Over 100 Data and Analytics Predictions Through 2025

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Initiatives: Data and Analytics Strategies; Analytics, BI and Data Science Solutions; Artificial Intelligence

> Our annual predictions highlight the importance of data and analytics in all types of business and IT initiatives, particularly in response to and recovery from COVID-19. Data and analytics leaders must consider these strategic planning assumptions to enhance their vision and delivery.

Additional Perspectives

- Summary Translation: Over 100 Data and Analytics Predictions Through 2025 (13 April 2021)

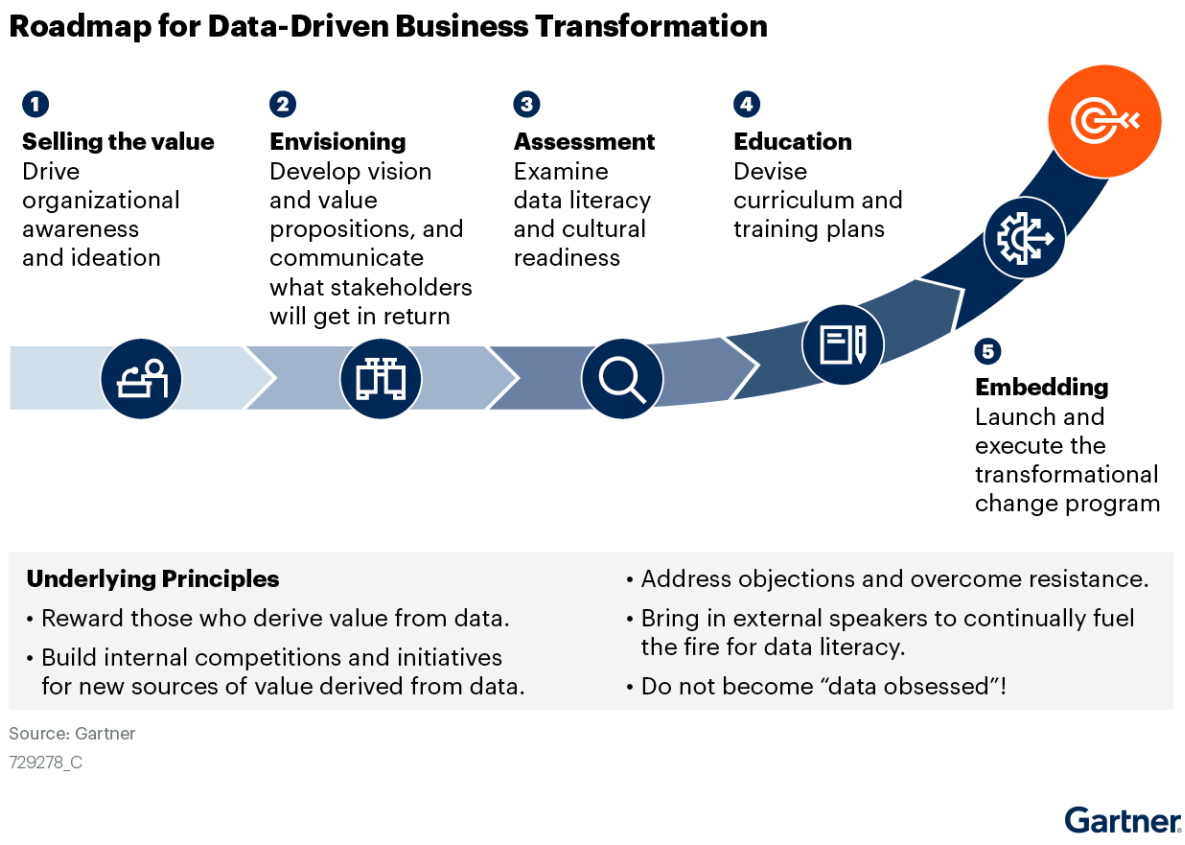
Analysis

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. This is particularly in response to the continuing situation with COVID-19, which has been an accelerant for digital transformation and data-driven business.

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 (see Figure 1).

Figure 1: Roadmap for Data-Driven Business Transformation



As evidenced by its pervasiveness within Gartner's published Predicts 2021 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 2025 summarizes predictions released at the end of 2020. Data and analytics leaders should include these in their planning for successful strategies.

Research Highlights

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Core Data and Analytics Predictions

Data and Analytics Leaders, Strategy and Innovation

The data and analytics leader faces an uncertain future. Delivering digital business outcomes with centralized/decentralized initiatives and data sharing is crucial, but title inflation is real. Focus on digital transformation and adapt data and analytics (D&A) financial models to cloud adoption for success.

Predicts 2021: Data and Analytics Leaders Are Poised for Success but Risk an Uncertain Future

- By 2023, 50% of chief digital officers in enterprises without a chief data officer (CDO) will need to become the de facto CDO to succeed.
- By 2024, widespread adoption of cloud will raise the CFO's influence over the chief data officer's (CDO's) decisions due to explicit linkage of workloads to cost, bringing disruption to the CDO role.
- By 2024, 75% of organizations will have established a centralized data and analytics (D&A) center of excellence to support federated D&A initiatives and prevent enterprise failure.
- By 2023, organizations with shared ontology, semantics, governance and stewardship processes to enable interenterprise data sharing will outperform those that don't.
- Through 2023, title inflation will drive 50% of chief data officer (CDO) appointments, leading to the CDO being an internal service, rather than a strategic business peer.

To increase business value, organizations will invest in data and analytics platforms, trust-based data sharing and synthetic data for AI development. However, expected returns on investment will fail to materialize, unless data and analytics leaders modernize existing governance practices.

Predicts 2021: Data and Analytics Strategies to Govern, Scale and Transform Digital Business

- By 2024, 30% of organizations will invest in data and analytics governance platforms, thus increasing the business impact of trusted insights and new efficiencies.
- By 2024, most organizations will attempt trust-based data sharing programs, but only 15% will succeed and outperform their peers on most business metrics.

- By 2024, 60% of the data used for the development of AI and analytics solutions will be synthetically generated.
- By 2025, 80% of data and analytics governance initiatives focused on business outcomes, rather than data standards, will be considered essential business capabilities.
- Through 2025, 80% of organizations seeking to scale digital business will fail because they do not take a modern approach to data and analytics governance.

Analytics, Business Intelligence and Data Science

Increased consumerization of analytics technology and the need for communities are changing the analytics, business intelligence (BI) and data science landscape, accelerated by movement to the cloud. Data and analytics leaders must leverage the collective intelligence of the organization to compose effective and augmented analytics solutions.

Predicts 2021: Analytics, BI and Data Science Solutions — Pervasive, Democratized and Composable

- By 2023, 30% of organizations will harness the collective intelligence of their analytics communities, outperforming competitors that rely solely on centralized analytics or self-service.
- By 2023, 60% of organizations will compose components from three or more analytics solutions to build business applications infused with analytics that connect insights to actions.
- By 2023, overall analytics adoption will increase from 35% to 50%, driven by vertical- and domain-specific augmented analytics solutions.
- By 2023, cloud architects will become key stakeholders when purchasing analytics and BI tools, as scalability and cohesive cloud ecosystems move into the top 3 key buying considerations.

Artificial Intelligence

The development process for AI is clear to enterprises today, but the pressing need for AI operationalization will shift the focus to continuous delivery of AI-based systems. Data and analytics leaders must focus on technologies that bridge the gap between development and continuous value delivery.

Predicts 2021: Artificial Intelligence Core Technologies

- By 2023, organizations that scale graph techniques will deliver five times more AI models, for multiple use cases, into production than those that don't.
- By 2024, 70% of enterprises will use cloud and cloud-based AI infrastructure to operationalize AI, thereby significantly alleviating concerns about integration and upscaling.
- By 2024, use of synthetic data and transfer learning will halve the volume of real data needed for machine learning.

Organizations aim to use AI to make major, measurable gains in business value. Gartner's predictions will help IT leaders identify promising business opportunities arising from the embedding of AI in enterprise applications in areas such as contract management, digital commerce, human resources (HR) and enterprise resource planning (ERP).

Predicts 2021: Artificial Intelligence in Enterprise Applications

- By 2024, the degree of manual effort required for the contract review process will be halved in enterprises that adopt advanced contract analytics solutions.
- By 2023, three-quarters of HR service management inquiries will be initiated through conversational platforms.
- By 2024, 10% of digital commerce orders will be predicted and initiated by AI.
- By 2023, ERP data will be the basis for 30% of AI-generated predictive analyses and forecasts.
- Through 2023, up to 10% of AI training data will be poisoned by benign or malicious actors.

The transformational impact of AI has second-order consequences that might not be readily discernible. Application leaders responsible for AI need to understand these impacts in order to prepare their organizations — for the impact on people, their employees, legislation and society.

Predicts 2021: Artificial Intelligence and Its Impact on People and Society

- By 2025, the concentration of pretrained AI models among 1% of AI vendors will make responsible AI a societal concern.
- In 2023, 20% of successful account takeover attacks will use deepfakes to socially engineer users to turn over sensitive data or move money into criminal accounts.
- By 2024, 60% of AI providers will include a means to mitigate possible harm as part of their technologies.
- By 2025, 10% of governments will use a synthetic population with realistic behavior patterns to train AI while avoiding privacy and security concerns.
- By 2025, 75% of conversations at work will be recorded and analyzed, enabling the discovery of added organizational value and risk.

The use of artificial intelligence in enterprises has tripled during the past two years, requiring IT leaders to reevaluate their core infrastructures and optimize for AI productivity. Data and analytics leaders need to devise AI orchestration platforms to accelerate and sustain AI operationalization.

Predicts 2021: Operational AI Infrastructure and Enabling AI Orchestration Platforms

- By 2025, 50% of enterprises will have devised artificial intelligence (AI) orchestration platforms to operationalize AI, up from fewer than 10% in 2020.
- By 2025, AI will be the top category driving infrastructure decisions, due to the maturation of the AI market, resulting in a tenfold growth in compute requirements.
- By 2025, 50% of enterprises implementing AI orchestration platforms will use open-source technologies, alongside proprietary vendor offerings, to deliver state-of-the-art AI capabilities.

Data Management and Infrastructure

The diversity of data production, consumption and persistence is driving interest in new ways to deploy, integrate and govern data across the enterprise. Data and analytics leaders must consider these predictions and their implications as they plan for a radically changed data management landscape.

Predicts 2021: Data Management Solutions — Operational Efficiency Rises to the Top

- By 2025, 50% of independent database management system (DBMS) vendors will cease operations, causing customers to adjust strategies and migrate back to their strategic DBMS suppliers.
- By 2024, organizations that utilize active metadata to enrich and deliver a dynamic data fabric will reduce time to integrated data delivery by 50% and improve the productivity of data teams by 20%.
- By 2024, 75% of organizations will have deployed multiple data hubs to drive mission-critical data and analytics sharing and governance.
- Through 2024, 50% of organizations will adopt modern data quality solutions to better support their digital business initiatives.

IT Leadership Predictions

Technology Leadership

CIOs face a future of unrelenting turbulence, transformation and associated uncertainty. Dealing with that effectively is resulting in breaking down traditional operating models, organizational and role boundaries. We look at three areas we believe will be significant over the next three years.

Predicts 2021: Turbulence and Transformation Accelerate the Breakdown of Operating Model Boundaries

- By 2023, over 50% of employees in lines of business will be technology producers.

To accelerate development and enable continuous delivery of customer value, organizations need to reach the next level in their agile and DevOps practices. I&O leaders and application leaders must focus on value stream management to maximize flow, improve delivery efficiency and drive innovation.

Predicts 2021: Value Streams Will Define the Future of DevOps

- By 2023, 70% of organizations will use value stream management to improve flow in the DevOps pipeline, leading to faster delivery of customer value.

Technology Innovation

Organizations face an uncertain future, but one that will demand the ability to deliver new business offerings and experiences rapidly. Enterprise architecture and technology innovation leaders must foster innovation in order to create the necessary resilience, adaptability and digital experiences.

Predicts 2021: Technological Innovation Becomes a Business Imperative

- By 2024, cloud-native platforms will serve as the foundation for more than three-quarters of new digital workloads.
- By 2025, one-fifth of Internet of Things (IoT) devices could possess swarm intelligence, enabling them to serve as autonomic decision makers via AI systems and social networks, up from less than 5% in 2020.

Without action, innovation has no value. Enterprise architecture and technology innovation leaders, including the chief technology officer (CTO), need to develop, curate and communicate innovation ideas in a more actionable way to achieve value through the right combination of skills and defined roles.

Predicts 2021: Combine the Right Skills and Roles to Drive Innovation to Action

- By 2023, 30% of companies will hire or redefine the chief technology officer role to accelerate technology-driven business model innovation.
- By 2024, 40% of enterprise architects will use innovation management as a bridge to using IT to drive business efficiency and transformation.
- By 2025, 50% of enterprises will have a formal cloud strategy, which will primarily be for enabling innovation.
- By 2023, more than 50% of technology innovation leaders will leverage personas and journey mapping to drive more impactful innovation projects.

Cloud Computing

2020 events have accelerated cloud adoption to the point where it is the de facto new normal. Enterprise architecture and technology innovation leaders should reject any new project that does not follow “cloud first” as a guiding principle.

Predicts 2021: Building on Cloud Computing as the New Normal

- By 2025, 50% of large enterprises will enable transformational business models using “distributed cloud” services at a location of their choice.
- By 2023, 70% of mainstream organizations will use a composability metric to select new cloud applications and platform services.
- By 2025, 85% of organizations will run containers in production, up from less than 30% in 2020.
- By 2025, the proportion of current enterprise applications that are containerized will rise to 15%, up from 5% in 2020.
- By 2025, 85% of enterprises will have a cloud-first principle.

Enterprise infrastructures continue to evolve — more cloud, more devices attaching to the network and more requirements at the edge. Infrastructure and operations (I&O) leaders responsible for cloud and edge infrastructure must be innovative with network security, workload deployments and infrastructure extended to the edge.

Predicts 2021: Cloud and Edge Infrastructure

- Through 2023, enterprises that isolate/segment their campus network devices will experience 25% fewer successful cyberattacks.
- By 2023, 40% of all enterprise workloads will be deployed in cloud infrastructure and platform services, up from 20% in 2020.
- By year-end 2023, 20% of installed edge computing platforms will be delivered and managed by hyperscale cloud providers, compared to less than 1% in 2020.

Cloud-native applications introduce visibility gaps, creating monitoring and management challenges. I&O leaders who are not equipped to leverage machine learning (ML) and AI technologies to understand relationships and performance of distributed systems put their digital business transformation initiatives at risk.

Predicts 2021: Infrastructure Operations and Cloud Management

- By 2023, 40% of product and platform teams will use AIOps for automated change risk analysis in DevOps pipelines, reducing unplanned downtime by 20%.

- Through 2022, 80% of organizations adopting cloud services without using a performance-focused approach for dependency mapping will experience a decrease in service quality levels.
- By 2024, 75% of organizations monitoring IaaS/PaaS environments will consume metrics via cloud providers' APIs.
- By 2025, 70% of new cloud-native application monitoring will use open-source instrumentation instead of vendor-specific agents for improved interoperability.
- Through 2024, enhancements in digital workplace infrastructure processes driven by analytics and automatic remediation capabilities will refocus 30% of IT operations efforts, from support to continuous engineering.

Data Security and Privacy Predictions

Privacy and Risk

The positive effects of proper privacy protection continue to show in more situations of everyday life and business, as do negative effects when privacy is insufficiently protected. Security and risk management leaders can use these predictions to avoid pushback, find opportunity and create value.

Predicts 2021: Balance Privacy Opportunity and Risk

- By 2023, organizations embedding privacy user experience into customer experience will enjoy greater trustworthiness and up to 20% more digital revenue than those that don't.
- By 2023, organizations that do not excessively monitor remote working employees will experience up to 15% higher productivity than those that do.
- By 2025, 50% of large organizations will default to privacy-enhancing computation for processing data in untrusted environments and multiparty analytics use cases.
- By 2023, over 20% of organizations will use a data risk assessment to identify and manage appropriate privacy controls, despite a lack of guidance from regulators on how to implement it.
- By year-end 2025, multiple Internet of Behaviors (IoB) systems will elevate the risk of unintended consequences, potentially impacting over half of the world's population.

Cybersecurity and IT Risk Management

Gartner has produced impactful predictions about cybersecurity program management. This year's predictions focus on governance, organizational structure, evolution of the role, talent and board reporting. Security and risk management leaders should monitor trends to be successful in the digital era.

Predicts 2021: Cybersecurity Program Management and IT Risk Management

- By 2022, 30% of all security teams will have increased the number of employees working remotely on a permanent basis.
- By 2025, 40% of boards of directors will have a dedicated cybersecurity committee overseen by a qualified board member, up from less than 10% today.
- By 2024, 60% of CISOs will establish critical partnerships with key market-facing executives in sales, finance and marketing, up from less than 20% today.
- By 2025, 50% of asset-intensive organizations will converge their cyber, physical and supply chain security teams under one chief security officer role that reports directly to the CEO.

Identity and Access Management (IAM)

Identity and access management (IAM) tools are being applied to an increasingly complex set of internal and external use cases. Security and risk management leaders must improve their approaches to identity proofing, develop stronger vendor management skills and mitigate the risks of a workforce that increasingly operates remotely.

Predicts 2021: Identity and Access Management and Fraud Detection

- By 2025, cybersecurity mesh will support more than half of all IAM requests, paving the way to a more explicit, mobile and adaptive unified access management model.
- By 2023, 40% of IAM application convergence will primarily be driven by MSSPs that focus on delivery of best-of-breed solutions in an integrated approach, shifting influence from product vendors to service partners.
- By 2024, 30% of large enterprises will newly implement identity-proofing tools to address common weaknesses in workforce identity life cycle processes.
- By 2024, a true global, portable, decentralized identity standard will emerge in the market to address business, personal, social and societal, and identity-invisible use cases.

- By 2022, 95% of organizations will require that identity-proofing vendors prove that they are minimizing demographic bias to protect their brand, up from less than 15% today.

Enterprise Architecture

Organizations will respond to increasing disruption and uncertainty by becoming "composable." To be successful, enterprise architecture and technology innovation leaders will shift their focus to business design and architecting composability across multiple interrelated viewpoints.

Predicts 2021: Enterprise Architecture Designs the Composable Organization

- By 2024, 85% of fusion teams will use business architecture deliverables to guide strategy, drive customer centricity and design the composable enterprise.
- By 2024, 25% of organizations will have an AI architect role as part of the EA practice to operationalize and scale AI, up from less than 5% today.
- By 2024, 80% of organizations will use iterative, experimental methodologies such as design thinking, lean startup and agile to support business and product design.
- By 2024, organizations that have adopted a composable approach to application architecture will implement new features by at least 80% faster than the competition.
- By 2024, 25% of organizations will split their enterprise architecture function into two distinct groups: "business technology strategy" and "product architecture" to ensure EA delivers business value.

IT Sourcing and Procurement

COVID-19 and the resulting economic crisis have made clear the urgency with which IT sourcing, procurement and vendor management leaders must transform their functions. Sourcing, procurement and vendor management (SPVM) teams must embrace this opportunity to address the dynamic demands of their organization.

Predicts 2021: IT Sourcing and Procurement in an Effort to Become a Trusted Advisor

- By 2025, 50% of large enterprise IT SPVM teams will have dedicated data analyst roles, enabling high value insights that drive effective sourcing strategies.

- By 2025, 30% of enterprises will be using blockchain capabilities to source technology services and products, halving the time needed to onboard new vendors.

Disruption of the IT infrastructure is accelerating due to the pandemic and the rapidly changing nature of future delivery models. Sourcing, procurement and vendor management leaders should use these predictions to strategize for the future, while resetting for a new normal.

Predicts 2021: The Evolution of Infrastructure and Communications Services Intensifies

- By 2024, organizations that neglect employee experience analytics for MWS will lose 40% of their operational efficiency due to workflow process loss.
- By 2023, 50% of clients of public cloud services will experience escalating costs and project failures resulting from poor management.

High demand for application services to support growth in digital technology adoption will cause resource challenges and require changes in modes of delivery. Sourcing, procurement and vendor management leaders must plan for disruption as they source and contract for digital application services.

Predicts 2020: Digital Adoption Drives People, Process and Technology Disruption in Application Services

- Through 2022, steep demand growth for specialist skills in digital transformation and cloud application migration services will increase labor rates by 50%.
- By 2022, the combined effect of cloud and process standardization will result in over 40% of BPO services being delivered via business process as a service (BPaaS).
- From 2021 onward, 75% of all application services deals will be won by vendors that are prepared to commit to AI quality and improvement for contracted services.

Project and Program Management

Despite challenging almost every organization, the COVID-19 pandemic and the resulting uncertainty have not stopped the rapid journey toward digital business. Program and portfolio management leaders must evolve their functions and capabilities to meet their organizations' digital ambitions.

Predicts 2021: Program and Portfolio Management Leaders Prepare for the Next Normal

- By 2025, dynamic program management offices (PMOs) will use predictive analytics, enabled by their own citizen data scientists, to deliver improved insights and results for digital business.

Robotic Process Automation (RPA) and Hyperautomation

The pandemic has accelerated a default-is-digital requirement. Business processes that were not digitized struggled or halted when forced to a virtual, remote-anywhere operations mode. IT leaders can use these predictions to reshape the use of RPA and begin a disciplined approach to hyperautomation.

Predicts 2021: Accelerate Results Beyond RPA to Hyperautomation

- By 2024, one or more technology megavendors will build or acquire targeted hyperautomation technologies, rendering 60% of the stand-alone RPA market offerings redundant.
- By 2024, 80% of hyperautomation offerings will have limited industry-specific depth mandating additional investment for IP, curated data, architecture, integration and development.
- By 2024, more than 70% of the large global enterprises will have over 70 concurrent hyperautomation initiatives mandating governance or facing significant instability.

Digital Business Function Predictions

Customer Relationship Management (CRM) and Customer Experience

Customer service will be revamped to include “huddle groups,” which will initiate more proactive outbound interactions through messaging platforms. As a result, customer service will likely become a profit center. Application leaders must investigate how to realize this future in their organization.

Predicts 2021: CRM Customer Service and Support

- By 2025, 80% of customer service organizations will have abandoned native mobile apps in favor of messaging for a better customer experience.
- By 2025, proactive (outbound) customer engagement interactions will outnumber reactive (inbound) customer engagement interactions.

Those leading customer experience initiatives believe the use of technology on customer experience (CX) projects will continue to increase. This will happen with or without the IT department. Application leaders supporting CX must reposition and prepare both themselves and their staff to contribute to the CX.

Predicts 2021: Technology Will Become More Critical to CX With or Without the IT Department

- By 2025, one in 10 technology leaders will find themselves the de facto leader of customer experience for their organization.

CRM Sales

Emerging imperatives like hyperautomation, digital selling and artificial intelligence will change the sales technology stack of every organization. This report explores five key trends for application leaders supporting sales' need to add to their CRM sales technology roadmaps.

Predicts 2021: New Selling Imperatives Drive CRM Sales Technology Roadmaps

- By 2025, 80% of organizations will use digital adoption solutions (DAS) across the sales stack to overcome insufficient application user experiences (UXs).
- By 2025, 30% of large business-to-business (B2B) companies will use AI predictive analytics to drive all of their sales KPIs and insights.
- By 2025, 20% of B2B companies will see revenue growth from multiexperience sales due to a well-executed "everywhere customer" vision.
- By 2025, 50% of companies with indirect B2B sales will manage prospect data for their resell partners through partner relationship manager (PRM) technologies as a means for getting access to end-customer market data.
- By 2024, 80% of ordering and replenishment will be touchless for most organizations.

Digital Commerce

COVID-19 has propelled digital commerce to become the leading customer buying channel for many organizations. Application leaders responsible for digital commerce technologies must quickly adapt to changing customer buying habits to grow revenue and sustain market share.

Predicts 2021: COVID-19 Drives Accelerated Shift to Digital and Commerce Model Evolution

- By 2024, 15% of B2B organizations will use digital commerce platforms to support both its customers and sales reps in all sales activities.
- By 2024, leading commerce organizations will generate 10% of online revenue from services attached to physical products.
- By 2023, 30% of enterprise marketplaces will transition into a majority third-party seller model for better profitability.
- By 2022, organizations using multiple go-to-market approaches for digital commerce will outperform noncommerce organizations by 30 percentage points in sales growth.
- By 2023, five countries will have launched digitization initiatives aimed at eliminating cash from circulation.

Digital Workplace

Application leaders responsible for digital workplaces are under huge pressure due to the pandemic, employee stress and fast technological change. They should transform remote workers into “force multipliers” and preempt “gaming” of AI-driven metrics in order to optimize engagement and productivity.

Predicts 2021: Digital Workplace Applications Evolve to Support Remote, “Force Multiplier” Staff

- By 2025, organizations that create a formal program for citizen development, analytics and automation will be far more agile than those that do not.
- By 2023, more than 10% of workers will seek to trick AI-driven metrics every day.
- By 2023, more than 40% of workers will work remotely at least one day a week, up from under 30% before COVID-19.
- By 2024, 50% of digital workplace services leaders will be promoted into direct CIO or CDO reports, up from 5% in 2020.

End-user services are being transformed by dynamic digital workplace I&O that automate tasks and improve user experience. To drive business growth, I&O leaders must operationalize technology deployed reactively during the initial pandemic response into permanent, strategic solutions.

Predicts 2021: Digital Workplace Infrastructure and Operations

- By 2024, endpoint analytics and automation will help digital workplace service staff shift 30% of time spent on endpoint support and repair to continuous engineering.
- By 2024, 50% of digital workplace services leaders will be promoted from I&O to a CIO/chief digital officer (CDO) direct report, an increase from 5% in 2020.

Enterprise Resource Planning (ERP)

The abrupt business disruption that arose in 2020 requires enterprises to act fast in order to prepare for recovery and renewal. CIOs should use Gartner's predictions when devising ERP strategies to enable continuous creation of business value.

Predicts 2021: Time to Compose an ERP Strategy to Outpace Disruption

- By 2025, over 65% of postimplementation ERP changes will be made by citizen developers using low-code application platforms.

Finance

Application leaders must focus on the continued digitalization of the office of finance to upgrade and enhance their financial management solution applications. This is vital to significantly improve front- and back-office financial management processes.

Predicts 2021: Navigating the Evolving Financial Management Market in the Age of Economic Recovery

- Through 2024, 30% of financial planning and analysis (FP&A) implementations will be extended to support operation finance processes, and 50% will require a substantial extended planning and analysis model (XP&A) roadmap from the vendor.
- By 2024, at least 65% of large organizations will invest strategically in integration capabilities.

- In 2024, 45% of core financial projects will simplify systems of record processes while improving analytical processes through the enablement of solutions to transform finance.
- Through 2024, 60% of organizations will seek AI use cases in native financial management solutions.

Human Resources and Talent Management

Organizations worldwide are responding to pandemic disruption and recovery by evaluating and deploying continuous human resources (HR) processes. Application leaders transforming human capital management (HCM) must prioritize investments in workforce management and planning, contingent labor tools and learning to meet stakeholder expectations.

Predicts 2021: HCM Technology Transformation

- By 2023, 25% of large enterprises will conduct continuous, rather than periodic, strategic workforce planning processes.
- By 2024, 20% of HCM suite providers will use contingent labor as early examples of composable applications to improve total workforce visibility for HR.
- By 2024, 40% of organizations will deploy continuous learning technologies to better support organizational shifts toward real-time performance, feedback and coaching.

The digital acceleration caused by the pandemic and its consequent global crisis demand that CIOs quickly address the challenges of the new talent and leadership ecosystem. These Gartner predictions will prepare CIOs to better face those challenges beginning right now.Predicts 2021: CIOs Must Adjust Talent and Leadership Direction for Digital Acceleration

- By 2024, 80% of large-enterprise CIOs will have a neurodiversity talent strategy that will comprise 3% to 5% of their IT workforces.
- By 2025, 50% of large-enterprise IT leaders will require operations technology management (OTM) skills to support artificial intelligence (AI) and augmented intelligence.

Legal and Compliance

The COVID-19 pandemic has altered the trajectory of technology adoption in legal departments. Rather than scrambling to catch up, application leaders responsible for legal and compliance technology must build a strategy that addresses pain points on the path to better legal and business outcomes.

Predicts 2021: Corporate Legal and Compliance Technology

- By 2024, legal departments will replace 20% of generalist lawyers with nonlawyer staff.
- By 2024, legal departments will have automated 50% of legal work related to major corporate transactions.

Supply Chain Planning and Operations

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

Predicts 2021: Supply Chain Technology

- By 2023, 50% of global product-centric enterprises will have invested in real-time transportation visibility platforms.
- Through 2024, 50% of supply chain organizations will invest in applications that support artificial intelligence and advanced analytics capabilities.

Industry Predictions

Automotive and Smart Mobility

The near-term future of the automotive industry will bring improvements in making money from connectivity, for automakers and consumers, as well as advancements for autonomy and mobility. IT leaders of automakers can use these predictions to help create technology roadmaps for their organizations.

Predicts 2021: Automotive and Smart Mobility

- By 2025, autonomous vehicles (AV) robotaxis will have expanded to 100 cities, signaling the end of personal car ownership in metropolitan areas.

- By 2025, the automotive retail landscape will be disrupted, with 20% of all new cars sold entirely online.
- By 2025, at least 25% of the revenue from vehicle options by premium carmakers will be enabled through digital upgrades, up from virtually none today.
- By 2023, transaction payments made through a vehicle will rise to $1 billion from less than $100 million today.
- By 2023, some electric vehicle (EV) users will be able to halve their vehicles' cost of ownership by generating income from digitally enabled services.

Banking and Investment Services

Banks were already digitally enabling their employees in early 2020, but the arrival of COVID-19 set a new bar that exposed servicing and automation inadequacies in real time. CIOs can use Gartner's 2021 predictions to prioritize strategies to empower employees throughout the organization.

Predicts 2021: Banking CIOs Must Digitally Enable Employees to Exceed Business Expectations

- By YE21, 20% of static credit scoring algorithms will be obsolete and replaced by dynamic ones.
- By YE24, at least 40% of customer-facing staff will engage with external ecosystems directly to support client preferences and service their banking needs.
- By YE22, 25% of automation business cases will fail because they are based on FTE reduction rather than customer satisfaction or new revenue.
- By YE24, more than 50% of financial services supporting vendors will offer no-code or low-code tools to enable non-IT employees.

Communications Service Providers (CSPs) and Telecommunications

Challenged with the slow pace and suboptimal outcomes of various transformation initiatives, CSPs will increasingly plan their transformation to revenue growth initiatives. CSP CIOs can use the strategic planning assumptions covered here to evolve their technology and operations strategies.

Predicts 2021: CSP Technology and Operations Strategy

- Through 2024, network-based CSPs who evolve their cloud network as a service using platform initiatives, marketplace and automation will increase from 5% in 2020 to 40%.
- Through 2025, the number of CSPs investing in artificial intelligence (AI) technologies for improving their infrastructure planning, operation and products will rise from 30% in 2020 to 70%.
- Through 2024, the number of CSPs implementing platforms for effective participation in digital ecosystems will rise from 10% in 2020 to 50%.

Radical change in the telecom industry is forcing vendors to make strategic choices that reshape business models, products, services and ecosystem participation. TSP product leaders can use the Strategic Planning Assumptions in this research to evolve their technology and business strategies.

Predict 2021: A Paradigm Shift for Technology Service Providers in the Telecom Industry

- By 2025, at least 30% of all CSPs will be using hyperscale cloud providers as their technology partners for cloud-native infrastructure and edge computing.
- By 2025, hyperscalers' IoT mobile core network infrastructure will manage 20% of 5G IoT connectivity.

Government

Government Digital Transformation

The pandemic has forced government agencies to reassess their digital strategies because priorities have shifted and resources are scarce. Government CIOs must accelerate transformational change to address urgent challenges and provide resilient services.

Predicts 2021: Governments Tackle Transformation Out of Necessity

- By 2023, over 60% of governments will have tripled citizen digital services, but less than 25% will be integrated across organizational silos.
- By 2023, over 20% of governments will leverage a digital twin of government for at least one major system, up from 4% in 2020.

Smart Cities

In postpandemic times, CIOs of smart cities and intelligent urban ecosystems will have to build citizen outreach and attractive service strategies by involving a data ecosystem, citizen insights and new ways of using technologies to deliver customized service experiences.

Predicts: Smart City Resilience and Citizen Experience Will Drive Sustainability and Urban Attractiveness

- The impact of COVID-19 triggered changes in mobility patterns, which puts even more emphasis on the need for data exchange and analytics across all mobility and transit providers.
- Advances in AI supporting conversational chatbot and robotic technologies have spurred the development of smart devices and information dissemination that support inclusion and opportunities for all society.

Resilient smart city development involves a broad range of stakeholders and ecosystem partners, and requires strong strategic governance. CIOs can use data to establish shared social and business benefits and drive the engagement needed for sustainable success.

Predicts 2020: Resilient Smart City Development Requires Data-Driven Engagement of Citizens and Businesses

- By YE22, half of city open data portals will have failed to become ecosystem data exchanges due to lack of automated management.
- By YE23, two-thirds of all smart city economic development strategies will have Industrie 4.0, healthcare or tourism at their core.
- By YE22, one-quarter of all urban infrastructure developments will be based on asset value models used by the digital giants.
- By YE24, at least 50% of smart city initiatives will include smart management of the circular economy.
- By YE24, more than 50% of smart city programs without a multisource funding model will not scale beyond their original scope.

Healthcare

Disruptions to healthcare provider operations have become the rule rather than the exception. Digital transformation efforts will need to continue during these unprecedented times. Healthcare provider CIOs should use these predictions to inform strategic planning for 2021.

Predicts 2021: Healthcare Providers Must Accelerate Digital Transformation to Address Disruption

- By 2022, 30% of outpatient encounters will be virtual, representing 15% of revenue, and making the effectiveness of this new care setting a leading strategic objective for healthcare delivery organizations (HDOs).
- By 2023, 30% of HDOs will deploy virtual health assistants for digital patient triage, replacing humans in directing patients to the right level of care.
- By 2024, 20% of all health information exchanged among patients and providers will be consumer-mediated.
- By 2023, 35% of HDOs will have shifted workflows outside the EHR to deliver better digital experiences.

The COVID-19 pandemic has increased business risk for U.S. healthcare payers, prompting them to focus on membership growth and financial performance. Our 2021 predictions illuminate how CIOs must minimize care and administrative costs to succeed in a highly competitive consumer health ecosystem.

Predicts 2021: U.S. Healthcare Payers Lower Total Costs and Transform Ecosystem Relationships

- By 2023, payers will own 10% of the Fast Healthcare Interoperability Resources (FHIR) apps available on electronic health record (EHR) marketplaces — making integration payers' biggest new revenue stream.

Insurance

For digital insurance success in the insurance market of the future, it is imperative that insurance CIOs address talent issues that have been previously overlooked. Filling skills gaps, empowering knowledge workers and managing knowledge transfer will be critical success factors for 2021.

Predicts 2021: The Insurance 'New Normal' Requires New Approaches to Talent

- By YE24, investment in AI enablement of knowledge workers will rise by 40% as insurers shift from automation to human support initiatives.
- By YE22, 75% of chief digital officers will shift focus to tactical initiatives aimed at automation and process optimization.
- By YE22, insurers' lack of investment in speculative game-changing technologies will have caused the closure of 40% of innovation hubs and labs.
- By YE23, insurtech acquisitions will be driven by the need to buy talent and boost innovation, but 70% will fail to do either.

Life Sciences

COVID-19 has shifted expectations for 2020 far beyond previous industry leaders' predictions. Life science CIOs must use the pandemic as an opportunity to accelerate digital business initiatives and refine digital capabilities.

Predicts 2021: Life Science Companies Must Quickly Adapt as Digital Expectations Change

- By 2023, nearly half of new product lead candidates will come from preclinical research and development (R&D) research portfolios that have invested in AI- and quantum-generated drug discovery initiatives.
- By 2024, demand for life science sales representatives will be reduced by 30% through deployment of biobots — which will in turn increase prescriptions by 5%.
- By 2024, 40% of life science companies will have active digital and decentralized trial programs, with as many as 30% of patient visits conducted remotely.
- By 2023, 25% of top pharma will have composable supply chain architectures to address unique CGT requirements.

Manufacturing

Manufacturing resilience in a time of extreme uncertainty will require sophisticated data analytics and collaboration capabilities. CIOs driving Industrie 4.0 programs must demonstrate leadership skills that support a cross-team data culture and information policy to overcome crises like COVID-19.

Predicts 2020: Resilience in Industrie 4.0 for Advanced Manufacturing Builds on Data and Collaboration Models

- By YE24, following the COVID-19 pandemic, more than 30% of manufacturers will have changed their business models, compared with just 10% before the crisis.
- By YE22, half of all Industrie 4.0 transformation programs will be failing because they are not linked to, accompanied by and measured by change leadership strategies.
- By YE23, half of all successful artificial intelligence (AI) implementations in manufacturing enterprises will be driven by a CIO-chief data officer (CDO) collaboration.
- By YE21, half of all manufacturing enterprises will have failed to recover from the impacts of the COVID-19 pandemic due to inconsistent analysis of ecosystem dependencies.

The pandemic catalyzed many consumer goods organizations to invest in long-delayed digital initiatives, and galvanized consumer buying habits around convenience, driving new loyalties and more engagement. CIOs can act as major change agents as their organizations prepare for the future state of consumer goods.

Predicts 2021: Consumer Goods Manufacturers Compete in the Brave New World

- By 2024, 75% of the top 20 global consumer goods companies will provide a digital experience to augment their physical product.
- By 2024, 70% of the top 50 global consumer goods companies will create direct-to-consumer (D2C) channels.

Oil and Gas

A combination of pandemic response, market volatility, digitalization and energy transition has led to the end of the “typical” oil and gas company. CIOs can use this research to adapt and leverage their constrained resources to deliver business value specific to their changing company needs.

Predicts 2021: Oil and Gas — The End of “Standard” Oil

- By 2024, 70% of the highest-performing oil and gas assets will be optimized using large-scale digital twins.

Retail

The ongoing COVID-19 pandemic is just one of many factors driving fundamental changes in retail operations, and especially how physical locations are used. Retail CIOs can use Gartner's 2021 predictions to make informed decisions about new business and operating models.

Predicts 2021: Retail — Redefining the Physical to Capitalize on Digital

- By 2024, augmented in-store associates in at least 10 Tier 1 retailers will execute inventory audits to support automated precision merchandising at the edge.
- By 2024, two of the top 10 global QSR brands will develop a collaborative food delivery marketplace to compete with third-party delivery aggregators.
- By 2023, five Tier 1 grocery retailers will have adopted hybrid store models, installing go-style, smart check-out formats within their larger superstores.

Retail tech providers need to adapt their solutions and go-to-market (GTM) strategies in line with profound postpandemic market shifts. We offer four predictions for retail product leaders to innovate through composable business capabilities, edge technologies, ecosystem partnerships and dynamic positioning.

Predicts 2021: Retail Tech Providers Adapt Through Innovation, Ecosystem Partnerships and Execution

- By 2024, one-third of all store technology solutions offered by vendors serving Tier 1 multichannel retailers will utilize edge computing.
- By 2024, at least 50% of all retail TSP revenue from merchandising and store operations applications will be realized through ecosystem partnerships.

Technology and Service Providers (TSPs)

Nimble tech providers alter their product and services portfolio as business models change, more so in a postpandemic world. Product leaders selling into different industries will use approaches directed by composable architecture, hyperautomation, AI and CX techniques to address evolving needs.

Predicts 2021: Navigating Through the Changes for Vertical Industries

- By 2025, 50% of vertical-specific software providers will leverage composable enterprise architectures to compete more effectively with generic SaaS.
- By 2023, AI and hyperautomation investments will double in banking, healthcare, retail, education and manufacturing due to demand from digital transformation projects.
- By 2023, financial services vendors in CX that focus on user journey will win twice as many deals compared to singular CX focus.
- By 2025, 50% of Tier 1 banks will launch a banking-as-a-service offering as a way to leverage their technology investments.
- By 2023, 80% of healthcare technology product firms will have at least one AI capability embedded in their product itself.

Utilities

The energy transition and disruptive innovation challenge energy provisioning business models and set the stage for utilities to explore new opportunities while also attracting new entrants. Gartner predictions highlight challenges and opportunities for utility CIOs during upcoming turbulent times.

Predicts 2021: Get Ready for the Energy Transition

- By 2020, 25% of new monitoring and control systems in the utility sector will use IoT to enhance algorithmic business capabilities.

Document Revision History

100 Data and Analytics Predictions Through 2024 - 20 March 2020

100 Data and Analytics Predictions Through 2023 - 8 January 2020

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