

White Paper

Harnessing Your Data to Deliver Better Experiences and Drive Digital Transformation

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EXECUTIVE SUMMARY

The transformation of businesses and entire industries through the expanded use of digital technologies is expected to scale dramatically in the coming years. According to IDC, 48% of businesses are investing significantly in digital capabilities today and 57% will be undertaking similar levels of investment in two years. With digital business transformation already at the heart of many corporate strategies, by 2020, 50% of the Global 2000 will see the majority of their business dependent upon their ability to create digitally enhanced products, services, and experiences.

Data – its generation, delivery, concentration, and exploration – is at the heart of this development, and the IT organization is at the center of this major shift in how organizations connect with customers in new ways, develop new revenue sources, and improve operational efficiency. The demands of gathering, protecting, and leveraging this deluge of data are a challenge for all IT organizations across all industries. While many IT organizations will struggle to simply survive the ongoing data deluge by focusing on containment and control, leading IT organizations are making investments in technology and partners to improve IT agility, enable adaptive networking, and adopt next-generation network-based security. These investments make it possible for IT organizations to capitalize on their data and thrive in this new digital business landscape.

With the right partner:

- They can trust their infrastructure to always be available and ready to meet expanding workloads and handle new real-time, data-driven workload requirements.
- They can connect and enhance a myriad of locations and "things" by leveraging artificial intelligence (AI) to adapt their networks to changing needs and conditions.
- They can ensure the proper use and custodianship of data about and from their customers across cloud, core, and edge.

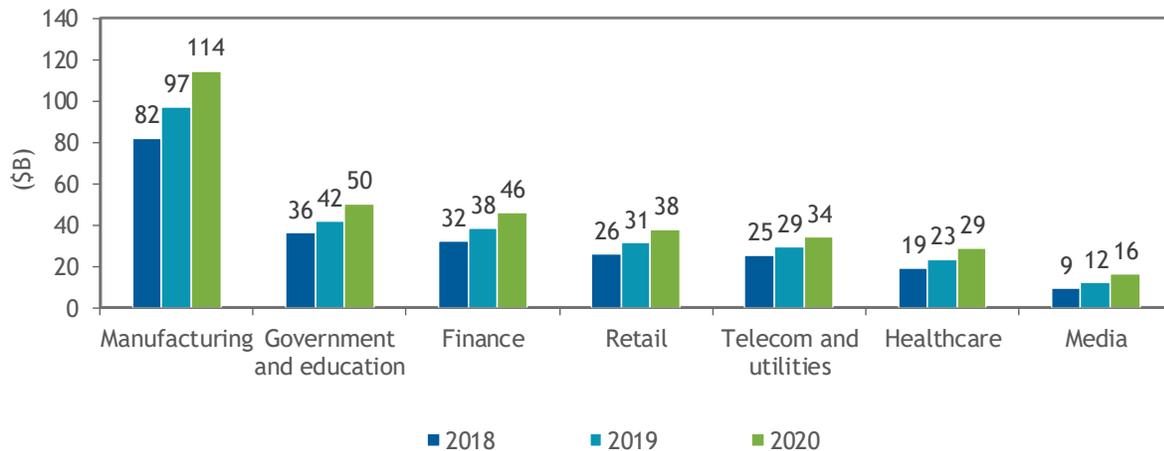
HOW DIGITAL TRANSFORMATION IS CHANGING THE BUSINESS CONVERSATION

In just a few short decades, IT has moved from the back office to the front office and is now embedding itself into nearly every aspect of people's business and personal lives. We are entering an era where the technologies and the processes that businesses deploy are so tightly linked to their customers and markets that the boundary between the enterprise's internal operations and the enterprise's external ecosystem (e.g., customers, markets, competitors, partners, and regulators) is rapidly disappearing.

Business leaders are challenged to move their enterprises to the next level, that of digital business transformation, employing digital technologies coupled with organizational, operational, and business model innovation to create new ways of operating and growing businesses. Enterprises in all verticals are planning sizable investments in technologies that support digital transformation (DX) initiatives in 2019 (see Figure 1).

FIGURE 1

Spending on Technologies to Support Digital Transformation in 2019 by Leading Verticals



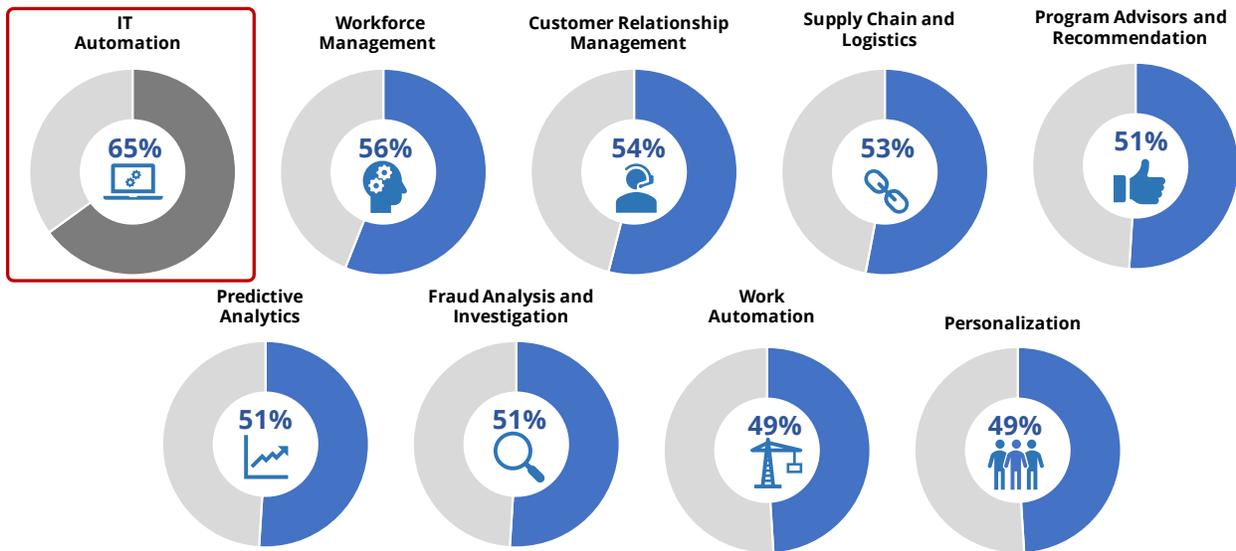
Source: IDC's Worldwide Semiannual Digital Transformation Spending Guide, November 2018

TRANSFORMING YOUR IT IN A DATA-DRIVEN WORLD

Data – its generation, delivery, concentration, and exploration – is at the heart of digital and IT transformation. New "smart" digital services being developed by organizations in retail, healthcare, financial services, manufacturing, and other industries to deliver better customer experiences and improve outcomes depend upon accelerated investment in a growing set of workloads that enhance and extend business reach and value. Leading IT organizations (thrivers) are making investments in technologies such as AI, machine learning (ML), and analytics to deliver better customer experiences (see Figure 2).

FIGURE 2

Top Use Cases for Artificial Intelligence/Machine Learning



n = 405, 1,000+ employees (United States) and 500+ employees (Canada)

Source: IDC's *Cognitive, ML, and AI Workloads Infrastructure Market Survey*, January 2018

The IT organization is at the center of this major shift in how organizations connect with customers in new ways, develop new revenue sources, and improve operational efficiency. The demands of gathering, protecting, and leveraging what many describe as a deluge of data are a challenge for all IT organizations across all industries.

When it comes to IT digital transformation, thrivers can:

- Ensure the proper use and custodianship of data about and from their customers.
- Trust their infrastructure to always be available and ready to meet expanding workloads and handle new real-time, data-driven workload requirements.
- Better serve customers and enhance a myriad of "things" by leveraging AI to drive insights, improve business decisions, and change customer experiences.

THE THREE KEYS TO IT TRANSFORMATION SUCCESS IN A DATA-DRIVEN WORLD

These thriving IT organizations are acutely aware of the need to continuously enhance their datacenter strategy and have adopted a vision for agility, automation, security, and resilience as they prepare for a data-driven world. They are focusing on delivering IT agility, enabling adaptive/automated networking, and taking full advantage of next-generation network security.

IT Agility

One of the key objectives of any IT transformation effort is to improve the use of data to identify opportunities, assess risks, and guide organization change. When IDC speaks with IT teams, they are frank when describing the shortcomings that they see within existing datacenters and early private cloud efforts:

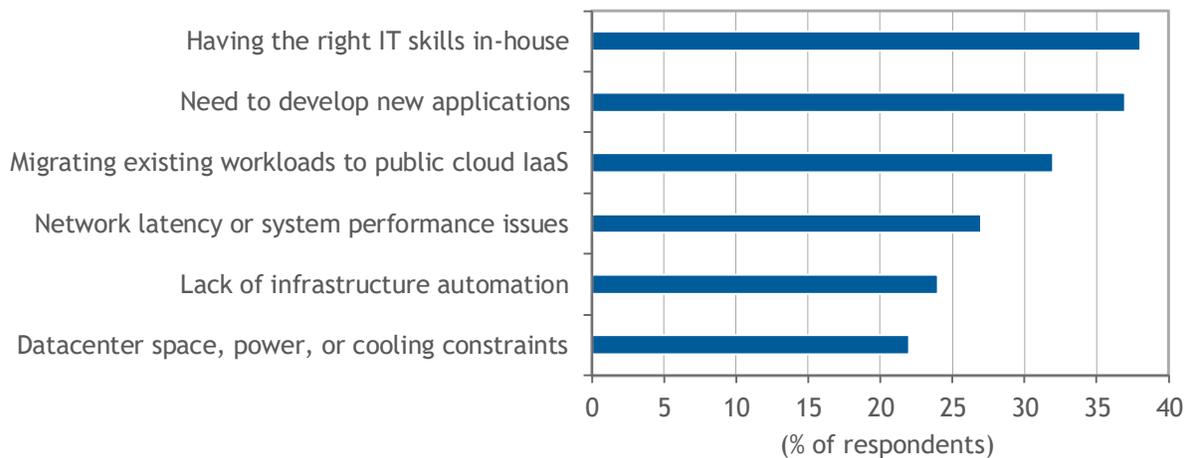
- Inconsistency in configuration of systems that increase operational costs and reduce reliability
- Inflexible deployment options that lead to over-deployment of under-used assets
- Limited usefulness as a platform for new service creation

As a consequence, their organizations must set aside significant time and up-front investments to sustain legacy environments rather than focus new investments on data-intense applications (see Figure 3) that can transform the business.

FIGURE 3

Challenges: Skills, Applications, and Data Slow Successful DX Execution

Q. From an IT perspective, what were the biggest challenges with the digital transformation project's successful execution?



n = 304

Base = all respondents

Source: IDC's *DX Datacenter Study*, 2017

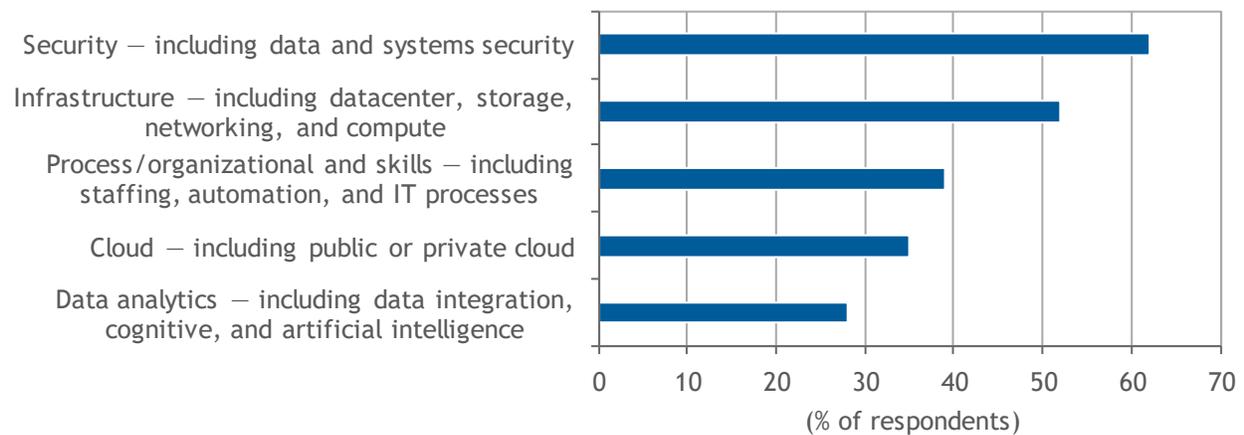
Key Product/Technology Developments

Today, a new generation of options to boost IT agility are emerging, built on a standard hardware (e.g., hyperconverged) platform and software-defined foundation. They deliver a standard portfolio of cloud services (instances, containers, and serverless) and automation tools that improve cross-cloud manageability. Concurrently, a new generation of managed service providers are focused on enabling IT agility and, in many cases, are making it possible to leverage more modern colocation datacenters that can speed the pace of IT transformation (see Figure 4).

FIGURE 4

DX Investment Priorities: Security and Infrastructure

Q. In which of the following IT areas were the largest investments and/or changes made in response to the digital transformation project?



n = 304

Base = all respondents

Source: IDC's *DX Datacenter Study*, 2017

Benefits Gained

Organizations that move aggressively to this kind of modernized and automated environment are better able to use their data to drive business innovation and competitive advantage compared with slower-moving organizations.

- They can more than double the support for new apps and reduce development cycles by months.
- They can consistently engage with customers, patients, partners, and employees across all personal and digital forums, dramatically boosting customer satisfaction.
- Their workforces have all the tools, data, and insight they need to deliver the optimal customer experience without degradations in quality due to application or data latency.

Agile IT enables the entire organization to achieve maximum insight and return from all the data that it generates, accesses, manages, and shares. They can fully take advantage of integrated analytics, AI, and cognitive technologies to enhance engagement with mobile people and smart things, thereby

improving business outcomes. When evaluating agile IT solutions, enterprises should focus on the need to continually balance three workload priorities:

- Low latency
- Rapid resource delivery
- Data control

For many workloads, this means keeping applications in existing datacenters, near existing users or devices. In other cases, workloads need to move to new datacenters or edge locations to extend their reach into new geographies and locations. Enterprises should look for an agile IT partner that allows the business to make extensive use of its own IT assets as well as service provider resident resources while dramatically reducing the time/effort required for patches, upgrades, or migrations. Such a partner must provide the right optimized systems and remote asset management capabilities that make it possible to grow and evolve an enterprise's IT environment quickly to meet changing data collection, storage, and analytic requirements.

Adaptive Networking

The communications network is an indispensable foundation of the enterprise DX road map. To implement competitive services that facilitate dynamic, reliable engagement with customers and partners, enterprises require a reliable, robust, and flexible networking infrastructure. One of the key aspects of DX is the increasing adoption of multiple networking protocols as part of a hybrid IT and network environment.

As companies migrate more applications to the cloud, they are contending with an increasingly challenging networking environment. Today's IT environment requires an increasing skill set that balances the requirements of maintaining a robust and reliable network while managing the performance of myriad applications across multiple platforms. This in turn is stimulating significant growth of internal traffic and data within the enterprise, as well as externally with partners, suppliers, and customers.

Data thrivers are enterprises that are aggressively disruptive in the use of digital technologies to affect new markets. Data thrivers leverage data efficiently across the organization. Spending on data analytics for IT and business services is higher than average among data thrivers. IDC forecasts that more than 50% of the \$260 billion spent on Big Data and analytics will be spent on IT- and services-related analytics. Managing data in a flexible and scalable environment is essential for success on many fronts. Enterprises need a streamlined internal flow of data for efficient internal operations, as well as the ability to analyze and predict current and future customer requirements. They also need an influx of data scientists with the requisite software and networking skills to manage business process data workflows across the organization while providing the most relevant information to customer-facing personnel.

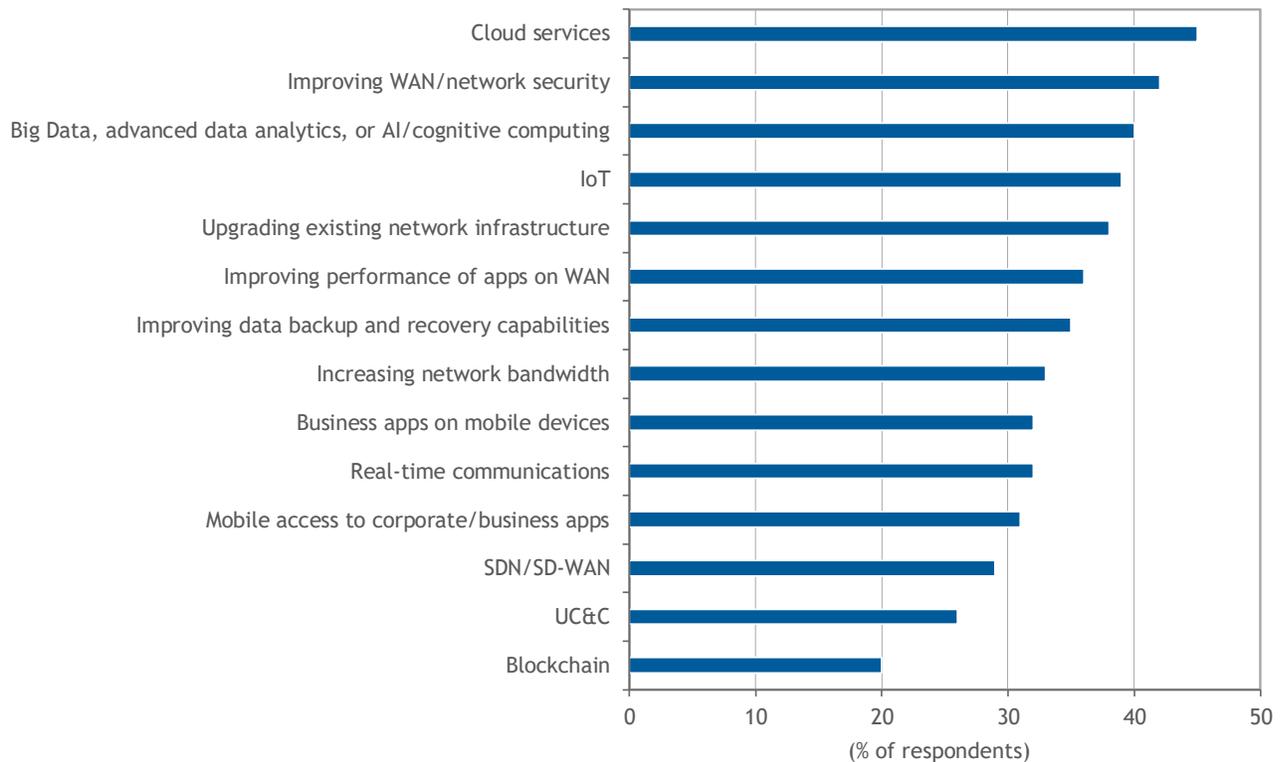
Key Product/Technology Developments

Several key emerging technologies will shape enterprise priorities over the next few years. Among the top key investment priorities are data analytics/AI, cloud services, and implementing IoT (see Figure 5). IDC forecasts that by 2025, the global "datasphere" will grow 163 zettabytes to 1 trillion gigabytes. This is being driven by billions of connected devices and the exponential growth in demand for both fixed bandwidth and the enormous capacity that will be enabled by 5G networking.

FIGURE 5

Enterprise Investment Priorities

Q. Does your organization plan to invest in the following areas over the next three years?



n = 800

Base = all respondents

Source: IDC's *U.S. Enterprise Communications Survey, 2018: Connectivity*

Harnessing this massive data to optimize and automate networking operations efficiently will be essential. In addition, leveraging customer data to drive new business outcomes will be a hallmark of the successful enterprise of the future. This will be achieved by investing in and implementing data analytics systems. Internally, enterprises will leverage AI to automate orchestration, to detect unusual and critical network anomalies, and to automate manual back-office processes. Another important function will be leveraging predictive machine learning models to identify failing equipment as well as for network healing and recovery. For customer engagement, enterprises will leverage predictive data

algorithms to analyze and predict customer usage and requirements. AI will also be implemented as part of customer support engagement (chatbots) as well as to upsell additional services based on usage patterns and customer demographics.

Another key growth sector is software-defined networking (SDN). In particular, software-defined WAN (SD-WAN) has emerged as a transformational technology that addresses the requirement of managing cloud applications within a flexible networking framework. It has introduced the concept of hybrid networking that blends fixed, wireline, and Layer 2 and Layer 3 WAN technologies together in a seamless holistic fabric. SDN offers real-time network and application monitoring and management as well as dynamic bandwidth allocation for managing event-driven fluctuations in traffic demand and at the edge.

Benefits Gained

Because of the exponential growth of connected devices and the associated growth of bandwidth and data flows, enterprises require new concepts to manage the IT infrastructure in real time. IDC estimates that by 2021, the overall number of "connected" devices installed worldwide will increase to over 30 billion. The associative storage, networking resources, and analytic and computing requirements will also increase significantly. The adoption of cloud-based applications and hybrid IT is a foundational aspect of the digital enterprise that will drive this expansion.

Cloud networking provides flexibility in accessing and managing applications, but the network is the center of this process because it requires a dynamic and flexible architecture to meet the disparate requirements of diverse sites. Cloud networking facilitates the most cost-effective implementation of consumption-based IT and networking services based on size and scale requirements.

SDN brings together multiple network access protocols in a seamless symphony that facilitates the monitoring and management of applications at the branch level via a dynamic dashboard that aggregates usage and performance data in real time.

Data analytics/AI facilitates the automation of a wide range of critical network functions, the transition to data-driven digital platforms, and enhanced customer engagement for support and revenue generation.

Network Security

As organizations undergo technology changes influenced by DX, networks are becoming more exposed and vulnerable to security threats and attacks. Long gone are the days when an organization needed to protect only what was within the perimeter. Today's organizations are highly distributed as applications and data are migrated to the cloud. A new era has arrived in which security is no longer concentrated in one specific area. Organizations must embrace these complexities and the security challenges that come with them.

The perimeter-centric approach that was trusted and had boundaries is not adequate because of the distributed nature of many organizations as well as the ongoing threat environment. Each connection introduces another point for attack or infection. In other words, as the perimeter evolves, IT complexity and risk grow along with it. For organizations, this means that:

- **IT resources are not in one place anymore.** There are now components that are located on-premises and in the cloud and are connecting to other resources throughout the internet. Applications are living in a hybrid IT environment.
- **Risks increase as a result of efficient hybrid WAN and cloud services.** Risk levels have increased and can differ among each asset and resource.

- **The "inside" and "outside" have diminished.** The belief that trusted zones are only inside the network does not exist; therefore, it is no longer about securing only the corporate perimeter. Data is no longer sitting in one place; hence, the IT architecture has changed how security is viewed.
- **Personnel and budget to appropriately address security are lacking.** The need for IT teams to have security expertise on staff has increased with the evolving IT infrastructure requirements. In addition, the budget to hire and add emerging security technologies will increase because of the changing IT environment.
- **DX initiatives also pressure security services to evolve.** Organizations must evolve security services because resources are no longer physical; rather, now they are virtual or software defined.
- **Users, data, and workloads and access from business partners and service providers may be terminated or reduced as more attention is required because of increased risk.**

DX is expected to scale dramatically within the coming years; however, without appropriate security built into development processes, the door is open to sophisticated, determined attackers. Digital security initiatives need to evaluate and mitigate new risks while ensuring privacy, confidentiality, integrity, and availability.

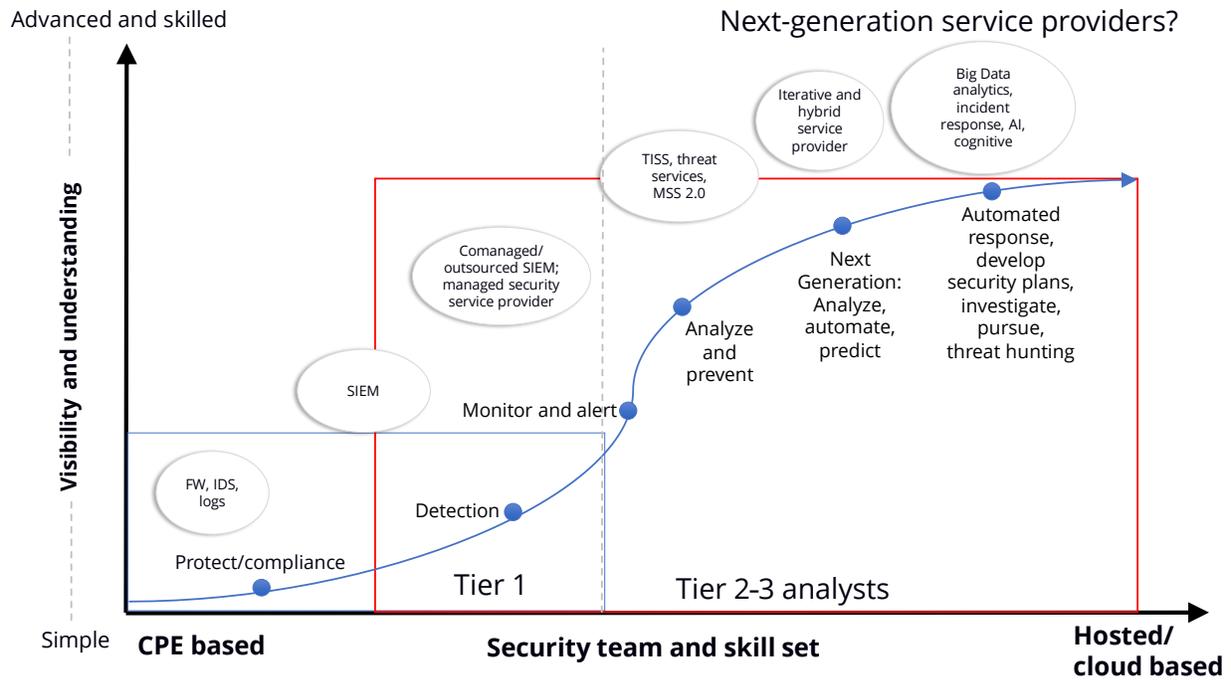
Key Product/Technology Developments

Security approaches and solutions are advancing with these changes and, in recent years, are moving from reactive to proactive to predictive. Technology techniques such as behavior-based threat analysis, automation, and prediction using AI and machine learning are required technologies that need to be adopted by enterprises in order to combat evolving advanced threats.

Market-leading security service providers and managed security service providers offer skills and technologies that include behavior-based threat analysis, automation, and prediction using AI and machine learning. The providers that have moved into the next-generation stage are best positioned to deliver security services for digital transformation (see Figure 6).

FIGURE 6

Security Service Provider Classification



Source: IDC, 2018

Next-generation service providers support hybrid environments, and their services are part of iterative cycles that encompass strategy, build, outsource, compliance, and breach management. An iterative approach builds learning and experience into threat detection and analysis to shorten time to detection, eradication, and recovery. A security service provider or managed security service provider can be engaged at any point in the cycle for tactical assistance, but the better course is to start at the beginning with assessment, recommendations, goals, and road maps.

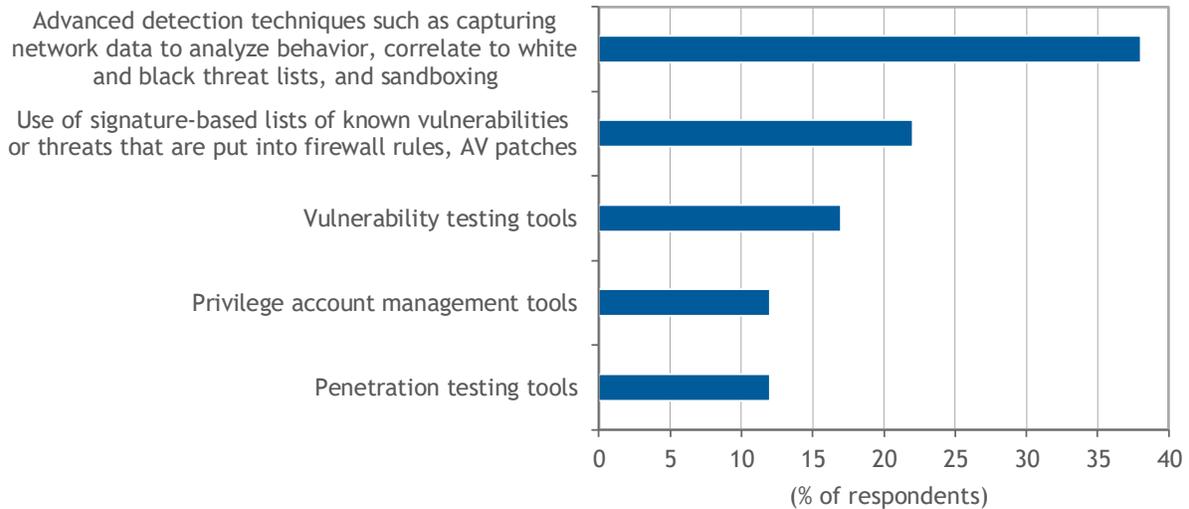
Because organizations are going through various changes with their IT environments, they understand that using basic security functions is no longer feasible. Emerging or advanced detection techniques are becoming more widely accepted and required.

Figure 7 illustrates the methods believed to be most effective at threat detection. Nearly 40% of firms ranked advanced detection techniques such as capturing network data to analyze behavior, correlate to white and black threat lists, and sandboxing as the most effective. Nearly 22% of firms believed methods such as use of signature-based lists of known vulnerabilities or threats that are put into firewall rules, AV patches were effective.

FIGURE 7

Advanced Detection Techniques Are Most Effective

Q. Which methods do you believe are the most effective in detecting a threat in your environment? Please rank in order of their effectiveness.



n = 1,003

Base = all respondents

Source: IDC's *Global Security Services Survey, 2017*

Benefits Gained

The security landscape is complex and challenging and becoming more so as organizations move to a digital world. Therefore, organizations need to deal with many moving parts to defend against and respond quickly to the sophisticated cyberthreats and cyberattacks of today. Organizations face new types of attacks such as those that combine advanced persistent threats. It is becoming harder to detect such threats, and organizations must respond to them quickly in a complex IT environment. Organizations looking for a provider to help with their security-focused digital initiatives should consider solutions that give a holistic security posture that is proactive and predictive versus reactive. A network-based approach to security can help organizations gain advanced protection and steers them away from traditional point security solutions. With network-based solutions, organizations can see a threat before it ever reaches the network. For example, with DDoS attacks occurring from different vectors, a network-based security solution can reroute the malicious traffic to a scrubbing center and then have legitimate traffic enter the network without any interruption, with little to no latency.

Organizations that choose a provider with this approach can realize greater synchronization of security policies and management of application and workloads. The updating of new malware signatures can be easily applied by the provider of choice and can also centralize security to block all known threats.

ESSENTIAL GUIDANCE

A key step for any organization with aggressive digital transformation agendas is making "data" the cornerstone for enterprise IT organizations. For CIOs and their IT teams, embracing the tasks of collecting, distributing, cleansing, protecting, securing, analyzing, and reacting to data in many different locations and from many different sources is critical. It requires clearly defined and articulated IT strategies for delivering IT agility, enabling adaptive/automated networking, and taking full advantage of next-generation network security.

The most consistent and recurring barrier to effective execution of this IT transformation remains executing on data security, visibility, governance, and policy control elements. Security and governance practices and policies must extend across all environments and data sets to ensure consistent service delivery and data control regardless of the range of infrastructure and platform resources supporting any specific application.

The IT team must develop and continuously refine best practices for its infrastructure (across cloud, core, and edge locations) including robust service evaluation, partner selection, governance, and performance monitoring practices. At that point, the IT organization itself will be in a strong position to serve as the "data driven" facilitator team, enabling digital transformation by line-of-business colleagues.

IT leaders must assess themselves and their teams with respect to what it will take to develop a world-class digital organization and/or when it becomes prudent to leverage partners such as CenturyLink with defined professional services that can speed the move to the next maturity stage. Organizations that thrive in a "data driven" environment are those that master the orchestration of IT, connectivity, and security to turn data into a wellspring of innovation. Those that do not will struggle to survive the coming data deluge.

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