Charting the Course: Hybrid Multicloud Strategies and AI Adoption in Canada

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1. INTRODUCTION

The need to innovate and modernize IT infrastructure is paramount to the success of Canadian organizations. They strive to progress in their digital business imperative by seeking superior and differentiated customer experiences and new revenue streams while reconciling their technical debt and navigating an ever-growing skills shortage.

The core of Canadian business innovation lies in the strategic adoption of innovative technologies such as cloud services, automation, artificial intelligence/machine learning (AI/ML) and Internet of Things (IoT). By leveraging these technologies, Canadian organizations can modernize their IT infrastructure and stay competitive and resilient in a rapidly evolving market.

While cloud services allow for flexibility and scale, the need for data security and control has resulted in Canadian organizations leveraging hybrid and multicloud ecosystems. Given the potential of generative AI (GenAI) and the need to optimize operations and costs while addressing data siloes and quality concerns, Canadian organizations will have to:

- Contend with complex infrastructure and data challenges
- Embrace best practices around cloud and data management
- Address the skills gap by embracing automation and AI, focusing on developing and nurturing new skills

Canadian organizations will have to ensure a delicate balance between growth and optimization to thrive, now more than ever.

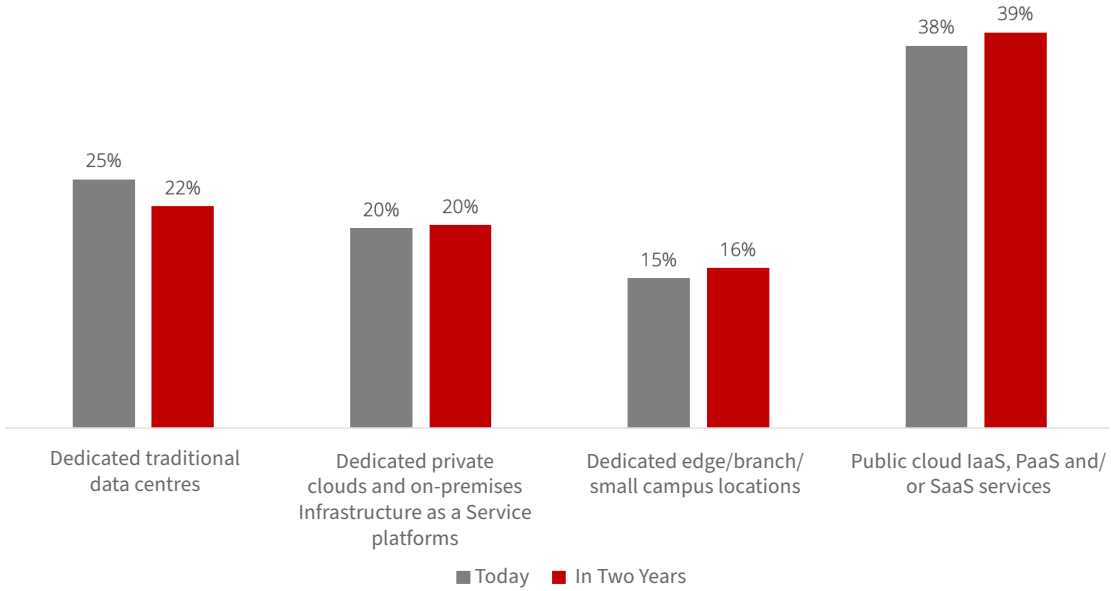
To better understand the current state of Canadian organizations and their adoption of cloud and AI, IDC Canada, on behalf of CDW Canada, independently conducted a Canada-wide survey of over 700 organizations between March 2024 and April 2024. This 2024 CDW Canadian Hybrid Cloud Report showcases the findings of the survey, covering:

- The key themes of digital infrastructure, AI, data management, automation and IoT across different segments and industries
- The technologies that allow businesses to focus on their core differentiation and elevate the value proposition for their customers

2. SHIFTS IN DIGITAL INFRASTRUCTURE

Chart 1: Allocation of Production Capacity Workloads and Storage Capacity Deployments

- Canadian organizations are moving away from traditional data centres and looking toward public and private clouds



Source: CDW Cloud Survey 2024 n = 711

Cloud has been at the core when it comes to enabling Canadian organizations to thrive in the digital business era. The initial wave of “cloud first” investments resulted in accelerated adoption of cloud applications and platforms. The initial wave also resulted in a learning curve around shared responsibility when it comes to data and security. The outcome was a series of repatriations and reconfiguring with a more strategic approach to moving workloads to the cloud.

When it comes to infrastructure, the shift to the cloud required organizations to contend with years of investments into their data centre footprint, modernize these infrastructure assets and move many of these assets into public cloud services to simplify management while improving performance, access and security.

However, while Canadian organizations plan on moving away from traditional data centres to the cloud, they are doing so at a cautious pace. The 2024 CDW Canadian Hybrid Cloud Report highlights that over the next two years, the allocation of digital infrastructure, when it comes to public cloud deployments, will be 39 percent, up a mere one percent from 2024, with a slight uptick around edge infrastructure. The reason for this lacklustre growth is largely due to Canadian organizations:

- Having to reconcile the technical debt around years of data centre investments, as this reconciliation will be accelerated by compelling events that will drive the need for scale and resiliency
- Managing long-term contracts with their hosting providers
- Navigating the lack of skills to manage a complex cloud environment
- Needing to comply with data governance resulting in private cloud deployments and, in some cases, a preference for leveraging edge-based use cases

Over time, Canadian organizations will have a digital infrastructure footprint that will be a mix of various on-premises and cloud infrastructure deployments, making management and optimization more critical than ever. This will give more flexibility, visibility and control to organizations when planning for a gradual transition to the cloud.

If we look at the different business segments, medium-sized organizations and enterprises expect to shift their digital infrastructure investments toward edge and public cloud infrastructure, while smaller organizations expect to move mostly toward edge infrastructure given their scale of operations.

When it comes to industries, all of them highlighted the slight uptick in the use of public cloud in two years, except for the energy sector, which indicated a higher uptick in using public cloud over the next two years, given the need to scale and optimize operations.

Gaining Digital Infrastructure Alignment

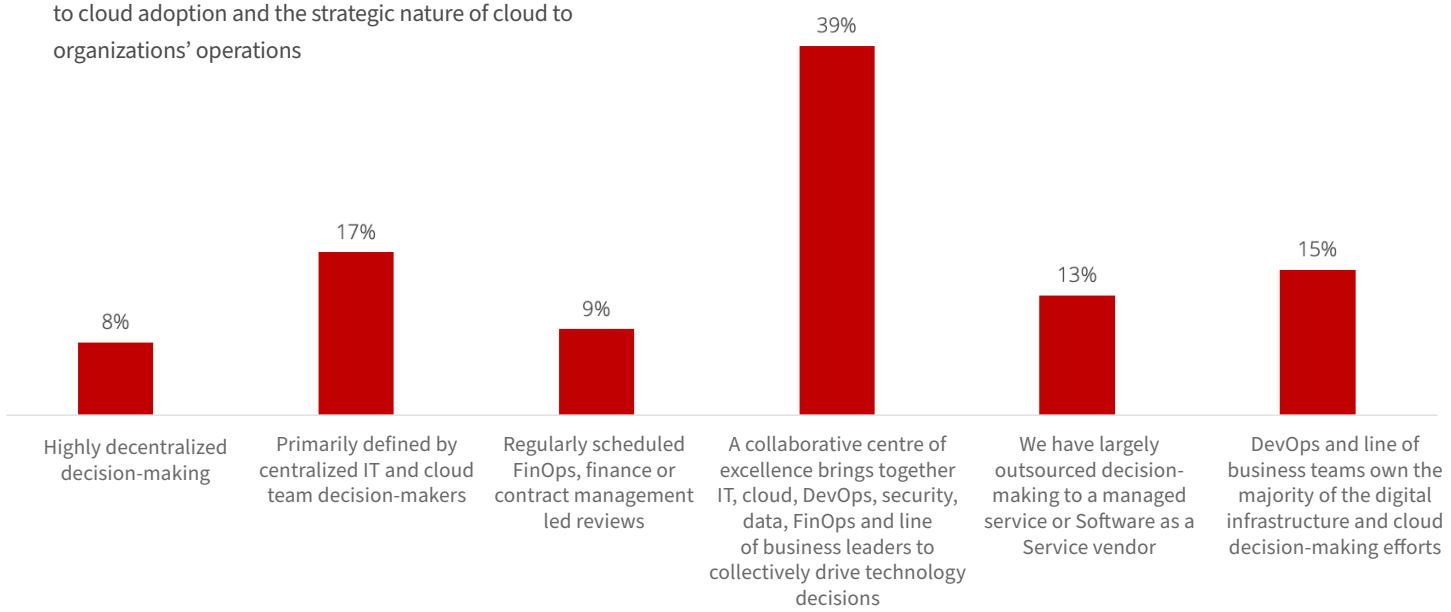
To scale their use of digital infrastructure, Canadian organizations must align across IT, cloud, business and developer teams when it comes to spending, operationalizing policies and developing strategic roadmaps. The 2024 CDW Canadian Hybrid Cloud Report found that only two in five Canadian organizations leverage a centre of excellence (CoE) model — whereby a team of highly skilled, experienced and innovative employees or managers are brought together to collaborate on technology strategies and investments — to ensure internal alignment on their digital infrastructure strategy. A CoE model allows for a shared approach among the IT and different business teams in identifying synergies, addressing interdependencies and working toward common business objectives.

The remaining three out of five organizations either lean toward IT or business teams separately. Organizations that leverage a CoE model seek a greater level of maturity when it comes to cloud and understand the strategic role of cloud in executing their digital strategy.

From a segment perspective, nearly 40 percent of all three segments — small, medium and enterprises — indicated leveraging CoEs. However, 23 percent of enterprises indicated that IT and cloud teams dominated digital infrastructure alignment given the fact that cloud is the dominant operating model for these organizations. Small organizations highlighted an inclination toward outsourcing these decisions to their managed services providers or SaaS providers since they may largely be consumers of cloud applications and platforms.

Chart 2: Approach to Aligning Digital Infrastructure Spending, Operational Policies and Strategic Roadmaps

- Only two in five Canadian organizations leverage CoEs to align on their digital infrastructure strategy
- This highlights a greater level of maturity when it comes to cloud adoption and the strategic nature of cloud to organizations' operations



Source: CDW Cloud Survey 2024 n = 711

Digital Infrastructure Concerns and Investments

While Canadian organizations continue to invest in digital infrastructure, they have to cope with a series of concerns that can impact their ability to achieve business outcomes. As per the 2024 CDW Canadian Hybrid Cloud Report, 44 percent of respondents indicated that they were concerned about rising cybersecurity threats, followed by 40 percent who were concerned about the rise in digital infrastructure costs and 35 percent who indicated a lack of understanding among business users on how digital infrastructure can support their business strategy. These concerns need to be addressed by Canadian organizations to achieve their business goals.

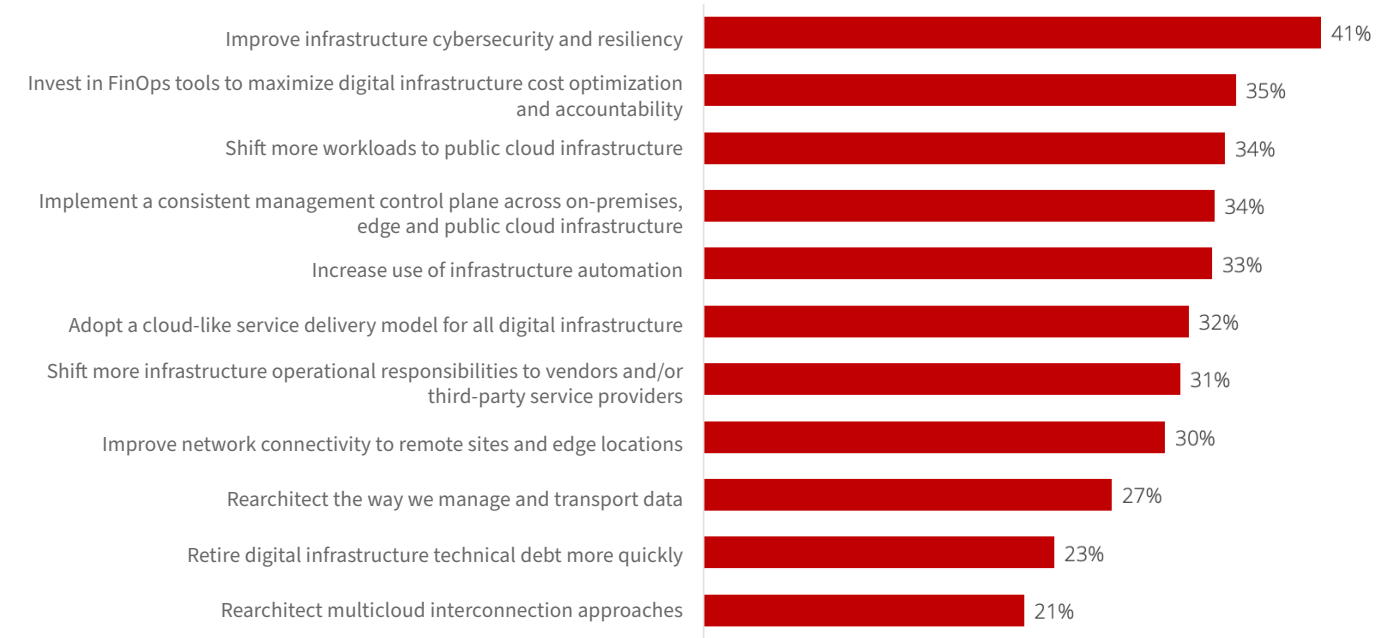
Security was the greatest concern across all three business segments. However, following security, the greatest concerns for small businesses were rising costs and data siloes, whereas for medium businesses, they were rising costs and technical debt and for enterprises, it was lack of business executive understanding, alongside costs and data siloes. These concerns clearly highlight the need for solutions to security, operations, cost and data management issues.

To better understand how Canadian organizations are addressing these concerns and ensuring success, it is important to consider the investments that organizations need to make over the next two years. Canadian organizations highlighted that it was important for them to invest in:

- Improving their infrastructure cybersecurity and resiliency
- Using FinOps tools to ensure cost control and transparency
- Improving management of their infrastructure footprint by moving workloads to the cloud
- Implementing a management control plane for their hybrid environment
- Increasing the use of infrastructure automation

Chart 3: Investments Organizations Need to Make in the Next 2 Years to Ensure Future Digital Infrastructure Success

- Canadian organizations noted that security, FinOps and simplified management are important for success
- This highlights the growing complexity and cost of infrastructure



Source: CDW Cloud Survey 2024 n = 711

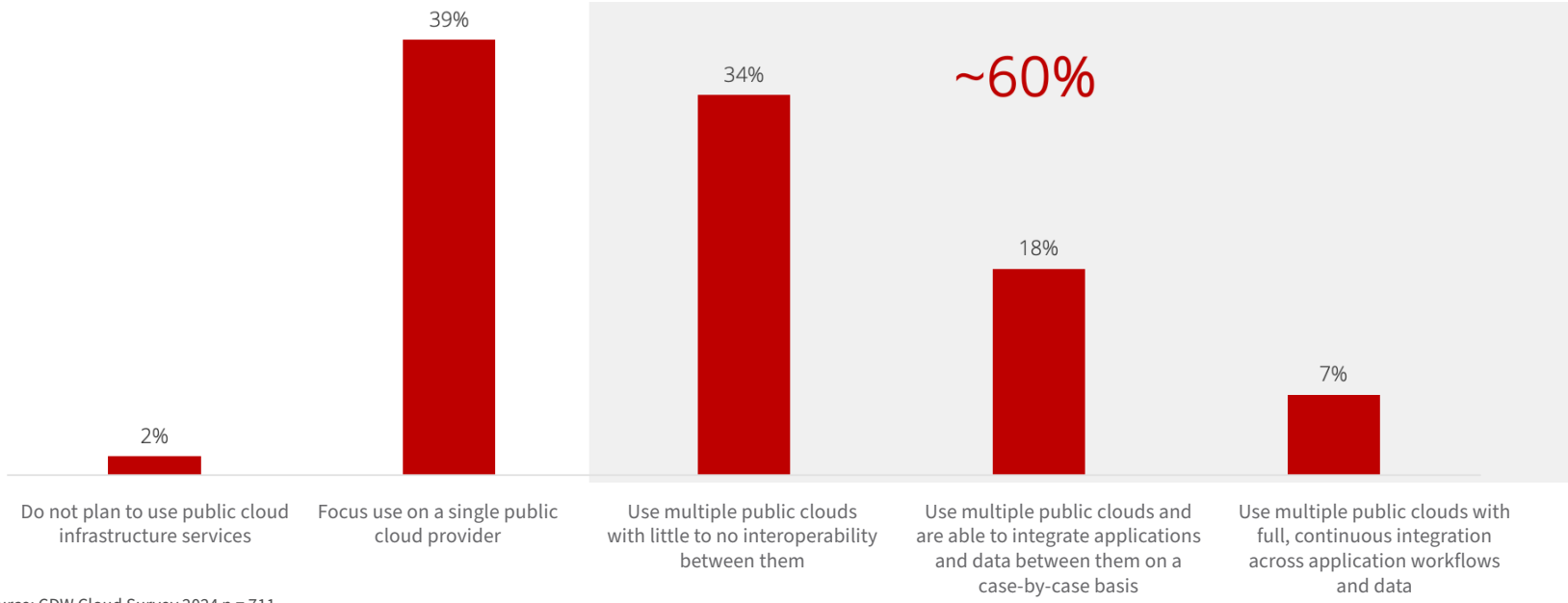
3. HYBRID MULTICLOUD MATURITY

Canadian organizations are increasingly leaning toward building out hybrid, multicloud environments. It enables them to leverage the right infrastructure for the right workload, use best-of-breed technologies, reduce cloud spend, centralize their management and ensure data governance and consistency in both customer and employee experiences.

As per the 2024 CDW Canadian Hybrid Cloud Report, nearly 60 percent of the respondents indicated they will leverage multiple public clouds over the next two years. However, one-third indicated having little to no interoperability between them. Canadian organizations still need to mature when it comes to managing and running multicloud environments. Interoperability and integration are critical to avoid data siloes and consistency in governance and experience.

This trend is consistent across the different business segments of organizations as well as across industries, except for financial services. A total of 30 percent of the financial services industry respondents indicated using multiple clouds and integrating applications and data between them on a case-by-case basis. This highlights that the financial services sector is focused on using best-of-breed solutions and is more mature when it comes to its data management and governance policies, enabling it to leverage data seamlessly across clouds.

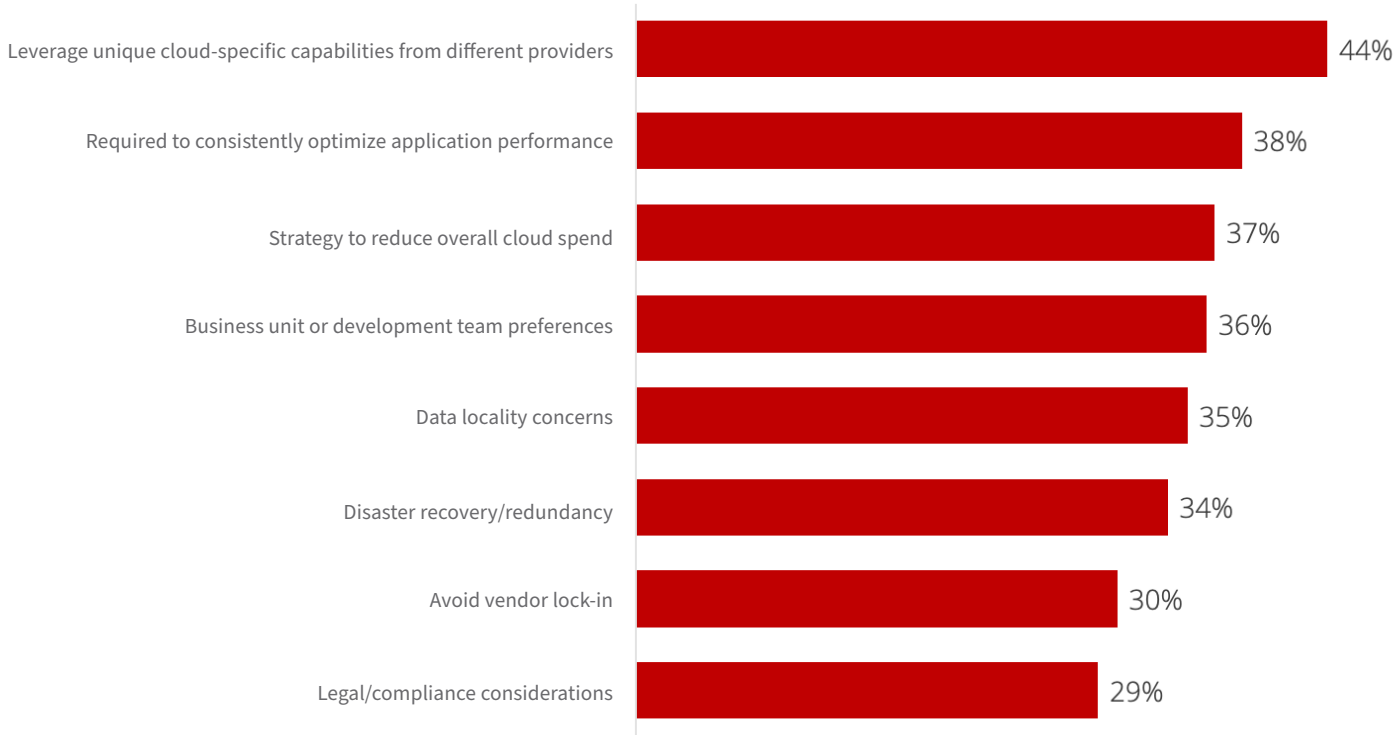
Chart 4: Plans for Using Multiple Public Cloud Infrastructure Service Providers



Source: CDW Cloud Survey 2024 n = 711

Chart 5: Reasons for Adopting Hybrid or Multicloud Architecture

- For Canadian organizations, the top reasons to use hybrid or multicloud architectures include seeking to leverage functionalities, optimizing performance, reducing overall spend as well as incorporating line of business preference



Source: CDW Cloud Survey 2024 n = 407, Base = Respondents indicated organization is adopting hybrid or multicloud data architecture

DRIVERS

Canadian organizations use hybrid multicloud deployments to leverage unique capabilities from different providers (best of breed) while optimizing application performance and cloud costs to meet business unit preferences.

Across the different business segments, the main reason for adopting hybrid or multicloud data architecture has largely been the ability to leverage unique capabilities from different providers. However, small organizations also highlighted that data locality matters to them, while medium-sized organizations indicated that their lines of business (LoB) teams had preferences and enterprises are seeking to optimize their cloud spend and application performance.

From an industry perspective, the health and education sectors are leveraging hybrid or multicloud architecture due to data locality concerns, given the personal information collected by organizations operating in these sectors.

CHALLENGES

As hybrid and multicloud deployments continue to rise, this will also result in challenges such as having to deal with changes to cloud offerings and pricing, availability of IT skills, consistency around security and compliance, IT staff and process optimization and workloads running on the best cloud option.

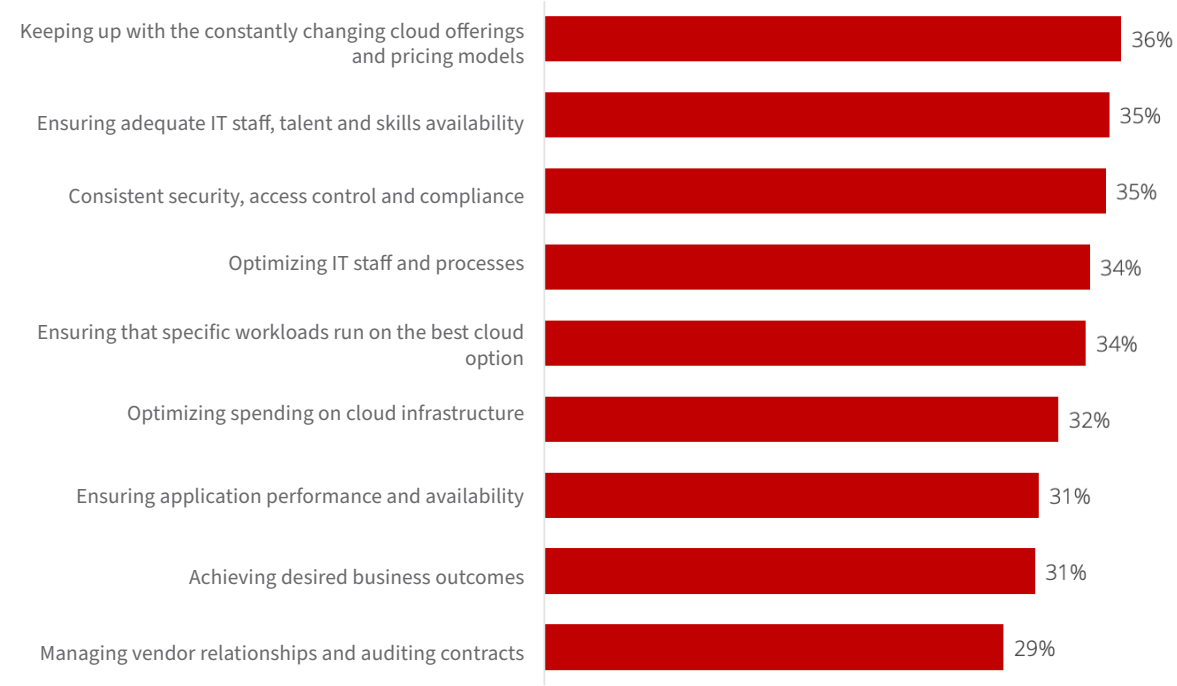
The main challenges with hybrid and multicloud deployments vary by company size. Smaller-sized organizations highlight the challenge of managing changes to cloud offerings and pricing. These organizations usually have smaller IT teams and can find vendor management cumbersome. For medium-sized organizations, the challenge is ensuring that workloads are running on the best cloud option. For enterprises, the challenges with hybrid and multicloud deployments include the availability of IT skills as well as application performance and availability.

The main challenges did not vary by industry except for the energy sector, which stated the challenges associated with managing vendor relationships and contract audits in addition to skills, security and optimizing processes. Energy firms must deal with both IT and operational technology vendors, resulting in a complex ecosystem that is further compounded with multicloud deployments.

Given that challenges with IT skills are commonplace, regardless of the business size and industry, Canadian organizations will need to double down on a robust cloud management strategy to simplify and better manage their IT environment.

Chart 6: Operational Challenges from Adopting a Hybrid or Multicloud Approach

- Organizations are grappling with changes from cloud providers, skills issues, security and ensuring the workloads are running on the best cloud. Adding to this is the optimization of cloud spend.



Source: CDW Cloud Survey 2024 n = 407, Base = Respondents indicated organization is adopting hybrid or multicloud data architecture

4. HYBRID MULTICLOUD MANAGEMENT STRATEGIES

To gain better control of their IT environment and cloud resources, Canadian organizations must adopt different strategies, including unified management control planes, cloud management tools, observability tools and infrastructure as code.

Unified Management Control Plane

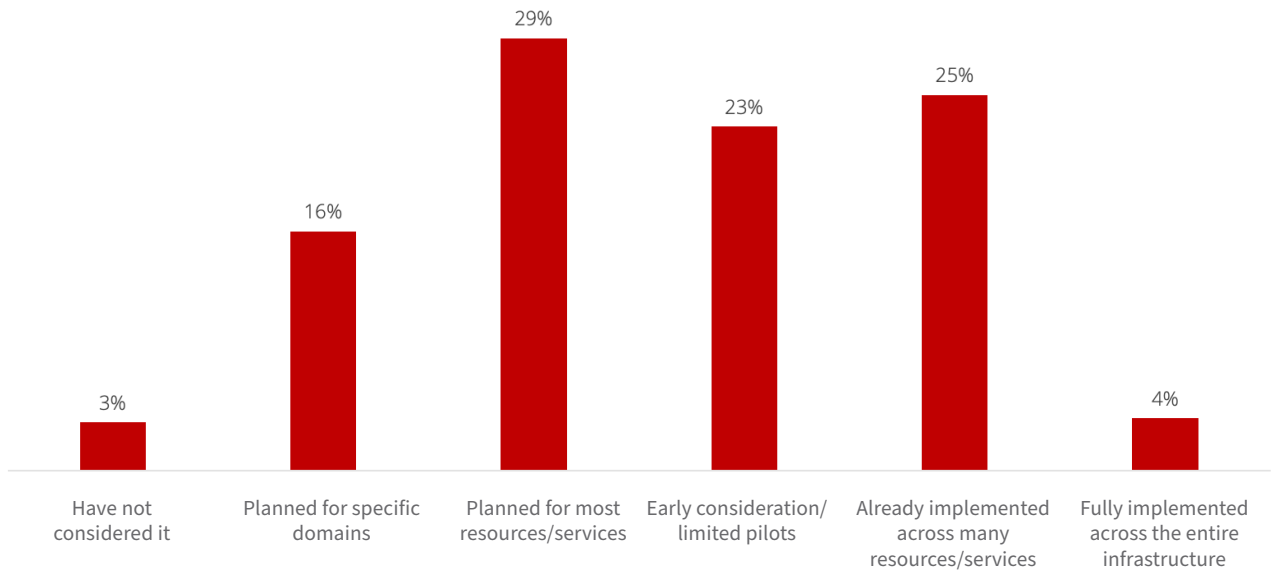
A unified management control plane is a platform that provides IT teams with the ability to manage, monitor and control various infrastructure deployments, be it on-premises, edge, hybrid or multicloud. It provides a centralized view resulting in improved viability, efficiency, security, scalability, cost optimization and compliance. Not only this, but by centralizing and standardizing on a unified management control plane, organizations can simplify the customer support experience significantly and optimize the number of people required on the support team. It should be noted that the unified management control plane encompasses both legacy systems and new systems and provides a holistic view of an organization's IT footprint.

As per the 2024 CDW Canadian Hybrid Cloud Report, only one-third of respondents indicated implementing a unified management control plane, while the remaining are either planning or in the early stages of consideration/ pilots. While Canadian organizations have matured when it comes to their cloud deployment, there is a gap when it comes to cloud management.

Looking at the different business segments, over 40 percent of enterprises indicated implementing a unified management control plane. Most medium and small organizations are either planning or in the early stages of considerations/ pilots. From an industry standpoint, one-third of the financial services and energy organizations indicated they had implemented a unified management control plane.

Chart 7: Implementation Plans of a Unified Management Control Plane

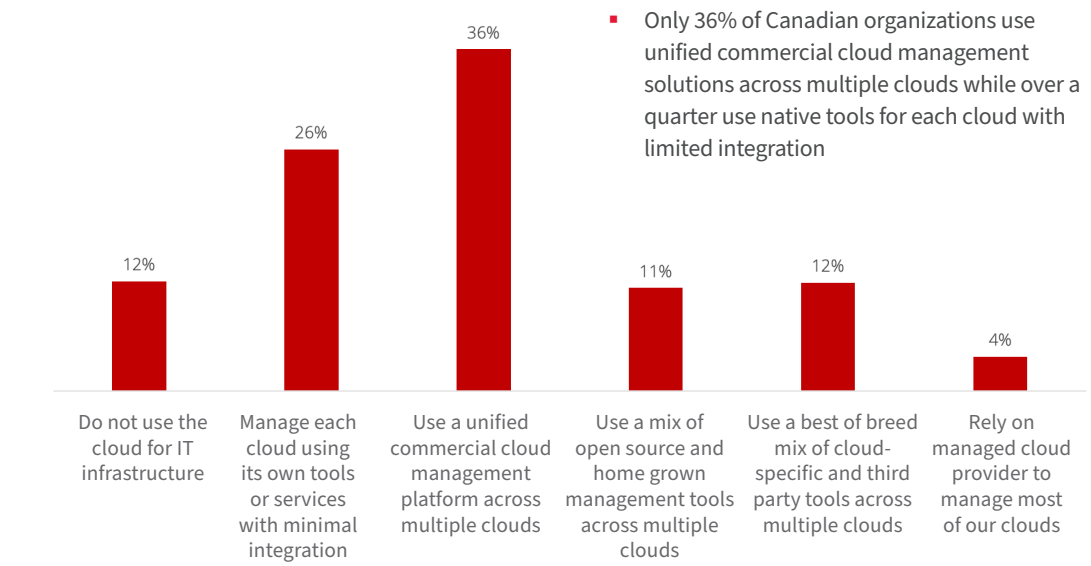
- Only one-third of Canadian organizations are using unified management control plane, amplifying the challenges around management



Source: CDW Cloud Survey 2024 n = 711

CLOUD MANAGEMENT STRATEGY

Chart 8: Description of Cloud Management Strategy



Source: CDW Cloud Survey 2024 n = 711

A unified management control plane applies to all forms of infrastructure, while a cloud management solution is important for managing cloud resources only. Managing both hybrid and multicloud environments is both critical and challenging. Canadian organizations need to have a robust cloud management strategy.

With regards to cloud management, only 36 percent of Canadian organizations that were surveyed indicated using a unified cloud management platform. The rest of the respondents used a combination of cloud-native, open source and home-grown tools or a mix of best-of-breed solutions. This makes cloud management complex and cumbersome.

It is also important for Canadian organizations to invest in a unified cloud management solution since it will enable them to better manage their cloud resources and cost, performance and workload management, as well as address aspects such as security and governance. Nearly 40 percent of the organizations across all three business segments indicated using a unified cloud management solution or managing each cloud with its native solution.

From an industry perspective, the cloud management strategy varied widely. The government and education sectors indicated using a unified cloud management platform, while the financial services sector leaned toward best-of-breed, open source and home-grown solutions. This mix of solutions results in complexity and can create a significant amount of risk and issues around compliance for the financial services sector.

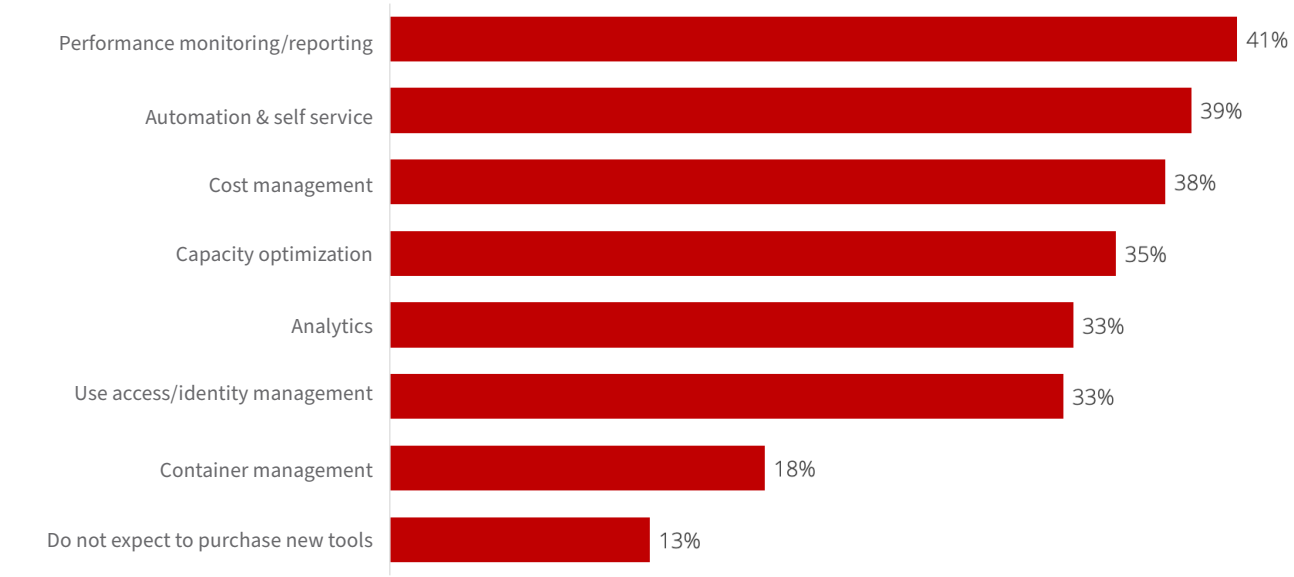
Cloud management solutions have an extensive set of functionalities that enable organizations to better manage their cloud environment and resources. The survey probed organizations on the cloud management functionalities that they are seeking to purchase over the next two years. Canadian organizations are seeking to purchase performance monitoring, automation and self service, cost management, capacity optimization and analytics. This highlights a need for optimization of cloud resources and efficiency.

Cost management was highlighted by both small organizations and enterprises, while medium-sized organizations highlighted performance monitoring and identity management as functionalities that they are seeking to purchase over the next two years. As per the 2024 CDW Canadian Hybrid Cloud Report:

- Small organizations are cost-sensitive to begin with and believe they need to rein in their cloud costs, especially in a challenging economic environment
- Medium-sized organizations prioritize securely scaling operations, hence the focus on performance monitoring and identity management
- Enterprises are seeking to gain better control over their cloud sprawl and optimize their overall cloud spend

Taking a closer look at the different industries, all the sectors highlighted purchasing performance monitoring and cost management as important. The government and healthcare verticals indicated that the purchase of automation and self-service take precedence over cost. Cloud automation allows for efficiency, consistency in process, security compliance and faster time to market, enabling IT teams within these sectors to focus on higher-value tasks.

Chart 9: Cloud Management Functionalities Organizations Expect to Purchase in the Next Two Years



Source: CDW Cloud Survey 2024 n = 711

OBSERVABILITY

Hybrid, multicloud environments are dynamic and complex. Organizations need a mature observability strategy to have real-time visibility into workloads to address issues, be alerted to “unknown unknowns” (issues that are not known) and any other performance concerns. Observability empowers organizations to optimize performance, troubleshoot efficiently and deliver exceptional digital experiences. A highly observable environment is critical, as Canadian organizations have distributed environments with the deployment of IoT and the integration of IT and operational technologies (OT).

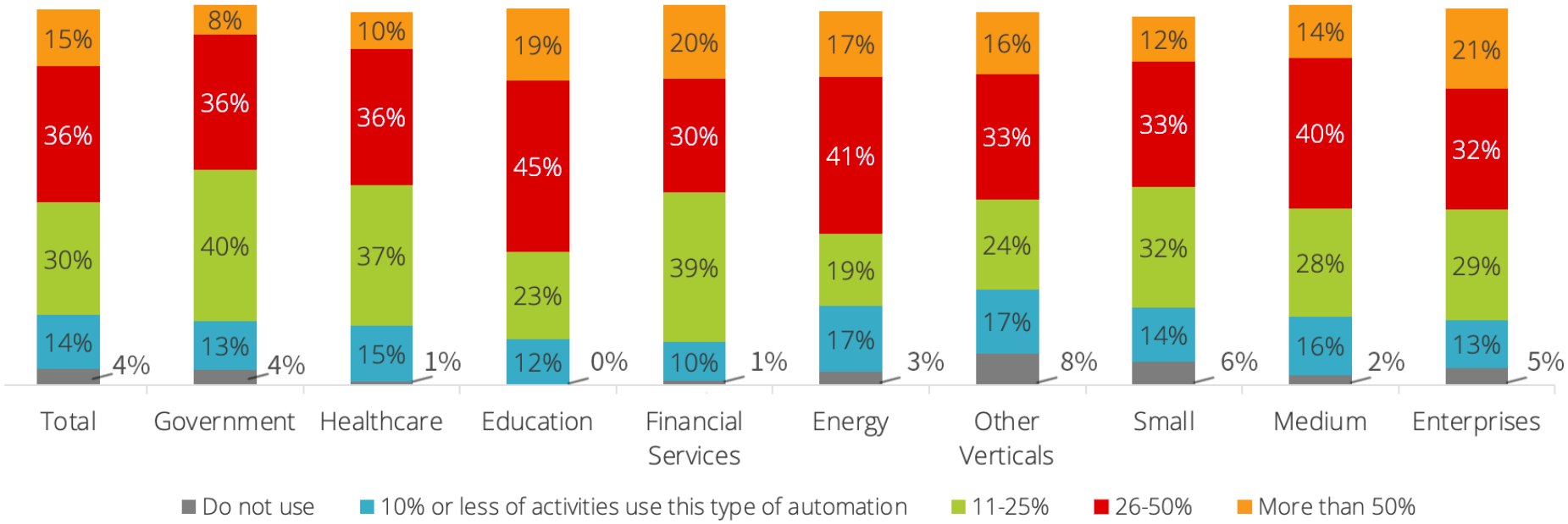
Unfortunately, Canadian organizations have limited observability maturity. A self-assessment of their observability maturity within the survey yielded only five percent indicating they have a highly observable environment, whereas 45 percent indicated they are making good progress and the remaining respondents indicated a limited or fragmented/siloed use. A similar trend was observed across segments, as from an industry perspective, financial services indicated a greater degree of maturity compared to the rest, with 20 percent of financial services organizations highlighting a highly observable IT environment.

INFRASTRUCTURE AS CODE

Infrastructure as code enables organizations to provision their infrastructure using code rather than manual processes and settings. It essentially automates many aspects of infrastructure management. This enables consistency and releases developers from having to manage complex infrastructure environments. The 2024 CDW Canadian Hybrid Cloud Report indicates that only 36 percent of respondents stated that 26–50 percent of activities across multiple clouds use "infrastructure as code" automation.

Chart 10: Use of Infrastructure as Code Capabilities

- 36% of the respondents stated that 26-50% of activities use this type of automation
- Over 40% of energy and education sector organizations indicated 26-50% of activities use this type of automation



Source: CDW Cloud Survey 2024 n = 711

Deployments around AI and IoT will only add to Canadian organizations' technology footprint since cloud will be critical to scale these deployments. It will be important to prioritize investments in management and automation solutions to gain better control over performance and costs.

5. DEMOCRATIZATION OF AI

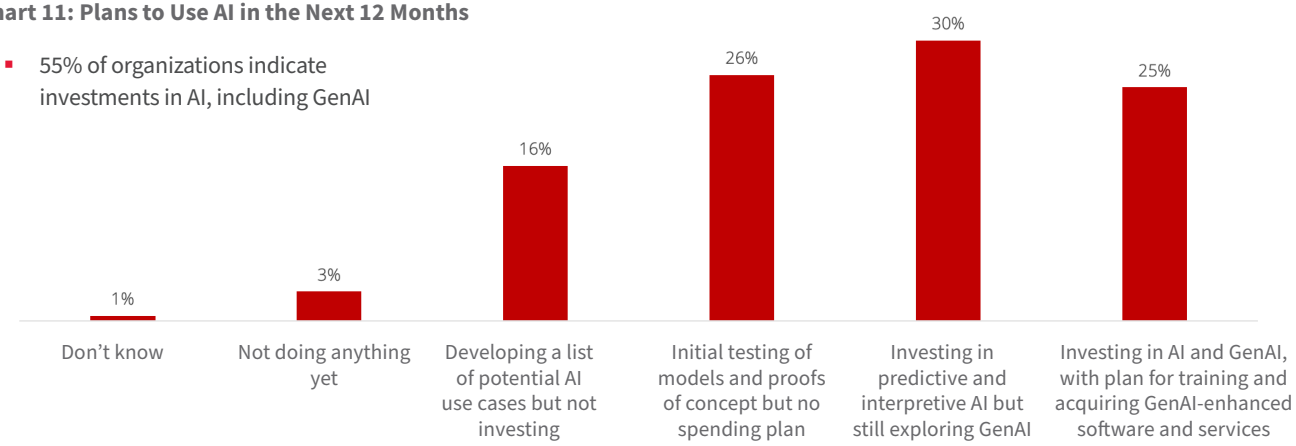
Generative AI has brought the focus back to AI within the enterprise. The consumerization of AI via Open AI's ChatGPT has made AI accessible, driving consumer curiosity and experimentation. Organizations realized that they needed to focus on AI and GenAI since it is viewed as driving competitive differentiation. Organizations leveraging AI, especially GenAI, expect benefits around productivity, efficiency, cost savings and improved customer and employee experience.

The 2024 CDW Canadian Hybrid Cloud Report found that 55 percent of Canadian organizations are investing in AI, including GenAI. Nearly one-third of enterprises and medium-sized organizations are already investing in AI. Investment plans vary by industry, with nearly 70 percent of the financial services sector investing in AI. This is followed by the healthcare sector at 61 percent and education at 58 percent. The adoption of GenAI is largely based on use cases and organizations need to arrive at the list of use cases that will help drive positive business outcomes. The 2024 CDW Canadian Hybrid Cloud Report also found that Canadian organizations are investing in all types of AI — interpretive, predictive and generative, with GenAI accounting for one-third of significant AI initiatives.

The AI landscape continues to evolve, with vendors integrating GenAI into their portfolio and building out use cases and the infrastructure and partner ecosystems building out systems to support resiliency and skills to enable Canadian organizations to scale their use of GenAI. Canadian organizations will need to navigate this growing AI ecosystem.

Chart 11: Plans to Use AI in the Next 12 Months

- 55% of organizations indicate investments in AI, including GenAI



Source: CDW Cloud Survey 2024 n = 711

Any organization seeking to embrace and scale when it comes to AI needs to have a holistic approach or elements of a fully scalable AI value chain built from infrastructure to front-end applications. These elements include:

- Infrastructure: Organizations need to decide whether they would like to leverage public cloud services, hybrid cloud services or on-premises infrastructure to provide the necessary compute and storage capacity for their deployment. This also incorporates networking.
- Foundation models: There needs to be a decision on what type of foundation models organizations are going to leverage or if they will be leaning toward a foundation model that is being provided by their AI applications' vendors. This will also be decided based on the type of use cases since some models are more multimodal than others.
- Platforms: Organizations will need to decide on their data management strategy along with aspects such as whether they are going to leverage a solution to develop their AI capabilities or use open-source platforms to gain access to such capabilities. Organizations will need to consider the AI/ML lifecycle to better manage data acquisition, preparation, training, testing and deployment of the model. It will bridge the foundation model and application layer.
- Applications: Organizations will need to consider the different applications that are either use-case specific or if they are to be incorporated into an existing enterprise application.

All these elements of the AI value chain are to be wrapped up with governance for both the data and AI models that are grounded on the responsible AI framework and security solutions and policies.

Successful AI projects are dependent on data, infrastructure and tools that can support the volume, velocity and veracity of the data being generated/leveraged within the organization. The 2024 CDW Canadian Hybrid Cloud Report asked Canadian organizations to gauge the level of readiness of their data infrastructure to handle AI challenges. Only three percent of organizations indicated that their data infrastructure was ready to handle AI challenges such as integrating privacy, traceability and security; reducing the power consumption of AI projects; handling a large number of complex AI projects; and having an optimized and responsible infrastructure for AI.

This lack of readiness requires organizations to improve their capabilities to ensure that their digital infrastructure can allow for a more AI-friendly data architecture. These capability improvements span both technologies and processes. The 2024 CDW Canadian Hybrid Cloud Report highlighted that organizations needed to improve in areas such as:

- Functionalities to prevent sensitive data from being used for AI training
- Auditable copies for data for traceability-error detection
- Scalability
- Data migration between infrastructures
- Support for streaming/real-time data processing

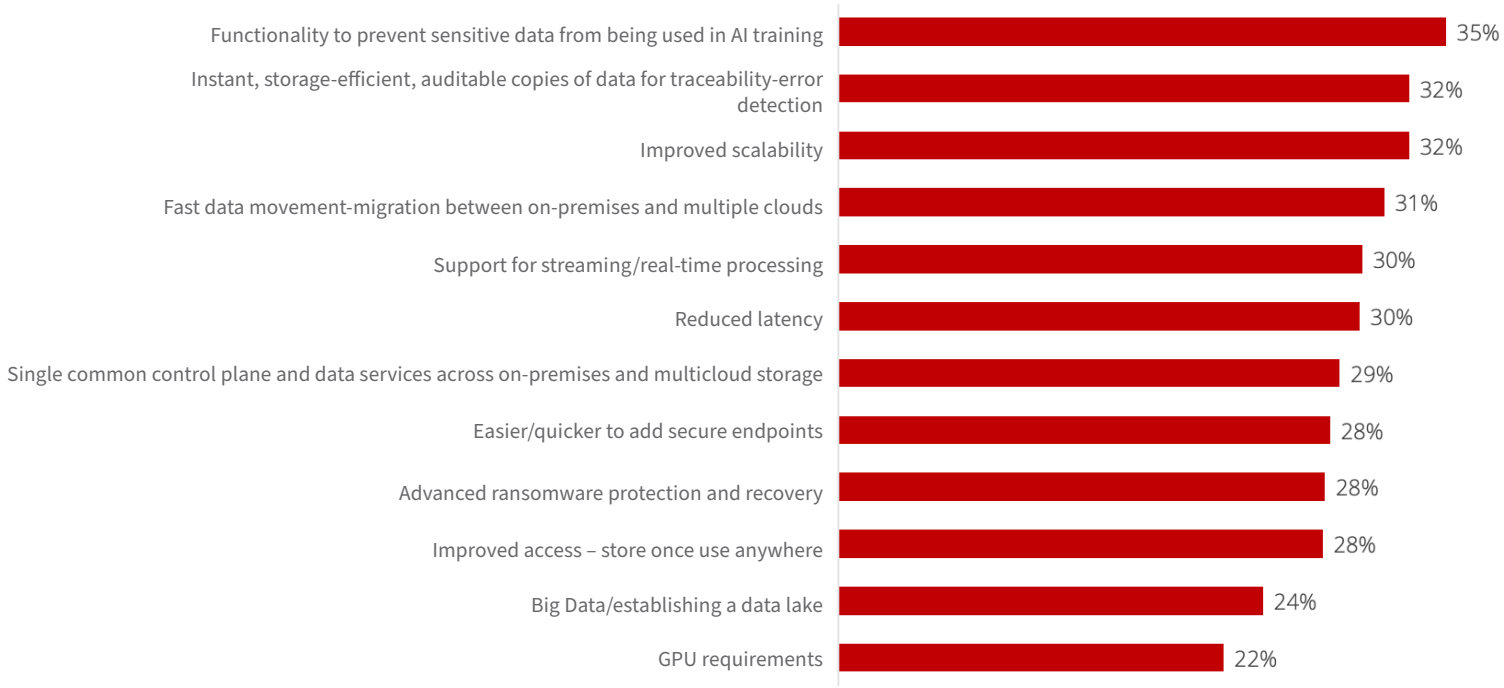
The main capability needed to improve digital infrastructure focuses on data governance to ensure that the right guardrails are put in place to prevent sensitive data from being used for training. This is critical since it impacts the trust of customers, employees and partners at large and also compliance with regulation and privacy mandates. Some of these capabilities reflect the need for increased transparency given the concerns around hallucinations/bias within GenAI models as well as the need to ensure organizations can justify outputs from their AI models. Other capabilities highlight the need for improved data operations to ensure data is accessible to enable AI models to provide real-time insights.

From a business segment perspective, organizations across all three segments highlighted that they needed to ensure that they could prevent sensitive data from being used for training. Enterprises highlighted the need to improve data migration and scalability, as they have more complex AI projects that require them to ensure that data is being accessed and managed properly and that the AI systems can manage a greater volume of requests.

Data governance and traceability-error detection were capabilities that all industries highlighted that they needed to improve upon. The government sector highlighted the need to also improve upon their latency and scalability capabilities. Latency was a concern for financial services and scalability for the energy sector. The government and financial services sector will need digital infrastructure that can scale to support AI capabilities across operations or citizen/customer experience. The energy sector leverages real-time insights, which makes scalability critical for this sector.

Chart 12: Capabilities Needed to Enable an AI-Friendly Data Architecture

- Organizations noted that data governance, traceability, agility and scalability need to improve for enabling an AI-friendly architecture



Source: CDW Cloud Survey 2024 n = 685, Base = Respondents indicated that organizations are developing a list of potential AI use cases/use or plan to use AI technology

The use of AI is not new to organizations; they have been leveraging AI/ML capabilities across several solutions to offer insights and recommendations such as within data and analytics, anti-money laundering solutions, risk management solutions and cloud management solutions.

As stated, GenAI has democratized AI and the use cases vary according to productivity, business function and organization/industry. These use cases have their own level of business-value impact:

- **Productivity use cases:** The use cases are more horizontal in nature such as the deployment of copilots or assistants across different applications. They are usually focused on improving employee productivity across standard tasks.
- **Business function use cases:** These use cases usually vary by functional department within the organization such as marketing, sales, customer service, legal, research and development. These use cases can apply to external users as well as in customer service, where customers are likely engaging with a GenAI-powered chatbot.

  These use cases require a higher focus on data quality and accuracy to avoid bias and hallucinations. Organizations can reduce these occurrences using retrieval augmented generation. This is essentially an AI framework that improves the quality of the responses of GenAI solutions by querying external data efficiently. These use cases increase the efficiency of business function operations and impact how organizations engage with their employees, customers and partners.

- **Organization/industry use cases:** These usually involve a custom use case/model that is built for a specific organization. It entails training the model on corporate data. Industry use cases currently involve the creation of models based on use cases that are commonplace in the operations of a certain industry.

IDC's Future Enterprise Resiliency & Spending Survey from January 2024 found that nearly half of all the respondents in Canada highlighted investing in business function use cases, followed by one-third focusing on productivity use cases. The scaling of these insights involves the level of trust organizations have when it comes to insights and recommendations being provided by different solutions.

So, what exactly has been the approach of Canadian organizations when it comes to trusting insights and recommendations that AI/ML capabilities offer, such as those found in cloud management tools to optimize their cloud environments? The 2024 CDW Canadian Hybrid Cloud Report found that nearly 40 percent of respondents tend to test the products against what they know to be true to ensure that users are being provided with proper and quality insights/recommendations. Canadian organizations tend to take this pragmatic approach and will likely apply this to all types of AI projects as well.

6. DATA MANAGEMENT STRATEGIES

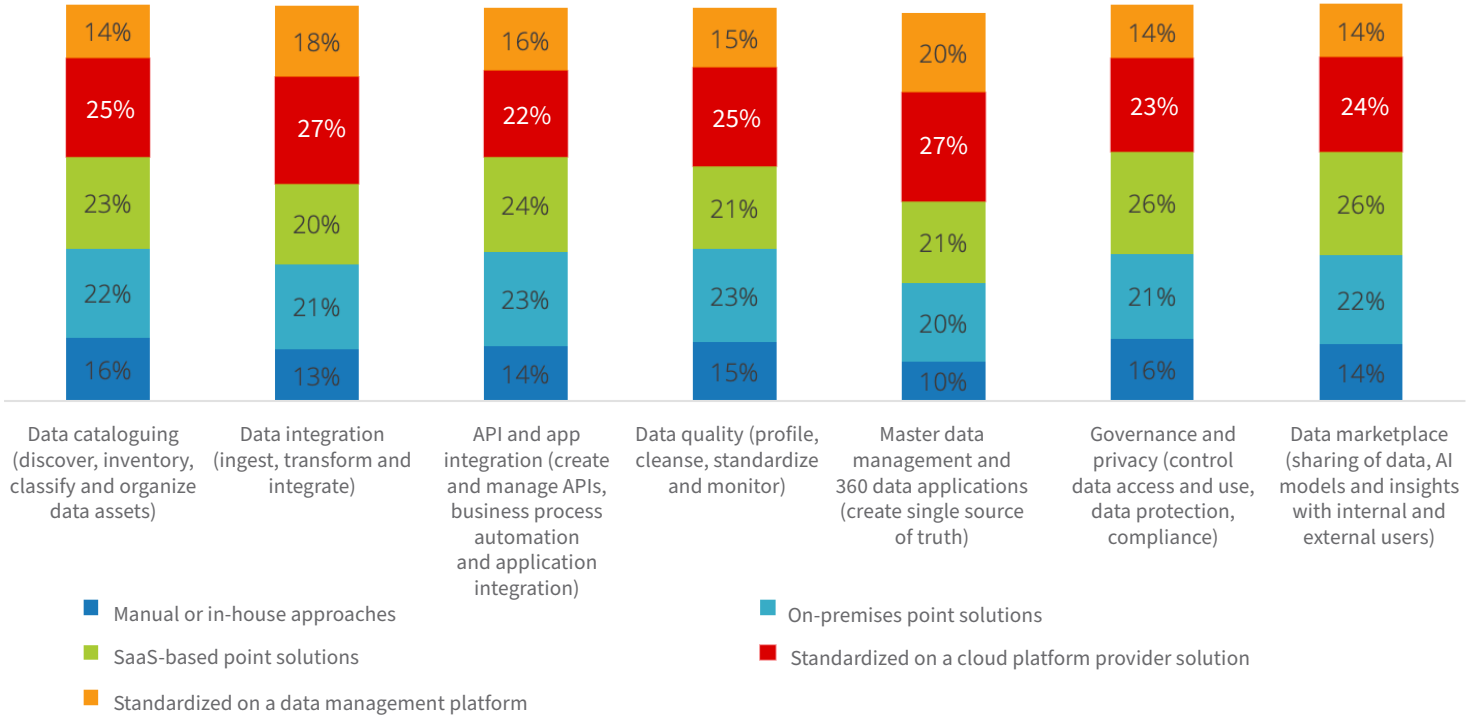
The success of leveraging cloud services, AI/ML/GenAI and IoT when it comes to achieving business objectives is largely dependent on an organization's data management practices. The way the data is classified, managed, integrated and governed as well as the data sources being used and the overall quality of data are critical for creating a streamlined, data-driven organization. This requires organizations to invest in the right skills, technologies and processes to ensure robust data management practices. Several data management functions are needed within organizations, such as:

- Data cataloguing (discover, inventory, classify and organize data assets)
- Data integration (ingest, transform and integrate)
- API and app integration (create and manage APIs, business process automation and application integration)
- Data quality (profile, cleanse, standardize and monitor)
- Master data management and 360 data applications (create single source of truth)
- Governance and privacy (control data access and use, data protection, compliance)
- Data marketplace (sharing of data, AI models and insights with internal and external users)

When we look at data management, nearly half of Canadian organizations are leaning toward SaaS-based solutions or leveraging their cloud platform provider, while 40 percent indicated that they are leaning toward manual or on-premises solutions. Given the need to remove data siloes and ensure data access, it is important to consider leveraging SaaS/cloud-based solutions more extensively. However, to meet data privacy and compliance requirements, some data sets may have to be managed on-premises.

Chart 13: How Are Organizations Implementing the Different Data Management Functions

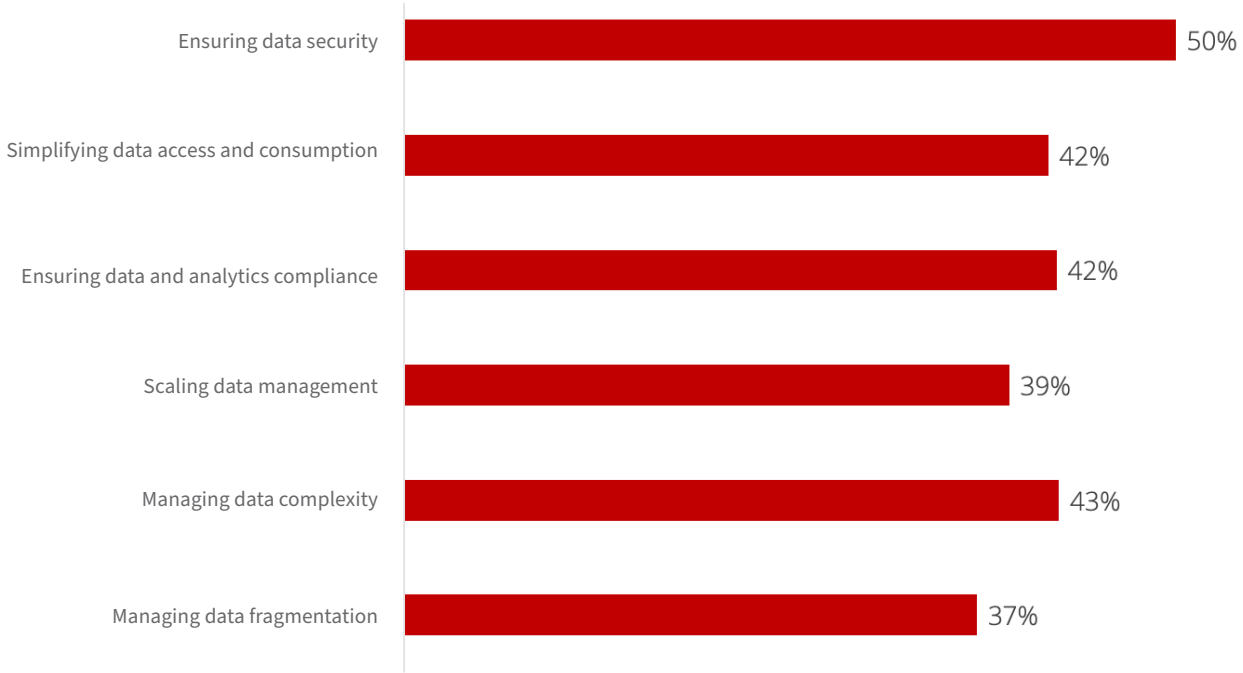
- For data management purposes, organizations are leaning towards using SaaS or a solution from a cloud platform provider. Nearly 40% of the data management functions are being handled in-house or on-premises.



Source: CDW Cloud Survey 2024 n = 711

Chart 14: Challenges For Data Management and Curation

- For Canadian organizations, the exponential growth in data results in a need for improved data security followed by having robust processes across the data lifecycle



Source: CDW Cloud Survey 2024 n = 711

Given the volume, variety and velocity of data being created, Canadian organizations have to manage a series of challenges such as ensuring data security, managing data complexity, simplifying data access and consumption and ensuring data and analytics compliance. Organizations clearly have challenges around establishing robust processes across the data lifecycle.

As per the 2024 CDW Canadian Hybrid Cloud Report, over the next 12 months, Canadian organizations plan to improve their data security and privacy, quality of data and analytics used for decision-making and the efficiency of data management and analytics activities and to leverage automation. These capabilities reflect the need for a robust data management strategy that will allow for a great utilization of data to enable innovation, drive productivity and enhance decision-making.

Chart 15: Capabilities That Need to Be Improved Over the Next 12 Months to Support Data Management and Curation

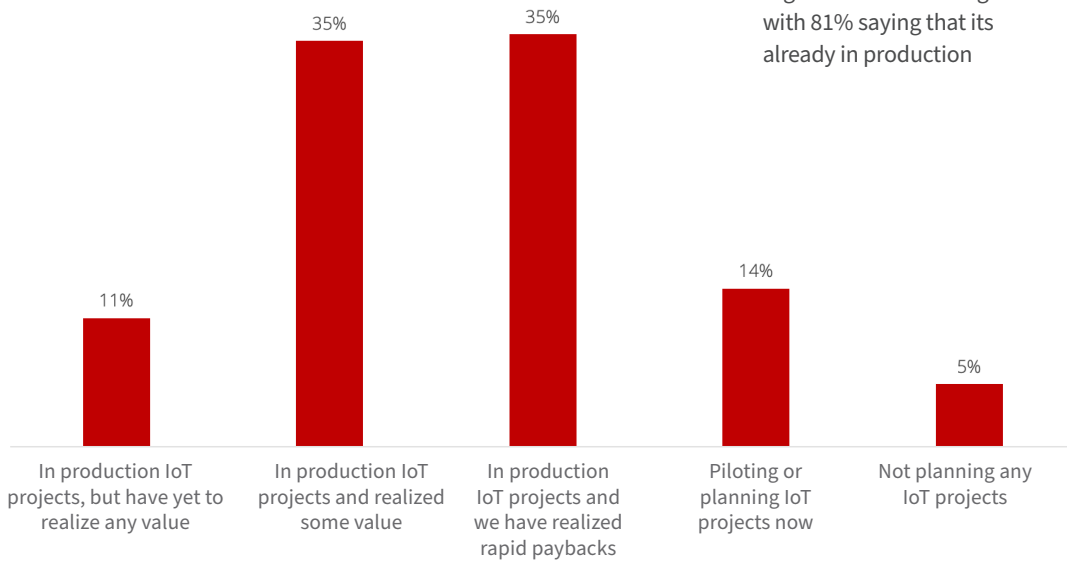
- Capabilities around data security and privacy, followed by data quality and quality of management and analytics need to improve over the next 12 months

Source: CDW Cloud Survey 2024 n = 711

7. PROGRESS IN INTERNET OF THINGS ADOPTION

Chart 16: Experience with Internet of Things

- 95% of Canadian organizations are using IoT with 81% saying that its already in production

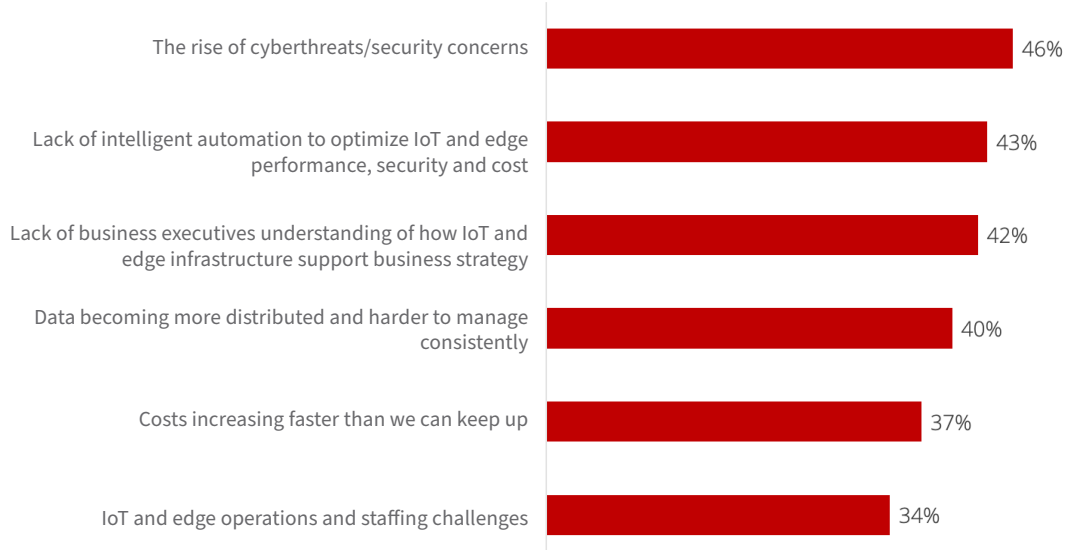


Source: CDW Cloud Survey 2024 n = 711

Canadian organizations have been investing in IoT over the past few years to gain operational efficiency and improve decision-making, experiences and differentiation. This has resulted in investment in edge infrastructure to ensure performance, latency, security and reliability. The 2024 CDW Canadian Hybrid Cloud Report found that 81 percent of Canadian organizations have IoT projects in production, but only 35 percent realized rapid payback. A similar trend was observed within segments and industries as well with 30–40 percent indicating that they realized rapid paybacks, the highest being financial services at 45 percent.

Chart 17: Concerns About IoT and Edge Deployments

- Security, optimization, LoB support and siloed data are the greatest concerns when it comes to IoT and edge for Canadian organizations



Source: CDW Cloud Survey 2024 n = 670, Base = Respondents indicated organization using/planning to use IoT Projects

There are several concerns that organizations need to address when it comes to their IoT and edge deployments. These include:

- Security, given the proliferation of IoT devices and the complexity of the threat landscape
- Lack of automation to better optimize IoT and edge performance, cost and security
- A gap among business executives and how IoT and edge can help them achieve their business strategy
- Complexity of data becoming more distributed and harder to manage

To address these concerns, Canadian organizations need to make some important investments over the next two years such as implementing a consistent management control plane. As mentioned earlier, only 34 percent of the respondents highlighted having a management control plane in place.

In addition to this, Canadian organizations stated that they needed to improve security and resiliency at the edge, move more operational responsibilities to vendors/third parties and improve overall network capabilities.

IoT and edge deployments can be complex to manage, and investments that are focused on security, resiliency, visibility, performance and control need to be made. The investments varied by business segments, with:

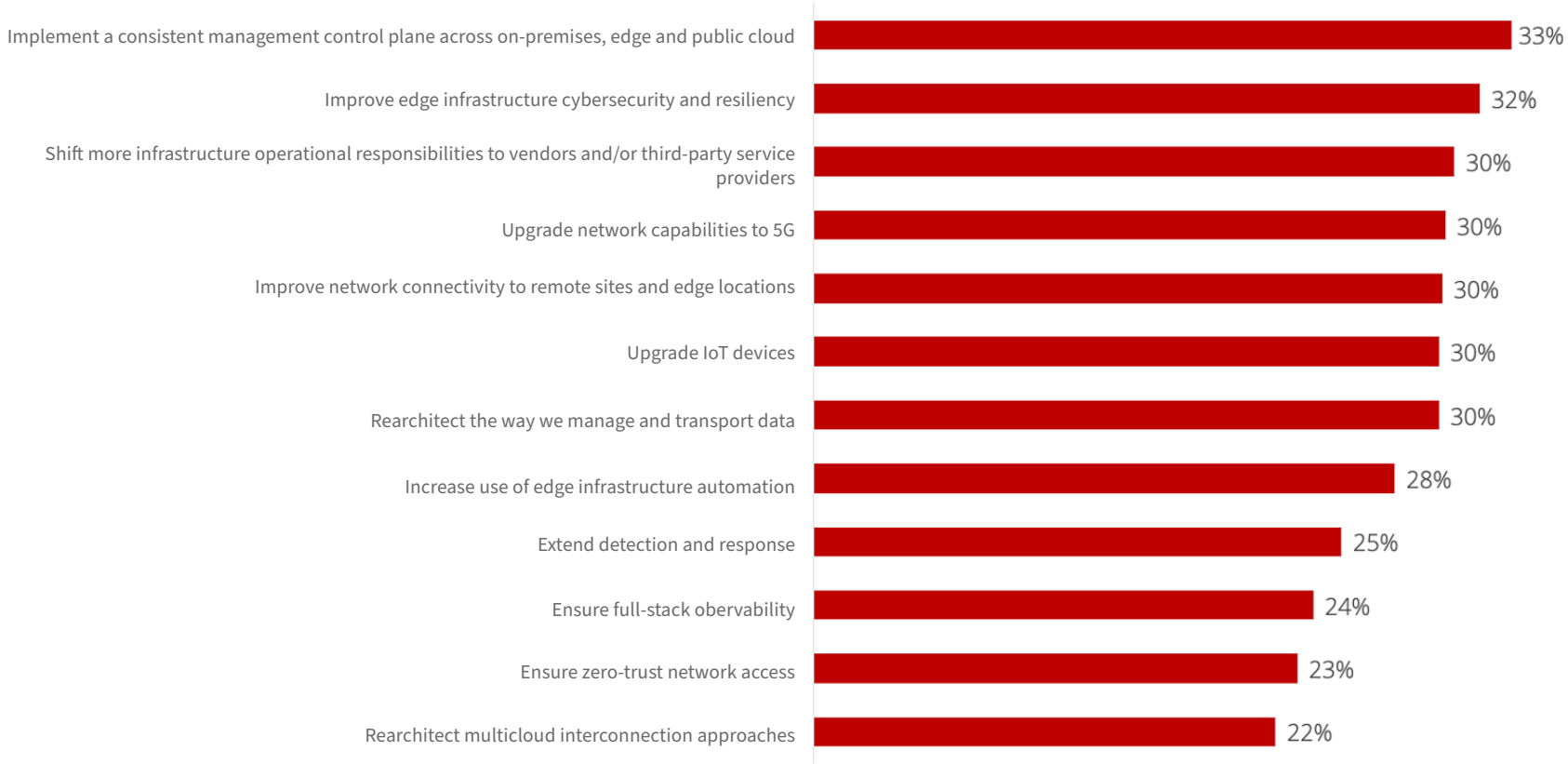
- Small organizations seeking a management control plane and upgrading their network capabilities
- Medium-sized organizations wanting to outsource operational responsibilities
- Enterprises focused on security and resiliency

Medium-sized organizations tend to not have enough staff to manage the scale and complexity of IoT and edge deployments, requiring them to outsource these responsibilities.

The investments varied significantly across industries, with upgrading devices being a major investment for government, financial services and healthcare and rearchitecting the way data is being managed and transported a major investment area for the energy and education sectors.

Chart 18: Most Important Investments in the Next Two Years to Ensure IoT and Edge Infrastructure Success

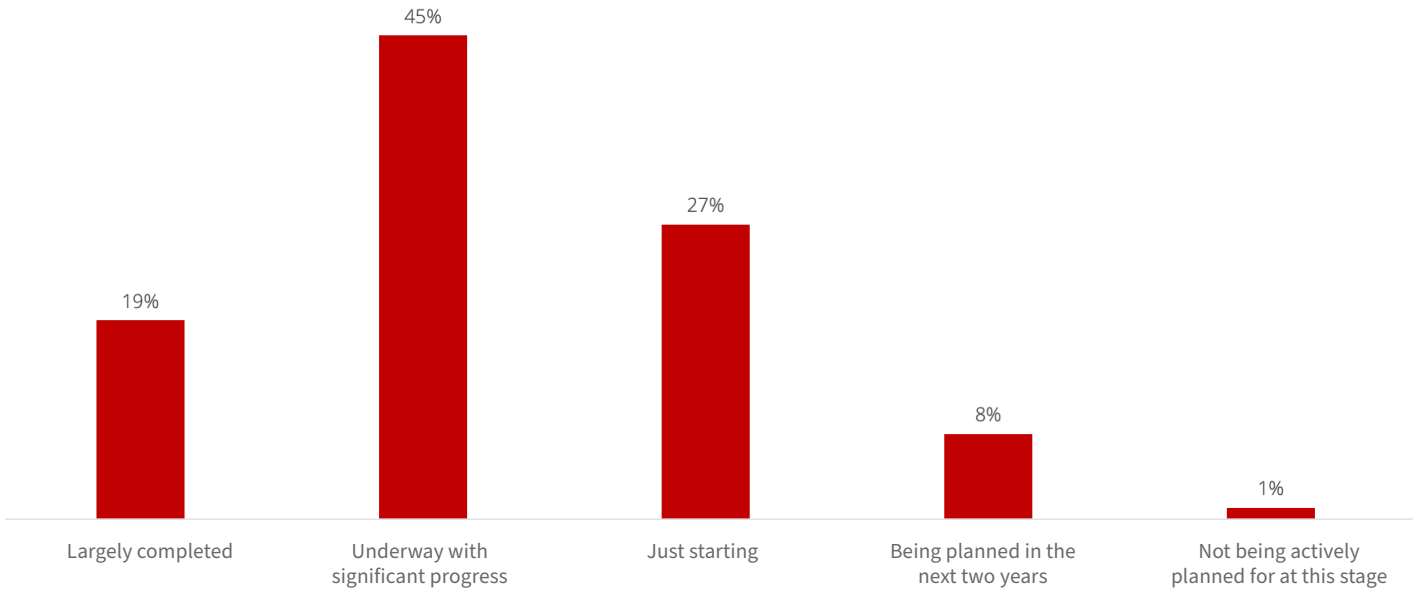
- Management control planes, resiliency, network capabilities and moving management to vendors are important investments to achieve success with IoT and edge



Source: CDW Cloud Survey 2024 n = 670, Base = Respondents indicated that organizations are using/planning to use IoT Projects

Chart 19: Status of Integrating IoT/OT Investments

- Only 19% of Canadian organizations have integrated IoT/OT, with 45% stating that it is currently underway



Source: CDW Cloud Survey 2024 n = 670, Base = Respondents indicated that organizations are using/planning to use IoT Projects

Integrating IoT with operational technology (OT) is important for organizations as it allows real-time data exchange, enabling smarter and more efficient operations and improved decision-making. The 2024 CDW Canadian Hybrid Cloud Report found that only 20 percent of Canadian organizations have IoT/OT integration, with 45 percent of those integration initiatives underway with significant progress. One-quarter of the medium-sized organizations and enterprises indicated that they had IoT/OT integration, while only nine percent of small businesses had IoT/OT integration in place. On average, 45 percent of all the sectors indicated IoT/OT integration being underway with significant progress. The three main reasons for organizations investing in IoT/OT integration are:

- Improving service performance to customers
- Improving reliability and availability of assets
- Making operations efficient and clean

The reasons for engaging in IoT/OT integration vary by business segment and industry. Small organizations focus on improving service performance to customers, medium-sized organizations seek to improve the reliability and availability of assets and enterprises seek to improve personnel and public safety and flexibility to scale operations based on demand.

From an industry perspective, the energy sector highlighted aiming to run more efficient and clean operations. The sector has been doubling down on its commitment to sustainability and accordingly has engaged in investments to meet sustainability targets. Within healthcare, the main reason for integrating IoT/OT is to enhance its ability to flexibly scale operations based on demand to improve patient care and run efficient operations.

8. KEY TAKEAWAYS

- Focus on making progress around hybrid multicloud deployments: Canadian organizations need to take stock of their workloads and decide on the right deployment model for each workload based on the data that is being leveraged by the workload. They also need to focus on interoperability between the clouds to ensure that data can be leveraged seamlessly while adhering to data governance requirements.
- Prioritize simplifying cloud management: The 2024 CDW Canadian Hybrid Cloud Report shows that Canadian organizations are fairly nascent when it comes to cloud management. They need to deploy both a unified management control plane and unified cloud management platform that will enable them to manage their infrastructure and cloud workloads more effectively. In many instances, automation might be the right route to address the shortage of IT skills.
- Leverage partners to help deploy AI/GenAI: Given the growing skills gap within Canadian organizations, organizations must lean toward partners to help them with GenAI use cases, governance (including directing, managing and monitoring the AI activities of the organization) and change management. Additionally, Canadian organizations need to ensure AI tools and systems are safe and ethical and remain that way.
- Innovation requires a robust data management function: Canadian organizations need to double down on how data is being managed within their organizations. Data volumes will only continue to rise and organizations need to have the proper processes and technologies in place to ensure the right data is being accessed and leveraged to meet their innovation goals.
- Build resiliency across technology priorities: Given the dependency on technology, Canadian organizations really need to leverage solutions that can help them manage their technology sprawl. Leveraging solutions that can automate and better manage these environments will drive resiliency and enable them to address challenges proactively.

APPENDIX: DETAILED SURVEY RESULTS

Demographics: A sampling frame of senior Canadian IT professionals/practitioners — who were the/a decision-maker or influencer (knowledgeable) of the procurement, use and management of cloud services and infrastructure — was selected to receive invitations to participate in this survey. All survey participants were screened for direct involvement in improving or managing their organization's IT cloud infrastructure. The following tables show the returns, including the removal of certain participants based on screening and reliability checks. Our final sample consisted of 711 surveys.

The survey firmographics and demographics are as follows:

Which of the following industry categories best represents the principal business activity of your organization?

Business/professional services (e.g., legal, accounting, engineering, architecture)	8.9%
Personal/consumer services (e.g., travel, beauty, personal training, dry cleaning)	0.7%
Construction	2.1%
Hospitality	1.7%
IT industry	9.7%
Manufacturing	6.3%
Crown corporation or other publicly funded organization	0.3%
Education K-12	6.6%
Education college/university	7.5%
Financial services	13.6%
Government	14.2%
Healthcare	14.5%
Primary (e.g., agriculture, mining, forestry)	0.1%
Oil & gas or field services related	6.6%
Retail	3.2%
Communications (e.g., cable and telecommunications services)	0.7%
Transportation and warehousing	0.8%
Utilities	1.5%
Wholesale and distribution	0.8%

Does your company have headquarters in Canada – and if so, which of the following areas is it headquartered in?

Not headquartered in Canada	2.5%
Western and Central Canada (BC, AB, SK, MB)	22.8%
Ontario	37.0%
Quebec	22.4%
Atlantic Canada (NB, NS, NFLD, PEI)	14.9%
North (Yukon, Northwest Territories, Nunavut)	0.4%

Which of the following best matches your seniority level within your organization?

Manager	10.8%
Director	52.0%
Executive VP/Senior VP/VP/Head of Business Unit	26.6%
C-level (COO, CIO, CFO, CSO, CTO, CMO, etc.)	10.5%

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CDW Canada is a leading provider of technology solutions for business, government, education and healthcare. CDW Canada helps customers achieve their goals by delivering integrated technology solutions and services that help customers navigate an increasingly complex IT market and maximize the return on their technology investment. Areas of focus include software, networking, unified communications, data centre and mobility solutions. CDW Canada is No. 1 on the Channel Daily News Top 100 Solutions Provider list in Canada, and is a wholly owned subsidiary of Vernon Hills, Illinois–based CDW Corporation, a Fortune 500 company. For more information, visit CDW.ca.

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