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451 Research
Business Impact Brief

Essential IT to drive innovation

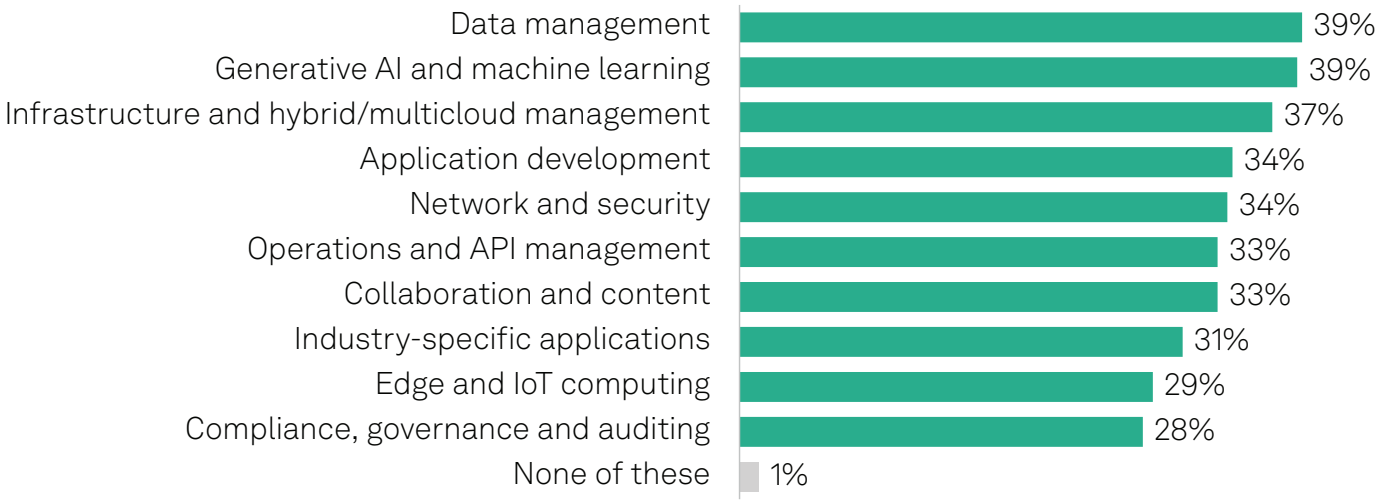
The Take

In today's AI era, innovation is essential. With technology advancing rapidly, businesses must harness these breakthroughs to adapt and evolve faster than ever to outpace the competition and exceed rising customer expectations. The traditional playbook no longer guarantees success; companies that fail to innovate risk obsolescence. To thrive, organizations must foster a culture of innovation by mastering key technologies that drive growth, improve efficiency, deliver exceptional customer experiences and adapt quickly to new business opportunities.

Despite widespread adoption of hybrid cloud infrastructure, IT automation platforms, cloud-native development tools, open-source software and AI technologies, many organizations acknowledge they are not fully leveraging these resources to drive innovation at the necessary pace. By integrating and optimizing these technologies, organizations can create new competitive advantages to outpace rivals and fuel business growth.

This conclusion is based on recent research into how organizations are using various cloud-native and open-source technologies, including data on Kubernetes as a workload platform.

Figure 1: Primary Kubernetes workloads



Q. In which of the following areas does your organization currently use Kubernetes as a workloads platform? Please select all that apply.
Base: Organizations where Kubernetes is in use or POC (n=290).
Source: 451 Research's Voice of the Enterprise: DevOps, Kubernetes in Generative AI 2024.

Kubernetes is an open-source container orchestration platform that automates the deployment, scaling and management of containerized applications. It enables organizations to efficiently run applications across multiple environments, including on-premises, hybrid and multicloud architectures, and at the network edge.

The research shows significant adoption of Kubernetes for data-intensive, mission-critical production workloads. Data management, GenAI/machine learning and infrastructure/hybrid-multicloud management are the primary Kubernetes workloads, indicating growing reliance on containerization for complex tasks. Collaboration among professionals and edge computing for real-time processing and analytics closer to data sources are also important for driving innovation. Notably, 90% of respondents that use Kubernetes use it for multiple workloads, highlighting its versatility.

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Key factors driving the use of Kubernetes for GenAI and machine learning workloads include flexibility, availability of in-house expertise and increased observability, as well as enhanced productivity, security and compliance. However, challenges such as cost, complexity and talent shortages persist. Difficulty leveraging community expertise and issues with version consistency also hinder adoption.

These findings illustrate that orchestration platforms such as Kubernetes play a significant role in integrating hybrid architectures, automation processes, cloud-native development, open-source software and AI workloads into a unified system. This integration facilitates fluid data exchange, awareness, intelligence sharing and ideation across business and IT functions, fostering enhanced collaboration and responsiveness. By strategically bridging these essential technologies, organizations can swiftly respond to shifting business requirements and technological advancements, driving efficiencies and mitigating risks while pursuing competitive advantage via innovation. However, inherent challenges remain.

Business Impact

Driving IT efficiencies requires a culture of curiosity, risk-taking and collaboration. Encouraging cross-functional teamwork and breaking down silos can accelerate ideation and generate diverse ideas. Leveraging emerging technologies such as AI, automation and cloud services enhances efficiency and unlocks new opportunities. Agile and DevOps practices enable faster development and continuous improvement. Empowering employees through training and resources fosters creativity, while engaging customers and partners ensures relevant solutions. Measuring and rewarding innovation through key performance indicators and recognition helps sustain momentum. By integrating these strategies, companies can continuously evolve, remain competitive and drive meaningful innovation for faster time to value.

Outdated development processes and infrastructure pose significant operational risks. Limitations on scalability and integration hinder growth, while reduced efficiency and productivity slow operations. Increased security exposure and high maintenance costs strain resources, and cultural resistance to change further complicates modernization efforts. Ultimately, slow innovation leads to competitive lag, preventing businesses from meeting customer expectations and adopting new technologies such as AI and automation. Addressing these challenges requires a strategic approach involving infrastructure upgrades, scalable IT architecture, cross-functional collaboration and employee training.

Treating essential technologies as integrated systems can accelerate the pace of enterprise innovation. A unified ecosystem enables diverse workloads, including AI, IoT and mobile applications, to coexist and interoperate. Support for agile development methodologies accelerates time to market for innovative services and features. Facilitating cross-functional collaboration between developers, data scientists and IT operations teams drives ideation, innovation and business growth. Organizations can leverage best-of-breed technologies, regardless of deployment location or vendor, and unlock enhanced data analytics and visualization capabilities. This informs strategic business decisions, reveals new opportunities and propels AI-augmented transformation initiatives to continuously drive enterprise-wide innovation and meet changing customer requirements.

Looking Ahead

The fusion of hybrid cloud environments, IT automation, cloud-native development, open-source innovation and AI is poised to continue accelerating and reshaping enterprise technology, driving iterative innovation and new competitive advantages. Within this framework, organizations will increasingly harness AI-driven automation to streamline operations, optimize cloud resources and accelerate software development. Hybrid cloud architectures will enable scalability and flexibility, while open-source tools will fuel rapid experimentation and collaboration. Cloud-native development will empower enterprises to build resilient, adaptive applications faster. Together, these technologies will compose intelligent, agile ecosystems that can enhance efficiency, unlock new business models and position enterprises to thrive in an increasingly digital, AI-powered economy.