How to develop a cloud strategy and technology roadmap for your organisation
Introduction

Cloud computing is being described as the most disruptive technology since the industrial revolution. Technology is always described as revolutionary, but in this case it could be true because not only is the cloud changing how we consume IT, it’s changing who buys it, how they buy it and who is in control of the means of production. That sounds like a popular uprising, a shift in the balance of power and a social upheaval – which pretty much qualifies as a revolution.

The three essential elements of cloud computing are that it is faster, more flexible and more affordable. That means more people can get access to computing power, more people can afford it and there’s a lot more you can do with it. It has enormous potential, as long as you steer it properly. On the other hand, a powerful disruptive force like this could do enormous damage, if managed badly.

That’s why a well planned out and executed cloud strategy is vital. It is a long journey from where most companies are now, and where they would like to be in five years time. There are many small steps to take in the meantime. The hardest part of the thousand mile journey, as the Chinese say, is the first step. However, anyone that rushes into the world of the cloud can easily head in the wrong direction. If you start off on the wrong foot you can easily find yourself locked into the wrong route, being led down a dead end and paying a lot of money to get yourself out of no-man’s land. So the first step is vital and it involves mapping out the landscape, devising a route and making contingency plans for change. If there’s one thing you can guarantee in the IT industry, it is that nothing stays the same.

Disruptive technology can work against you as well as for you. This ideas paper (“How to develop a cloud strategy and technology roadmap for your organization”) is intended to help you make the right journey, by flagging up all the routes, alerting you to the signposts, warning you of the proprietary dead ends and the deadly pitfalls. It will provide you with the questions you should keep asking to keep you on course. And, most importantly, provide some of the answers that your staff will be asking because unless the people come with you, there will be no revolution.

When the question is no longer why cloud computing, it becomes one of how. This paper has been written to help you understand what cloud computing means to different people and how to develop a strategy to get the most out of it. As departments discover how they could use cloud computing tools, they will bombard you – the decision maker – with questions, such as:

- **Sales & Marketing:** “How do I acquire, retain and foster customer loyalty?”
- **Human Resources:** “How do I attract, retain and motivate my employees?”
- **Procurement:** “How do I effectively manage suppliers and mitigate supply chain risks?”
- **Management:** “How do I expand overseas to reach new customers?”

Cloud computing offers users a number of business benefits from reducing the total cost technology ownership to improving your organisation’s ability to be respond faster to market opportunities. However, moving to the cloud brings new and unique challenges thanks to the complexities of existing IT investments. According to a survey conducted by NTT Europe, 56% of CIOs see complexity of their own Information and Communications Technology (ICT) systems as the biggest barrier to the adoption of the cloud. Market analyst Gartner has studied what the early adopters are doing.
According to Gartner, 53% of CFOs estimate that over half of their enterprise transactions will be delivered through the cloud, up from the 12% who use that delivery model in 2012. In addition to non-core business processes like project management and email, CFOs are also starting to embrace the cloud to deliver core ERP processes, including financial management, human capital management, and procurement.

The cloud isn’t just about cost saving. Sometimes it isn’t actually cheaper, but it delivers other, more valuable business benefits. It might help a project get up and running more quickly. A cloud application might be more suited to cater for more mobile workers, which allows a company to recruit from a wider, more geographically dispersed, pool of talent. The cloud might give a company the chance to experiment, temporarily, with a system, without committing to long term capital expenditure. The cloud makes all the capital involved in a company more fluid and manageable and efficient.

To fund investments in new initiatives, CIOs are finding ways to find IT savings. For example, they are delivering process and infrastructure improvements in existing technologies, by purchasing hosted services that streamline your business processes.

For those organizations that successfully develop a clear cloud strategy, technology roadmap and user adoption path, the business benefits will quickly follow as they boost business performance and quickly improve profitability.

The real revolution represented by cloud computing is that, finally, business systems work around the way people and companies function – instead of the other way around.

In order to transform your IT infrastructure from an intransient, slow moving number cruncher to a fast, fluid, work enabler, you need to instil five disciplines that must be maintained as part of your cloud plans. These imperatives are:

1. **Conduct a company-wide data management review** which involves improving, migrating and integrating quality data from across your organisation;

2. **Deploy a unified technology platform** which provides a single repository of high quality data for on-demand analysis and reporting including but not limited to integration with on-premise systems;

3. **Trial and roll-out applications** geared around demonstrating the success and business value including a quick return on investment before expanding usage in your organisation;

4. **Improve and optimise business processes** which includes establishing an information framework and governance policy for cloud users; and,

5. **Run a change management program** that drives collaboration and extended user adoption of new decision support tools.
Why embrace the cloud?

**Speed:** You will benefit from faster roll outs of applications. Empowerment of local departments becomes an option.

**Flexibility:** Cloud applications give you more options for how you want to work, where and on what devices. Your IT works around you, for once, where for decades companies worked around the limitations of their automated systems.

**Cost savings:** The price of computing is lower per user, per computer and per server. This is because maintenance costs are better managed. You enjoy economies of scale, you pay for what you use and, since you have the option to expand at will, you tend to only pay for what you use. There are no rash purchases, white elephants or ghost machines sitting in your company that nobody uses.

**Storage:** As company data rapidly grows (by 50 percent a year, according to Gartner) management of information is an increasingly large contributor to both capital and operational expenses. The cloud gives you flexibility and manageability in dealing with this issue. Like everything else, scalable storage options give you more cost effective management of assets. Storage becomes an operational cost, which also makes it simpler to manage budgets.

**Fewer meetings and management headaches:** Your cloud service provider is a skilled operator and will carry out maintenance, security checks and management in a fraction of the time. You outsourced many management tasks (and the hours you would have wasted in meetings) to people who specialise in this work, have seen it all before and complete the job in a fraction of the time it would take you.

**More time for your customers:** With time being your most precious asset, the most valuable contribution the cloud gives you is more hours in the day to concentrate on the work you are best at – be it strategy, people management or addressing your customers.

**Better protection:** The improvements in security that come with automating management can make your IT infrastructure far safer, more reliable and available. The cloud gives you more options for duplication, backup and data recovery.
Is the cloud right for your organisation?

Though every organisation can benefit from the cloud, your company may not be ready for it. Not surprisingly, many departments within organisations - such as marketing - have embraced cloud-based customer relationship management (CRM) solutions as a quick way to solve business problems such as the lack of customer visibility.

However, technology purchases often have unforeseen effects. This causes huge organisational and costs issues which cannot be resolved without a lot of hard work to forge them into a holistic, joined-up and enterprise-wide IT strategy.

Five questions to help you assess if your organisation is ready to move into the cloud:

1. Is your organisation mandated to invest in existing technologies?
2. Is your organisation governed by external legislation such as data privacy and compliance?
3. How will your current IT infrastructure integrate with the cloud computing services you are considering?
4. Will there be internal resistance to the change in organisation? Who from? Why?
5. Who will be the winners and losers when cloud computing changes the dynamic of your company? How will you prepare for that?

Every company is different but there is a common set of challenges and procedures they will all go through:

- Discovery of the existing infrastructure
- Conducting a needs analysis
- Comparing needs to existing capacity and calculating the different
- Internal Consensus-Building with the users
- Researching and making key technology decisions
- Meeting analysing and selecting vendors
- Trials (of apps and systems) – and tribulations
- Rollouts, fallouts and making do
Practical tips for moving to the cloud

Avoid taking the route to disorder and expensive proprietary lock-in by following these rules of the road.

Check your vehicle before you start

It helps enormously if you know what’s in your tank before you start your journey. What systems do you already have in place? If you are to match new systems to old, you will need to know what hardware, networks and, particularly, software you already own. Many companies lose track of the software they own and waste money on licenses they never use or fines that could have been avoided.

Check your Legal Status over Compliance and Regional Regulations

Different apps, in different industries, are covered by completely different legislation. Heavily regulated industries like banking and pharmaceuticals, and public sectors like healthcare, are a legal minefield.

Compliance is such as vast issue that it calls for copious further studies but a good starting point is this question: What are the special requirements for security and compliance for your proposed apps?

Guestimate the future

This is impossible to predict, but someone will ask you to answer these questions and put a figure on it. So ask yourself: How much growth do managers expect to see for each app over the next three years? How many hardware refreshes can you expect? Storage arrays are meant to last five years, but in reality they never go longer than three. Have you made a realistic assessment of their useful life?

Any applications that aren’t killed by latency, or whose data isn’t bound by suffocating regulations, should be OK. Applications with lower security thresholds or compliance requirements are OK. As are those types of system which are not subject to massive demand fluctuations. You can put all these on the public cloud cheaply.

Product catalogues, marketing campaigns, product launches, customer self-help services and low-risk work – such as inventory tracking, mapping and project management – can all go in the public cloud.

Even more sensitive data can go in the cloud – if it’s private. As long as the hardware it resides on is dedicated to you, it’s as good as an internal system. Any apps that aren’t hostage to massive demand can probably go in the cloud.

As a rule of thumb, the older a system is, the less likely it is to go in the cloud. Legacy apps weren’t built for distribution – they were built for a different world, where computing was much more insular.

Decide which apps you keep in-house and which go into the cloud

Today, the cloud is for everyone, but not everything. In the future, we expect the cloud to be able to handle nearly any workload, but it is important to assess application requirements for the current and future states of the cloud.

You need to decide which apps to keep and which to put in the cloud. Initially, the cloud is no place for the sensitive. So any data which is confidential must be kept in house. (As the cloud matures, that may change.) Already we are seeing cloud services emerge which offer level of encryption and intrusion prevention that could meet the highest compliancy standards. But for now you should play safe.

Any applications that aren’t killed by latency, or whose data isn’t bound by suffocating regulations, should be OK. Applications with lower security thresholds or compliance requirements are OK. As are those types of system which are not subject to massive demand fluctuations. You can put all these on the public cloud cheaply.

Product catalogues, marketing campaigns, product launches, customer self-help services and low-risk work – such as inventory tracking, mapping and project management – can all go in the public cloud.

Even more sensitive data can go in the cloud – if it’s private. As long as the hardware it resides on is dedicated to you, it’s as good as an internal system. Any apps that aren’t hostage to massive demand can probably go in the cloud.

As a rule of thumb, the older a system is, the less likely it is to go in the cloud. Legacy apps weren’t built for distribution – they were built for a different world, where computing was much more insular.
Decide what types of cloud you need

There are three main types of cloud – public, private and hybrid. Each has its own pros and cons. Public is cheap but insecure, private is secure but expensive, hybrid is a compromise.

For every app you have to make a decision over housing. Here are the factors you have to wrestle with:

1. **Public cloud: Pros and cons**
   An off-premise multi-tenant solution enables a utility computing model. Example: a website hosted by a third party that can scale up or down to match fluctuating demand.

2. **Private cloud: Pros and cons**
   A secure single-tenant solution hosted either on- or off-premises. Example: a customer database running on a set of virtualized servers behind a firewall.

3. **Hybrid: Pros and cons**
   Two or more clouds connected to support load balancing or cloud bursting between dedicated in-house resources and virtualized resources in the public cloud.

The charity Help for Heroes uses a hybrid cloud for its fundraising. On normal day-to-day activity, its web servers can cope with traffic. But if the charity is featured on national TV – as was the case with the X Factor recently – it can cope with the massive surge in demand by spinning up servers in the public cloud in a matter of minutes. The rest of the time, when it doesn’t need these extra servers, it doesn’t have to pay for them and they are wound down again.

Assess each workload to determine which kind of cloud it should be in. You need to establish the need for availability, security and cost. This will tell you whether you need a public or private cloud.

Research possible hosting companies

Shortlist your potential cloud partners and explain your goals to each. Make a note of which seems to be a good listener and which simply talk over you in their haste to sell you something and hit their monthly target. Some suppliers have a one size fits all approach to every problem. You need to identify and eliminate them as soon as possible.

Ask each supplier for a proposal. Then you will see which of them listened to you intently.

Do your homework on your partners

Compare written proposals and perform due diligence on all prospective partners. Read customer case studies and check references. Set up a site visit to see first-hand how each vendor handles physical security and meets compliance regulations.

Start the system going and watch it like a hawk

Most companies try out one app for an initial trial period, such as 30 days. Work with your new partner to deploy your trial app in the cloud. Evaluate the performance using your choice of metrics. Watch how long it takes to process transactions, add new servers or new users. At the end of the trial, assess how well the cloud matches your needs.

Deploy and monitor further apps

If the trial was a success, then you are in the happy position of having to decide which app to roll-out next. Your partner should provide a suitable way to monitor your cloud apps. These steps will help your enterprise make a sensible plan for moving your apps to the cloud.

Set your goals and make sure you all have the same one

Make sure everyone has the same goals and wants the same outcome from their cloud apps. It is no good if the CFO expects more customer satisfaction if the CMO is working towards doubling sales at all costs. Most CFOs want to contain costs to build profits. Marketing will want to expand their market share. While cloud computing helps you do more with less, the CIO won’t want cloud computing to be the vehicle for budget cuts!

Review all the new apps coming online and the expected growth from existing apps. If your data centre can’t handle the load or you have difficulty quickly deploying new infrastructure, your enterprise needs to find a way to support those apps without investing vast sums in new capital expenses. That will most likely mean finding a cloud partner.
Nine frequently asked cloud questions

1. What is the difference between cloud, PaaS, DaaS, IaaS, SaaS solutions?

IaaS (Infrastructure as a Service) provides you the computing infrastructure, physical or (quite often) virtual machines and other resources like virtual-machine disk image library, block and file-based storage, firewalls, load balancers, IP addresses, virtual local area networks on a pay-per-usage model. Examples include Amazon EC2 or Windows Azure.

PaaS (Platform as a Service) provides you computing platforms which typically include operating system, programming language execution environment, database, web server. Examples include Force.com, Google App Engine or SAP HANA Cloud platform. The client typically pays for services used and metrics vary.

SaaS (Software as a Service) is a software distribution model in which applications are hosted by a vendor or service provider and made available to customers over a network, typically the internet. You don't have to worry about the installation, set-up and running of the application. Examples include Google Apps, Salesforce.com or SAP Cloud solutions.

DaaS (Data as a Service) works on the principle that data can be provided on demand to end users no matter where they are. This concept is underpinned by the emergence of service-oriented architecture (SOA) which makes the machine on which the data resides irrelevant. At its best, when it delivers on its promise, DaaS will give the client more options and freedom to adapt (which IT vendors describe as agility), while improving the quality of the data and lowering the cost. The biggest service involved in DaaS is in improving the management of this resource.

2. What's the difference between a private cloud and a public cloud?

We gave you the short answer earlier in this paper. This is the long one.

A Private cloud is a cloud infrastructure operated solely for a single organization, whether managed internally or by a third-party and hosted internally or externally. A cloud is called a 'Public cloud' when the services are rendered over a network that is open for public use.

Technically there may be little or no difference between public and private cloud architecture, however, security consideration may be substantially different for services (applications, storage and other resources) that are made available by a service provider for a public audience and when communication is effected over a non-trusted network.

3. How secure is the cloud?

As with all important and critical systems, security is always a priority. With cloud, this is no different, as the back-end architectures are secured just like your legacy hosted systems. By allowing your provider to manage round the clock security, it allows your business to focus on doing what you do best.

The cloud can be very insecure, if you have not conducted your due diligence research. You need to know where your data resides, how secure it is, what local regulations apply to that data in the country in which it resides. For example, data in the US is subject to the Patriot Act. Do you know what that means to your company and under what circumstances it may affect your data? Do you know which country or countries your data may reside in? Do you know how physically secure the data centres are that play host to your data?

On the supply side you may need to ask questions too. How reputable is your cloud provider? Is it financially viable? Is it likely to be taken over? Who are its other clients? Could, say, the FBI one day have cause to seize the servers owned by your service provider because they want to investigate a rogue client? All these are questions you may need to consider.

4. Who owns – and how do I recover – my organisation’s data in the cloud?

It is always important to understand the terms of your cloud service, but we believe that, as with the vast majority of cloud services, YOU do, and should always, own your data in the system. However, you need to check the terms and conditions of your contract with your cloud service provider to ensure you do actually own the data so: 1) you can recover the data on-demand; 2) your service provider cannot access, use or share your data in any shape or form without your written permission.

5. How do I integrate on-premise systems (and business processes) with cloud-based technologies? I don’t want to throw away past investments.

Hybrid Cloud is the terminology used when integrating on-premise systems with cloud solutions. Data and transactions integration is achieved with a cloud integration software layer (usually itself in the cloud) where all the mappings and transformations are done. Examples of cloud integration providers include Mulesoft, Boomi, Websphere Cast Iron.
6. How much will the cloud save me compared to the price tag of an on-premise system?

There is no easy answer to that because every installation is unique. In theory, a cloud service should save the user money, because cloud computing offers the potential for economies on several levels. Installation can be easier, adoption simpler (which means less money is spent on user training), management is less of a burden and the economies of scale enjoyed by the supplier mean that they can deliver a service more cost effectively.

However, there are complications that can make a cloud service more expensive. For example, the savings enjoyed by the service provider from its economies of scale are not always passed on to the customer. In some cases, enterprises have found they get a better price per Gigabyte by buying and hosting their own systems rather than use Amazon Web Services. If integration of a cloud service is not successful, then a cloud installation can be a false economy – especially if any form of legal action is involved.

The bottom line is that every use case is different and thorough preparation is needed.

7. Can I change my cloud solution to meet my precise requirements?

In a nutshell, yes. But beware of falling into the trap of thinking that – as far as cloud solutions go – once size fits all. It’s not a question of assuming that any cloud will do.

8. What are the costs of maintaining a cloud solution?

Typically, the costs of maintenance are many times lower, or zero, as there is no infrastructure, applications or software for your organisation to support or maintain. The precise arrangement can differ, but overall cloud solutions are cheaper than legacy on-premise systems.

9. How do I migrate my organisation’s on-premise data to the cloud and vice versa?

Each software vendor will provide its own data migration solution for loading data into their application. It could be achieved by either loading data directly in the SaaS application using the right data format or by leveraging the Cloud integration layer software to transform and load the data. Extracting data will work the other way and will vary by software vendor.
Planning your strategy

Define your business goals

Be very clear and unambiguous about what you want from the cloud. Do you want to save money? Or save time? Or make more sales? Do you want to change the way you pay for IT, so that it becomes an operational cost, rather than a capital expenditure? Do you want to get rid of the IT department? Or free up their time and get them working on other projects? Are you looking to give buying power to individual department heads and devolve it away from the CIO?

It helps to define your goals as clearly as possible; otherwise they will never be seen as a target. Not every cloud service saves you money, but sometimes saving money is not a priority. Don’t assume that the cloud service provider knows what you want.

Once you and the supplier both understand your business goals, they can begin to work out how cloud computing can help you achieve them.

Work out which jobs are suited to the cloud

Which part of your existing IT infrastructure is on the way out? Could an infrastructure as a service offering make a more affordable alternative? Are certain applications coming to the end of their life? Is support for them about to be discontinued? What do the analysts and reviewers say about the suitability of these apps to run in the cloud?

Which non-essential apps could you try out in the cloud as a viability test?

Are there any apps or systems that are subject to massive fluctuations in demand? Would these be better suited to the cloud, where you can ramp up and gear down capacity as you need it?

Which Departments Are Most Likely To Accept Change?

Early adopters can be ambassadors for the cloud and they can prove the concept to the rest of the company. But which department is most likely to be your most enthusiastic guinea pig? Marketing departments, for example, often have younger staff and are more likely to be adept in the ways of using Google Apps. Staff in the more conservative departments, such as Accounts, is more likely to be dyed in the wool Microsoft Office loyalists and resistant to changes in the way they have worked for over a decade. It pays to assess which employees are likely to be your allies.

Work closely with your lawyers

Contracts are incredibly important, but often service level agreements are poorly defined and prove unenforceable. You need to spend many hours defining what you want and whether this is expressed in the contract.

Many companies have service level agreements with Amazon Web Services but have no idea how their software as a service offering is performing. That’s because Amazon gives them figures for the performance of the infrastructure, not the software. This anomaly is only now beginning to be addressed. But for years, companies were unable to measure how their service was performing.

If you cannot measure something, it cannot be monitored or managed. Or indeed, legislated over.

Create a migration strategy

You will need to audit your existing infrastructure. Even if you didn’t go to the cloud, this exercise on its own would yield enormous benefits. Prepare to help staff with the transformation. You need to get staff buy in, so prepare to canvass the end users.

Plan how you will integrate cloud applications with in-house software. Leave nothing to chance. Never make assumptions.

Evaluate cloud suppliers

The tender process for IT suppliers is one of the least accurate gauges of competence. Questioning a potential host is even trickier. Don’t be impressed by stats on speed and feeds or choose a supplier based on the quoted price.

Visit the data centre which will be hosting your services, pick a random cable and ask them to identify when it was installed, who installed it and whether it was tested. Ask to see their maintenance records.

This gives you an idea how well organised they are.

Don’t accept the tame customer references the supplier gives you. Ask to see a random customer set – three companies beginning with the letter R perhaps. That will give you a much fairer, random cross section sample.
What to look for in an ideal cloud partner:

- Flexible solutions
- No vendor lock-in to cloud architecture, tools or hosting
- Ability to plan and architect public, private or hybrid clouds
- Robust networking with advanced load balancers and application delivery controllers
- Value-added services like IT planning available
- Dedicated team available to support you 24/7/365
- Online dashboard updated in real-time with all relevant specs
- Support for industry-standard configurations such as Windows, Linux, x-86 hardware, NetApp
- Thousands of happy customers with extremely high retention rate

Define your data policy

Where will your data be stored? Who manages the cloud service? Is the service guaranteed reliable? What backups are in place if something goes wrong?

Work out the cost

Many businesses think that cloud computing will be cheaper than buying new hardware and software to use in-house, but actually this isn’t always the case. The issue of costs is more complex.

Usually you’re swapping a capital expenditure (buying new equipment and software) for operational expenditure (paying for a service by the month). It’s worth analysing where the financial advantages lie for your business.

The big advantage of cloud services isn’t typically in the cost. It’s in the flexibility and freedom that they offer.
Conclusion

Technology is too often described as revolutionary and disruptive. Too often it represents the wrong type of revolution – the type where lots of people get hurt and nobody is much better off. The same goes for disruption. Nobody likes being disrupted by technology as most people have negative associations with technology upgrades that never seem to make their working lives any easier.

Cloud computing is the first technology for years that deserve these twin accolades. It changes the dynamics of IT on so many levels. It gives more power to individuals to choose the applications that work for them. It makes the assets of any organisation – such as the computing hardware, software, and even the workers’ intellectual capital – more flexible and fluid. Which means the machinery of production can adapt to more situations, creating greater efficiencies and more output. And, most revolutionary of all, it changes the balance of power between man and machine.

Computing resources has always been rigid and inflexible and the workforce has, over the year, learned to shape itself around the limitations of the computer. However, the cloud model, by making IT more flexible, means that now the technology works around the way humans wants to work. It connects us in our home, it allows us to work with whatever device we want, and provides an app for whatever we want to do.

The tables have turned, and WE are the masters now – and that is an IT revolution we can all cheer. The cloud computing revolution will be met with enthusiasm from users. You should not have trouble making a case for this particular ‘disruptive technology.’

However, as this paper makes clear, there is still much to be done. Your cloud strategy will be vital. Hopefully, this paper will give you the right start to your journey.
Authors

This paper was written in collaboration with Thierry Crifasi, Ingrid Buff, Jamie Brown and Lance Mercereau.

Bluefin Solutions is a global independent consultancy and SAP partner. We work with you to challenge traditional thinking and bring new ideas to life.

Every day, a Bluefin team of industry consultants is listening, advising and helping to create value for large organisations across the world. Headquartered in the United Kingdom, we have offices in Malaysia, Singapore and the United States.

To read the latest insights, ideas and innovations, visit bluefinsolutions.com