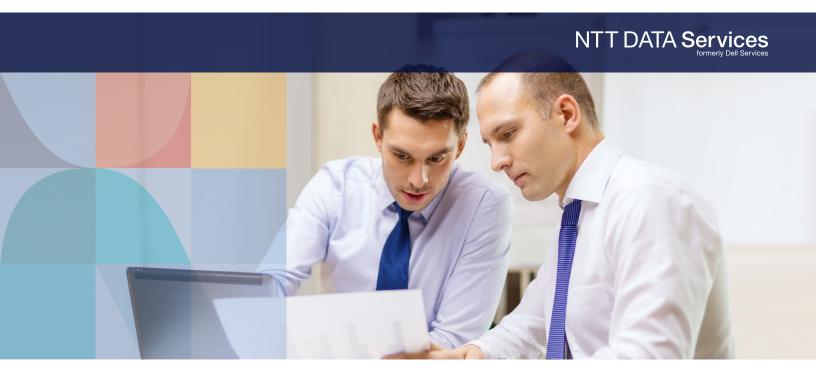# NTT Data

Infrastructure Strategy for Digital Transformation: An NTT DATA Roadmap

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Executive summary

The possibilities in the realm of digital business are limitless. The internet, smartphones and, more recently, wearables are just a few examples of technology assisting and enhancing a user's interactions in everyday life. Advancements in digital technologies have empowered organizations with three unprecedented abilities: massive scale, unparalleled speed and heterogeneity. As a result, barriers to enter markets are constantly being disrupted, leading to organizations losing their competitive edge and, in some cases, risking their survival. Thus, it is essential that companies of all shapes and sizes understand the implication of digital transformation on their business models and plan their future appropriately. This paper discusses five impact areas of IT infrastructure that organizations should carefully evaluate and plan for in their digital transformation.

Empower organizations to avoid digital disruption

If one was asked what Kodak, Nokia and Blockbuster have in common, chances are the responses may refer to these organizations as pioneers and long-time leaders in their respective industries. However, they all also failed to notice the wave of upcoming digital technologies that led them to be marginalized.

In the era of digital business, the barrier between the physical and virtual blurs at a rapid pace as they intertwine to provide a seamless experience. It's an era where payments are made by a touch on a wristwatch, groceries are ordered by a refrigerator and soon humans will be transported by self-driving cars operated through servers that are located miles away from them.

This shift in the industry landscape is driven by the invention, evolution and convergence of many groundbreaking digital technologies such as cloud, mobility, predictive analytics, social media, connected devices (popularly known as the Internet of Things), 3D printers and intelligent systems. These advancements disrupt business models across all industries as they empower organizations with three unprecedented abilities:

- **Massive scale:** With advancements in digital technologies, every business can be a global organization. Enterprises can serve multiple segments that transcend geographical boundaries on a scale that was once unimaginable. Today, organizations have an extraordinary ability to capture, store and process huge volumes of data. For example, Amazon sold 426 items per second on Cyber Monday 2013 — more than 1.5 million products per hour[1]. That's an unimaginable number of transactions for a traditional brick-and-mortar retail shop to process and deliver.

- **Unparalleled speed:** Organizations can quickly enter newer markets with minor to no modifications to their digital business platforms — and give sleepless nights to their competitors. Take Uber, a digital native organization that, in just five years since its launch, had operations in 58 countries and more than 300 cities.[2] This translates into expanding to a new city every six days.

- **Heterogeneity:** Digitalization has enabled industries that are at a crossroads to discover new opportunities. As a result, organizations are now able to satisfy the needs of different market segments — often not considered in their native industries. That is why, today, a sports apparel company like

Nike is venturing into the preventive health management sphere. Similarly, a legacy postal and logistics organization like UPS is able to make a foray into financial management solutions.

The disruption triggered by digital business is real, fluid and nonstop. Empowered with the massive potential of speed, scale and heterogeneity, companies can deliver value to customers in ways previously unimagined. However, industries will continue to witness the digital disruption by new market leaders and pioneers.

IT infrastructure strategies for a digital world

Most businesses today were conceived in a very different world when compared to the current digital era — with no pervasive connectivity, mobility, social platforms or the cloud. In a sense, the majority of organizations are working on operational models that were designed for a physical world, not a digital one. It is no surprise that, according to a Forrester report, a mere 15% of business executives believe their company has the capability to execute a digital business strategy.[3]

While digital business is about reimagining the consumer experience and an organization's strategic direction, IT infrastructure also needs precise planning. This paper examines five key impact areas, which are fundamental to designing a sound IT infrastructure strategy.

End-user devices

According to Gartner, in 2015, there were 4.9 billion connected devices in use — primarily driven by consumer applications.[4] Traditionally, an enterprise would be in control of these devices. However, by 2020, there will be more than 20 billion devices such as smart watches, self-driving cars, televisions and even baby strollers connected through

> By 2020, there will be more than 20 billion devices such as smart watches, self-driving cards, televisions and even baby strollers connected through sensors, radio frequency identification and near field communication technologies.

sensors, radio frequency identification and near field communication technologies. Many of these devices will be owned by individuals, not by enterprises, yet managed by enterprise IT.

This dramatic increase in the number of end-user devices will raise the stress on an organization's IT infrastructure. As a result, it becomes essential to have a robust IT framework in place to manage all these user devices consistently, enabling them for peak performance.

Enterprise storage

Digitalization will have a paramount impact on an organization's storage requirements. For example, Virgin Atlantic has a group of connected Boeing 787 aircrafts and cargo devices, which produce more than half a terabyte of data per flight.[5] Many other industries are in a similar situation. Consequently, data capture, storage capacity and retrieval requirements would all need to grow exponentially.

Enterprise computing

With digital business blurring the line between the physical and digital worlds, consumer-centric mobile applications complemented by powerful wearables will take center stage. This makes enterprise computing an important factor to closely evaluate.

Take Google Maps, a service that may appear quite seamless but actually assimilates and computes data from a large number of connected devices. Similarly, UPS uses sensors on its fleet of delivery vehicles to monitor speed, miles per gallon, number of stops and engine health. The sensors capture more than 200 data points for over 80,000 vehicles every day.[6]

Tomorrow's digital enterprise — comprised of a large number of interconnected devices and well supported through the IT ecosystems outside the enterprise's control — will need to reevaluate their computing capabilities. There will be a huge demand for complex, real-time processing that is able to perform comprehensive algorithms to easily account for both structured and unstructured data.

Networking

Also imperative to the success of a seamless, digital business is increased networking capability. An organization cannot afford to be unavailable for even a split second as the digital world is bolstered through several internal, external and independent devices that constantly exchange and utilize data. Soon, utilities such as electricity will be facilitated through a mesh of smart grid systems and smart meters. Each home, commercial complex and government building will be connected to a network that will be required to support the capture, analysis and exchange of data. And a momentary disruption could lead to a potential loss of millions.

Thus, service levels and user experience become essential for organizations to maintain at a business level and not merely at a technology level. A disruption of the digital network for a few seconds could lead to large losses. Digital business services will need to invest in a strong, secured network capable of transmitting, receiving and processing vast quantities of data in real time.

Security

Security is one of the most critical of these five areas in a digital IT infrastructure. When compromised, it can result in huge losses. For example, Target, a leading retail chain, reported in August 2014 that it suffered a loss of $148 million because of the December 2013 data breach that compromised customer information, such as credit card numbers.[7] Sony Corporation pegs their loss at $15 million for their 2014 hack.[8]

Digitalization gives organizations and their direct stakeholders, including employees and consumers, direct access to their specific data, providing complete control on how the technology and information are used. But this leaves the entire ecosystem more vulnerable to cyberattacks.

Organizations need to design a security system that effectively identifies, classifies and removes threats, as well as maintain data integrity at any stage.

Conclusion

Organizations must realize that digital business is a reality. Enterprises of all sizes and shapes are already carefully evaluating digital technologies and how they would impact their value chain. Further, companies will witness competition from unforeseen corners, which could disrupt their competitive position. According to Gartner, 25% of businesses will lose competitive ranking by 2017 because of digital business incompetence.[9] Thus, it is paramount that organizations should plan for a robust, future-ready IT infrastructure. To succeed, they need to implement the right partner model, which allows business units to benefit from an entire range of expertise and services.

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[3]Forrester: Businesses having trouble getting with the digital times. May 6, 2014. http://www.infoworld.com/article/2608153/it-strategy/forrester--businesses-having-trouble-getting-with-the-digital-times.html

[4]Gartner Says 4.9 Billion Connected "Things" Will Be in Use in 2015. November 11, 2014. http://www.gartner.com/newsroom/id/2905717

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[9]Gartner Says Digital Business Incompetence Will Cause 25 Percent of Businesses to Lose Competitive Ranking by 2017. September 30, 2013. http://www.gartner.com/newsroom/id/2598515

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