White Paper

Unlocking the Power of IoT

Navigating Obstacles, Embracing Emerging Tech, and Achieving Operational Excellence

YASH Technologies®

More than what you think.

Modern enterprises are seeking IoT solutions to improve productivity, asset safety, operational efficiency, supply chain resilience, cost savings, and revenue growth. However, the expansive use of IoT also brings challenges, such as the careful selection of technologies, strategic planning, and effective execution. To maintain seamless operations and drive overall success, businesses need to focus on factors such as track and trace capabilities, meticulous inventory management, efficient warehouse management, overall equipment efficiency (OEE) optimization, and computer-based process monitoring (CBPM).

Global IoT Growth and Emerging Technologies

As per the IoT Analytics *State of IoT-Spring 2023* report, global IoT connections grew by 18% in 2022 to 14.3 billion active IoT endpoints. In 2023 the number of connected devices will likely increase by another 16%.

The rise of interconnected devices will be facilitated by emerging technologies such as 5G connectivity, digital twins, blockchain, mesh sensors, low-power networks, and decentralized analytics architecture. These capabilities will enhance existing ecosystems and introduce new disruptive technologies.

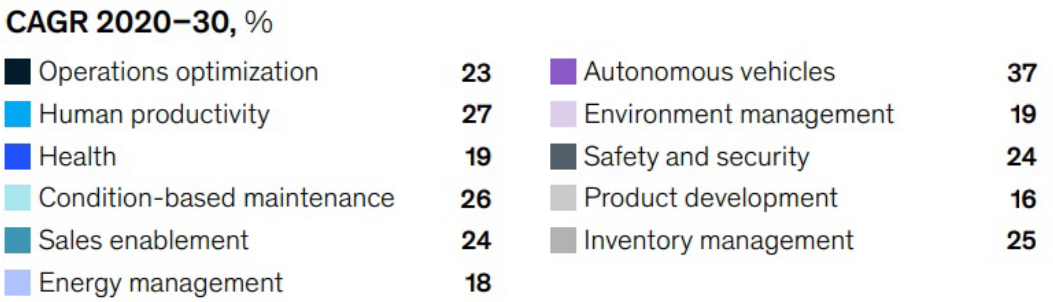
IoT adoption has emerged as a widely embraced digital transformation approach among businesses. This surge is propelled by cost-effective, high-speed networks and compact sensors that capture vast device data. Companies recognize cloud-based solutions as reliable support for IoT implementation owing to their scalability, rapid deployment, and multi-tenant capabilities-moreover, AI-ML-NLP advancements aid in automating IoT application management. As a result, the global IoT market is predicted to achieve a substantial milestone, with projections indicating a value of *$875 billion by 2025*.

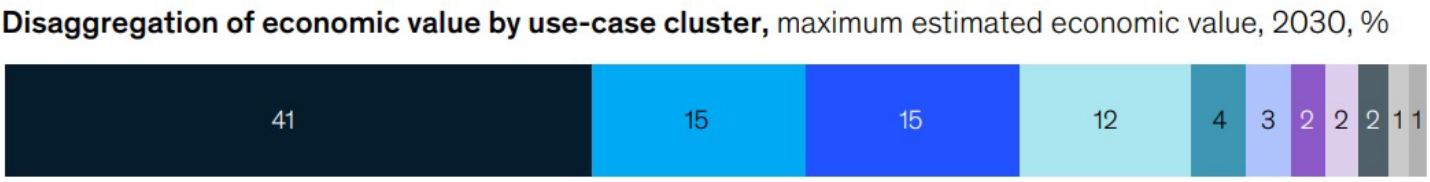
Identifying decision-making factors for IoT implementation

Businesses are increasingly embracing IoT setups to leverage specific solutions like asset tracking and predictive maintenance. By utilizing this technology, companies can uncover new market opportunities, optimize supply chains, reduce costs, boost productivity, and enhance customer engagement.

IoT Use Cases

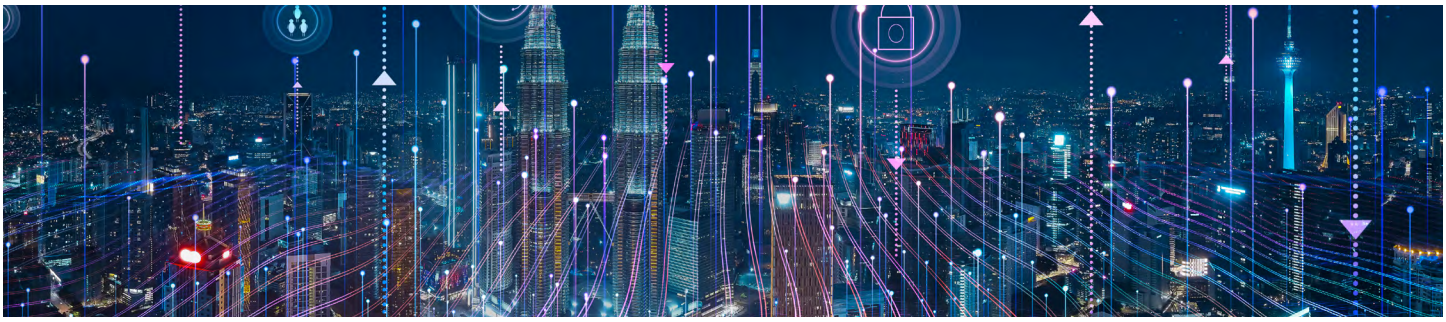
Among use-case clusters, operations optimization is estimated to provide the most economic value by 2030.





Note: Figures may not sum to 100%, because of rounding.

Source: McKinsey



To effectively innovate business models through IoT applications, organizations should consider the following steps:

Study successful IoT implementations across various industries (manufacturing, services, hospitality, automotive, utilities, infrastructure management)	*Identify the primary drivers for change in their own business*	*Clearly define or refine the long-term business vision*
Conceptualize the solution by determining what needs to be monitored, data to collect, appropriate platform architecture, and cloud service specifications	*Conduct a pilot program and iterate based on critical operational touchpoints to evaluate the impact of IoT*	*Adopt an agile or DevOps approach for a swift and smooth rollout, minimizing deployment challenges*

Users must also be ready to stay updated with the evolution of IoT and actively incorporate new features and upgrades regularly to ensure the relevance of their applications.

Challenges and Considerations in IoT Usage

When businesses have a well-thought-out plan to harness the advantages of IoT, they must recognize the challenges associated with this technology. It becomes crucial to address these issues, particularly when striving to expand the number of connected devices, accelerate speed-to-market, and achieve prompt returns on investment. Enterprises should prioritize the following key considerations during IoT adoption:

1. Misaligned goals and efforts:

Business goals and timelines for IoT projects tend to be unrealistic. Companies may need help establishing appropriate KPIs to measure the expected success of device connectivity. Besides, IoT initiatives require coordination among multiple teams responsible for managing interconnected elements such as hardware, software, protocol stack implementation systems, and backend tools. If roles and responsibilities within cross-functional teams are not clearly defined, and there is no formal issue resolution process, the outcomes may fall short of management's expectations.

2. Data and analytics challenges:

In specific IoT deployments, sensors gather extensive data and transmit it to the cloud, including information unnecessary for meaningful analysis. This approach can present challenges related to bandwidth limitations, battery power consumption, latency issues in specific applications, and regulatory concerns regarding data ownership.

3. IoT ecosystem integration complexity:

The intricate connections among endpoint devices, mobile apps, and cloud platforms contribute to the complexity of IoT ecosystems, thereby affecting performance and availability. Additionally, managing these devices requires monitoring configurations, performance, and failures, presenting challenges when deploying IoT solutions on a large scale.

4. Security and privacy concerns:

Since the inception of IoT, connected devices have been susceptible to cyber-attacks, providing potential entry points to network breaches. These devices often operate on a limited power supply and require long-lasting battery life. When traditional encryption, authentication, and security protocols are applied to secure them, the power consumption of transmission systems increases, posing a challenge for many IoT devices. Moreover, as new threats continuously emerge, the distributed nature of these devices makes it difficult to receive timely updates from manufacturers, leading to a buildup of vulnerabilities and compromising network safety.

5. ROI and cost implications:

Despite continuous refinement, IoT and its deployment methods remain evolving, making it challenging to define clear use cases. Quantitative ROI analysis can be complex, and unrealistic expectations and vague value statements can frustrate network management. Consequently, some businesses may abandon their incomplete solutions.

6. Interoperability and standardization issues:

While there are possibilities to customize the technology stack of IoT to suit specific conditions, not all devices and solutions are compatible with each other or with the enterprise applications used by organizations. Accommodating new hardware and software technologies often require adjustments to achieve the desired functionality. Interoperability also poses challenges for IoT manufacturers, particularly when their solutions rely on open-source technology. Although not always problematic, it's important to note that open-source tech needs a regulated universal standard, resulting in different variations used by businesses and regions. Consequently, integrating technology from another vendor or deploying IoT solutions in new countries can become complex.

7. Scalability challenges:

As enterprises scale their IoT deployments, connecting hundreds or thousands of devices, they often adopt a fragmented approach by incorporating various connectivity solutions for deployments in different locations. The interoperability challenge intensifies as the IoT network expands, with each solution having its platform architecture, cellular support systems, and compatible tools. Managing devices becomes increasingly overwhelming as operations grow in scale.

In addition to the challenges mentioned above, a need for more skilled talent capable of managing these extensive networks hinders many companies from fully harnessing the potential of IoT deployments.

How YASH Helps Addresses Such Challenges

IoT solution providers are crucial in assisting clients in navigating implementation, management, and security challenges. At YASH Technologies, we leverage our industry expertise and long-term vision for IoT solutions to design, optimize, enhance, and scale projects. Our focus areas include:

- ***Advisory and Consulting Expertise:***

  Our expert advisory and consulting services provide valuable insights to clients seeking to navigate the complexities of IoT implementation. Our approach combines technical expertise with a practical understanding of business needs, resulting in effective strategies and solutions that drive innovation and growth.

- ***Sensor Cloud Implementation Excellence:***

  YASH offers sensor cloud implementation as a service that helps businesses collect, store, and analyze data from sensors. Through thoughtful sensors and cloud technology integration, YASH achieves seamless data flow and real-time insights. This approach highlights our commitment to excellence without any need for self-promotion.

- ***Tailoring IoT offerings to enhance decision-making:***

  Our tailored business solutions encompass remote monitoring, asset management, and predictive maintenance. We aim to revolutionize decision-making by implementing customized technologies such as automation, AI-ML data collection, real-time failure prediction, and remaining useful life prediction.

- ***Security and privacy-focused solutions and frameworks:***

  We prioritize the security of connected devices by employing robust network protocols like HTTPS and VPN. Our engineers ensure secure and uninterrupted communication, safeguarding data from cyber threats. We configure gateways to authenticate devices, encrypt communications, and consistently monitor network traffic for any signs of suspicious activity.

- ***Demonstrating ROI and cost-effectiveness:***

  Our solution architects develop a proof of concept for IoT projects, focusing on strategic use cases that deliver the measurable value of operational efficiency, asset security, cost reductions, and profitability. Our solutions prioritize collecting only essential data for analytics to optimize IoT ecosystem maintenance costs and maximize bandwidth utilization. Additionally, we harness edge computing to perform local analysis whenever possible.

- ***Providing interoperability and standardization support:***

  At YASH, we believe in the power of collaboration and diverse perspectives to create effective IoT solutions. Through partnerships with industry leaders like AWS, Microsoft, and SAP, we utilize standard-based communication platforms for seamless deployment across environments, ensuring long-term interoperability with various hardware and systems. We aim to keep our IoT solutions versatile by prioritizing simplicity in integration.

  In addition to assisting clients with IoT deployments across diverse industries such as manufacturing, logistics, utilities, telecom, retail, healthcare, and life sciences, YASH provides training and educational resources to help organizations leverage this technology effectively. We offer guidance on IoT architecture, decision frameworks, sensors, actuators, and security best practices, empowering them to optimize their ROI.

To explore the potential of IoT
and how YASH can support your IoT journey,
book a consultation with us at
info@yash.com or visit ***www.yash.com***

About YASH Technologies

YASH Technologies focuses on customer success. As a leading technology services and outsourcing partner for large and fast growing global customers, the company leverages technology and flexible business models to drive innovation and value throughout its customer's enterprise. YASH customer centric engagement and delivery framework integrates specialized domain and consulting capabilities with proprietary methodologies and solution offerings to provision application, infrastructure and end user focused Right-Sourcing services. YASH is a SEI CMMI (Level 5) and an ISO 9001:2015 certified company with U.S. and India headquarters and regional sales and development offices globally with customers spread across 6 continents.

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