

# EXPLORING THE PROS AND CONS OF EDGE COMPUTING

A Guide to the Benefits and Challenges of Adopting Edge Solutions

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# INTRODUCTION



Edge computing has emerged as a game-changer, revolutionizing the way data is processed, managed, and utilized. By shifting the computing paradigm to the edge of the network, closer to data sources, edge computing offers a multitude of benefits that address the limitations of centralized architectures. Quite rightly, it is seen by the majority (73%) of senior IT and line-of-business (LOB) decision-makers as a strategic investment, [according to IDC](#).

However, edge computing isn't without its challenges, especially around implementation. When assessing whether to adopt edge solutions or implement an edge computing network, both the pros and cons should be weighed carefully.

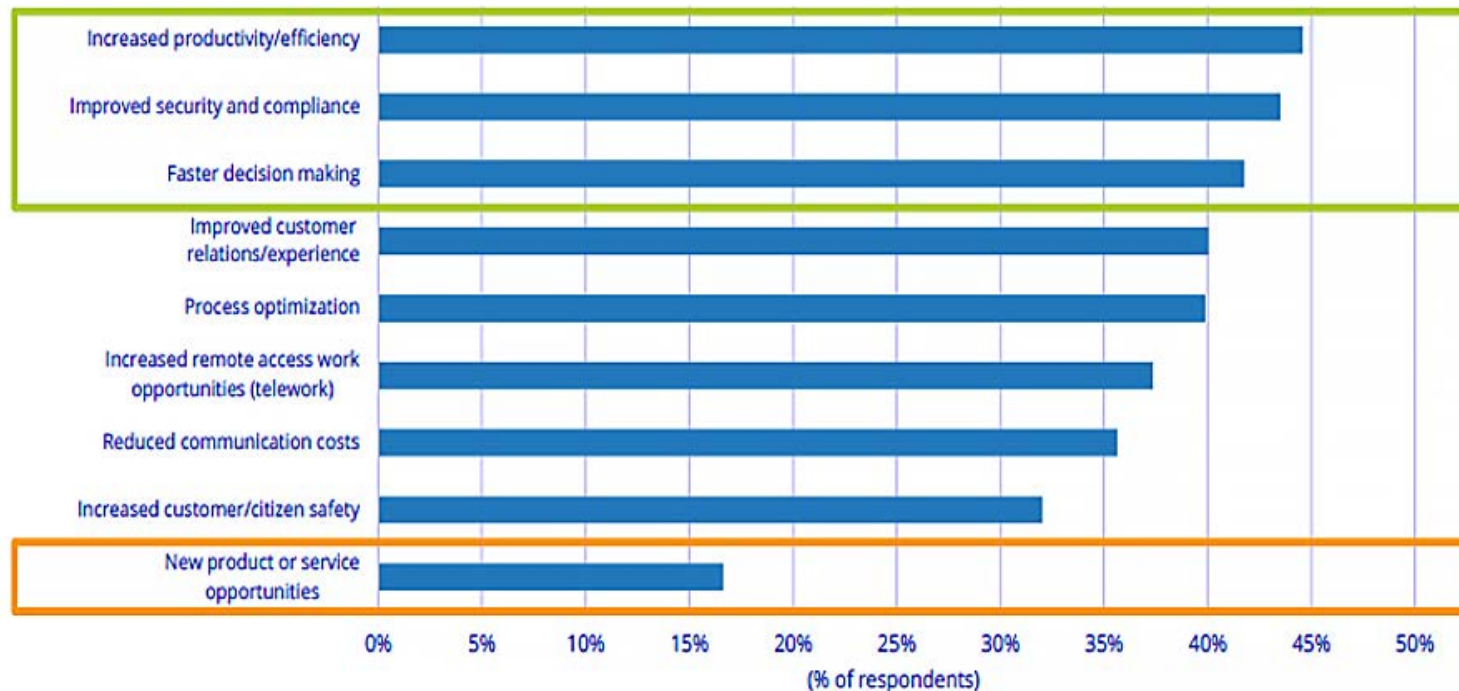
# TOP BENEFITS OF EDGE COMPUTING

Nearly 70% of new data is generated at the edge via intelligent endpoints, and more than 50% of new enterprise IT infrastructure will be deployed at the edge by this year rather than corporate infrastructure, according to IDC. Organizations are making this shift because there are real advantages to having data processed close to the source.

According to an IDC study, those benefits include increased productivity and efficiency, improved security and compliance, faster decision-making, and improved customer relations and experience.

FIGURE 1: *Organizations Expect Short-Term and Long-Term Benefits from Edge*

**Q** *What business benefits do you expect edge adds/will add to your organization?*



Source: IDC, 2021

# TOP BENEFITS OF EDGE COMPUTING

(CONTINUED)

## Increased Productivity and Efficiency

One of the primary drivers behind the adoption of edge computing is its ability to significantly reduce latency and enhance response times, which in turn increases productivity and efficiency. In traditional centralized systems, data must travel back and forth to a distant data center, which causes delays in processing. However, with edge computing, data is processed locally, minimizing the time it takes for an application to request to receive a response. This is particularly critical for real-time applications where milliseconds matter, such as autonomous vehicles, virtual reality, and IoT devices.

Edge computing also optimizes bandwidth usage by processing data locally and sending only relevant information to centralized systems. This approach alleviates network congestion, making it ideal for scenarios with limited bandwidth or in remote locations. By minimizing the amount of data transferred across the network, edge computing contributes to more efficient and reliable operations, especially in environments where network resources are scarce.

## Improved Security and Privacy

Edge computing introduces a layer of security by keeping sensitive data closer to its source. In contrast to transmitting data to a centralized cloud, where it is potentially vulnerable during transit, edge devices can process critical information locally. This reduction in data movement inherently minimizes the attack surface, as there is less exposure to potential breaches during transit. Moreover, with the capacity to process data on-site, edge devices can execute tasks like encryption and anonymization closer to the data source, providing an added layer of protection.

In terms of data privacy, edge computing aligns with a more distributed and localized model. Instead of relying on centralized servers, edge devices process sensitive information within proximity to where it's generated. This decentralized approach empowers users with greater control over their data.



# TOP BENEFITS OF EDGE COMPUTING

(CONTINUED)

## Faster Decision-making and Improved Customer Experiences

By drastically reducing latency and response times, which ensures a quicker and more seamless interaction with real-time applications, edge computing can significantly improve the customer experience and speed decision-making. The ability to process and analyze data locally also empowers the delivery of personalized and context-aware services, which enhances customer engagement in sectors like retail. Finally, edge computing ensures reliability and continuity even when central servers face connectivity issues. In sectors like healthcare, having uninterrupted services is crucial.

## Greater Scalability and Flexibility

The decentralized architecture of edge computing brings unparalleled scalability and flexibility. As the volume of data continues to surge, edge devices can independently handle processing tasks, ensuring a scalable infrastructure. The flexibility to deploy edge solutions in various environments—from manufacturing plants to smart cities—also makes it adaptable to a wide array of use cases.

## Cost Savings

Tangible cost savings can be realized from edge computing by optimizing resource utilization. With local processing capabilities, organizations can reduce the need for massive data storage and expensive network infrastructure. The decentralized nature of edge computing also minimizes the reliance on cloud resources, resulting in lower operational costs. Additionally, the reduced latency and improved efficiency add to overall savings by enhancing the lifespan and performance of connected devices.



# CHALLENGES WITH EDGE COMPUTING

Despite its many advantages, deploying an edge solution comes with its own set of hurdles, especially around implementation and the complexity of integrating with legacy systems and proprietary networks.

Here are some of the most common challenges with deploying edge solutions:

## Network Complexity

One of the primary challenges in the successful implementation of edge computing lies in the intricate network dynamics. As organizations strive to distribute computing resources closer to the data source, creating a robust and seamlessly interconnected network becomes imperative. The complexity arises in maintaining low-latency, high-bandwidth connections across diverse edge devices, necessitating sophisticated networking solutions that can adapt to dynamic and geographically dispersed environments.

## Data Management and Governance

Efficient data management and governance pose significant hurdles when adopting edge computing. The decentralized nature of edge devices generates vast amounts of data, making it crucial to establish effective strategies for data storage, processing, and retrieval. Implementing comprehensive data governance frameworks becomes challenging, as organizations need to ensure data consistency, integrity, and compliance with regulatory standards across a distributed and diverse edge ecosystem.

## Standardization and Interoperability

Because of the diverse and decentralized nature of edge environments, standard and interoperability challenges exist. Hardware variability due to diverse devices with different capabilities and protocols can hinder the establishment of standardized interfaces. At the same time, the lack of universally accepted protocols and discrepancies in data formats across edge devices can create communication challenges. Lifecycle management can also be difficult due to trying to coordinate updates across devices with different lifecycles and industry-specific requirements.

# CHALLENGES WITH EDGE COMPUTING

(CONTINUED)

## Security Concerns

While edge computing offers some benefits that improve security, it also raises security concerns due to the decentralized nature of data processing. Edge devices, often located in physically vulnerable environments, become potential entry points for cyber threats. Protecting sensitive data, ensuring secure communication between edge nodes, and implementing robust access controls demand innovative security measures. Addressing these concerns is vital to establishing trust in edge computing systems.

## Skill Gap and Workforce Training

The successful deployment and maintenance of edge computing infrastructure require a workforce equipped with specialized skills. Bridging the skill gap and providing comprehensive training programs become essential to empower professionals in managing, securing, and optimizing edge environments. Organizations must invest in cultivating a skilled workforce capable of navigating the intricacies of edge computing technologies.





# CONTACT CONNECTION

If you need help getting started with an edge computing strategy or implementation, reach out to your Account Manager or [contact us](#) for more information.

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