WHITE PAPER

New Design Cloud Patterns

for Next-Generation Business Transformations

The cloud is changing. Sophisticated capabilities are opening new horizons for companies with vision.

Faced with fast-moving global competitors, no business can afford to stand still. Innovation must be a constant goal. To serve new customers in emerging markets, companies must introduce groundbreaking products and services quickly, within tight budgets. It's a daunting challenge, often requiring nothing short of business transformation.

IT leaders are getting the message. Worldwide spending on digital transformation technologies will be more than $1.2 trillion in 2017, an increase of 17.8% over 2016, according to IDC. And that trajectory is holding steady: Digital transformation spending will grow to nearly $2 trillion in 2020, with a compound annual growth rate of 17.9% between 2015 and 2020, according to IDC.[1]

"Changing competitive landscapes and consumerism are disrupting businesses and creating an imperative to invest in digital transformation, unleashing the power of information across the enterprise and thereby improving the customer experience, operational efficiencies, and optimizing the workforce," said Eileen Smith, program director in IDC's Customer Insights & Analysis Group.[2]

Against this backdrop of change, several industries are ripe for transformation:

Healthcare. Hospitals are looking to improve care by tracking patient conditions remotely, while streamlining operations and regulatory compliance.

Financial Services. Banks, brokerage houses, and insurance companies are searching for ways to offer new services and improve the customer experience, while tightening security.

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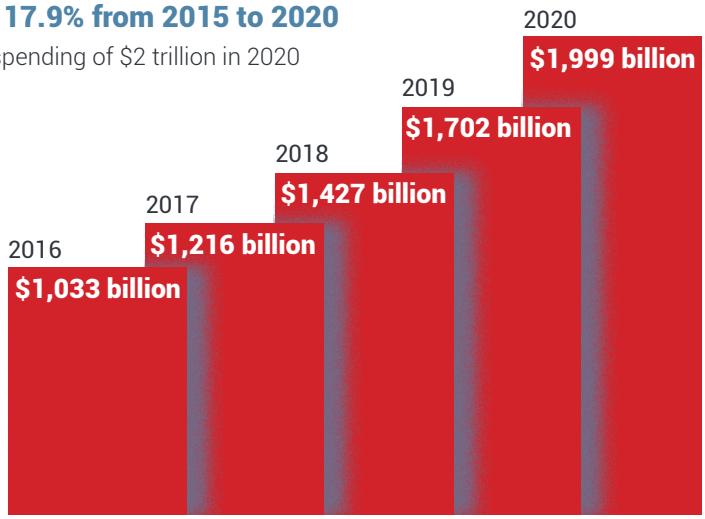
1 Worldwide Digital Transformation Spending Guide, IDC, Feb. 2017 2 Ibid

CAGR of 17.9% from 2015 to 2020
with total spending of $2 trillion in 2020



By 2020, 67% of all enterprise IT infrastructure and software spending will be for cloud-based offerings.

Source: 2017 FutureScape, IDC.

Manufacturing. Producers of industrial and consumer products are seeking methods of increasing the quality of goods, while controlling costs and improving security.

THE 5 CHARACTERISTICS OF THE TRANSFORMATIVE CLOUD

While the cloud has already been accepted as a mainstay of IT infrastructure and operations, new cloud technologies will prove critical for business transformation in the next several years.

Businesses that are able to leverage these future-state cloud technologies will be well positioned to establish digital business leadership.

1: Openness and interoperability
Because different cloud services deliver varying benefits, organizations should embrace standards that will make it possible to utilize the cloud service that is best for a given application, and to move data between different cloud services. For example, Microsoft Azure cloud services are well adapted to Microsoft workloads, but Amazon Web Services (AWS) might be a better choice for non-Microsoft and open source workloads. Google cloud services, meanwhile, might be the best choice for analytics workloads.

When a single data set can be used by various applications running on different cloud services, it is possible to gain the benefits of best-of-breed cloud services, while avoiding the costs and inconsistencies that arise from duplicating data for use with different applications. For example, it should be possible to run a Hadoop big data application on AWS, while allowing a Microsoft analytics application to access the data.

2: Modularity, abstraction, and containers
Just as virtualization technology revolutionized the data center by separating operating systems and applications from the underlying hardware, a modular approach to software that separates it from hardware through an abstraction layer promises to revolutionize the cloud. By decoupling software from hardware, applications that are built on software as a service (SaaS) will be hardware-agnostic.

There are many benefits to this approach. For example, some applications, such as social media, may form automatic associations with hardware and software as needed. In a similar way, the infrastructure and software of a data center will adapt itself to a given task, rather than requiring laborious provisioning as in the past. In addition, storage may be movable between different cloud providers like Amazon and Azure. And because uptime will be independent of the underlying infrastructure, changes can be made to an application without taking it offline.

Container technology is perhaps the best expression of this kind of abstraction. A container includes everything, such as libraries and settings, required to make a piece of software run. But unlike virtualization, a container does not include an instance of the operating system. Using containers, developers need not worry about provisioning a server with things like storage and a network switch, as this will happen automatically. Take the case of a large company that wants to deploy 1,500 instances of a given application. Rather than complete that many separate deployments, it is possible to create a single containerized deployment and propagate it 1,500 times, a significant savings of time and effort.

3: Cloud stratification—new, specialized clouds
Clouds traditionally have fallen into a few major categories, such as SaaS, platform as a service (PaaS), or infrastructure as a service (IaaS). However, new industry-focused cloud services are gaining popularity. These cloud services can

AI Everywhere By 2019:

40% of digital transformation initiatives

100% of IoT initiatives

provide an organization with essential business tools on a pay-as-you-go basis. For example:

GE Predix – An industrial internet of things (IIoT) cloud service that gathers and analyzes machine data, feeding it to an asset performance management (APM) application to reduce downtime and cut costs.

Athenahealth – A cloud-based healthcare management service that handles tasks ranging from claims processing to compliance to accounts payable.

Acturis – A comprehensive SaaS implementation for insurance providers.

In many cases, such as GE Predix, companies that have succeeded in digitizing their own processes are selling those processes as a cloud-based service to others. IDC predicts that by 2020, over 80% of the Global 500 will be digital services suppliers through such clouds—that is, they will be providing cloud-based services utilizing their own software and expertise to other companies with similar needs.[3]

In some instances, competitors within an industry are finding common ground by creating clouds to serve mutual needs, such as regulatory compliance. "Compliance is not a competitive advantage, but an expense, so companies can pool their resources," said Scott Lundstrom, group vice president and general manager, software, health, and government at IDC.[4] IDC calls these cloud initiatives Industry Collaborative Clouds, and predicts that by 2018, the number of these clouds will triple to more than 450.[5]

4: AI, robotic processes, and automation

Robotic process automation (RPA) uses artificial intelligence (AI) to study the behavior of current applications and then apply the knowledge acquired to new applications. This technique is particularly effective for repetitive processes that are common across a number of different applications. The result is to reduce or eliminate the need for human involvement in building or enhancing applications, saving significant time and expense.

A related concept is serverless computing, or function as a service (FaaS), such as AWS Lambda, which automates tasks such as scaling, patching, and administration to accelerate application development and ease deployment. In addition, cloud-based services can add functionality to many different applications. A good example is AWS Alexa, which can be used to add intelligent voice control to any connected product that has a microphone and speaker.

5: IoT, big data, and analytics

Because of the need for large amounts of processing and storage capacity, along with specialized expertise, cloud-based big data analytics are emerging as a popular service. Because much big data is generated by IoT devices, the ability for the IoT data to be transmitted across different telecommunications networks is important to realizing the promise of platform- and carrier-agnostic IoT.

However, IoT data that is generated in a factory, for example, might best be processed and analyzed close to where it is generated; that is, in the factory at the edge of the corporate network. Data that requires further analysis can be sent to a regional or central site to be examined for long-term trends.

By 2019, 43% of IoT data will be processed at the edge of the cloud, according to IDC.

"More and more of the cloud will come to a neighborhood near your IoT devices," said Frank Gens, senior vice president and chief analyst at IDC.[6]

Going hand in hand with IoT deployments, according to IDC, will be the use of AI. By 2019, AI will be integrated into 40% of digital transformation initiatives and 100% of IoT initiatives.[7]

3 *IDC FutureScape: Worldwide IT Industry 2017 Predictions*, Nov. 2016
4 *Directions 2017*, IDC, Boston, Mar. 8, 2017
5 *IDC FutureScape: Worldwide IT Industry 2017 Predictions*, Nov. 2016
6 *Directions 2017*, IDC, Boston, Mar. 8, 2017
7 Ibid.

CADS: The 4 Disciplines of Business Transformation

Cloud – The cloud has emerged as a cornerstone of corporate IT strategy. An agnostic approach across AWS, Google, Microsoft, and IBM enables the greatest flexibility.

Analytics – IoT sensors and other big data sources are fueling a revolution in analytics as companies derive more insights of high strategic value than ever before.

Digitalization – Insights into customer behavior are driving new business strategies across key industries, including healthcare, financial services, insurance, and manufacturing.

Security – Expanded use of the cloud and IoT are presenting security challenges that must be addressed for a customer-centric business strategy to be successful.

HOW THE FUTURE-STATE CLOUD IS ENABLING BUSINESS TRANSFORMATION

Because the five characteristics of the transformative cloud are interrelated, it is important for organizations to gain a firm grasp of all of them. Doing so will position them for business transformation now and over the coming three to five years. Further, it is important to understand this future-state cloud is a key part of the four critical disciplines for digital transformation known as CADS: cloud services, analytics, digitalization, and security (see sidebar).

The future-state cloud is already enabling disruptive business transformation across the industries mentioned earlier:

Healthcare. To fight the high cost of hospitalization, healthcare organizations are seeking new methods of outpatient treatment. By communicating with IoT sensors across wide-area networks, it is possible to track the condition of patients, recommend treatment, and remind patients to take medicine at prescribed intervals. Health insurers are also working with IoT devices such as smart watches to track patient fitness and exercise schedules. When a patient runs three miles, for example, that information may be sent to the health insurance provider, resulting in lower premiums for the patient. In addition, many healthcare institutions, particularly smaller ones, are utilizing new cloud-based services to improve day-to-day management, insurance claims processing, and compliance.

Financial Services. To make consumer interactions faster and more convenient, financial services firms are digitizing processes and offering cloud-based services. Via the Rocket app, for example, Quicken Loans is making it possible for customers to apply for a mortgage on a mobile device. Similarly, insurance providers are making it possible to access a cloud-based service to file a claim. And the use of AI and bot technologies is enabling startup companies like Lemonade to create policies and process claims in minutes via mobile apps.

Manufacturing. Using a combination of cloud-based services and IoT devices, manufacturers are increasing product quality while lowering costs. By placing IoT sensors on factory machines, they are tracking tendencies such as vibration that might result in product defects. By intervening during regularly scheduled downtime, they are stopping defects from occurring, thereby improving product quality and customer satisfaction while reducing costs. In addition, manufacturers are increasingly using edge-based analytics to more efficiently and securely analyze IoT data.

CONCLUSION

In a global business arena filled with fast-moving competitors, innovation must become second nature for any company to survive and thrive. Rather than fear disruptive change, organizations should be embracing digitalization to transform their businesses. The future-state cloud, in the context of the CADS disciplines, should be a key instrument of business transformation.

Forward-looking organizations and IT executives need to fully grasp the five transformative cloud capabilities and then map their business strategies to them, keeping in mind that all are tightly interrelated. Doing so will position them to drive the competitive agenda for their industry with new products and services, as well as entirely new business models.

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