

# Immense Digital Power on Demand:

Shifting to the Brave New World  
of Cloud Computing





To thrive in a world of customers who demand personalized customer experiences and digitally sophisticated competitors that can provide them (part of the today's digital landscape that we call Business 4.0™), companies need immense amounts of computing power. To be sure, they may not need this power all the time.

More often, they require it at periods of peak demand—for example, when millions of customers are flocking to their website at the same time. Or when they must transmit massive amounts of digits to customers at the spur of the moment. (Think streaming videos, one of the biggest digital data hogs of all time.)

For many big companies, buying the computing gear necessary to process such enormous data loads has become prohibitive. If the cost isn't too high, finding the IT people who know how to manage the data tsunamis is.

Fortunately, the remarkable decade-long ascendance of cloud computing providers now makes it possible. Large companies everywhere are relying on suppliers of immense data processing resources on demand—businesses like Amazon Web Services, Google, and Microsoft—as well as niche cloud players that are building deep competencies in different domains.

As a result, cloud computing has become a staple of the modern IT budget. IDC expects spending on cloud services worldwide to reach \$160 billion in 2018, and

that within two years more than 90% of enterprises will use multiple cloud services and platforms.<sup>1</sup>

None of this surprises us. Every company must now be able to deliver new digital services, or tweaks to existing services, in minutes or hours, not days. That, in turn, requires unprecedented amounts of computing power. At the same time, enterprises face constant pressure to reduce their data processing costs while complying with new data protection rules like the European Union's General Data Protection Regulation (GDPR).

All in all, success in a Business 4.0 world hinges in part on how well a company can embrace risk to

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<sup>1</sup> IDC, "Worldwide Public Cloud Services Spending Forecast to Reach \$160 Billion This Year," accessed Aug. 16, 2018, <https://www.idc.com/getdoc.jsp?containerId=prUS43511618>



shift its systems to cloud computing vendors, and then manage the relationships. The rewards for executives who master this will be plentiful. By harnessing the immense computational power of cloud providers and the growing number of sophisticated tools (such as artificial intelligence and analytics) offered through the cloud, these companies will be able to

- ✔ **make better decisions**
- ✔ **more easily delight customers**
- ✔ **develop new business models faster**
- ✔ **increase revenue more rapidly**

As a result, they have the opportunity to create exponential value for themselves and their customers.

In this article, we explain why cloud computing represents a sea change for executives, and how leaders at such companies as Cargotec Oy, Air France-KLM, Rolls Royce, and Malaysia Airlines are already embracing it. We also lay out a process by which they and their IT peers can determine what, when, and how to move their company's systems to the cloud.

## The Cloud as Game Changer

Early implementations of cloud have already enabled companies to develop new, more profitable business models. Cloud-enabled companies can unlock new revenue channels that may not have been possible before.

For example, rather than selling tires to commercial truck fleets, Michelin now also rents them on a per-mile basis, creating a constant revenue stream.<sup>2</sup> The reason Michelin can do this? It puts IoT sensors in its tires, and those tires report their usage digitally into a data center that collects the information.<sup>3</sup> Aircraft engine manufacturer Rolls Royce has developed a cloud platform to house Internet of Things data so that it can work more closely with customers (airlines) and suppliers (engine component manufacturers) to improve engine performance and maintenance.

These business models are based on the continuous collection of data about how customers use a product and when those products will fail. Through the cloud, companies can analyze this data and personalize customer offers and offerings.

By generating uncommon insights through cloud-based analytics-as-a-service offerings (increasingly referred to as the "Insight Economy"), companies can deliver timely information that customers need. Examples of this abound. Take TellusLabs, a satellite imagery and machine learning company that uses satellite imagery data to track the conditions of farmland in 2,000 U.S. counties. It created algorithms to predict agricultural yields, crunching huge volumes of digital data daily. In 2016,

<sup>2</sup> Michelin, Fleet Solutions, <https://www.michelintruck.com/services-and-programs/michelin-fleet-solutions/>

<sup>3</sup> Harvard Business School article, Nov. 16, 2016. Accessed Aug. 16, 2018. <https://rctom.hbs.org/submission/michelin-tires-as-a-service>

the company predicted the country's soybean output for September of that year within 1% of the eventual output and made that prediction two months earlier than the U.S. Department of Agriculture's prediction.<sup>4</sup>

The advantages of the cloud can be found everywhere, and in every business function. Here are some of the biggest ones, which fall into four categories: superior customer experience; always on, everywhere; rapid response; and reduced costs.

## Four Ways the Cloud is Changing the Basis of Competition

### 1. Enabling Superior Customer Experiences

European airline giant **Air France-KLM** is using the cloud so that its website can handle huge volumes of customer searches for flights and fares, and so it can send automated updates on customers' social media accounts. 2017 KLM passenger count was a company record 32.7 million, with 88.4% seat load factor (also a company record).

### 2. Making Business Always On, Everywhere

Finland-based global cargo and load handler **Cargotec Oyj** uses the cloud to monitor conditions of key physical infrastructure and predict when equipment will need maintenance. **Impact:** lower equipment downtime, improved safety, and higher customer satisfaction.

### 3. Ensuring Rapid Response

Aircraft engine manufacturer **Rolls Royce** is putting Internet of Things data in the cloud to work more closely with customers (airlines) and suppliers (engine component manufacturers) and improve engine performance and maintenance. **Goal:** reduce plane downtime and increase safety.

### 4. Dramatically Lowering Costs

**Malaysia Airlines** has moved 80% of core applications to the cloud.<sup>5</sup> It expects a 51% IT cost reduction over the next five years. It has also reduced the time to achieve certain financial processes from as many as 20 hours to less than 30 minutes.



## Superior Customer Experience

As more and more products become commodities, companies increasingly must compete on the basis of the experience they provide to customers in selecting and using their products. This trend, established 20 years ago (and dubbed then as "The Experience Economy"<sup>6</sup>), has been accelerating.

What's different today, however, is that the digital customer experience is as important as the non-digital one, and that they must work in tandem to delight customers. But when companies talk about creating a superior digital customer

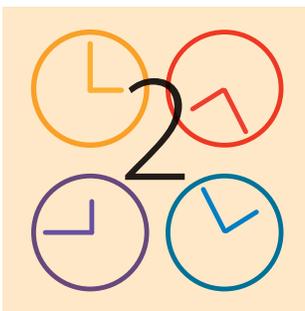
<sup>4</sup> Trajectory, "The Insight Economy," <http://trajectorymagazine.com/the-insight-economy/> accessed Aug. 16, 2018

<sup>5</sup> TCS, "Malaysia Airlines Reaches the Cloud with TCS," accessed Aug. 17, 2018 <https://info.tcs.com/malaysia-airlines-cloud-transformation>

<sup>6</sup> B. Joseph Pine II and James H. Gilmore, "Welcome to the Experience Economy," Harvard Business Review, July-August 1998. Accessed Aug. 23, 2018. <https://hbr.org/1998/07/welcome-to-the-experience-economy>

experience, that experience must be highly interactive with transactions (clicks for information, clicks to purchase, and so on) able to be made in no longer than a few seconds. When many customers are online and trying to make those transactions concurrently, that can require huge amounts of computing power.

It's a reason why European airline Air France-KLM turned to cloud computing to improve its customer website (klm.com). Dealing with very high volumes of customer searches for flights and fares, the airline realized it needed to put the system into a public cloud. The website's performance improved dramatically, and customer traffic increased exponentially. In 2017, KLM passenger growth reached a record 32.7 million, with a company record of 88.4% of its seats full, 1.2% more than the previous year.<sup>7</sup> One of KLM's innovations (which requires enormous computing power at peak times) has been automated messages to passengers who use social media (such as Twitter and Facebook) that provide status updates on flights and missing luggage. "The response from passengers was extremely positive and we were soon given the nickname of 'the social media airline,' says Jos Kerssen, KLM vice president of development passenger business."<sup>8</sup>



## Always On, Everywhere

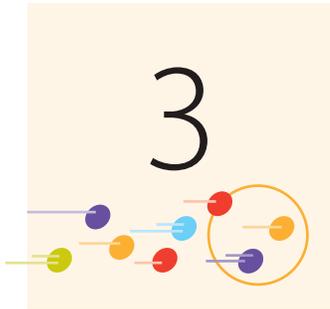
The cloud allows companies to operate as a multi-region, always-on enterprise. Customers may be located anywhere, and companies need to be able to serve them 24/7, even when they're far away from headquarters.

Cargotec Oyj, a multibillion-dollar global cargo and load handling provider based in Finland, uses the cloud to monitor the conditions of its key physical infrastructure.<sup>9</sup> Sensors installed in its equipment collect data in real time and upload it to the cloud, where analytics software makes predictions about when the equipment will need maintenance. These insights have reduced equipment downtime and improved safety, increasing customer satisfaction.

<sup>7</sup> KLM newsroom web page, Jan. 9, 2018. Accessed Aug. 23, 2018. <https://news.klm.com/record-passenger-numbers-for-klm-in-2017/>

<sup>8</sup> Jos Kerssens, KLM, write-up of a TCS Summit Europe 2018 presentation. Accessed Aug. 23, 2018. <http://tcsummiteurope.com/from-volcanoes-to-ai-using-technology-to-improve-air-travel/>

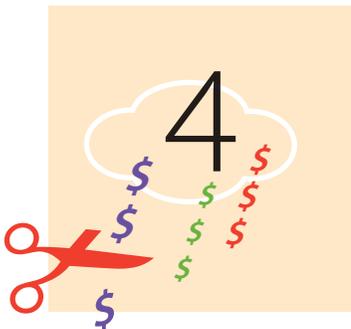
<sup>9</sup> TCS, "Success Story: Cargotec IoT Platform for Digital Services," <https://www.tcs.com/cargo-tech-iot-platform-for-digital-services> accessed Aug. 16, 2018



### **Rapid Response**

Cloud computing increases enterprise agility: the ability to respond quickly to changing business needs. When companies decide to deploy new capabilities, they can get to market faster if they are doing it in the cloud, accelerating the time to value. Cloud providers can quickly provision the infrastructure needed to run the new systems

Another type of agility enabled by the cloud is when companies simulate new products and business processes. That allows them to test them without committing huge resources to build physical representations.<sup>10</sup> Such simulation capability is useful not only for product R&D, it's also applicable to asset management and optimization, recruitment, and workforce deployment, customer experience, fraud detection, customer and field service, and inventory management.



### **Lower Costs**

Cloud has enabled enterprises to reduce IT spending and the cost of systems ownership. Instead of operating data centers, they can tap the cloud for computing resources when they need them.

By 2017, TCS helped Malaysia Airlines to move 80% of its core applications to the cloud.<sup>11</sup> The airline projects a 51% IT cost reduction over the next five years. In addition, it has reduced the time needed to run certain financial processes from as many as 20 hours to less than 30 minutes.

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*Enterprise agility: the ability to respond quickly to changing business needs.*

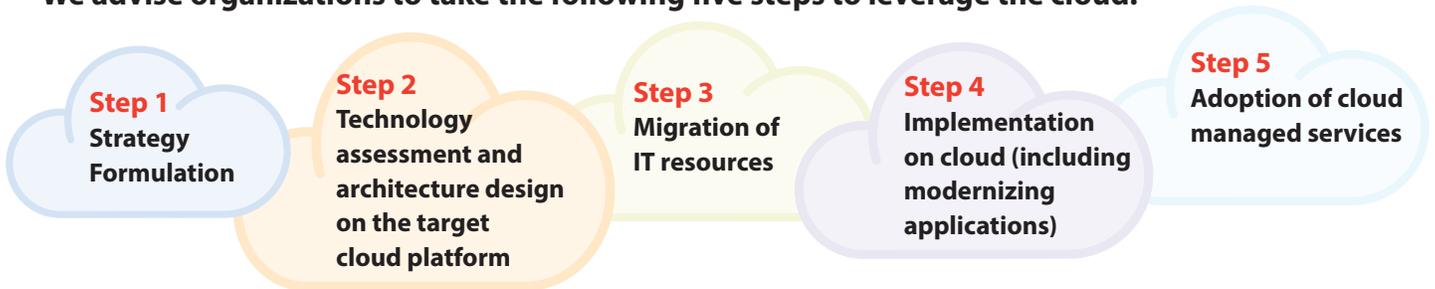
<sup>10</sup> TCS, "Now You Can Simulate Nearly Anything," <http://sites.tcs.com/insights/perspectives/wp-content/uploads/media/Now-You-Can-Simulate-Nearly-Anything.pdf> accessed Aug. 16, 2018

<sup>11</sup> TCS, "Malaysia Airlines Reaches the Cloud with TCS," accessed Aug. 17, 2018 <https://info.tcs.com/malaysia-airlines-cloud-transformation>

# Five Steps to a Cloud-Powered Business

Businesses that embrace the cloud have many opportunities to transform their business models and their daily operations. As with any significant initiative, a successful cloud transformation requires approaching the program strategically and cautiously.

**We advise organizations to take the following five steps to leverage the cloud:**



**Step 1: Strategy formulation.** Even though many companies already have some IT resources and applications running in the cloud, business leaders need an enterprise-wide strategy to determine what kind of cloud implementation makes the most sense for the business as a whole, given its specific circumstances.

**To formulate their cloud strategies, companies must factor in:**

- Their digital ambitions, for example, whether they want to launch more digital products and services, or provide digital experiences that will require enormous compute power at peak times.
- Their competition, including that from digital disruptors.
- Regulatory compliance needs, for example, whether a country where they operate requires customer data to remain within national borders.

Next, companies should evaluate the different types of cloud implementations that are appropriate given their IT resources. Data, applications, analytics platforms, security services, and infrastructure are all candidates for cloud transformation. But they can be handled in different ways. The options

include using a public cloud operated by a third party; a private cloud, dedicated to the enterprise and managed by its IT department or a technology partner, or a hybrid cloud, which mixes public and private cloud resources, or to keep some resources on premise in their data centers.

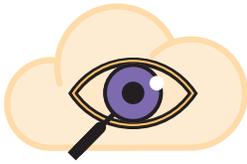
With business goals defined, and cloud options explored, business leaders can develop a business case for cloud implementation to address the company's ambitions and the impact they will have on the company's resources.

Such careful deliberation is critical as the wrong strategy can lead to lost opportunities as well as wasted money and time. IT professionals report wasting around one-third of their cloud spending.<sup>12</sup>

A cloud strategy will not necessarily put everything in the cloud. Some legacy applications may not be

easily migrated. In addition, some applications will continue to run most efficiently on-premises.

Strategy formulation is the first step to assessing a company's cloud goals and use cases. But once designed, strategy is not immutable. A company's subsequent technology assessment, architecture design thinking, migration, and implementation processes may affect the strategy. Therefore, it makes sense to maintain a team that will work on all stages of a cloud initiative to be alert to opportunities to improve the overall results. More than half of large enterprises have a central cloud enabler team.<sup>13</sup>



**Step 2: Technology assessment and architecture design.** Once leaders define their cloud strategy, they need to deeply evaluate their company's IT landscape to determine how best to execute it. Following the assessment, they should design a cloud technology architecture to understand how all the current technology and data pieces will interact, whether or not they are ultimately migrated to the cloud. The technology assessment should cover every IT resource, including:

- **Applications**
- **Infrastructure and connectivity**
- **Data**
- **Integrations within the ecosystem**
- **Security**

If the company identifies any of the above elements as a candidate for cloud migration, the next step is to determine the path forward. For example, some applications can be lifted to the cloud with few or no alterations. Many commercial off-the-shelf software applications, such as office productivity software, already are available in a Software-as-a-Service (SaaS) version.

<sup>12</sup> Right Scale, "2018 State of the Cloud Report Uncovers Cloud Adoption Trends," accessed Aug. 16, 2018. <https://www.rightscale.com/press-releases/rightscale-2018-state-of-the-cloud-report>

<sup>13</sup> "2018 State of the Cloud Report Uncovers Adoption Trends." accessed Aug. 16, 2018. <https://www.rightscale.com/press-releases/rightscale-2018-state-of-the-cloud-report>

Other applications may require small tweaks to make their capabilities cloud-ready, while still others will need to be re-architected before they can be hosted on the cloud. Meanwhile, as noted above, some applications are not cloud ready, or should remain on-premises for reasons such as regulatory restrictions. This will focus cloud efforts on areas that deliver the greatest benefits in the shortest possible timeframe.

Next, companies should create a migration roadmap for each IT resource moving to the cloud. A typical large enterprise will have hundreds of applications; a “big bang” migration for all of them at once would be ill-advised. It is better to define migration phases for each resource logically

grouped to be moved together. A business case for the roadmap will spell out why these steps make sense in terms of strategy, cost, and timing. Determining the right order and cadence for the migration is critical to its success.

When the company’s IT resources have been evaluated, it’s time to design a technology architecture that defines the best cloud system for each resource and that ensures network and data security. The technology architecture should include recommendations for the cloud model (public, private, or hybrid) and the provider for each resource, and it should incorporate security best practices as set out by the Cloud Security Alliance.



**Step 3: Cloud migration.** When the technology assessments and architecture design are completed, a company can begin moving IT resources to the cloud, according to the migration roadmap that it finalizes in the assessment step. Beginning with building a solid cloud foundation architecture in the design, most cloud migrations follow one of two approaches:

**1.** A low-touch approach in migrating resources, which requires no change in the resource configuration and a straight forward “lift-and-shift” model, using automated tools that make the process fast and seamless. About 40% of applications are suitable for this route.

**2.** A high-touch approach that is better for migrating applications and IT resources that require some tweaking to make them cloud ready thereby, and rendering them future technology proof.



**Step 4: Implementation.** Implementation goes hand in hand with migration, and proceeds in three distinct ways as determined by the technology assessment and migration roadmap.

As noted above, certain applications and IT resources will need to be modernized—that is, re-architected or reengineered to ensure robust performance in the cloud. For example, a company may have to modernize its consumer-facing legacy applications. One way to do that is through a cloud native architecture, which will ensure a superfast response to customers' changing needs.

In addition, companies will need to integrate any cloud-based IT systems with their remaining legacy on-premises enterprise IT services and processes, and with each other.

Companies also implement SaaS solutions, such as cloud ERP, CRM, and marketing systems, available from a host of providers, replacing their legacy enterprise software applications.



**Step 5: Cloud managed services.** Once a company has migrated systems, or operationalized new applications in cloud, it has to decide who will operate, maintain, and support them to ensure they perform as expected.

Of course, a company can keep that responsibility in-house. But this will tie up IT personnel with support work, and fewer people will be available to design, build, and test the new applications. One expected outcome of a shift to the cloud is to transform the company IT personnel to strategic business partners instead of only supporting the current IT infrastructure.

That's one big advantage to letting a third party run and support a company's cloud systems and apps. But there are other benefits. For one, managed services shift risk management to the

service provider, which ought to have greater expertise than the company's in-house personnel. (If the company deems that it doesn't, it is probably the wrong provider.) In addition, cloud managed service providers may provide value-added features such as metering (tracking and measuring compute resource usage by individuals or groups either to better understand operational needs or reduce waste). These features would be complex for a company to implement on its own.

In any event, company leaders (especially the CIO) must decide on a common governance structure to use with their cloud services. Some



global companies use different cloud vendors for different lines of business or different geographic units. Executives who head these units should work with the group executive management and the centralized cloud enabler team to collectively

set governance policies that apply to all cloud platforms deployed within the company.

This will help the company run its cloud ecosystem securely and seamlessly.

## **Leading the Way to the Cloud**

Cloud migration is critical to digital transformation. Successful leadership in the digital era requires creative thinking, not only about new businesses and markets a firm could enter, but also how it can and should reimagine the way it runs its existing business.

Long-term success depends on a relentless focus on increasing value to customers. That means feeling the pulse of the customer frequently, in whatever way, and through any technology that a company can use. Rather than imitating what competitors are doing, they should concentrate on delivering unprecedented levels of value to their customers.

The initial shift to the cloud from on-premises technology may well be costly, and leaders will need to manage it carefully. As part of the transformation process, they must reshape the purpose and work of the IT function: from managing technology to strategizing how the business can use it best, and then managing the cloud vendors that deliver it.

Within IT and beyond, leaders will need to remain loyal to their top talent, even as they automate and outsource employees' current jobs. Finding new and better roles for high-performing employees will help ensure that the company retains their talent, energy, and expertise for the road ahead.

The cloud already powers many of the most advanced and successful companies in the world. It is enabling the digital transformation of large enterprises, readying them to compete in a Business 4.0 world. It's time for companies to stop thinking about the cloud and instead determine how it can dramatically improve the customer experience, revenue and profits in a rapidly digitizing business landscape.



*Cloud migration is critical to digital transformation.*



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