Operating a Digital Business in a Hybrid Cloud World

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INTRODUCTION

Over the past few months, Canadian organizations have had to navigate a series of “storms of disruption” with interest rates and inflation continuing to rise, supply chain disruptions, geopolitical turmoil, the ongoing skills shortage and the exponential growth in cybersecurity threats. Many organizations have had to revise and prioritize their spending plans and focus on initiatives to drive resiliency, efficiency and growth. While this reprioritization does impact IT spending plans, the focus has largely shifted toward consuming software functionalities via cloud services and transitioning their data centre footprint toward more hybrid environments. It is expected that spending on IT will continue to outpace GDP. As of June 2023, IDC expects IT spend (excluding business and telecom services) in Canada to grow at 1.5 percent year-over-year (YoY) in 2023, while GDP is expected to grow at 0.9 percent.

Rising interest rates continue to trigger concerns of a looming recession. As per IDC’s Future Enterprise Resiliency & Spending Survey Wave 4, May 2023, nearly 61 percent of Canadian organizations expect a moderate recession and expect that either their IT budgets will stay the same, or they will reduce spend on specific aspects of the budget.

TRANSFORMING INTO A DIGITAL BUSINESS

While Canadian organizations have been pursuing digital transformation in order to stay resilient, achieve efficiencies and sustain growth, they are also increasingly leveraging digital technologies to create value by transforming processes, products and services to deliver digital assets and experiences to their customers. This has enabled Canadian organizations to transform and operate as a digital business where these digital products, services and/or experiences are increasingly contributing toward a greater portion of their revenue. As per IDC's CEO Survey 2023, Canadian CEOs expect that in five years, nearly 50 percent of their organization's revenue will come from digital products, services and/or experiences.

These digital business ambitions require organizations to leverage cloud platforms extensively since they allow for scale, efficiency, innovation and business continuity. As per IDC research, moving to public cloud services enables organizations to innovate across their business processes, user and customer experiences, new products and services as well as improving their sustainability and operating model. Small- and medium-sized organizations highlight that moving to public cloud allows for innovation across business processes as well as new product and service development. Large enterprises highlight that moving to public cloud services allows for innovation across their business processes as well as user and customer experience and their overall business model.

Figure 1: Impact of Moving to Public Cloud on An Organization's Ability to Innovate
Please indicate how the move to public cloud has impacted/will impact your organization's ability to innovate in each of the following areas.

Business processes	**72%**
User and customer experience	**69%**
New products and services	**68%**
Sustainability	**67%**
Operating model	**67%**

Source: IDC Canada ITAP N5 2022, August 2022

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BENEFITS OF ADOPTING CLOUD PLATFORMS

Given their digital business ambitions, IDC's Future Enterprise Resiliency and Spending Survey Wave 5, June 2023 highlighted:

- Two in five Canadian organizations are "spreading their resources, skills and development efforts across several cloud platforms whose offerings address their infrastructure, data and application needs."
- 30 percent highlighted that they are "committing a majority of their resources, skills and development efforts to a primary cloud platform that addresses a wide range of infrastructure, data and application needs."
- Another 20 percent highlighted leveraging "cross-cloud/multicloud management solutions based on standard infrastructure and data technologies that make it possible for them to use a wide range of cloud resources."

The approach to using cloud platforms varies by state of cloud maturity, access to skills and size of the organization, and results in a hybrid and multicloud environment. A series of benefits are experienced by Canadian organizations from their cloud platform approach, such as improved security, faster access to innovative technologies, improved productivity, accelerated use of artificial intelligence (AI) and automation and better control over cloud costs.

Figure 2: Top Benefits of Cloud Platform Approach
What is the top benefit an organization expects to get from its cloud platform approach?

Improve security of our data and applications	**57%**
Faster access to innovative technologies	**42%**
Improve IT staff productivity	**40%**
Accelerate use of AI & automation in business	**38%**
Better control over cloud costs	**34%**
Rapid application modernization	**30%**
Quicker time to market for our digital offerings	**30%**
Achieve a single source of data	**26%**

Canada = 100; Source: IDC's Future Enterprise Resiliency & Spending Survey Wave 5, June 2023

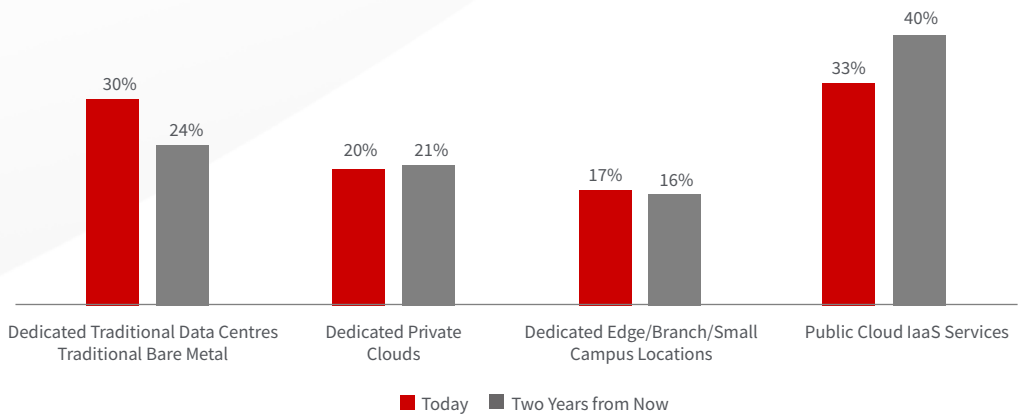
FUTURE IS HYBRID, MULTICLOUD

Running a digital business requires organizations to consider their existing technology investments in applications and infrastructure. It requires them to evaluate the modernization of these investments based on such factors as the availability of and access to skills. Canadian organizations consider several factors – the top five being security, cost, lack of business disruption, application interdependencies and ease of migration – while trying to determine which workloads to move to the cloud and which ones to keep on-premises.

While security is the top factor for both medium and large-sized organizations, cost and technical expertise are more important for medium-sized organizations. For large enterprises, application interdependencies and ease of migration are important, too. In addition to these factors, most Canadian organizations also consider data sovereignty and industry compliance and regulations to determine where to deploy specific applications and data workloads. This results in Canadian organizations deploying workloads across on-premises and cloud environments, be it for applications or infrastructure.

Take digital infrastructure, for example. Canadian organizations are increasingly moving away from their traditional data centre deployments (declining from 30 percent to 24 percent) to run their compute and storage capacity across dedicated private and public clouds (increasing from 33 percent to 40 percent), resulting in hybrid, multicloud environments. Running hybrid, multicloud environments allows for agility, resiliency and the ability to scale performance as and when needed while meeting security and compliance requirements. However, these are complex environments and without the right types of skills or partners, Canadian organizations will have to address challenges around management, governance, security and visibility.

Figure 3: Annual Compute and Storage Capacity Provided by the Following Types of Digital Infrastructure Deployment Options
What percentage of your annual compute and storage capacity is provided by the following types of digital infrastructure deployment options today? And what percent do you expect in two years?



Source: IDC Canada ITAP N5 2022, August 2022

BUSINESS OBJECTIVES AND ASPECTS OF CLOUD THAT NEED TO BE CONSIDERED

Canadian organizations seek to achieve a number of external and internal facing business objectives by adopting hybrid, multicloud services to meet their digital business ambitions. These range from operational efficiency, to productivity, to superior customer and employee experience, to resiliency and security.

Figure 4: Top externally facing business objectives
What are the top three externally facing business outcomes shaping your digital infrastructure strategy over the next two years?

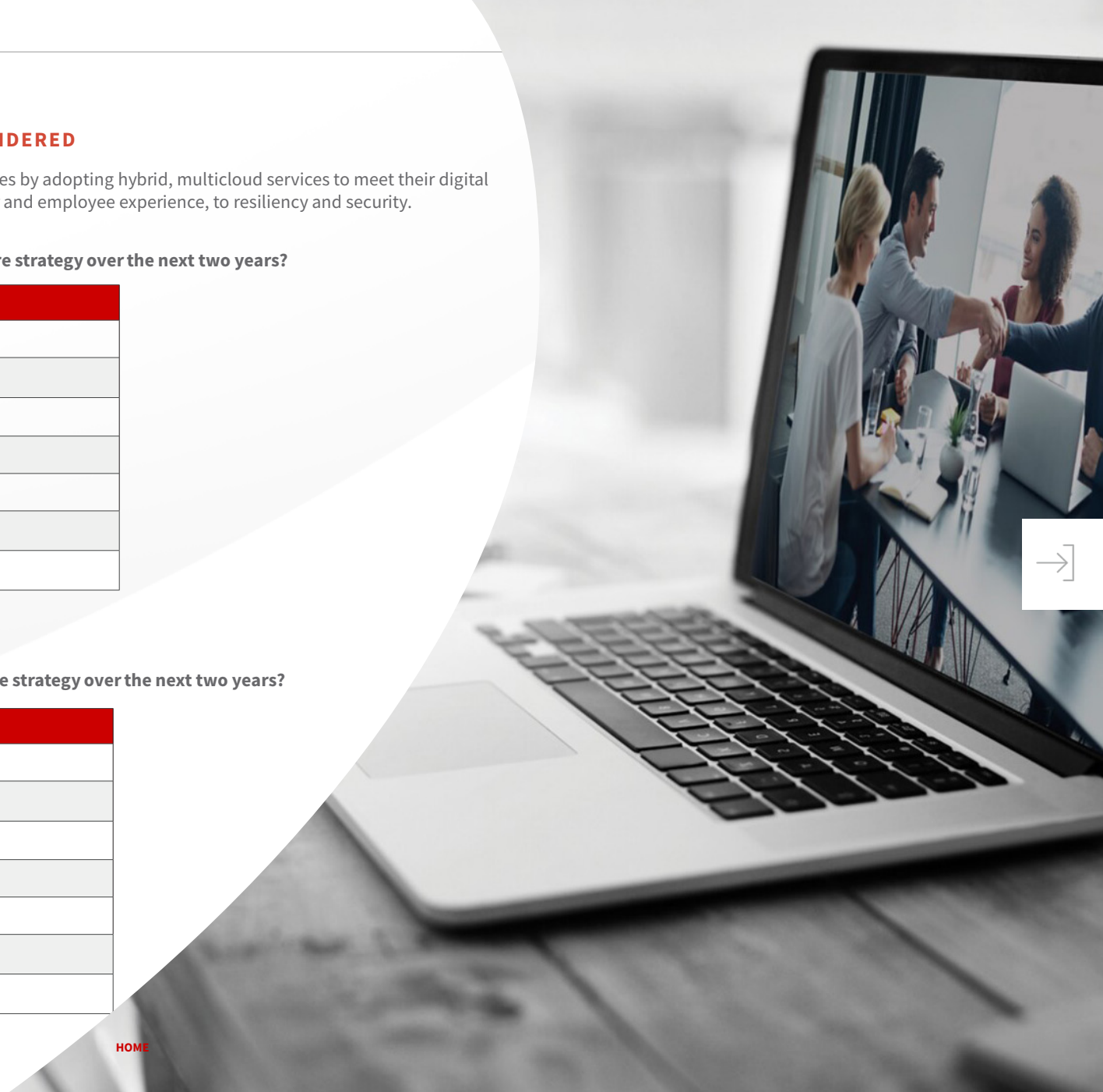
Reduce overall cost of doing business	42%
Support more personalized, omnichannel customer engagement	41%
Respond to specific crisis-driven requirements	37%
Speed new applications to market	35%
Create differentiated digital business offerings	35%
Improve distributor/partner engagement	35%
Reduce friction across supply chains	25%

Source: IDC Canada ITAP N5 2022, August 2022

Figure 5: Top internally facing business objectives
What are the top three internally facing business outcomes shaping your digital infrastructure strategy over the next two years?

Improve internal staff productivity and efficiency, including remote work	47%
Consistent cybersecurity and data protection across all locations and geographies	45%
IT response to unexpected business conditions	40%
Data privacy and regulatory compliance	40%
Maintain mission critical legacy application viability	37%
Reduce time it takes to make IT resources available to the business	31%
Reduce cost of IT as a percent of overall cost of doing business	28%

Source: IDC Canada ITAP N5 2022, August 2022



For Canadian organizations to deploy and manage hybrid, multicloud environments, they need to consider five main aspects: portability, observability, manageability, resiliency and security.

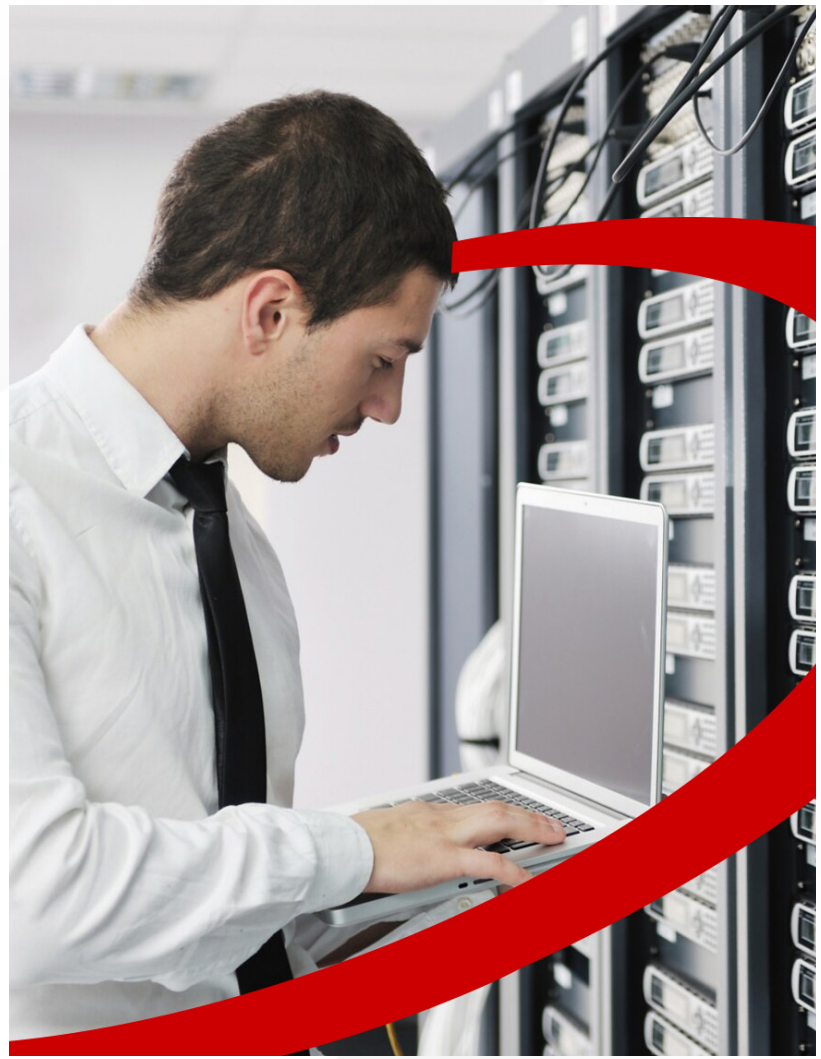
PORTABILITY: This allows organizations to move data, applications or platforms across different cloud environments based on demands of the business, including the need for temporary "bursts" to the cloud, while ensuring workload performance and efficiencies. Containers and microservices enable organizations to build, operate and run workloads across environments. They allow for application modernization as well as agility in the development processes to introduce new features and functionalities with minimal disruption. Organizations need to consider the modularity of their workloads and access to skills before leveraging containers and microservices to refactor the application to run on the cloud. In some cases, it might be suitable to replace a legacy workload with a Software as a Service (SaaS) alternative entirely.

OBSERVABILITY: Hybrid, multicloud environments are dynamic and complex, and organizations need real-time visibility into workloads to address issues, and to be alerted to "unknown unknowns" (issues that are not known) and any other performance concerns. Observability helps organizations proactively monitor and address concerns. The real-time telemetry around logs, metrics, traces and dependencies can be leveraged by cross-functional teams as well. For example, developers can leverage observability to build more secure and resilient applications, while infrastructure teams can leverage observability to address issues around performance and latency and optimize utilization.

MANAGEABILITY: Complex cloud environments require organizations to have mature strategies around management in order to avoid cloud sprawls. This requires organizations to leverage automation and orchestration in order to simplify management of resources, ensure policy management and governance, and eliminate bottlenecks. The demand for automation and orchestration will only rise with hybrid, multicloud environments. It should be noted that automation focuses on one task while orchestration covers multiple automated tasks. Orchestration allows for data integration and self-service by benefiting both IT and line-of-business resources. More importantly, it provides a connection between public and private cloud resources.

RESILIENCY: Managing hybrid and multicloud environments brings its own set of challenges. Intermittent partial failures due to situations like transient downtime, network outages, overload or slow response times take valuable resources and bandwidth away. It is in their interest for organizations to develop practices of factoring in such partial failures. Designing for failures in the architecture of applications, assuming there will be outages, identifying weak points ahead of time and building contingencies into the deployment of systems are crucial for ensuring high availability and performance of microservices and cloud-based applications.

SECURITY: When it comes to cloud services, data security and network security are the most challenging aspects in the cloud as compared to on-premises environments. It is important for organizations to understand the shared responsibility for security in running cloud environments. Doing so allows for better cloud security management and governance. Another important aspect is that of data classification: not all data needs to reside in the cloud. It is important for organizations to classify which data will reside in the cloud and define the policy and security controls that govern that data. Regardless of the environment in which they operate, Canadian organizations need to take a zero-trust approach to security. A zero-trust strategy relates to having a scalable security architecture that extends across different environments, allowing for better visibility and control, and also for faster detection and response. While it is gaining in popularity, only 68 percent of Canadian organizations have adopted a zero-trust approach to security.



KEY TRENDS

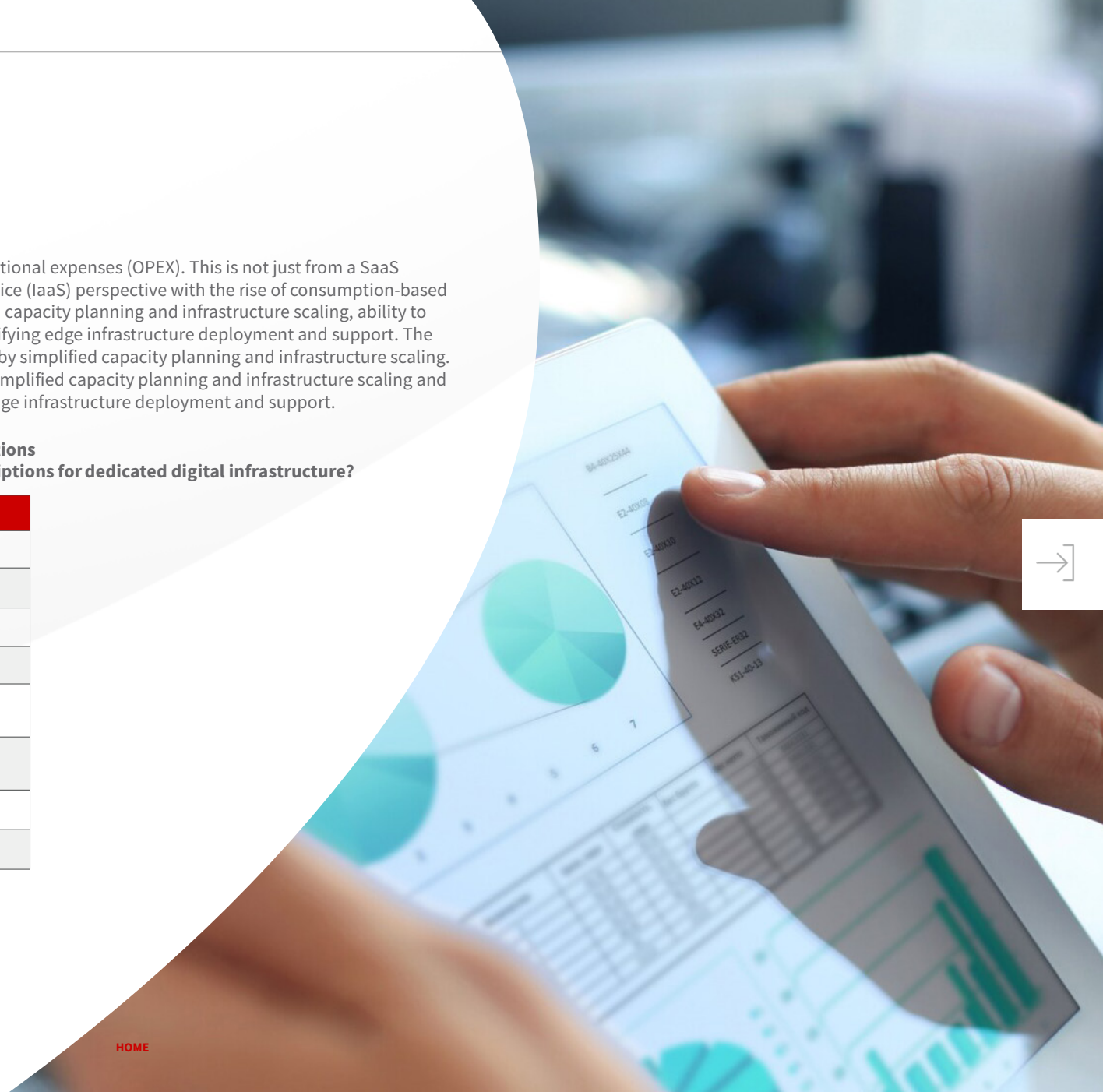
OPTIMIZATION OF CLOUD SPEND

The shift to cloud has allowed organizations to move away from capital expenses (CAPEX) to operational expenses (OPEX). This is not just from a SaaS perspective (moving from on-premises software to cloud) but also from an Infrastructure as a Service (IaaS) perspective with the rise of consumption-based subscriptions for dedicated digital infrastructure. The factors driving this uptake include simplified capacity planning and infrastructure scaling, ability to better match cost to business demand, satisfying data protection and privacy concerns, and simplifying edge infrastructure deployment and support. The ability to better match cost to business demand is a major driver for small organizations, followed by simplified capacity planning and infrastructure scaling. For medium and large organizations, the major drivers for consumption-based subscriptions are simplified capacity planning and infrastructure scaling and satisfying data protection and privacy concerns. Large organizations also highlighted simplified edge infrastructure deployment and support.

Figure 6: Most Important Factors Driving Consideration/Use of Consumption-Based Subscriptions
What are the most important factors driving consideration/use of consumption-based subscriptions for dedicated digital infrastructure?

Simplifies capacity planning and infrastructure scaling	46%
Ability to better match cost to business demand	40%
Satisfies data protection and privacy concerns	38%
Simplifies edge infrastructure deployment and support	34%
Availability of co-lo/ hosted options that can be managed the same as on-premises resources	29%
Reduces internal staff required for day-to-day digital infrastructure support and management	27%
Vendor responsible for ongoing tech refresh and remote management	27%
Guarantee of a trusted digital infrastructure supply chain	26%

Source: IDC Canada ITAP N5 2022, August 2022



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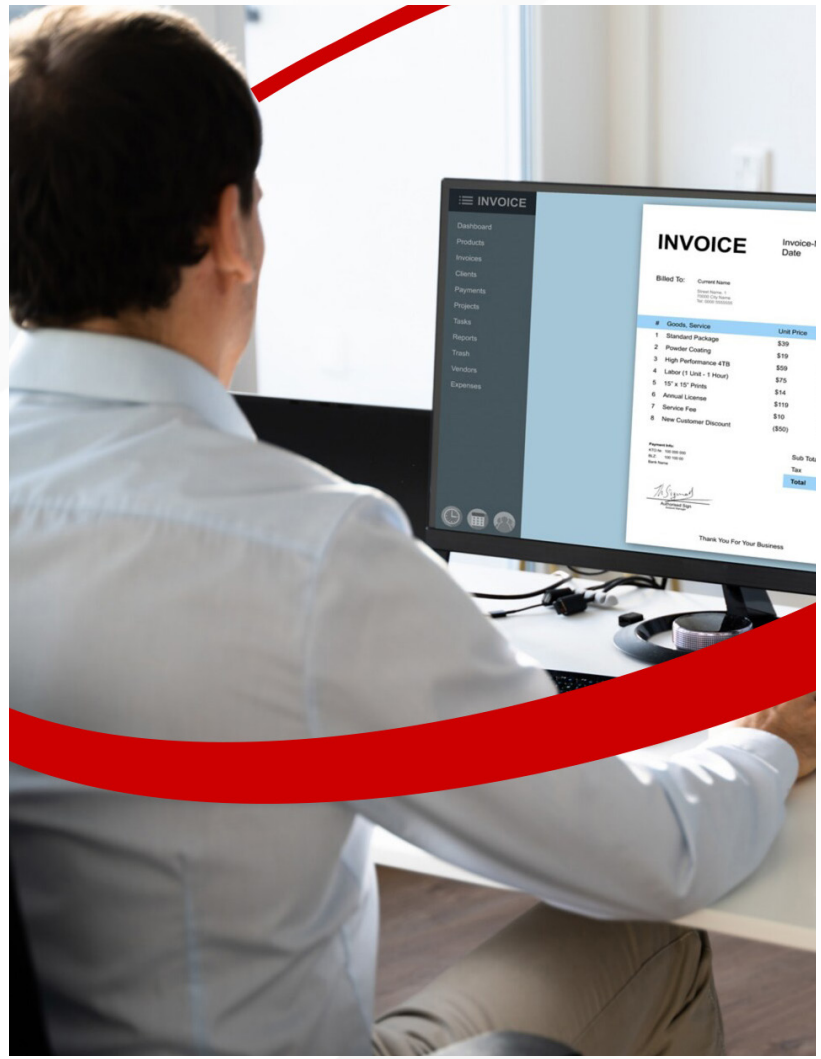
However, with cloud, organizations not only have to contend with cloud sprawl, but also the fact that their cloud investments are not being utilized efficiently. Given the current economic environment, many organizations are evaluating their operational expenses and in general seeking to optimize their cloud spend. As per a study conducted by IDC in early 2023, on average, 18 percent of all public cloud services spending in Canada is being wasted. This need for cloud optimization has given rise to financial operations (FinOps), which is an evolving cloud financial management discipline and cultural practice that enables organizations to get maximum business value by helping engineering, finance, technology and business teams to collaborate on data-driven spending decisions. FinOps is a fairly new discipline, and in some cases, it may be the responsibility of one individual or a team within a large enterprise.

IDC research shows that only 55 percent of the Canadian organizations surveyed in early 2023 have an individual or team dedicated to FinOps. Challenges faced by the person or team performing IT FinOps around cloud expenditure include trying to understand how to optimize cloud spend for architectural and business benefits, allocating cloud costs to the correct team (charge backs), understanding cloud pricing models and how to apply them, and establishing governance to ensure that the cost and optimization recommendations are implemented. For medium-sized organizations, the challenges are mostly around allocating cloud costs to the correct teams and understanding cloud pricing models. For large organizations, the challenge is optimizing cloud spend for architectural and business benefits given that these organizations run more complex environments.

Figure 7: Challenges Around IT FinOps
Which of the following are challenges faced by person or the team performing IT FinOps around cloud expenditure?

Understanding how to optimize cloud spend for architectural and business benefit	**42%**
Allocating cloud costs to the correct team	**40%**
Understanding cloud price models and how to apply these optimally	**39%**
Establishing governance to ensure FinOps cost and optimization recommendations are implemented	**34%**
Understanding billing and reporting from cloud providers	**31%**
Developing accurate cloud expenditure forecasts	**30%**
Getting insight into waste and oversizing	**25%**
We do not have peer benchmark data to determine the right cloud expenditure level for our organization	**24%**

Source: IDC Canada ITAP N2, April 2023



There are native and third-party cloud cost management tools covering cloud SaaS management, reporting, pricing analytics and container and IaaS resource optimization. Canadian organizations can also work with partners to help them with industry benchmarks and to evaluate how they can better optimize their cloud spend. Similarly with security, FinOps are also a shared responsibility whereby cloud services providers need to focus on cost efficiency of the cloud while the users need to focus on cost efficiency in the cloud. The intersection of these two results in FinOps excellence. For the FinOps practice to add value to the organization, it should ideally be a cross-functional team with representation from FinOps, IT and cloud architects, as well as lines of business.

MEETING SUSTAINABILITY GOALS

Environmental, social and governance (ESG) is an emerging business imperative whereby organizations reduce their environmental impact or footprint. It has become a board-level priority; as per IDC's 2023 CEO Study, 81 percent of the Canadian CEOs who were surveyed stated that as part of their sustainability strategy, they will invest in digital technology to operationalize sustainability use cases to drive business value.

This focus on sustainability requires organizations to invest in cloud-based solutions as well as technologies that will allow for optimized power and cooling of their infrastructure assets. An IDC study conducted in December 2022 highlighted that 71 percent of the Canadian organizations surveyed believe that sustainability can be achieved through efficient and innovative IT solutions. In terms of the top three most important indicators for Canadian organizations, half of the respondents stated product/equipment lifecycles, 44 percent stated energy sources and 41 percent stated carbon footprint/CO2 emissions. To meet their sustainability ambitions, organizations need to ensure both IT and lines of business are aligned with these goals and that proper KPIs are in place and tracked on a regular basis.

Figure 8: Top Three Most Important Indicators of Sustainability.
In terms of sustainability, choose the TOP three most important indicators.

Product/equipment lifecycles	**50%**
Energy sources (solar, water, fossil, etc.)	**44%**
Carbon footprint (CO2 emissions)	**41%**
Production efficiency	**38%**
The consumption of utilities	**37%**
Supply-chain energy consumption	**37%**
Other greenhouse gases (methane, nitric oxide)	**30%**
Water consumption	**23%**

Source: IDC Canada BITAP N4, November 2022

PROGRESS IN ADOPTION OF INTERNET OF THINGS (IoT)

As Canadian organizations move away from being heavily reliant on their traditional data centre investments, they are also investing in edge computing, especially for their IoT workloads. An IDC study conducted in December of 2022 found that 60 percent of Canadian organizations are using IoT for remote asset/sensor monitoring followed by data collection and remote asset/sensor management. Small- and medium-sized organizations are using IoT for remote asset/sensor monitoring while large enterprises are using it for data collection purposes. Leveraging edge computing for IoT has a series of benefits, including improved bandwidth, operational efficiency, reduced latency, faster response time and most importantly, real-time data processing.

Figure 9: IoT Use Within Organizations
How is IoT currently used in your organization?

Remote asset/sensor monitoring	**60%**
Data collection	**58%**
Remote asset/sensor management	**55%**
Predictive management	**32%**
IoT created new business models	**26%**
Monetizing Data as a Service	**5%**

Source: IDC Canada ITAP N7, January 2022

RISE OF GENERATIVE AI

The popularity of AI-based large language models (LLMs) skyrocketed with the advent of ChatGPT. While several vendors have taken major steps to introduce and accelerate their generative AI (GenAI) portfolio, Canadian organizations are still trying to evaluate the best use cases. An IDC study conducted in June 2023 found that 21 percent of the Canadian organizations that were surveyed are investing in GenAI technologies in 2023, followed by 42 percent that are in the initial exploration of use cases and the remaining who are not doing anything as yet. While cloud services are critical for scaling GenAI, many organizations need to build a robust AI strategy around what type of infrastructure, platforms and applications they plan to leverage for their GenAI use cases. However, GenAI also brings to the forefront concerns around intellectual property, data veracity and hallucinations. It is important for organizations to address these concerns and more importantly establish a “Responsible AI” framework to ensure trust and transparency to customers, employees and partners as well.

Figure 10: GenAI Adoption in Canada
What’s your organization’s current approach to Generative AI?

Not doing anything yet	**37%**
Doing some initial exploration of potential use cases	**42%**
Investing in generative AI technologies in 2023	**21%**

Source: IDC Canada BITAP N1, June 2023

CONSIDERATIONS TO IMPROVE DIGITAL BUSINESS MATURITY

- To progress on their hybrid, multicloud journey, Canadian organizations need to evaluate their current workloads and decide their cloud migration strategy. Based on the modularity of the solutions, the skills that are available and the impact the workload will have on the business, organizations can either do a lift and shift or leverage containers and microservices to refactor/rearchitect the workload, or entirely replace the solution with a SaaS workload.
- Organizations need to build out strong IT FinOps practices. Like security, it is a shared responsibility, and it is important to have a clear understanding of the role of the cloud services provider and the organization itself. If organizations are in the early stages of their IT FinOps journey, they can lean toward their partners to better understand how they can run optimized cloud environments.
- The main goal of cloud deployments is to drive business value, and this requires proper alignment between IT and lines of business. In addition, organizations need to invest in strong change management practices that allow for successful adoption and utilization of technologies.
- Given that sustainability is a board-level imperative, it is important for organizations to evaluate their current IT vendor portfolio and ensure it aligns with their sustainability ambitions.
- To transform into a digital business, and do it successfully, organizations need to leverage a variety of skills and technologies. And to achieve this, they need to build a robust partnership with their cloud services provider partner ecosystem to develop and enhance their cloud competencies, and effectively deploy technologies such as digital workplace, IoT and GenAI.

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