenue sources.

## **Life Sciences**

Smart uses of disruptive technologies like AI, IoT and cloud are transforming how healthcare organizations deliver value to consumers. Life science CIOs must incorporate these capabilities in their strategic plans and accelerate their adoption to fully transform their businesses.

**“Predicts 2020: Life Science CIOs Must Digitalize for Business Growth”**

- By 2023, life science business leaders will push AI into 50% of enterprise core processes — exposing gaps in IT architecture, governance and skills.
- By 2023, a major life science organization will abandon U.S. television advertising for a new product in favor of an AI-driven, all-digital engagement strategy.
- By 2023, IoT sensors and devices used to augment existing clinical and commercial product monitoring, tracking and management technologies will be used in 25% of the top 50 life science companies.



## Oil and Gas

Oil and gas CIOs face new, increasingly complex challenges. Digital technology impacts operating models across the enterprise, and demands radical new abilities of IT. CIOs can use this research to understand the implications of developments at the forefront of industry digital transformation.

### **“Predicts 2020: Digital Maturity Magnifies Opportunities and Threats in Oil and Gas”**

- By 2022, inappropriate reliance on AI will contribute to at least one major oil and gas industry environmental, health and safety incident or regulatory breach.
- By 2022, over 50% of central IT budgets within oil and gas companies will be dedicated to funding digital products rather than IT projects.

## Retail

Customers are demanding greater levels of contextualization of products and services. Retail CIOs can leverage intelligence to capture deeper insights, anticipate customer needs and proactively deliver across every touchpoint.

### **“Predicts 2020: Consumers Determine Retail Success Well Before the Sale”**

- By 2025, the top 10 retailers globally will leverage AI to facilitate prescriptive product recommendations, transactions and forward deployment of inventory for immediate delivery to consumers.