

# Cloud Computing Guidelines



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## Introduction

This eBook is designed to guide you through some of the basics of cloud computing, provide some tips on how to determine if and how it can benefit your business and what to do next if you choose to proceed.

## What is cloud computing?

**The cloud** symbol is typically used to represent the internet. **Cloud computing** is now commonly used to describe the delivery of software, infrastructure and storage services over the internet.

Users of the cloud can benefit from other organizations delivering services associated with their data, software and other computing needs on their behalf, without the need to own or run the usual physical hardware (such as servers) and software (such as email) themselves.

Cloud computing is the next stage in the evolution of the internet, it provides the means through which everything — from computing power to computing infrastructure, applications and business processes — can be delivered to you as a service wherever and whenever you need them.

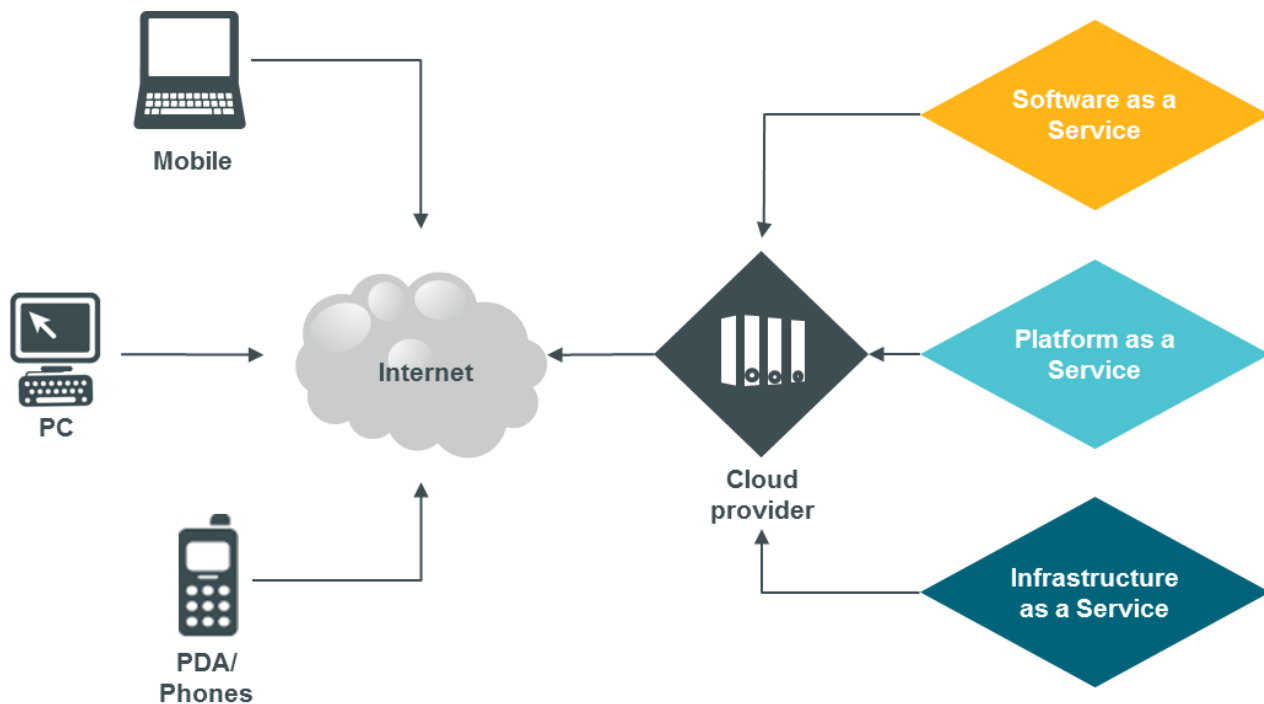


Figure 1: Cloud computing services delivered over the internet

### Did you know?

There are many ways that you may come across cloud computing in everyday life, without realizing it.



560,000,000 user accounts



2,000,000,000 videos viewed daily



360,000,000 Hotmail accounts



150,000,000 Gmail addresses

Cloud computing solutions can simplify the way in which your business operates, particularly in terms of hardware needs. Through a cloud solution you are able to connect and access the same information – but now you can connect from anywhere and enjoy a more streamlined technology installation, as shown in the graphic below.

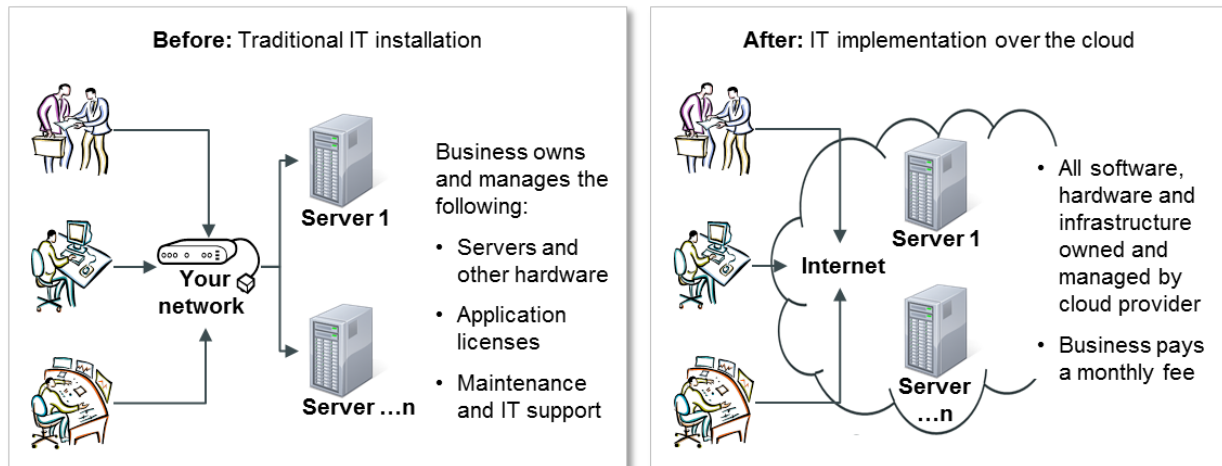


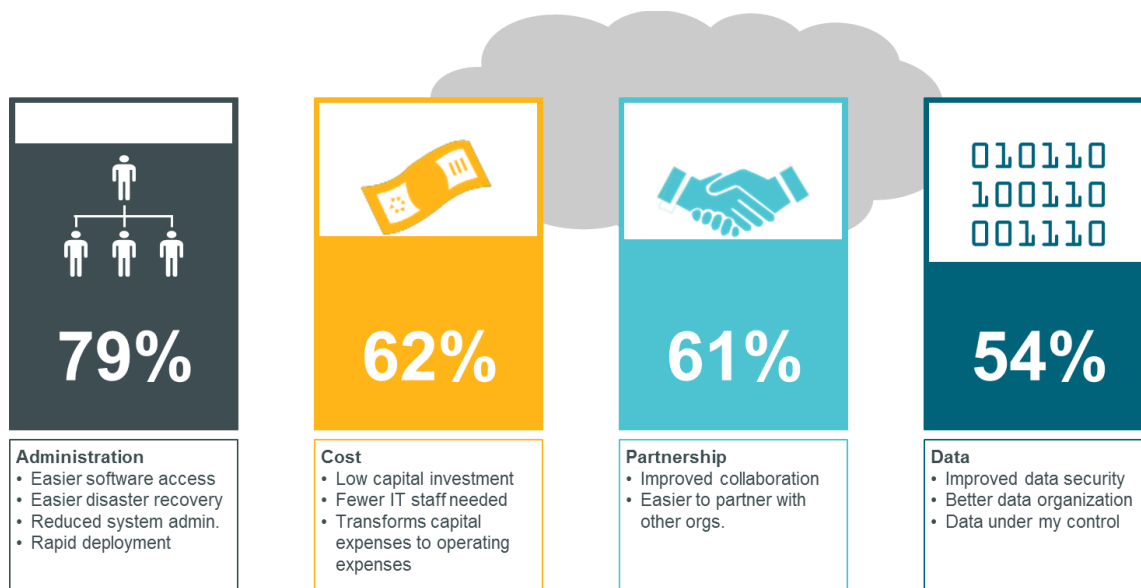
Figure 2: Technology installation before and after cloud implementation ([www.keystonecorp.com](http://www.keystonecorp.com))

## Why use cloud computing?

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✓ Reduce capex costs and improve the predictability of on-going operating expenses
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✓ Enable your employees to work from anywhere
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✓ Access your data anytime, without risks associated with physical storage since this is managed by cloud providers
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✓ Avoid complex disaster recovery planning; let cloud computing vendors take care of this for you
- 
✓ Access the same class of technology as your bigger, more established competitors
- 
✓ Let cloud computing vendors do your server maintenance for you, freeing up your resources for more important tasks
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✓ Improve your document control, with all your files in one central location, allowing everyone to work from one central copy

The benefits of cloud computing are far reaching. Cloud computing is not just a technology solution or a server stored in another location; it is a business enhancing form of computing that affects the business on a positive level. For SMEs in particular, the benefits of reduced infrastructure costs, reduced dependency on in-house IT skills and flexibility to adjust the services delivered to their needs are significant.

In a 2012 survey conducted by TechSoup Global, respondents were asked to select the most important benefits of cloud from a long list of options. Benefits relating to administration, cost, partnership and data were ranked as the most important, with 79% selecting administration benefits as shown in the graphic below.



**Figure 3: Benefits of cloud adoption** (Results from TechSoup Global 2012 Global Cloud Computing Survey)

The most common benefits are discussed in more detail below.

### Flexibility

When a company needs more bandwidth than usual, a cloud-based service can instantly meet the demand because of the vast capacity of the service's remote servers.

### Disaster Recovery

When companies start relying on cloud-based services, they no longer need complex disaster recovery plans. Cloud computing providers take care of most issues, and they do it faster.

### Automatic software updates

On a global average, in 2010, online companies spent 18 working days per month managing on-site security alone. But cloud computing suppliers do the server maintenance themselves, including security updates. This frees up their customers' time and resources for other tasks.

### **Capex free**

Cloud computing services are typically pay-as-you-go, so there's no need for capital expenditure up front. Because cloud computing is much faster to deploy, businesses have minimal project start-up costs and benefit from predictable on-going operating expenses.

### **Increased collaboration**

Cloud computing increases collaboration by allowing all employees, wherever they are, to connect and work on documents and shared applications simultaneously. They can also allow colleagues and records to receive critical updates in real time.

### **Work from anywhere**

As long as employees have internet access, they can work from anywhere. One study found that 42% of working adults would give up some of their salary if they could "telecommute" (work remotely from home), and on average they would take a 6% pay cut.

### **Document control**

In companies not using the cloud, employees will typically send files back and forth over email, meaning only one person can work on a file at a time and the same document may have a multitude of names, formats and versions.

Cloud computing allows all the files to be kept in one central location, and everyone to work from one central copy. Employees can even chat to each other whilst making changes together. This whole process makes collaboration stronger, which increases efficiency and improves a company's bottom line.

### **Security**

Some 800,000 laptops are lost each year in airports around the world. This can create some serious monetary implications and data security issues; but when everything is stored in the cloud, data can still be accessed no matter what happens to a machine, as the data is not physically stored on the machine.

### **Competitiveness**

The cloud grants SMEs access to enterprise-class technology. It also allows smaller businesses to act faster than big, established competitors.

### **Environmentally friendly**

Businesses using cloud computing only use the server space they need, which decreases their carbon footprint. Relative to using on-site servers, using the cloud results in at least 30% reduction in energy consumption and carbon emissions.

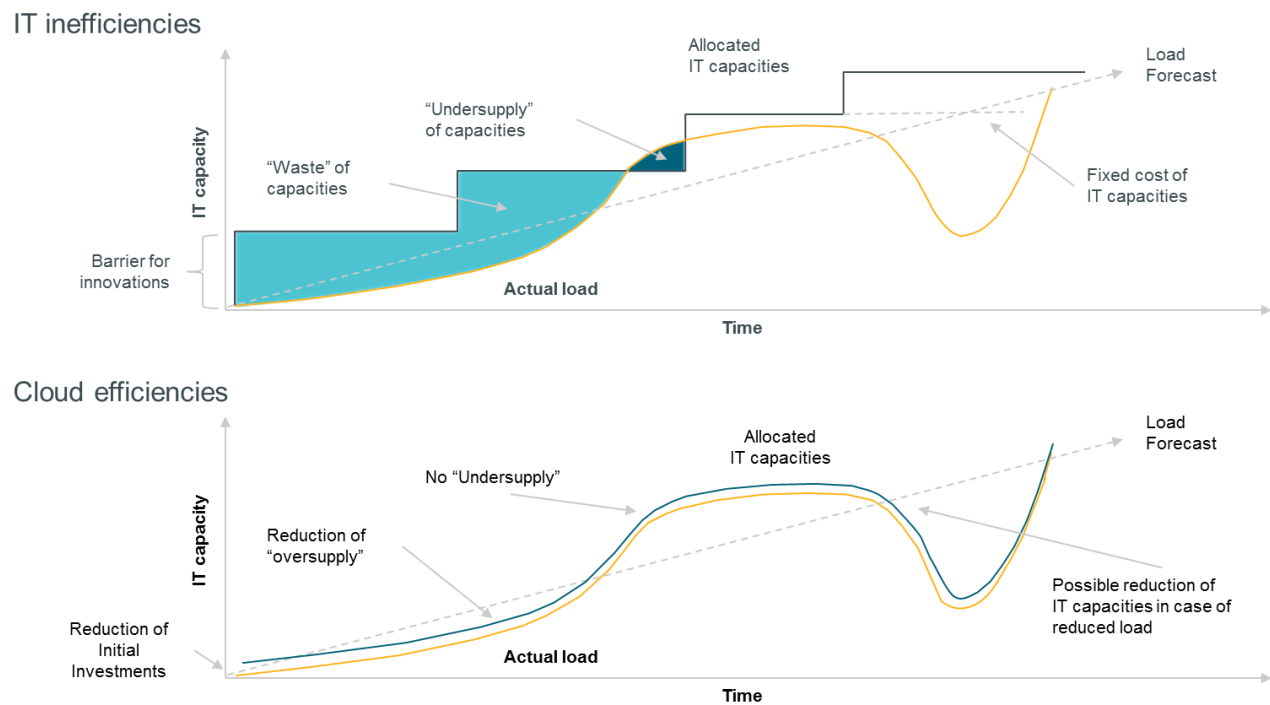
## An illustration of cloud efficiency versus traditional IT efficiency

The graphs below provide a view of how cloud computing can help businesses to be more efficient.

The top graph shows a traditional IT department's computing capacity. The curved line is the "actual" load experienced, while the stepped line is the "planned for capacity".

As you can see, for a traditional IT department, there are often areas where the actual load is either significantly under or over the planned capacity. This means that the solution is inefficient. There will be times where computing power is not being utilized and there will be times when there is not enough computing power.

The lower graph describes the same load pattern, but for a cloud computing solution where the "planned capacity" and "actual" load are continually matched, making it a far more efficient solution.



**Figure 4: The potential for aligning planned and actual capacity through cloud computing (Deloitte)**

## The building blocks of cloud computing

The following are some of the terms that you will come across in a cloud computing solution. It is not important that you know everything about cloud right in the beginning; what is important is that you understand that there are many different ways in which a cloud computing solution can be implemented.



Figure 5: Three types of cloud computing – Application, Platform and Infrastructure as a service




When initially getting involved in cloud; choose a provider who is able and willing to explain everything to you in detail to make sure that you are both working towards the same goal.

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✓ **Software as a Service** is where the service provider hosts the software so you don't need to install it, manage it, or buy hardware for it. All you have to do is connect and use it.
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✓ **Platform as a Service** is where your operating system (such as Windows) is hosted "in the cloud", rather than being physically installed on your own hardware.
- 

✓ **Infrastructure as a Service** is where physical server space is rented and kept at a vendor's data warehouse. As the customer, you can install any legal software to the server and allow access to your staff and clients as you see fit.
- 

✓ **Private Cloud** services are owned and operated on-site by you and your company, operating as a single enterprise.
- 

✓ **Public Cloud** services are provided by third party vendors. They may be multi-tenant or dedicated to you as a single company. Multi-tenant means that your company shares the solution with other organizations – the data is kept separate and secure.
- 

✓ **Hybrid Cloud** is where a combination of public clouds and private clouds are used and connected by the same organization.

### **SaaS: Software as a Service**

For SaaS, the service provider hosts the software so you don't need to install it, manage it, or buy hardware for it. All you have to do is connect and use it. SaaS examples include customer relationship management (CRM) as a service; email; logistics software; order management software; payroll software; and any other software which is hosted on the internet and not physically installed on your computer.

Software as a Service (SaaS) is where most businesses start their journey to cloud computing; typically starting with the remote delivery of email and online backup of business information.

Software as a Service has its roots in the 1960s with ASPs (Application Service Providers) who hosted and managed specialized business applications. They reduced cost through central administration.

### **PaaS: Platform as a Service**

Platform as a Service is where your operating system (such as Windows, Android, BSD, iOS, Linux, Mac OS X and IBM z/OS) is hosted "in the cloud", rather than being physically installed on your own hardware.

The PaaS layer offers standard remote services with which developers can build applications on top of the computer infrastructure. This might include developer tools that are offered as a service from which to build services, data access and database services, or billing services.

### **IaaS: Infrastructure as a Service**

IaaS is where physical server space is rented and kept at a vendor's data warehouse. As the customer, you can install any legal software to the server and allow access to your staff and clients as you see fit.

The IaaS layer offers storage and computer resources that developers and IT organizations can use to deliver business solutions.

Infrastructure as a Service is the most basic form of cloud. Users rent storage space, firewalls, and any other forms of hardware and software. As the client, you are responsible for every aspect of the hardware from the operating system (OS) through to the applications that are built and run on it. Applications are developed either by the customer, or by another vendor.

There are different packages offered by vendors of cloud services, offering differing levels of integration. The most basic offer just the hardware, such as server space, whilst more comprehensive offerings include service maintenance.

### **Computer hardware virtualization**

In computing, virtualization means to create a virtual version of a device or resource. This may be a server, storage device, network or even an operating system. Devices, applications and human users are able to interact with the virtual resource as if it were a real single logical resource.

Virtualization allows you to “trick” your operating systems into thinking that a group of servers is a single pool of computing resources. It allows you to run multiple operating systems simultaneously on a single machine.

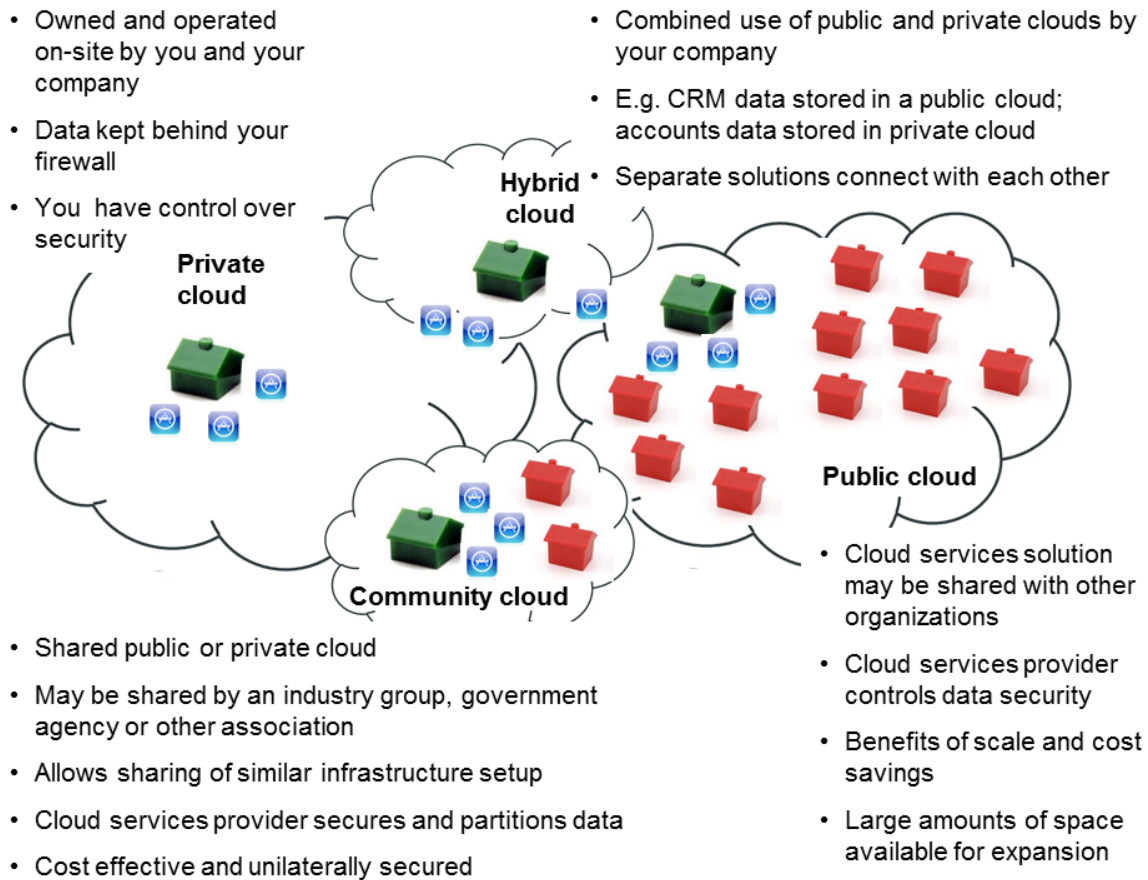
Virtualization is a great way of simplifying your IT solution as all licenses, anti-viruses and operating system upgrades are done on one machine, rather than on every machine within your network. This not only saves time and energy, but cash as well. The virtualization of your IT Solution is very often the first step in a cloud computing solution.

### **Delivery of cloud services**

Cloud computing services may be delivered over the following models:

- **Private cloud:** Services are owned on-site by you and your company, with your data behind your organization's own firewall.
- **Public cloud:** Services may be shared with other organizations, with data security provided by the cloud vendor.
- **Hybrid cloud:** Services for a single organization delivered over a combination of private and public cloud.
- **Community cloud:** Public or private cloud shared by more than one organization, with the data secured and portioned by the cloud services provider.

The models are described in more detail in the following graphic.



**Figure 6: Cloud computing service delivery models**

## Best practice guidelines



- ✓ *Conduct a readiness assessment to see how ready your organisation is for cloud and assess your requirements*



- ✓ *Create a strategy and a set of realistic goals upfront*



- ✓ *Discuss concerns with those who have tried and failed and those who have tried and succeeded in setting up a cloud solution*



- ✓ *Assess what data you can afford to move to the cloud and what you cannot*



- ✓ *Establish guarantees of performance and data availability from your service provider*

### Conduct a readiness assessment for your organization

A readiness assessment will let you know which areas of your business are ready and developed enough to warrant a cloud computing solution. This will also show which areas of your business need additional work to get them ready. This step is important as it safeguards you from rushing in to a solution for which you are not prepared or which can have a negative effect on your business.

When assessing whether you are ready or not to move to cloud you should ask yourself the following questions:

1. Do I currently use in-house enterprise applications (e.g. HR, Accounting or even email)?
2. Do I have to dedicate time of my staff to maintaining these applications?
3. Do I currently use applications "in the cloud" (such as Gmail, Dropbox, Skype, Webex etc) without thinking I am using cloud computing?
4. Do I have to invest in hardware, software licenses, etc to run these applications and other needs (databases etc)?
5. Do I believe that the performance and reliability of my IT systems (software, hardware) could be improved?
6. Does my company have issues in keeping up with changes in technology including software upgrades, etc?
7. Do my applications and data have different levels of privacy, sensitivity and mission-criticality?

If you answered yes to more than 5 of the questions above, it is very likely that your organization is ready to move at least partially to the cloud.

The cost benefit calculator on the ictQATAR website will also assist you in determining whether or not your business is ready for cloud.

### Create a strategy and a set of realistic goals upfront

As with any business initiative, goal setting is very important. Together with your cloud solution provider, you need to make sure that you both understand what makes a successful cloud implementation. You

may be focusing on increased computing efficiencies, or the ability to connect remotely. What is most important for you will influence the selection and design of the right package and service for you.

**Learn from others; ask questions of those who have tried and failed or succeeded in setting up a cloud solution**

There are going to be other companies just like you who have tried to implement a similar solution. For whatever reason, some of those implementations are going to have met with obstacles. It is in your company's best interests to understand what some of those obstacles were so that you can safeguard against it happening to you as well.

**Implement a strong framework for governance**

Cloud computing will change the way that your business runs; this means that there needs to be a clear and well understood set of rules which covers how and where documentation is stored and who has access to what information. This is a security measure to make sure that your business is safe from any potential risks.

**Be sure to understand what data you can afford to move to the cloud, and what you cannot**

For whatever reason, there may be critical data that you do not wish to move to the cloud at the moment; this could be data that you are worried could become a security risk when stored in the cloud. There may be other data which has no "competitor value" at all which you could move to the cloud immediately. It is important that you understand the relationship between your sets of data as well as which data you are willing to move now, and which not.

**Be sure to connect with a reputable cloud computing provider**

Make sure that you are dealing with a cloud computing provider that knows how to implement the solution that you are interested in. Be sure to follow up on client testimonials and reference checks.

**Establish guarantees of performance and data availability from your service provider**

One very important aspect of cloud computing is that you are not in control of the hardware that you are using. This means that you need to be sure that the service provider you choose is able to guarantee that your data will be available to you when you need it. This should ideally come as a guarantee against which you can act if their service level drops below the agreed upon level.

## The legal environment in Qatar

There are already a number of laws and initiatives in place in Qatar intended to reassure you that your interests are being represented.

- 1- The Data Privacy Law, currently awaiting signature, has been developed to ensure that personal data of your company and of your customer's details are kept confidential. The law imposes penalties on all those who disclose any financial or non-financial information of their customers without their consent. This helps in ensuring that data hosted by local suppliers is protected.
- 2- There are several entities within Qatar that deal with bestowing security and confidentiality across the cyber space. These entities work together to ensure a safe and secure digital space.
  - a. Q-CERT: The Qatar Computer Emergency Response Team, proactively seeks to identify major threats to the digital space and resolve them before they cause harm to a persons or companies. The response team also promptly reacts in cases where cyber-attacks have actually occurred in any of the critical sectors. The response team is always ready to receive incident logs from anyone in Qatar, when they encounter a cyber-mischief act.
  - a. Ministry of Interior Cyber Crime Center: The cybercrime center enforces the laws and regulations set forth by the government against offenders who use sophisticated electronic methods to carry out criminal activities. The center is equipped with latest technologies to detect cybercrimes and prevent them.

*Find out more on the legal environment in Qatar online as you navigate through the stages of the SME Toolkit which can be found on the ictQATAR website.*

## Choosing a partner

Choosing a partner can be difficult. There are many factors that need to be considered: not only whether or not they are affordable, but also considerations such as your experience as a customer, and cultural fit with your business. Below we highlight some key considerations when deciding on your cloud service provider.

### **The ability to show that they have successfully implemented what you are buying**

Find a provider with deep knowledge in the specific product you plan to buy. Ask the service provider for a list of clients or completed projects using a similar cloud solution that you are considering using.

### **Be sure that they can demonstrate expertise in your specific industry sector**

Seek service providers with clear experience in your particular industry and market segment. A cloud solution in financial services can look very different to a cloud solution in agriculture. Vendors that have developed vertical solutions often have sophisticated knowledge of that market and great technical expertise that may be costly – but often worth paying for.

There are certain parts of any industry that look completely different from other industries and, because of this, implementing any solution across industries can be difficult. If the cloud vendor has worked in your industry before, they will already have experienced some of the unique challenges that your industry might have. They will therefore be able to deliver a better service and be prepared for some of the challenges. This may include specialized software add-ons or software stacks which could be of benefit to you.

### **A demonstrated commitment to user adoption**

User adoption is the lifeblood of any successful enterprise deployment. Find a cloud service provider with proven experience, and who are continually seeking to refine their approach and service to align IT and business users.

### **Hire a company you like and (more importantly) trust**

Implementing cloud is just one step in a potentially long-term relationship between you and the software vendor or cloud service provider. Once the implementation is done, the vendor is responsible for the maintenance and upkeep of the cloud solution. While their credentials are important, it is far more important that you feel you can trust and work with the vendor; their corporate culture should resonate with yours. Do business with companies that place *your* success at the top of their list.

### **Prefer vendors who have gone through a third-party compliance audit**

Cloud service providers need to be able to show that they deliver on the promises they are making. "This is a world where you go through more scrutiny and ongoing regulation to cut hair than you do to manage a corporation's sensitive data and that of your end users," say cloud computing specialists.

For a detailed step by step process of how to select a partner, please view the *Choosing a Partner* section of the eCommerce eBook which will help guide you through the process.