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Confederation of Indian Industry

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Global Business Consulting

CIO INSIGHTS

Leading Technology Trends 2023

Quotes from Jury
CII - CIO Excellence Awards 2023

"As the architects of digital transformation, CIOs are leading the way with innovation and excellence. The CII CIO Excellence Awards recognize the most inspiring CIOs in India, celebrating their vision, commitment, and success. The path-breaking work done by this years' nominees has set a precedent for the impact of digital transformation to be not just a promise but a reality.

Mr. Vijay K. Thadani
Chairman of the Jury, CIO Awards & Co-Chairman of
CII Centre for Digital Transformation (CDT)
Vice Chairman and Managing Director – NIIT Ltd.

"The commitment to excellence and the transformative impact of these CIOs in the world of technology is truly remarkable, and it's an honour to help acknowledge their contributions.

Dr. Gulshan Rai
Former DG, CERT-in & Former National Cybersecurity Coordinator-PMO
Government of India

"The vision and transformative contribution of the nominees is inspiring. Super work, incredibly innovative! Great going!!.

Mr. J S Deepak
Former Secretary, Telecom and Secretary Electronics
& Information Technology
Government of India

Quotes from Jury
CII - CIO Excellence Awards 2023

"I am deeply impressed by the extent of innovation and quality of leadership demonstrated by the nominees, making it an uplifting experience to be a part of this thorough process. The commitment to excellence and the transformative impact of these CIOs in the world of technology is truly remarkable, and it's a privilege to be associated in recognizing their contributions.

Mr. Kiran Karnik

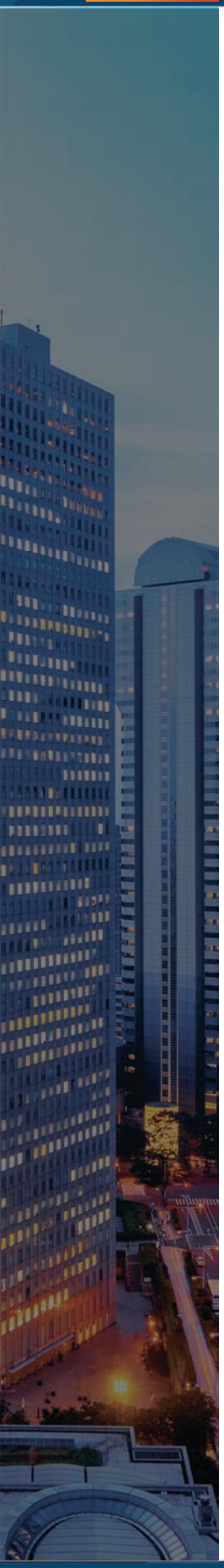
Former President - NASSCOM | Founder Director - ISRO's Development and Educational Communicational Unit

"The unwavering commitment to excellence exhibited by these CIOs is truly commendable. Their relentless pursuit of innovation and their ability to adapt to the ever-evolving technology landscape is commendable. By recognizing their achievements, we not only honor their dedication and ingenuity but also draw inspiration from their success stories.

Mr. Sunil Chandiramani

Chairman – Sapphire Foods
Founder & CEO NYKA, Advisory Services

Content



Publication Overview

CIOs have evolved into pivotal figures in shaping business strategies. They are tasked with the ongoing challenge of maintaining a forward-leaning position on the technology frontier. To keep their businesses competitive in a global marketplace characterized by perpetual change, they must harness the potential of new technologies, such as AI, ML, edge computing, 5G, cloud computing, IoT, the metaverse, and blockchain.

The publication represents a compilation of insights from technology leaders. These insights have been acquired through our interactions with them as part of the CIO Excellence Awards program, as well as through our exploration of emerging technology trends across various industries. Our aim is that this publication serves as a valuable resource for business leaders and CIOs, providing them with a comprehensive understanding of the most recent developments in technology and business transformation, spanning a wide range of industries and technology domains.

We take the opportunity to thank the CIOs for their valuable insights to the publication.

Mr. Sandeep Gupta
Managing Director – Technology Consulting
Protiviti Member Firm for India

Sectors

Automotive & Auto Ancillary

The automotive and auto ancillary industry stands at the intersection of innovation and evolution. In recent years, it has faced various challenges, including supply chain disruptions, environmental concerns, and changing consumer preferences. Despite these hurdles, the industry is surging forward, driven by technological advancements. In 2022, electric vehicle (EV) sales skyrocketed by 85%, emphasizing the shift toward sustainable transportation. The high manufacturing cost and data management pose challenges to the automotive market, which could affect its growth.

Key Trends

Digital Customer Experience

Technology solutions that are powering the automotive industry's customer experience trends, expected to reach USD 253.92 billion by 2027, include:

- **Customized Vehicles with WebGL** – It is an emerging tech that can help automotive companies deliver personalized customer experience
  - **3D Web Applications** – Using 3D web applications can give automotive businesses a competitive advantage, boost customer satisfaction and revenue, and contribute to long-term success
  - **Digital Buying in Metaverse** - Industry experts have found that using metaverse solutions has helped car companies reach more customers, increase sales, build brand loyalty, and save money on showroom and inventory expenses

Enhanced Vehicle Connectivity

- Electric vehicles (EVs) require technology integration to communicate with drivers and the external environment. Some of the technology solutions powering vehicle connectivity trends include:
  - **User Applications** - User applications are software programs designed for automotive companies that offer various features related to the user's vehicle, such as vehicle diagnostics, remote start and stop capabilities, navigation, parking assistance, safety features, and entertainment options
  - **Advanced Driver Assistance Systems** – A collection of technologies intended to enhance driver comfort and safety

Human-Machine Interfaces (HMI)

Human-machine interfaces (HMIs) are used to control vehicles using voice or touch. HMIs expand the range of what drivers and passengers can control in their cars, making the driving experience safer and more enjoyable. Smart virtual assistants are another type of HMI that can help drivers and passengers interact with their vehicles and other service providers.

3D Printing

3D printing is transforming the automotive industry in three primary ways. Rapid prototyping allows the iteration of new designs quickly and testing them using 3D-printed models, accelerating product development. Custom spare parts printed on demand reduce inventory costs and turnaround times. Additive manufacturing of composite materials to create complex and lightweight components improves the performance and efficiency of vehicles.

Internet of Things

In the automotive industry, the Internet of Things (IoT) allows vehicles to communicate securely with each other and with infrastructure components. This technology improves road safety, solves traffic congestion, and reduces pollution and energy expenditure by enabling better fleet management. Startups and emerging companies are developing advanced sensing technologies that can collect more data about vehicles and their surroundings, and that can also automate payments for fuel and tolls.

Artificial Intelligence

Artificial intelligence (AI) technologies, such as machine learning, deep learning, and computer vision, are used in robotic automation in the automotive industry to guide self-driving cars, manage fleets, assist drivers in improving safety, and enhance services such as vehicle inspection and insurance. Guided by machine learning algorithms, Self-driven cars are gaining momentum and contributing to the growing autonomous vehicle market, which is expected to reach USD 556.67 billion by 2026 at a CAGR of 39.47%. AI also finds applications where it accelerates the rate of production and reduces costs.

Conclusion

In both the Indian and global automotive industry, technology trends have been shaping the future of transportation. From the proliferation of electric vehicles and the development of autonomous driving systems to the integration of connectivity and digitalization, the automotive sector is undergoing a profound transformation. These trends are not only enhancing sustainability and safety but also revolutionizing the way we experience and interact with vehicles. As we move forward, the convergence of innovation and mobility promises to redefine the automotive landscape, offering exciting prospects for the world.

BFSI & Fintech

The global digital transformation in BFSI market, valued at USD 68.2 billion in 2022, is poised to surge to USD 310.7 billion by 2032, with a robust CAGR of 16.6%. In parallel, the global fintech technologies market, which stood at USD 110.57 billion in 2020, is on track to reach USD 698.48 billion by 2030, driven by a compelling CAGR of 20.3%. This dynamic sector is shaped by technological advancements and digital innovations. However, a critical challenge lies in cybersecurity threats due to the increased tech reliance, necessitating a focus on robust security measures, encryption, and system updates to ensure customer trust and data protection.

Key Trends

Insurtech

Insurtech harnesses cutting-edge insurance technologies to drive cost savings for both insurers and policyholders, enhance operational efficiency, and elevate the overall customer journey. While it shares similarities with traditional digital insurance solutions, insurtech takes these capabilities to a higher echelon, pushing the boundaries of innovation and performance.

Hyper Personalization in the Banking Industry

Banking-as-a-service, APIs, and fintech partnerships are enabling highly personalized banking and financial services. Consumers, banks, and fintech companies are increasingly using APIs to exchange information, which is driving this trend. The banking sector will develop in the direction of personalizing, offering new customers, and accompanying them with many services in an almost invisible way.

Data Privacy & Data Ethics

Data privacy and ethics are rapidly evolving into central technology trends within the BFSI and fintech sectors. Amid increasing data regulation and consumer concerns, institutions are emphasizing rigorous data protection and ethical data use. This includes transparent data collection, stringent privacy measures, and responsible AI applications, fostering trust and compliance in a data-driven industry.

Blockchain

Blockchain can transform fintech with secure, transparent, cost-effective, and efficient transactions. In many parts of the world, blockchain is already being used in several areas, including supply chain management, identity verification, and digital payments. With the increasing adoption of blockchain, fintech companies & BFSI industry are expected to develop new products and services that leverages this technology.

Sustainable Finance & FinOps

With a growing emphasis on environmental, social, and governance (ESG) criteria, there's a heightened focus on integrating sustainable practices into financial strategies. This includes responsible investments, green financing, and ESG risk assessment. Additionally, FinOps, leveraging advanced technology and data analytics, are optimizing financial processes, cost management, and resource allocation, aligning seamlessly with sustainable finance objectives.

Smart Applied-AI & Automation

Banks are harnessing AI and ML to boost operational efficiency, detect fraud, and enhance customer experiences. AI-driven chatbots and virtual assistants offer personalized support, while ML algorithms glean insights for risk assessment and customer segmentation from vast datasets. Concurrently, RPA is gaining momentum, automating manual tasks like customer onboarding, data entry, and compliance checks, reducing errors, and bolstering productivity in the banking & Financial industry.

Low-code or no-code platforms

Low-code platforms will become emerging in banking technologies for several reasons. First, banks must significantly accelerate the time to market for digital banking products and services. Second, there is a massive increase in the number of FinTech's or third parties that offer turnkey digital financial solutions that easily integrate with core banking systems. Third, there is an ever-increasing desire to strengthen the cooperation of businesses, including banking, with IT.

Open Network for Digital Commerce

Open APIs enable banks to share data with fintech companies and third-party service providers. These APIs allow for faster, more secure, and more efficient transactions on digital platforms. Open APIs are also expected to facilitate data sharing between financial institutions, third-party service providers, and customers. This integration could lead to faster innovation and improved customer experiences for banks and their customers.

RegTech (Regulatory technology)

RegTech is a type of technology used to monitor regulatory compliance. It identifies problems that don't follow the rules and make them work with the system. Specialized software automates monotonous procedures, keeps an eye on data security, and alerts users and bank workers to fraud. Makes it simpler for organizations to communicate with their regulatory authorities so that data may be sent without interruption, compliance is monitored (for example, by adhering to PCI compliance rules), and financial crimes are tracked.

Digital Lending

Digital lending is expected to be a significant growth area for fintech industry. With the increasing adoption of digital payments and the rise of alternative credit scoring models, digital lenders are well-positioned to serve the underserved and unbanked segments of the population.

Open Banking

Open banking is an emerging trend in the fintech industry, where banks and other financial institutions open-up their APIs (Application Programming Interfaces) to third-party developers. RBI guidelines for open banking in India are in place and banks have started sharing their APIs with fintech firms.

Core Modernization

Banks must upgrade their core operational and IT infrastructure to modernize and remain competitive in 2023. These systems are the foundation of the bank's IT infrastructure and support mission-critical functions such as processing accounts, loans, payments, and securities.

Banking of Things

IoT is revolutionizing banking with streamlined data collection, automating KYC and lending, and enabling real-time responses. Mobile-integrated IoT digital wallets offer convenient customer purchases. These IoT devices transmit real-time data, helping banks swiftly detect and prevent fraud, reducing potential losses.

Distributed Ledger Technology (DLT)

Distributed ledger technology (DLT), also known as decentralized finance (DeFi), is the intersection of blockchain and fintech. DLT has a wide range of applications in areas such as insurtech softwares, decentralized payment platforms, cryptocurrency exchanges, and open banking APIs, enabling innovative banking services. Some of the technologies that support this trend include digital wallets, digital assets, distributed data storage and exchange, zero-knowledge identity proof, and smart contracts.

Conclusion

Technology trends in BFSI and fintech are driving a financial revolution, utilizing blockchain, AI-powered services, and digital payments for efficiency and security. Collaboration and competition between institutions and startups are set to empower global financial inclusion and convenience, promising an era of innovation.

Consumer Products

The consumer-packaged goods (CPG) market was worth USD 20 billion in 2021 and is expected to reach USD 25 billion by 2030, growing at a compound annual growth rate (CAGR) of 2.9% from 2022 to 2030. Technological advancements and innovations are driving the market in both offline and online channels. CPGs have a short lifespan, which keeps demand high since they are expected to be used quickly. CPG companies must balance innovation and flexibility while maintaining the core offerings that made them successful.

Key Trends

Data Centricity

Companies are generating enormous amounts of data as they undergo digital transformation. Data scientists can use this data to accelerate digital transformation. Visual analytics and storytelling are the keys to creating effective data-driven solutions. As data becomes the foundation of enterprise decision-making, companies automatically prioritize profitability.

Connected Packaging and Serialized QR codes

Serialized QR codes are QR codes with a unique serialized code in the middle. This code is linked to a database and can be used to authenticate products and track their journey through the supply chain. When a customer scans a serialized QR code, they can access information such as the product's ingredients, batch number, packaging, routing, and authenticity.

Intelligent and Contactless Route to Market

Due to the rise of quick commerce, retail execution powered by image recognition, and digital payments, all route-to-market roles are evolving. In the coming years, CPG brands will continue to focus on reinventing their sales and supply chain strategies to address rising delivery costs and out-of-stock distribution.

New Technologies - AR, VR, AI, & 5G

Consumer experiences are now driving brand growth in the modern CPG world, making it essential for consumer goods companies to invest in new technologies and digitization. Consumer goods brands also adopt technologies like AR and VR to facilitate immersive, interactive, and unique interactions.

Driving Innovation with Robotics

Robots in retail can surpass humans in innovation and efficiency, leading businesses to invest heavily in robotics for warehouse and factory automation. Manufacturers are also starting to realize that robotics should be used throughout the supply chain, not just in the warehouse.

Moving to Cloud

Cloud computing enables CPG companies to optimize operations, adopt innovative and advanced technologies, and modernize their existing technology. It is also cost-effective, as it reduces the need for assets and only requires costs for acquiring server space.

Incorporating NFTs into Marketing Strategy

Consumer goods companies can inculcate a sense of community by creating and selling NFT to their customers. In turn, these collectable and verifiable assets create consumer loyalty. Moreover, the sales from NFT collections can go into their digital marketing efforts and trade spending without chipping away at the product margins.

Virtual Commerce using Metaverse in Retail

The metaverse is a new frontier for CPG brands, with the potential to revolutionize the way we sell and buy virtual goods. By creating immersive and engaging experiences, CPG brands can use the metaverse to connect with consumers on a deeper level, build stronger brand loyalty, and drive sales.

D2C (Direct-to-Consumer) Technologies

D2C tech is more agile and resilient, allowing brands to maintain stable profits in uncertain environments. It also has a lower cost of entry and lower channel maintenance costs. Brands are moving to D2C platforms to capitalize on the surge in e-commerce and online ordering.

Conclusion

The consumer products industry is undergoing a profound transformation driven by technology trends. From the rise of Intelligent and Contactless Route to Market to the incorporation of NFTs into marketing strategies, technology is reshaping how consumers interact with and benefit from everyday products. As the industry continues to innovate and adapt to these trends, it is poised for further growth and enhanced customer experiences in the years to come.

Industrial Manufacturing

The global Industry 4.0 market was worth USD 114.55 billion in 2021 and is expected to grow from USD 130.90 billion in 2022 to USD 377.30 billion by 2029 at a compound annual growth rate (CAGR) of 16.3% during 2022-2029. A host of technologies are driving Industry 4.0 revolution and Manufacturing CIOs are at the forefront of embracing these technologies to drive efficiencies in the overall business value chain.

Key Trends

Digitalization and Industry 4.0

Digitalization has had a profound impact on the manufacturing sector, enabling businesses to optimize processes, improve quality and reduce costs. Industry 4.0 also known as the fourth industrial revolution is the latest phase of the manufacturing industry's digital transformation. It integrates advanced technologies like the Internet of Things (IoT), artificial intelligence (AI), Robotic Process Automation (RPA) and cloud computing into an organization's existing manufacturing processes.

3D Printing

3D printing, also known as additive manufacturing, is a rapidly growing technology that has changed the way companies design, prototype and manufacture products. In smart factories, 3D printing is a popular tool for producing complex parts and components quickly and precisely.

Artificial Intelligence (AI)

With Industrial Internet of Things (Iot) devices and sensors collecting data from machines, equipment and production lines, AI algorithms can quickly process and analyze data to identify patterns and trends, helping manufacturers understand how production processes are performing and key Analytics from AI enabled systems improve the overall performance of production lines . Furthermore, AI can help manufacturers implement predictive maintenance systems, streamline supply chain management, and identify and address workplace safety hazards proactively.

Extended Reality

XR technologies can help manufacturers create immersive training simulations that help employees learn new skills and procedures in a controlled environment. As a result, workers get real-time information and guidance, and companies get more productivity and fewer errors.

Robotics And Automation

Robotics technology can perform repetitive tasks faster and with a much higher degree of accuracy and precision than human workers, improving product quality and reducing defects. Manufacturers can also integrate robotics with Industrial Internet of Things (Iot) sensors and big data analytics to create a more flexible and responsive production environment.

Digital twins

In smart factories, digital twins are used to monitor and optimize the performance of manufacturing processes, machines and equipment. By collecting sensor data from manufacturing equipment, digital twins can detect anomalies, identify potential problems, improve forecasting capabilities and provide insights into how to optimize production processes. Manufacturers can also use digital twins to simulate scenarios and test configurations before implementing them.

Wearables

Wearables are emerging as a transformative trend in the manufacturing industry, offering benefits in terms of safety, efficiency, and productivity. Such wearable devices, ranging from smart glasses and helmets to exoskeletons and wristbands, are equipped with advanced sensors and AR capabilities. For instance, wearables enhance worker safety by delivering real-time alerts and guidance, enabling employees to avoid accidents and potential hazards.

Modernizing Through ERP

A particularly important technology priority for manufacturers is to modernize and consolidate their ERP systems, in most cases by moving them to cloud services to ensure they have access to regular updates and the latest security controls. Cloud ERP suites also let companies scale their finance, manufacturing, and other individual applications on demand, paying only for what they need and integrated suites of cloud applications ERP integrated with SCM integrated with PLM give manufacturers needed visibility across those functions.

Conclusion

The widespread adoption of Industry 4.0 technologies, such as IoT, AI, and automation, is enhancing efficiency and productivity. 3D printing and additive manufacturing are revolutionizing production processes, reducing waste, and enabling customization. Sustainability remains a central concern, with a growing emphasis on eco-friendly practices and materials. Overall, these tech trends are reshaping manufacturing, fostering innovation, and propelling the industry towards a more sustainable and agile future.

Information Technology / Information Technology Enabled Services

The global IT services market size was estimated at USD 1.22 trillion in 2022 and is expected to grow at a compound annual growth rate (CAGR) of 9.7% from 2023 to 2030. Emerging technologies such as Generative AI are driving demand. Emphasis on Data-driven service improvements are finding favor with organizations. Data threats, such as data breaches, are increasing due to improved IT infrastructure. This requires advanced security solutions instead of traditional ones. As this trend gains momentum, companies are investing in their advanced security offerings.

Key Trends

Cloud-Based Services: Unleashing Scalability And Flexibility

Revolutionizing business operations, cloud-based services offer scalability and speed. Managed service providers (MSPs) offer tailored cloud solutions that empower businesses to access their applications & IT infrastructure and services from any corner of the globe. This trend is set to continue as companies increasingly seek agility and cost optimization.

Cybersecurity: Safeguarding Against Evolving Threats

With the rise in cyber attacks, data breaches, and ransomware, cybersecurity has become a critical concern for businesses. Managed IT service providers offer a comprehensive suite of cybersecurity services to shield organizations from online dangers. These services encompass Security Information and Event Management (SIEM), Managed Endpoint Protection, and Managed Firewall Services.

Streamlining IT Management

Hyper-converged infrastructure (HCI) is revolutionizing the way organizations architect their IT infrastructure. By integrating computing, storage, and networking into a unified system, HCI simplifies IT management while optimizing hardware costs. Businesses reap the benefits of enhanced performance, scalability, and cost savings.

Data Analytics & Data Engineering

Managed IT services now encompass data analytics and data engineering to help businesses harness the power of their data. Through services such as data warehousing, data visualization, and predictive analytics, organizations gain valuable insights for informed decision-making, enabling them to gain a competitive advantage in the marketplace.

DevOps: Fostering Collaboration And Efficiency

DevOps, bridges the gap between development and operations teams. Embracing DevOps practices leads to faster time-to-market, higher-quality software, and improved collaboration, resulting in enhanced customer satisfaction, productivity, and overall business success.

Digital Transformation: Innovating Business Operations

Digital transformation has become a transformative trend in managed IT services, enabling businesses to optimize their operations in the digital age. By digitizing processes, automating tasks, and harnessing the power of data, organizations unlock new opportunities for growth and efficiency. Managed IT services support digital transformation through services like cloud adoption and migration, digital workplace and collaboration, and IoT and edge computing solutions.

Robotics & Automation

Automation has emerged as a critical trend in managed IT services, empowering businesses to enhance efficiency and reduce errors. Robotic Process Automation (RPA), IT Infrastructure Automation, and Network Automation are among the automation solutions offered by MSPs. By identifying areas for automation, MSPs deliver tailored solutions that yield substantial business value.

Generative AI

Generative AI is gaining traction, with applications such as Chat GPT building major media buzz. Investment in generative AI is expected to grow approximately by 4 times over the next 2 to 3 years. MSPs are building focus on Generative AI enabled services for their clients, also assisting their clients identify suitable use cases to deploy. Security comes across as the major concern in enterprises adoption of Generative AI.

Conclusion

In conclusion, the IT/ITES industry is at the forefront of technological innovation, with a constant evolution of trends. From the rise of cloud-based services to the adoption of Robotics & automation, these trends have reshaped the industry's landscape. Embracing these advancements is essential for staying competitive and meeting the ever-growing demands of clients. As the IT/ITES industry continues to adapt and leverage emerging technologies, it remains a dynamic and vital sector in the global economy.

Oil Chemical Energy & Utilities
(Oil & Chemical)

The oil and chemical market, a global powerhouse, faces both opportunities and challenges. The sector is vital, as the chemical industry has already reached USD 5.7 trillion, while the oil industry is rebounding post-pandemic. Challenges include environmental concerns and the need for sustainability. Solutions lie in adopting greener technologies and investing in renewables. Additionally, the adoption of advanced data analytics and digitalization is essential for efficient operations and reducing carbon footprints. Navigating these changes is critical for long-term success in this ever-evolving market.

Key Trends

Manufacturing Execution Systems

MES (Manufacturing Execution Systems) seamlessly merge manufacturing facilities with operational technologies like SCADA and computing systems to oversee intricate oil & gas equipment production. Engineers rely on MES to monitor and control ongoing processes efficiently. This integrated control system enhances oilfield technologies, promoting faster, safer, and more dependable production methods.

Robotics & Automation

In demanding oil and gas environments, safety concerns are prevalent. To mitigate risks, the industry is turning to robotics and automation, enhancing workplace safety and operational speed. Robots are invaluable for inspection, surveys, and automation in rigs and refineries, streamlining operations, reducing manpower needs, and improving efficiency while minimizing human errors.

Predictive Maintenance

Predictive maintenance and operations use sensor data and machine learning to swiftly evaluate equipment conditions, enhancing maintenance efficiency. Alongside software platforms, they offer detailed part visualizations, enabling operators to foresee potential failures in the oil & gas industry. Applicable across upstream, midstream, and downstream operations, these solutions boost safety, prolong equipment life, and cut operational and maintenance expenses.

Internet of Things

The chemical industry embraces IoT for data capture, process optimization, and safety enhancement. It predicts maintenance needs and prevents production disruptions, offering transparency across the supply chain by uniting OEMs, operators, and service providers on a single platform. This represents a significant trend in the chemical sector.

3D Modeling & Visualization

3D modeling and visualizations provide lifelike depictions of subsurface reservoirs and oil & gas equipment. They, along with historical data, simulate reservoir lifecycles, aiding risk prediction and optimization. This approach reduces costs, mitigates risks, and enhances performance for oil & gas assets.

Advanced Manufacturing

Chemical manufacturing embraces additive tech, automation, and digitalization. XR, digital twins aid training and crisis prep; 3D printing automates electrochemical processes. Cobots speed up hazardous lab work, AGVs optimize goods transport, shaping fresh trends in the industry.

Blockchain

Blockchain technology is employed in the chemical industry to track products from raw materials to manufacturing, offering trusted data, insights into customer needs, and new revenue possibilities. It optimizes demand planning, eliminating overstocking and scheduling issues. Smart contracts provide distributed control, ensuring quality and minimizing errors in testing processes.

Cloud Computing

Cloud computing is quickly gaining prominence in the chemical industry for its efficiency in material compatibility calculations. It's scalable, cost-effective, and enhances data storage and exchange, reducing operational expenses and supply chain risks. Startups in this space prioritize cybersecurity due to the sensitivity of chemical data, like formulas.

Data Analytics

Advanced data analytics in chemical manufacturing boosts productivity and profitability. Big data insights optimize energy use, plant operations, and supply chains, while AI-driven algorithms predict and prevent potential equipment failures, minimizing downtime.

Artificial Intelligence

AI and deep learning algorithms enhance laboratory experiments, generating novel biochemical formulations and safer material combinations. They automate chemical processes, improve operational efficiency, and swiftly detect anomalies or contamination for early prevention, making AI a leading trend in the chemical industry.

Conclusion

In conclusion, technology trends in the oil and chemical industry are transforming the way operations are conducted. Advanced data analytics, automation, and digitalization are driving efficiency, safety, and sustainability across the sector. Innovations like predictive maintenance, 3D printing, and automation are revolutionizing processes and ensuring a competitive edge. As these trends continue to evolve, the industry is poised to thrive and adapt to the changing landscape, meeting both environmental and economic challenges.

Oil Chemical Energy & Utilities
(Energy & Utilities)

Despite energy price shocks, India's resilience in 2023 is evident in its 8.7% growth in electricity demand, fueled by COVID-19 recovery and intense summer heat waves. Coal generation also increased by 8.7% but resulted in higher emissions. Energy security and affordability remained top priorities in 2022, necessitating efforts to improve domestic coal production, mandate coal imports, and expand local manufacturing.

Key Trends

Growth of Energy Poverty — Focus on Relief, Revival and Renewable Energy

A majority of the population, currently in the Northern Hemisphere, is wrestling with the challenges caused by the lack of access to fuel, food and finance. Energy poverty is the core problem. CIOs can approach with a dual focus on addressing affordability concerns and ensuring financial and operational stability.

Orchestrate Flexible Resources to Maintain Power System Operational Integrity

Intermittent renewable energy is displacing large-scale fossil-fueled resources that provided inertia and stabilized the grid. With the diminishing role of fossil fuel resources, CIOs must support integration of consumer-owned resources with digital IT and operational technology (OT) services.

Water Security Management Is the Water Industry's Existential Imperative

Effluent management is the new disruptor for water security management in water utilities and the downfall of legacy water management strategies. Failures in water quality will break water utilities overall. CIOs should use this trend to evaluate how and why water security management is the key challenge and opportunity for water utility enterprises.

Digital Customer Experience Is Remodeling for the Energy and Water Transition

For years, customer engagement has been focused on customer service while managing a narrow scope of commodity transactions. But during this transition era, customer experience (CX) will define the breakout enterprise. CIOs can design a CX/total experience (TX) that syncs with the energy and water transition.

 Sources: Gartner

Evolving Markets Challenging Traditional Energy Trading Tools

Turbulent geopolitics and the energy transition result in power outages and spot market price shocks that challenge the utility's existing operational and financial agility. CIOs should factor in the effects of electricity market volatility when developing their IT strategy, operating model, and budget.

Establish Decision Intelligence Before Chasing Autonomous Business

Decision intelligence is an essential precursor to automation execution, irrespective of decision execution technology to support intelligent operations. CIOs can prioritize and manage business demand for decision automation.

Green Hydrogen Expectations Are High, but So Are Challenges

Hydrogen has great potential to ease the energy transition journey, but multiple challenges remain. This research will help CIOs gain a balanced view of opportunities created by government incentives and investors' interest, as well as challenges faced on the road toward a hydrogen economy.

Composable Architecture Delivers Business Agility

Diverse pressures, like operational and business challenges and disruptions triggered by global events, are forcing utilities to adopt new plans focused on agility and resilience. CIOs can use the rise of composable architecture to assess how it can enable agility in achieving business outcomes.

Sustainability Is a Double-Edged Sword for Utilities

Tightening regulations, stakeholder scrutiny and climate change impacting assets and infrastructure frame environmental challenges, with changing customer attitudes making opportunities for utilities. CIOs should align digital strategies and technology investments with climate change risks.

Utility Business Models Are Evolving From 'Ego-Centric' to Eco-Centric

Democratization of energy provisioning is forcing utilities to evolve business models from internally focused ego-centric business models to externally focused, collaborative, eco-centric business models. CIOs must ensure that their digital technology strategy and technology investments reflect this shift.

Conclusion

Technology leaders must confidently compose the future for their organizations in the midst of uncertainty during this energy transition volatile period — the future that requires organizations to be both agile and resilient. This is where utility trends for 2023 can help. These can help organizations set priorities, explore technology investment directions and compare positions to others in the industry.

 Sources: Gartner

Pharma Healthcare & Life Science

The healthcare industry in India is estimated to reach INR 110 Tn by 2027 with a CAGR of 30.70%, with the digital healthcare segment having a 17.44% market share. The healthcare industry faces a set of urgent challenges, such as a rapidly growing population and a rising prevalence of chronic diseases. These challenges are putting significant pressure on the current healthcare infrastructure, leading to a heightened demand for high-quality healthcare services from both patients and providers.

Key Trends

Generative AI

AI will be instrumental in many of the trends, but generative AI, in particular, will be particularly impactful over the next 12 months. It will democratize access to other transformative AI applications, making it easier to implement and interpret results and generate personalized recommendations.

Personalized Medicine

Pertains to the development of customized treatment strategies for each patient. In reality, technology and data are increasingly employed to achieve this. The cutting-edge applications of this concept are found in genomics, where AI is utilized to examine patients' DNA for disease diagnosis and treatment, and to formulate personalized medicines tailored to individuals at the molecular level, often referred to as precision medicine.

The Rise of Healthcare SaaS

Healthcare SaaS is gaining popularity among organizations seeking to enhance efficiency and care quality. It offers solutions for storing electronic health records, population health data, and manages patient records, appointments, and billing information.

IoT-Powered Virtual Hospitals and Telemedicine 2.0

This trend encompasses telemedicine and IoT-connected wearable devices. It involves using these connected devices to remotely monitor patients and facilitate communication for healthcare professionals, expanding the scope of remote care. We refer to this as "telemedicine 2.0" because it extends beyond basic remote care delivery, like remote consultations, to embrace a comprehensive approach to remote patient care and treatment.

Virtual and Augmented Reality

The use of virtual reality (VR) in healthcare is beginning to take off, with several innovative use cases now entering the mainstream. In particular, it has been shown to be effective in helping patients manage long-term chronic pain and cause fewer side effects than traditional pharmaceutical pain management. Meanwhile, augmented reality (AR) is increasingly being used by surgeons to provide digital information as they work without the need to look at separate screens.

Remote Monitoring

The adoption of remote monitoring tools is on the rise as people prioritize their health and well-being. These tools empower patients to actively participate in their healthcare and receive prompt interventions when needed. Popular options include fitness trackers, blood pressure monitors, heart rate monitors, and glucometers, which patients can either wear or place at home to regularly send data to healthcare providers. This data serves to track trends and make essential adjustments to care plans.

3D Printing

Additive manufacturing, which involves the production of items through methods like 3D printing, plays a significant role in the healthcare sector. In regions with limited access to medical equipment, it enables the on-demand creation of various tools and devices, including surgical tools, orthopedic and dental implants, as well as prosthetic devices.

Data and Analytics

In 2023, data and analytics will catalyze a new healthcare landscape. With the global healthcare analytics market expected to surpass USD 43 Billion this year, primary stakeholders – payers, Healthcare Professionals (HCPs), and patients – will benefit from the all-new insights, services and levels of experience that next-generation healthcare-related data and analytical capabilities provide.

Conclusion

In 2024, the healthcare landscape will be shaped by a confluence of factors, including an aging population, economic uncertainties and transformative technologies like Artificial Intelligence (AI), the Internet of Medical Things (IoMT), telemedicine, big data, immersive tech, 3D printing, blockchain, cloud computing, and genomics. These innovations are reshaping clinical diagnosis, treatment, and disease management, with a focus on precision medicine.

Real Estate & Infrastructure

The global real estate and infrastructure market was worth USD 3.69 trillion in 2021 and is expected to grow at a compound annual growth rate (CAGR) of 5.2% from 2022 to 2030. However, COVID-19 lockdowns across various regions delayed new construction projects and slowed industry growth. However, the real estate activity has begun to rebound, returning to pre-pandemic levels owing to increased search and purchase of homes by potential buyers thereby boosting the growth of the real estate market.

Key Trends

Building Management Systems (BMS)

BMS software empowers real estate firms to oversee and regulate a building's physical environment, covering aspects like temperature, humidity, lighting, security, and more. It also streamlines property management tasks, automating maintenance scheduling and access control.

Property Management Software

Real estate management software streamlines communication, automates processes, and centralizes data for agents, landlords, and tenants. It offers real-time property updates and quick issue resolution, greatly benefiting the real estate sector's efficiency and customer service.

Property Aggregation Platforms

PAP platforms aggregate data from diverse sources, including public records and local real estate associations, offering agents a holistic view of their market. This technology empowers agents to monitor market fluctuations and uncover hidden opportunities that might otherwise go unnoticed.

Artificial Intelligence

Real estate agents are using AI algorithms to find patterns in customer behaviour and tailor their marketing campaigns. AI is also being used to optimize online ads, so they reach the right audience more effectively. Leveraging AI, agents can gain an edge over their competitors, reach the right people with their message, increase conversions, and provide a more streamlined service for their prospective buyers.

Building Information Modelling (BIM) & Drones

BIMs are versatile digital files for sharing and analysis, aiding informed home purchases. Drone-captured images provide unique property perspectives. Drones are also integral in real estate app development, enhancing visual experiences.

Blockchain in Real Estate Apps

Smart contracts are digitally signed agreements containing information about real estate transactions on a blockchain. It makes the process more open and secure by eliminating the requirement for third-party participation and paper documents. Because of tokenization and blockchain technology, even those with modest means can participate in the real estate market by purchasing tokens.

Metaverse

In 2023, Forbes anticipates the continued expansion of virtual real estate and investment possibilities to be the final technological trend driving real estate. A total of USD 5.95 billion is expected to be spent on real estate in the metaverse by 2028, up from an initial estimate of USD 821.9 million in 2021. Innovations in other real estate tech trends, such as virtual reality (VR), augmented reality (AR), and blockchain technology in the real estate industry, have aided in this expansion.

Data Security

Data security is the most critical trend in real estate development, and it will remain a priority beyond 2025. Software companies and startups offer solutions to encrypt data, monitor and prevent cyberattacks, secure network traffic, and manage risk. They are also developing cybersecurity tools that enable security staff to manage risk and access systems remotely to manage vulnerabilities and back up data.

Conclusion

In conclusion, technology trends in the real estate and infrastructure industry are reshaping the way we plan, construct, and manage our built environments. The adoption of innovative solutions, such as smart buildings and sustainable construction practices, is driving efficiency and sustainability. Moreover, data-driven decision-making and digital platforms are enhancing collaboration and customer experiences. As these trends continue to evolve, the industry stands at the forefront of transformation, offering promising prospects for the future.

Services

The services sector is India's largest economic sector, attracting significant foreign investments, contributing heavily to exports, and providing large-scale employment. The service sector makes up over 50% of India’s GDP, and it has witnessed a growth of 10.8% during the first half of 2021-22. The service sector has emerged as the highest employment generator, with a 5%-7% y-o-y growth in 2022.

Key Trends

Substantial Investments on the Horizon in the Deployment of AI and Chatbots

Leaders will invest heavily in VCAs/chatbots and AI in the next several years, according to the Gartner Technology Roadmap Survey. Currently, only 25% of service organizations are entirely using chatbots and AI, but 37.5% of leaders are testing or planning to deploy chatbots by 2023, and 36.3% are doing the same for AI capabilities.

The Future Lies in Understanding the Preferences and Behaviour of Digital Customers

Digital self-service channels and predictive customer analytics are expected to be the most important capabilities for service organizations in the next two years. Digital self-service channels can save service organizations a lot of money, and leaders should invest in analytics to understand and predict customer behaviour on these channels to improve the customer experience.

Leaders Expect the Most Gains from Data and Analytics

Leaders indicate that in the next two years, they will focus on more than just analyzing customer data using digital analytics, sentiment analysis, and machine learning. They will also use the insights gained from that data to make informed decisions

Technologies that Enable Reps are Bringing Most Value to Service Organizations

Despite the hype around AI, IoT, and VR in customer service, employee-centric technologies like workforce management, case management, consolidated desktop agents, internal collaboration tools, and unified communications provide the most value today.

Conclusion

The latest customer service tech emphasizes assisted service, freeing support reps, and aligning with digital self-service and analytics. These trends support improved customer understanding, ROI growth, and enhanced digital experiences.

 Sources: IBEF, Gartner

Technology, Media & Communications

The global telecommunications market was worth USD 1.7 trillion in 2021 and is expected to grow from USD 1.8 trillion in 2022 to USD 3.1 trillion by 2030, at a CAGR of 6.2% from 2023 to 2030. E-commerce retail, media and entertainment, IT and telecom, healthcare, transportation and logistics, and other industries are the key verticals for analyzing potential in the telecommunications market. The challenges faced by the industry are the need to adapt to fast-paced technological advancements and evolving consumer preferences continually.

Key Trends

Artificial Intelligence And Automation

Machine learning and natural language processing (NLP) are automating routine tasks like answering customer inquiries and processing transactions. This boosts efficiency, cuts costs, and lets human agents focus on complex, high-value customer interactions.

Technology Verticalization

Semiconductor companies evolving into software companies with a focus on a “chip-to-cloud” strategy operating on a subscription-based model. This trend should continue as more use cases for industrial artificial intelligence emerge each with its own unique need for power, connectivity and compute.

Cloud Services

The rise of cloud computing and the Internet of Things (IoT) is demands faster, more reliable connectivity. This is driving an increased focus on 5G networks, which offer significant advantages over previous generations of wireless technology, including faster data speeds, lower latency, and greater capacity. 5G enables businesses to take advantage of new applications and services, such as virtual and augmented reality, that require high bandwidth and low latency.

Metaverse Monetization

Business and consumer hype around the metaverse will continue into the coming year, with more and more organizations seeking ways to monetize its potential. For example, by layering in augmented and virtual reality (AR and VR), media organizations will begin developing ways to carry an individual consumer’s online persona and preferences across the digital world.

Conclusion

In the ever-evolving TMT industry, verticalization and the subscription model are set to dominate, while the metaverse will become a pivotal focal point for brands aiming to capitalize on expansive digital ecosystems.

Solutions

Cloud Computing

Despite only accounting for 1.5% of the global public cloud market, India is now growing faster than the global average. From 2016 to 2021, the global public cloud market grew at a healthy compound annual growth rate (CAGR) of 26%, while the Indian public cloud market grew at a CAGR of 44%. As organizations undergo cloud adoption and digital transformation at an unprecedented pace, CIOs find themselves at the forefront of decision-making, grappling with an array of opportunities and challenges. Below are a few insightful perspectives and disruptive trends to make informed decisions regarding strategic planning, drive innovation, optimize costs.

Key Trends

Multi and Hybrid Cloud Deployment

It is expected that by the end of the year 2024, an impressive 84% of medium to large-scale companies will have adopted a hybrid or multi-cloud strategy. Organizations in India are increasingly adopting these cloud solutions to take advantage of the benefits such as the scalability and agility of the cloud and the security and control of on-premises infrastructure.

Simplified Cloud Computing

In 2024, the adoption of simplified cloud computing through low-code and no-code technologies is poised to become a transformative force for application development and cloud management. We will see a significant reduction in the coding requirements for creating cloud-based applications, empowering individuals to take charge. With intuitive visual interfaces, pre-built templates, and drag-and-drop functionality, application development will accelerate, turning months-long projects into mere weeks or days. Furthermore, the democratization of cloud resources through low-code and no-code tools offered by cloud service providers will make the cloud more accessible than ever before, fostering innovation and efficiency across various use cases, from internal applications to IoT projects.

Cloud Native Development Driven by Kubernetes and Microservices

Cloud Native development has become a prevalent trend, underpinned by the synergistic interplay of Kubernetes and Microservices. Organizations are embracing container orchestration through Kubernetes to streamline deployment and management, while Microservices architecture is modularizing applications for agility and scalability. This reflects a fundamental shift in software development, fostering rapid innovation, improved resource utilization, and enhanced resilience. As cloud computing adoption grows, these technologies become increasingly essential for managing cloud deployments.

IoT & Edge Computing

By 2025, India is expected to have >500M IoT Devices, ranging from smart sensors to industrial machines, which are generating vast volumes of data at the edge of networks. To harness the potential of this data and enable real-time decision-making, organizations are increasingly adopting Edge Computing solutions. These technologies are reshaping how businesses collect, process, and act on data, driving efficiency, responsiveness, and innovation across various industries.

 Sources: Gartner

AI and ML-Powered Cloud

In 2024, the convergence of AI/ML Cloud and GenAI technologies promises to revolutionize industries. The integration of AI and machine learning capabilities within cloud infrastructure, combined with the emergence of GenAI solutions, will lead to unparalleled advancements in automation, personalization, and data-driven decision-making across various sectors. Many cloud providers are offering GenAI and AI/ML services making it easier for businesses to develop and deploy GenAI applications. This is set to redefine the landscape of industry operations and user experiences, ushering in a new era of innovation and efficiency.

Cloud Security and Data Privacy

The introduction of the Digital Personal Data Protection Act, 2023 (DPDP Act, slated to take effect in 2024, businesses are expected to increasingly invest in cloud security measures, such as cloud access security brokers (CASBs) to manage access and comply with data privacy regulations, and encryption to safeguard data at rest and in transit. Additionally, the adoption of emerging cloud security technologies, including artificial intelligence (AI) and machine learning (ML), is enabling more effective threat detection and response. With a growing emphasis on data privacy and regulatory compliance, businesses in India are prioritizing these aspects as they migrate their data to the cloud to ensure compliance and protect user data.

Conclusion

Since the pandemic's onset, cloud adoption has surged and is set to continue its upward trajectory. Organizations are leveraging the cloud to enhance their digital products and capabilities. The "purpose-fit for the cloud" approach has already given way to a "cloud-first" strategy as of the end of 2022. In the coming time, a strong focus on innovation and continuous learning will be crucial for mastering cloud solutions.

 Sources: Gartner

Cyber Security & Privacy

The digital age has made cybersecurity a key concern for businesses and individuals alike. This underscores the importance of adopting a forward-thinking approach to cybersecurity, focusing on human-centric design, zero-trust architecture, and regulations. With global cybercrime damage predicted to hit USD 10.5 trillion per year by 2025, it is essential to get ahead of the potential risks.

Key Trends

Rise of Privacy Regulation

Modern privacy regulation, among other cybersecurity trends, will cover the majority of consumer data. Despite the growing awareness of privacy programs' benefits, less than 10% of organizations are expected to use privacy as a competitive edge.

Human Element in Cybersecurity

Chief Information Security Officers (CISOs) will incorporate human-centric design practices into their cybersecurity programs. This approach has been designed to reduce operational friction and enhance control adoption.

Internet of Things (IoT) Security

IoT devices are often insecure and can be easily hacked, putting sensitive data at risk. IoT security will become increasingly important in the coming years, as the number of IoT devices continues to grow. IoT security solutions include device authentication, data encryption, and threat detection, among others.

Zero-Trust Security

Zero-Trust security is becoming increasingly popular, as it provides an additional layer of protection against cyber attacks. With the rise of remote work, Zero Trust security is becoming even more critical, as it ensures that only authorized individuals can access sensitive data from any location.

Changes to Cyber Insurance Contracts Will Gain Pace

There has been an increasing fear of a tidal wave of cyber insurance cancellations, followed by a desperate race to secure new coverage, probably at significantly higher rates. Companies will thus need to demonstrate very strong cybersecurity credentials to obtain coverage, as insurance underwriters raise the threshold of expectations.

AI and ML in Cybersecurity

Artificial intelligence (AI) and machine learning (ML) are expected to play a crucial role in the future of cybersecurity. These technologies can help organizations detect and prevent cyber attacks in real time by analyzing vast amounts of data and identifying patterns that indicate potential threats. AI and ML can also help in automating the security process, which can save time and reduce the risk of human error.

 Sources: Gartner

Cloud Security

Cloud security is expected to become a top priority in the coming years, as more organisations move their data to the cloud. Cloud security solutions include data encryption, access control, and threat detection, among others. As organisations continue to embrace the cloud, cloud security will become a critical aspect of their cybersecurity strategy.

Quantum Computing

Quantum computing is expected to revolutionize many industries, including cybersecurity. Quantum computers will be able to break existing encryption algorithms, which will render many current cybersecurity solutions obsolete. To counter this threat, researchers are developing new encryption algorithms that are resistant to quantum attacks.

Conclusion

The year 2024 promises significant changes in the cybersecurity landscape. The growing presence of cybersecurity experts on corporate boards underscores its strategic importance. Zero-trust programs, evolving CISO roles, and emerging AI and IoT vulnerabilities highlight the need to stay ahead in cybersecurity.

 Sources: Gartner

IT/ Digital Transformation

Organizations across industries are speeding up digital business transformation to achieve long-term growth and profitability. Gartner found that the transformation journey takes large enterprises at least twice as long and costs twice as much as they expected. This is largely due to cultural readiness: 53% of the organizations surveyed have not been tested by digital challenges, so their digital transformation readiness is uncertain.

Key Trends

Customer Data Platforms

Customer data platforms (CDPs) help businesses manage customer data, analyze customer trends, identify marketing opportunities, and create more personalized customer experiences. CDPs integrate customer information from different sources into a single place, so businesses can make better decisions.

Increased Migration to the Cloud

Businesses increasingly rely on cloud technologies to save money, improve accessibility, and outsource tedious routine maintenance tasks. As technology advances and internet speeds improve, more businesses will move to the cloud, especially in countries where internet speeds have traditionally been slow.

AI and Machine Learning

AI and ML are the most talked-about technologies in digital transformation. AI is important because it helps businesses make better decisions by providing insights into customer behaviour, demographics, and preferences. ML is essential because it helps companies use data to personalize customer experiences.

Intelligent Search

Intelligent search uses AI technologies like machine learning, computer vision, semantic search, and natural language processing to deliver more accurate and personalized search results. It breaks down data silos in businesses, so information can be pulled from any data source.

Increased Investment in Blockchain

Blockchain is a new technology with the potential to disrupt many industries, such as finance, healthcare, and supply chain management, by enabling smart contracts and permanent, tamper-proof record-keeping.

Wider Adoption of Low-Code Platforms

Low-code development is a visual programming platform that allows non-technical users to create software applications without writing code. It provides drag-and-drop tools that allow business analysts and other non-technical users to design and build custom solutions without coding.

Automation

Business process automation solutions help organizations eliminate the need for human intervention in internal processes and speed them up. These technologies can boost productivity, improve the customer experience, and digitize operations in the medium to short term, but they do require some upfront learning to get started.

Virtual Business Collaboration

The COVID-19 pandemic forced companies to adopt digital technologies, which they discovered were essential for remote work. This led to increased investment in digital software, such as collaboration tools and document collaboration tools, which facilitate remote collaboration.

Everything as a Service (XaaS)

XaaS is a new, increasingly popular business model that stands for Everything-as-a-Service. It provides software on demand to customers, extending the SaaS (Software-as-a-Service) model, which delivers applications over the internet.

Conclusion

The top digital transformation trends are change management, cloud migration, and advanced technologies like AI and ML. These trends can assist in being more competitive and adaptable, which will help to future-proof business models.

Emerging Technologies

In 2023, the tech landscape continues to evolve, paving the way for groundbreaking advancements. These cutting-edge innovations are revolutionizing various industries and driving unprecedented growth and efficiency. Gartner predicts that by 2025, more than half of all successful emerging technology solutions will be sold to non-IT buyers within enterprises, allowing vendors to reach new markets and customers.

Key Trends

Generative AI

Generative AI is expected to yield substantial ROI for enterprises in the next two to four years. To maximize its potential, companies must address associated risks, such as trustworthiness, changing regulations, and intellectual property concerns. Despite these challenges, generative AI is a top investment choice due to its far-reaching impact and its potential to accelerate other emerging technologies like autonomous workplace assistants (AWAs) and conversational AI.

Internet of Things

The Internet of Things is a network of physical devices. The Internet of Things (IoT) is a network of physical devices that are connected to the internet and can collect and exchange data. The goal of the IoT is to create self-reporting devices that can communicate with each other and users in real-time. The IoT market is expected to grow from USD 662.21 billion in 2023 to USD 3,352.97 billion by 2030, at a CAGR of 26.1%.

Blockchain

Blockchain is an emerging technology that uses a distributed network of computers to store and verify transactions in a secure and transparent way. Blockchain can be used for various applications, such as cryptocurrency, supply chain management, legal records, and more.

Web3

Despite its promise of a new, more democratic web, Web3 remains a self-referencing ecosystem of financial engineering fraught with risk and scandal. Key technical challenges surrounding Web3 still exist for enterprises, including scaling and security, identity and key management, and privacy.

Edge Intelligence

Turning massive data sets produced by computer vision and sensors into real-time action requires more intelligent software running at the edge of business and consumer networks. Customer digital experiences will benefit from edge intelligence the most.

Low Code Application Platform

By 2024, Gartner projects that low code will comprise more than 65% of app development activity. A low code platform is a development environment. It allows non-technical users to create applications. These apps can be deployed on the cloud.

Decentralized Digital Identity (DDID)

DDID will ultimately replace physical proof-of-identity documents, with financial services, government, and education likely to benefit most. Blockchains and zero-knowledge proofs will play a substantial role in this slow transformation.

Conversational AI

Conversational AI, enabled by generative AI, is the second top emerging technology that will deliver the fastest ROI. E-commerce, B2B sales, and customer service functions will see the biggest impacts from conversational AI. AWAs will also deliver near-term benefits for most firms, as they are poised today to take over increasingly complex but repetitive human tasks.

Conclusion

To sum up, while many emerging technologies show great promise, it is imperative for tech leaders to assess whether these technologies can deliver value and if their business can navigate their associated risks. This means side-stepping misinformation, mitigating poor decisions driven by a fear of missing out, and narrowing focus from the shiny objects down to the few technologies that have real potential. Firms must also ensure that their time frame for implementing these technologies is commensurate with their overall risk/reward tolerance.

 Sources: Forrester

Data Analytics & Business Insights

The data and analytics software market grew 12.3% to USD 133.4 billion in 2022, with nonrelational DBMS and data science and AI platforms growing the fastest at 26.8% and 19.7%, respectively. Three key factors driving the growth of the big data and analytics market are the increasing importance of data in businesses, the shift to public cloud, and the rise of AI and ML in enterprise applications. However, data analytics also faces some challenges, such as data quality, governance, integration, selecting the right tool, shortage of professionals, budget limitations, and so on.

Key Trends

Managing AI Risk

The increasing use of AI has introduced new risks, such as ethical concerns, poisoned training data, and circumvention of fraud detection systems. Companies must mitigate these risks, not only to comply with regulations but also to build trust with stakeholders and accelerate AI adoption and use.

Data Governance

Data governance ensures that data is available, high-quality, and secure by setting policies and standards for data ownership, security, and usage. It helps organizations maintain accurate and accessible data for better business insights.

Value Optimization

Most data and analytics (D&A) leaders find it difficult to explain the value of their work to the organization in business terms. To maximize the value of an organization's data, analytics, and AI portfolio, D&A leaders need a set of value management skills, including value storytelling, value stream analysis, investment prioritization, and business outcome measurement to ensure that expected value is realized.

Data Sharing Is Essential

Data sharing can take place both inside and outside of an organization. Organizations can create data products by preparing and packaging their D&A assets for sharing. Both internal and external data-sharing collaborations can increase the value of data sharing by adding reusable, pre-created data assets. To enable a single architecture for data sharing across heterogeneous internal and external data sources, organizations should adopt a data fabric design.

 Sources: Gartner, IDC

D&A Sustainability

Data and analytics (D&A) leaders must go beyond providing analysis and insights for environmental, social, and governance (ESG) projects. They must also optimize their processes for sustainability improvement. This has the potential to deliver enormous benefits, as D&A and AI practitioners are increasingly aware of their growing energy footprint.

Converged and Composable Ecosystems

Converged data and analytics (D&A) ecosystems design and implement a D&A platform that operates seamlessly through integrations, governance, and technical interoperability. The composability of an ecosystem is achieved by architecting, assembling, and deploying configurable applications and services.

Practical Data Fabric

Data fabric is a data management architecture that uses all types of metadata to monitor, analyze, and suggest data management solutions. By collecting and enriching the meaning of the underlying data and applying continuous analytics to metadata, data fabric generates alerts and recommendations that can be acted upon by both humans and systems. This enables business users to confidently consume data and allows less-skilled citizen developers to become more proficient in the integration and modelling process.

Emergent AI

ChatGPT and generative AI are at the forefront of the emerging AI trend, which is poised to revolutionize how most companies operate by making them more scalable, versatile, and adaptable. The next generation of AI will enable organizations to apply AI in situations that are currently impractical, expanding AI's reach and value.

Conclusion

Businesses increasingly prefer data-driven decision-making to intuition-based decision-making, which probably accounts for why the data analytics market is growing at a fast pace. Organizations that cultivate a resilient analytics culture and foster analytical competency will undoubtedly position themselves to innovate and make well-informed decisions, thereby capitalizing on the wealth of opportunities data presents.

 Sources: Gartner

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The Confederation of Indian Industry (CII) works to create and sustain an environment conducive to the development of India, partnering Industry, Government, and civil society through working closely with Government on policy issues, interfacing with thought leaders, and enhancing efficiency, competitiveness and business opportunities for Industry.

For more than 125 years, CII has been engaged in shaping India's development journey and works proactively on transforming Indian Industry's engagement in national development. The premier business association has around 9000 members, from the private as well as public sectors, and an indirect membership of over 300,000 enterprises from around 286 national and regional sectoral industry bodies.

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As organizations navigate their business through Digital Transformation (DX), they face multiple challenges, and seek a platform of trust to handhold their digital journey. To help organizations leverage the technology changes, Confederation of Indian Industry (CII) has created a focused Centre for Digital Transformation (CDT). The centre operates with Tata Communications as principal partner and other Industry members.

CDT aims to emerge as leading authority in guiding and enabling organizations to building intelligent systems and help in personal computing, cloud and reinventing their productivity and business processes. Vision is to be a Centre of international repute that provides role model products and services for continuous betterment of organizations, industries and society through digital transformation. Ultimate goal is to evolve and leverage a Digital Transformation Movement that transforms India and make Indian industry globally competitive.

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