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The Chartered Institute of
Public Finance & Accountancy

\accounting for the cloud

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Supported by Microsoft:

At Microsoft, we are passionate about the potential of the cloud. We are very pleased to support the development and publication of this report, including providing background information, with the aim of helping readers to understand better the issues and ensure that decisions are based on robust and informed processes. Our thanks to CIPFA for undertaking this project.

Suzy Foster, Director: Health & Life Sciences, Microsoft UK

\ foreword

Public sector organisations are facing unprecedented pressure to reduce costs and reassess how services can be delivered more efficiently and to consistently higher standards. In many cases exploiting the power of cloud computing is a key component of plans to reconcile these competing pressures.

In the NHS, for example, cloud computing has huge potential to support modernisation and efficiency improvements. Providing easy access to patient information for a busy and more mobile workforce; using simple tools such as skype to assist with remote diagnosis; delivering cost effective and flexible storage for the vast amounts of data that will be generated through telecare, imaging and remote monitoring; supporting advanced analytics; and, enabling patients to see and comment on their records, are just a few of the developments on the horizon. It is important therefore that finance teams, clinicians and policy makers, as well as IT professionals, have a shared understanding of what is possible and how.

'Accounting for the Cloud' has been developed to explain in everyday language the advantages that cloud computing offers and the options for taking it forward, from a finance perspective. It draws on desk research and feedback from a consultation exercise, as well as formal and informal interviews. It provides a mix of 'how to' information, informed comments based on experience, and signposts to further information.

Our thanks to Nick O'Reilly, the former Director of Information Systems, Derby City Council for allowing us to share extracts from his blog *Journey to the Cloud – Four Years in the Making*. The full blog can be accessed via LinkedIn www.linkedin.com/in/nickoreilly1/. Nick is now Head of Information Technology for NHS Business Services Authority and also participated in one the formal interviews for this study.

We commend this report to our colleagues in all parts of the public services.

Rob Whiteman, Chief Executive, CIPFA
Will Smart, NHS Chief Information Officer
Martin Ferguson, Director of Research, Socitm

\ summary

Accounting for the cloud is about more than simply recording financial transactions. To support their organisations finance teams will want to understand more about this disruptive technology and play their part in developing business cases, procuring, financing and managing the transition to the cloud.

Cloud computing is revolutionising the way that IT services are provided across government, healthcare and the broader public services. It promises to radically reduce costs and increase flexibility, with some organisations claiming savings of 30%or more from its adoption.[1] It is not surprising therefore that most public sector bodies are moving away from using their own data centres and increasingly sourcing their software and technology needs in the cloud. It is also why the UK Government has had a 'cloud first' policy since 2013.

Cloud computing can, however, creates challenges for finance teams in terms of understanding the opportunities and playing their full part in developing the business case, financing, procuring and getting the best from suppliers. The purpose of this report is to signpost some of the opportunities, challenges and developing good practices from a financial perspective to encourage and support finance teams as their organisations begin to exploit more fully the power of cloud technologies.

This report has been prepared for finance staff and colleagues in other professions, across the public sector. It explores why the 'cloud' is different, the finance role in developing the business case and how to get the best from suppliers.

SECTION 1

\ what is the cloud and why is it different?

Cloud computing is a broad term used to describe the delivery of technology services over the internet rather than from an organisation's own onsite data centre.We all use it every day when we use services such as Amazon or LinkedIn. The term 'cloud computing' simply signals that the location of the hardware and software is somewhere beyond the boundaries of the traditional ICT department and could reside on a server elsewhere in the UK or overseas. It is often referred to 'as a service' in 'software as a service' (SaaS) or infrastructure as a service (IaaS).

In 2013, central government adopted a 'cloud first' policy, making it mandatory for buyers of IT products and services in central government to consider purchases through the cloud as their first option. In 2014, the Digital Marketplace was created to include what are called 'G-Cloud frameworks' for procuring cloud services. All public service bodies can now purchase through this online marketplace using pre-negotiated framework contracts, with standard terms applied to suppliers. This makes the buying process easier, quicker and less costly for buyers. This should also mean each product only needs to be accredited once for security purposes, rather than security teams in each department or organisation all accrediting the same software package. By October 2016, cumulative sales through the G-Cloud frameworks totalled nearly £1.6bn.[2]

A research study from Eduserv in 2016 concluded that "the march of cloud solutions to support local government is an exorable one". Where the move was being led by larger councils the smaller ones will follow but the report says it is important to ensure that the process is managed effectively. Eduserv stress that having a policy for using and procuring cloud IT needs to be a priority for every council to avoid "a proliferation of ad hoc point solutions, which may not serve the business effectively in the future".[3]

For software suppliers, cloud solutions are easier to deploy, sell and maintain. This means that more and more technology products are moving to the cloud and that in future software companies will likely only offer cloud options of their products. Gartner, the information technology research company, is forecasting that by 2019 more than 30% of the 100 largest software companies will have shifted from a 'cloud-first 'to a 'cloud-only' policy for developing and updating their products, and that by 2020, a corporate 'no-cloud' policy will be as rare as a 'no-Internet' policy is today.[4]

South London and Maudsley NHS Foundation Trust

The South London and Maudsley NHS Foundation Trust is one of the UK's largest providers of mental health services, with staff working in four main hospitals and 88 other sites. Its ageing IT structure was slow, caused delays, inefficiency and frustrations for staff. Using cloud computing to deliver their core functions has enabled the Trust's clinicians to be mobil, to collaborate more, share data more easily and most importantly, spend more time in the field with patients.

Source: https://enterprise.microsoft.com/en-gb/customer-story/industries/public-sector/health/slam-gets-connected-office-365/

Advocates of cloud computing promote its flexibility and point to a range of areas where significant savings can be achieved.

Digital policing

Based on an amalgam of comments from police information specialists at a TechUK Local Government and Police Cloud Clinic.

- Every crime now includes a 'digital footprint' whether it is a big fraud or small burglary planned using mobile phones.

- There are 43 police forces with 43 ways of collecting and storing evidence.

- Most forces are moving to the use of body-cameras to support policing and digital evidence. 100,000 body worn cameras generating one hour of digital assets per day, will produce a terabyte of data in a week.

- You may only need five minutes of a 90-minute video, but what happens when the defence asks for the preceding two minutes and it has been deleted?

- There is a massive requirement for data holdings over the next five years.

- There is need to move from data silos to role-based access across multiple organisations, including CPS, probation, police and courts.

- The police now need a tiered approach to holding data, with the 'hot stuff' readily available and cold data available when needed.

- There is a compelling need to bring down the price of data storage moving forward.

- **Key challenges:**
  - Sharing?
  - Storing?
  - Reducing costs?
  - Security?

> TechUK believes that adoption of cloud computing by police forces will be a key enabler of modern crime prevention. In order to fully realise the potential of data and analytics tools, forces must embrace cloud computing.

Source: Digital Policing: The Future of Modern Crime Prevention, TechUK, December 2016

Advantages

- Savings on costly IT infrastructure and data centres
- Easier to remain up-to-date without the need for major refreshes of technology
- Ongoing savings on the cost of technical staff needed to maintain IT equipment
- Reduce operating costs for power, heat and light etc.
- 'Pay as you go' approach offers greater flexibility:
  - On-demand – when you need it
  - Self-service
  - Unconstrained – as much as you need
- Remote working is simpler and more flexible
- Improved security, backup and recovery

Concerns

- A perceived loss of control
  - Possible 'supplier lock-in'
  - Knowing where data is held
  - Costs more than anticipated
  - Uncertainty over future pricing
- Security and resilience: risks of data breaches
- Supplier going out of business
- Internet connection – need good connection to function
- Existing contracts can delay migration and restrict opportunities for savings

Concerns about using the cloud usually revolve around security of data and a perceived reduction in 'control' of IT systems. However, most informed commentators now consider cloud services to be more secure than traditional data centres as the big cloud suppliers can afford to invest in world class security and recovery systems that are beyond the budgets of local data centres. Also, as with any contract for services, effective control of systems is achieved through the procurement and management processes; always remembering that an organisation's data protection responsibilities continue to apply, regardless of where its data is held.

A large number of councils have no Cloud IT strategy
61% of councils (including 45% of the top 100) have no cloud IT policy.

The majority of councils still hold most data on site
– 69% of council (77% of small councils) hold 75% or more of their data on premise.

Source: Up in the Air: The state of the cloud adoption in local government in 2016, eduserv.org.uk

The picture around the world shows a similar process of transition to the cloud. The City of Chicago announced in 2013 that it was adopting a cloud strategy for all employee email and desktop applications in a move that would save the city $400,000 per year, also helping its 30,000 employees perform their jobs more effectively and streamlining its operations.[5] In KwaZulu-Natal in South Africa, Impendle Municipality responded to a failed audit of IT service continuity by adopting cloud computing as an alternative to the costly task of building infrastructure and creating a revamped data centre.[6]

In summary, cloud computing is good news for government and public sector organisations, and most organisations will need to move to greater use of cloud solutions as the market continues to evolve.

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Developing a policy for the use of cloud IT to support the organisation needs to be a priority for every council.

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\ preparing for transition to a cloud environment?

Developing the business case

This report is structured around a simplified process for developing the business case that is summarised in Fig 1 (page 10). Organisations may have their own processes and templates for developing business cases, but this process aligns broadly with the Better Business Cases™ initiative[7] from HM Treasury and the Welsh Government (based on HM Treasury's Five Case Model[8]) and the CIPFA Transforming Corporate Services Toolkit.[9] This report does not, however, seek to describe or prescribe a specific process for developing business cases. The tracking arrows at the start of each section are to help orientate readers through the process.
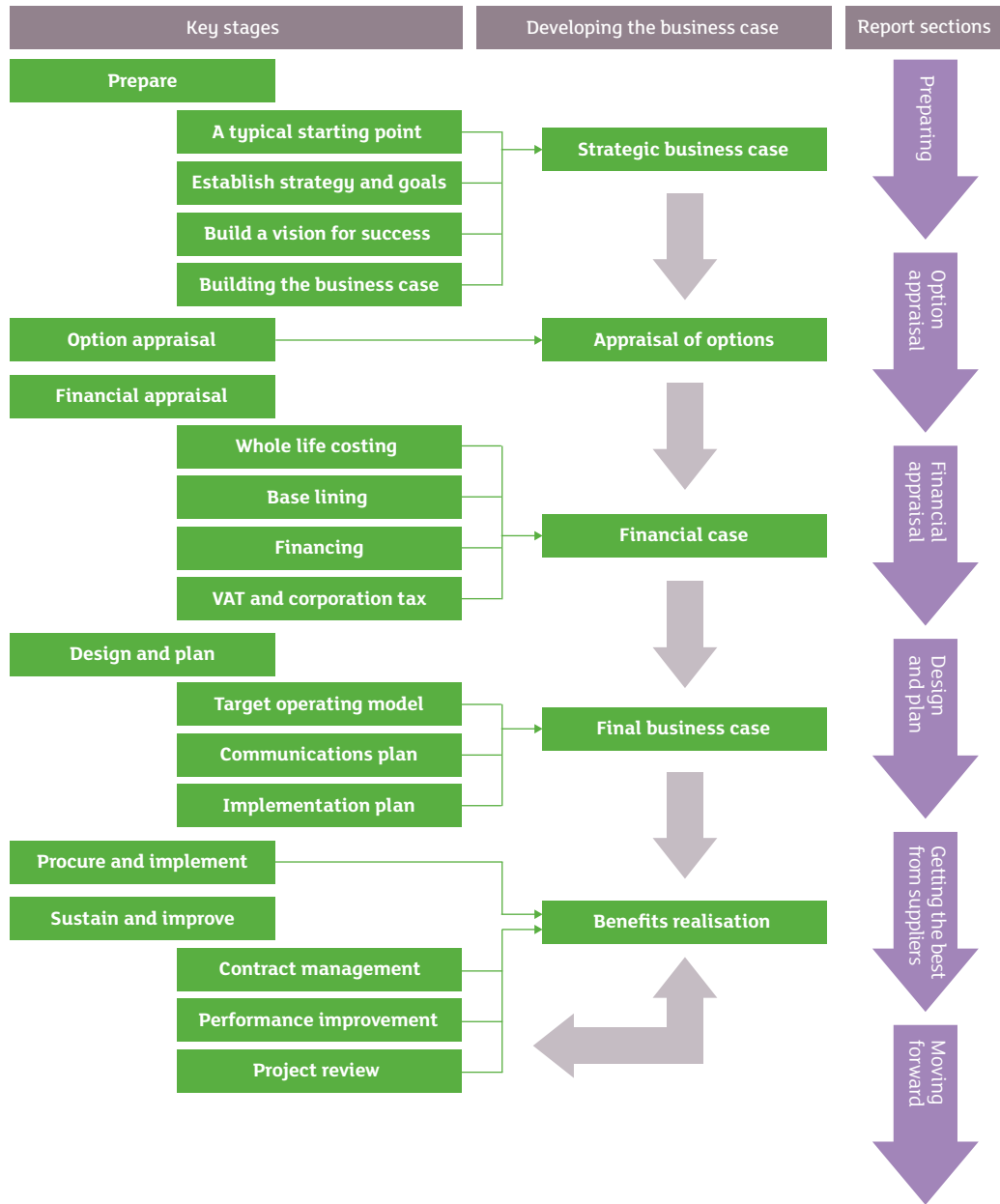
A typical starting point

The Derby City case study (starting on page 11) exemplifies the starting point for many public sector bodies.[10] For most, there are three main drivers: Sustained pressure to reduce costs; the need to increase productivity as limited resources are spread more thinly, and the recognition that staff require the support of up-to-date ICT and modern processes in order to realise potential savings and productivity gains.

Establish strategy and goals

It is important at the outset to be clear about what the organisation is trying to achieve and why. Briefing sessions for senior management, suppliers and staff will help to draw in stakeholders and build understanding to ensure that, even at this early stage, key stakeholders understand the reasons for moving to the cloud. The move should be seen as a corporate project, owned by the whole organisation and not an 'IT project'. Having said this, the CIO and IT team clearly have a lead role in drawing up and sharing the strategy.

Senior members of the IT team need to take time to understand all aspects of the cloud and which of the many options and approaches to recommend. They will need to be able to articulate an overall plan of action together with costed options. The finance team needs to be able to work with them in a positive way, encouraging, questioning and helping to build costed models to underpin decision making and support strategy development. It is probably best to establish a small high-level Cloud Strategy Board to oversee and steer the development of the Cloud Strategy.

Fig 1: Key stages to cloud migration

Key stages	Developing the business case	Report sections
Prepare		Preparing
A typical starting point	**Strategic business case**	
Establish strategy and goals		
Build a vision for success		
Building the business case		
Option appraisal	**Appraisal of options**	Option appraisal
Financial appraisal		Financial appraisal
Whole life costing	**Financial case**	
Base lining		
Financing		
VAT and corporation tax		
Design and plan		Design and plan
Target operating model	**Final business case**	
Communications plan		
Implementation plan		
Procure and implement	**Benefits realisation**	Getting the best from suppliers
Sustain and improve		
Contract management		Moving forward
Performance improvement		
Project review		

Build a vision for success

Involve and consult as many people as possible, at all levels of the organisation, in the creation of the vision. Explaining in non-technical terms what is planned and describing the expected benefits should help to build support and commitment. The vision needs to mean something to everyone and to align with the values, objectives and culture of the organisation. It is also important at this early stage to address concerns and identify areas of risk, taking note of important times of the year when specific systems must be available.

The vision might include:

- [ ] delivering responsive and timely services, cost efficiently
- [ ] benefiting from economies of scale
- [ ] an office with modern efficient systems
- [ ] supporting managers with up-to-date and timely information
- [ ] delivering world-class corporate services
- [ ] supporting agile and flexible working
- [ ] being supported by world class security and business continuity systems.

Derby City Council

Financial Context: The revenue budget has reduced from £250m in 2010/11 to £222m in 2015/16; a reduction of £28m (11.2%). But, this has required savings of £96m to offset new demands and increased expenditure on Adult and Children's Care. A further £49m of saving is required over the coming two years.

IT expenditure: This has reduced from roughly £12m in 2010/11 to £8.3m in 2015/16; a reduction of £ 3.7m (30.8%), with a further reduction due in 2016/17.

Revenue and capital: Historically most IT infrastructure has been funded from capital with big bang refreshes every five or seven years. Moving to a utility model and cloud computing would therefore transfer expenditure from capital to revenue budgets at a time when revenue budgets are under increased pressure and scrutiny. However, delaying a 'technology refresh' risked lower productivity and additional hidden costs to the business. Solving this dilemma was a key part of the cloud journey, and involved taking time to develop a robust cost model that compared total costs, including capital expenditure, and showed how cloud computing could offer like for like savings, and use less IT resources as the council's shape and size changed.

Source: Extracted from *Journey to the Cloud – Four Years in the Making*, a blog by Nick O'Reilly, CIO

Questioning, challenging and supporting

Asking the right question is at the heart of effective planning and decision making. At the preparation stage and throughout the transition process, the finance team have a key role to play in questioning, challenging and supporting, both as part of the project team and more generally in supporting good governance and stewardship. Early in the decision-making process, you will want to build rapport, get people talking and understand their points of view to gather information. You might, for example, want to check understanding, help to generate options or open-up the conversation. Once you have lots of information, some options and a good corporate understanding of the way forward, it is time to start to refine and narrow down the options, assess feasibility, identify priorities and preferences and be clear about commitments. At this stage the aim is to focus the conversation and draw conclusions.

Challenge is about asking the 'right' questions to really understand needs and requirements (not taking things at face value) in a genuine desire to help correctly diagnose what is required and why it is important. Knowing when and how to challenge is important, as is style. Challenge is about focusing resources on priorities and getting the right result for the organisation; and making decisions built on mutual trust and respect.

Questions could include:

☐ What do we think is most important here?

☐ How could we evidence this?

☐ What will our customers think?

☐ What will our staff think?

☐ Why is that?

☐ What options do we have?

☐ Which one might be best?

☐ How can we investigate this option further?

☐ Who will do what next and by when?

SECTION 3

option appraisal and types of cloud services

Preparing → **Option appraisal** → Financial appraisal → Design and plan → Getting the best from suppliers → Moving forward

Cloud computing has more than its fair share of acronyms and specialist terms. This section provides a basic guide to deciphering some of the terms used and an outline of the type of process that the IT Team might use for option appraisal.

Common terms

Public cloud: The public cloud is a 'multi-tenant' environment, where an organisation purchases access to a portion of a cloud computing environment that is shared with other clients or tenants. This is attractive because the big cloud providers can achieve huge economies of scale by buying hardware in bulk, tens of thousands of servers at a time, and operating very large and efficient datacentres.

Private cloud: In a private cloud the hardware, storage and network are dedicated to a single client or organisation. This may be chosen for security reasons, for example, where the hardware, data storage and network can be designed to assure high levels of security that cannot be accessed by other clients in the same data centre. A private cloud can also be hosted in an on-premises datacentre, where certain applications or data cannot be moved off premises. Private clouds, however, do not provide the cost savings and efficiencies that the public cloud can. Private clouds are not delivered through a utility model or on a pay-as-you-go basis because the hardware and in many cases the staff are dedicated to a single organisation. Establishing a private cloud in an existing data centre may be a stepping stone to moving to the public cloud.

Virtualisation: Understanding virtualisation helps explain the transition to the cloud. 'Virtualisation' enables an IT team to reduce the amount of hardware required by using software tools that will run multiple applications and multiple operating systems on the same machine.[11] The most common form of virtualisation is the consolidation of servers. Traditionally, each software application has had its own server, a computer that stores and shares files and programmes for many users, together with the operating system to run the application. Virtualisation means that a single machine can operate as several servers simultaneously. Each 'virtual server' has its own operating system that believes it has sole control of the underlying hardware, but the virtualisation software controls access in such a way that several operating systems can work without colliding with one another. One important aspect of virtualisation is that it provides a powerful capability without imposing the need for significant changes to software products or processes. Virtualisation is a technology that has already been widely adopted in on-site datacentres.

Infrastructure as a Service (IaaS): with IaaS[12], the application virtual machines are simply moved from on-premises to the cloud. This is the easiest migration strategy and has many benefits, including cost savings. But, it still means that your operations staff will need to perform tasks such as patch management, updates and upgrades. IaaS is one of the most common routes to using the cloud as it is similar to operating onsite IT services and it reduces the time between purchasing and deployment to almost nothing.

Platform as a Service (PaaS): With PaaS[13], the cloud provider maintains all system software, removing the burden of upgrades and patches from an IT department. In a PaaS deployment model, the client organisation needs only to focus on deploying its code on the PaaS machines; the cloud provider ensures that operating systems, database software, integration software and other features are maintained, kept up to date and meet targets set in out in the service level agreement (SLA).

Software as a Service (SaaS): This means that the software application (say email and productivity tools such as Microsoft's Office 365) is rented rather than purchased. Instead of buying applications and paying for periodic upgrades, SaaS is subscription based, and upgrades are automatic during the subscription period. When the subscription expires, the software is no longer valid. The involvement of an IT department may perhaps be as limited as setting up users and integrating the application with single sign-on.

The hybrid cloud: Organisations might choose to keep some applications on-premises – perhaps they are based on non-standard systems or out-of-date software, or perhaps they will remain on-premises while waiting for their turn to be migrated to the cloud. In this model, some applications run in the cloud, whereas others remain on-premises, requiring a secure, high-speed communications path between the two environments. The cloud then becomes an extension of the existing datacentre and vice versa.

Option appraisal

Explore the options and test viability as changes to plans, usually become more costly and have a bigger impact the later that they are implemented. Further advice on conducting option appraisals is available from CIPFA.[14] The outcome of the option appraisal will then set the foundations for the final business case (see Fig 1), procurement and implementation processes.

The first challenge for the IT team is to take stock of systems that are currently used. The optimum strategy from an efficiency and cost perspective may be to move as many applications as possible to a SaaS model, with the least efficient approach (involving the highest cost and most resources) being to keep them on-premises. This means analysing each application to determine its best fit for its hosting environment. The IT team should look at the job that each application performs – is it still required, does it need further investment or should it be retired and replaced? Can it be run as a SaaS service or does it need to be migrated to PaaS or IaaS? Fig 2 shows a high level decision tree that illustrates a typical approach for appraising options.

It is probably best to use as your starting point a 'leave nothing behind' approach, ie move everything to the cloud. You will probably end up with plans to move perhaps 50% to 80% to the public cloud but you should start with an expectation that you want to move everything.

Work with the IT team to develop several scenarios for a cloud migration, including aggressive, moderate and slow migration plans. An aggressive plan might involve say moving 60% of your workloads to the cloud in the first year, whereas a moderate plan might be 30%. Aggressive plans will potentially save you more, but this must be weighed against greater risk and higher migration costs. You will also want to consider any existing service contracts that might reduce flexibility or involve additional costs. Also include the impact/implications for key activities and policies such as the IT Service Desk, mobile and remote working, greater use of productivity tools and 'bring your own device' (BYOD).

Derby City Council

As part of the emerging Cloud First strategy we adopted four measures to test future investment that we continue to use today:

1. Helps us better deliver our services to residents and businesses

2. Is cost effective

3. Is able to respond to changes in the business

4. Allows us to work flexibly

Source: Extracted from *Journey to the Cloud – Four Years in the Making*, a blog by Nick O'Reilly, CIO

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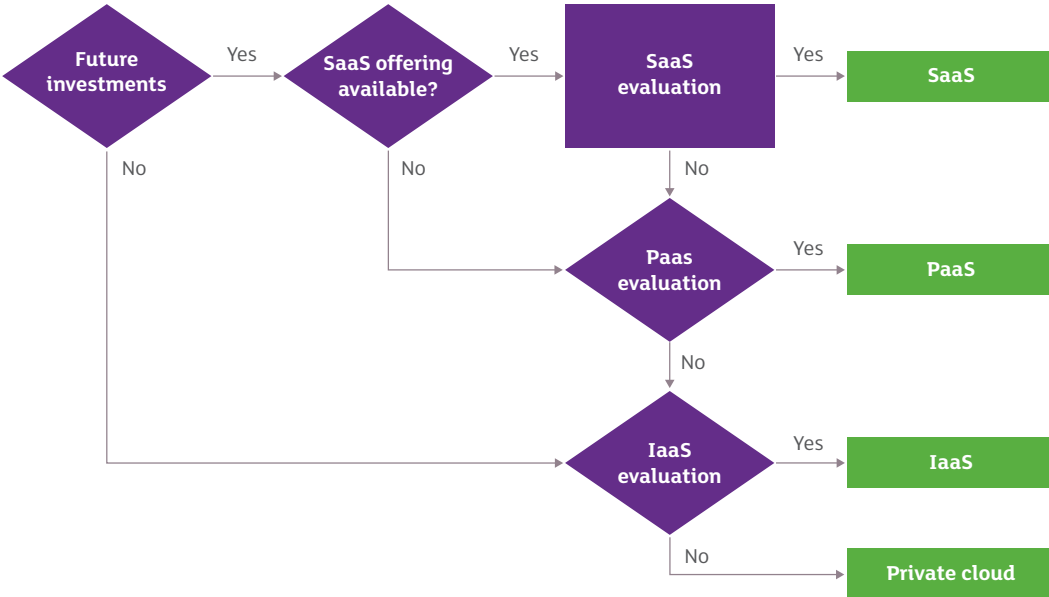## We wanted much more flexibility in where and how we worked, both within the office and well beyond it.

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As the team analyses the information, or more information becomes available, this may spark new ideas or variations. Appraisal development should be a dynamic process.

Fig 2: High level decision tree

Source: Based on Enterprise Cloud Strategy, Barry Briggs and Eduardo Kassner, Microsoft Press, 2016

SECTION 4

financial appraisal

Preparing → Option appraisal → **Financial appraisal** → Design and plan → Getting the best from suppliers → Moving forward

Derby City Council

A five-year cost model was base-lined for IT services as at 2014/15 which showed annual expenditure for the council and Derby Homes ALMO of £10.4m a year. This was then adjusted for the £1.06m savings committed in 2015/16; leaving an annual combined spend of £9.34m. Over five years without including any inflation this came to a total of £ 46.7m.

The cost model for moving to the cloud was built up from soft market testing and estimates provided prior to procurement through G-Cloud. This showed additional implementation costs of £1.96m; however, the council would have faced some technology refresh costs even if it had extended the existing contract or faced procurement and migration costs had it tendered for a new service partner.

The annual costs based on an initial 'like for like' number of servers was estimated to be £8.4m; a saving of just under £1m a year. Taking into account the set-up costs, this would produce a saving of just over £3m over a five-year period, before taking into account any additional savings from optimising the cloud environment, and achieving further software cost reductions using the G-Cloud framework contract.

Both the set up and annual costs following the procurement process were less than we had allowed in the cost model.

Source: Extracted from *Journey to the Cloud – Four Years in the Making,* a blog by Nick O'Reilly, CIO

Whole life costing

Appraisals often focus on initial capital costs, with limited attention given to longer-term costs arising from the decision process. For example, future likely maintenance or energy costs linked to maintaining data centres, and additional costs of physical and information security in an increasingly aggressive cyber world may receive limited attention at the point that key decisions are made, but become increasingly important going forward. Similarly, the potential benefits arising from a more mobile and collaborative workforce may not be fully factored in.

Whole life costing[15] is usually the best way to avoid shortcomings, compare options and support informed decision making. Whole life costing is used to establish the total cost of acquisition, migration and ownership. It is used to capture all the elements of cost over the anticipated lifespan of a contract, software application or service, and compare options in an objective manner.

Generally, the introduction of new cloud computing services is part of a wider transformation project that involves the transition of services from a traditional data centre, whilst at the same time introducing new ways of working and driving broader efficiencies. These transformation projects can therefore include additional costs such as business process reengineering, testing, training and data migration. There may also be prepayments for software services, including payments for enhanced functionality or for integration with other software in use or planned. These costs may relate to activities performed by the service provider, the customer's internal personnel or third parties, and may also include overhead and administrative costs. Additionally, they might include rights to future service upgrades and enhancements, as well as payment plans to smooth out either large upfront costs or initial discounts. These factors may add complexity to both costing and financing decisions.

The evaluation of options and the final decision will usually be based on the option that provides the best value for money over the whole life of the project. This does not necessarily mean that the decision is based purely on price. Qualitative aspects will also play an important part in the decision, such as the supplier's ability to deliver to certain standards and provide appropriate support, as well as ensuring security and resilience. Also, options that allow for, and share, the benefits of technology developments that might reduce costs or improve performance are likely to be more attractive than those that don't.

A checklist of key elements of the financial case

☐ Benefits of proceeding

☐ Implications of not proceeding or delaying a decision

☐ Total cost over expected Life

☐ Overall funding and affordability

☐ Impact on income and expenditure account

☐ Impact on balance sheet

☐ Cashflow implications

☐ Capital and revenue requirements

☐ VAT and corporation tax implications

☐ Assessment of environmental impact and sustainability

Concerns are sometimes expressed over the difficulties of forecasting and assessing some of the costs and benefits identified above. Others point out that the future is uncertain and that technologies will continue to change over time. Whole life costing does not mean perfect forecasts of long term cash flows. Financial planning and forecasting often involves estimating and, in some cases best 'guesstimates'. Good reliable data should be sought out and used where possible, recognising that whole life costing is a process of assessing and comparing a range of options based on the best information that is currently available.

The appraisal should also include environmental and sustainability assessments, such as issues relating to consumption of resources and minimising environmental impact. A study by Accenture[16], for example, concluded that organisations can reduce their carbon emissions by 30% to 90% by switching to a cloud infrastructure.

Base lining

An essential element of option appraisal and developing a business case is establishing the base-case, knowing what is happing now and what it costs. In theory, this ought to be easy, in practice it can be much more complex. Omid Shiraji, Interim Chief Information Officer (CIO), at the London Borough of Camden explained some of the difficulties. At the time of writing Camden is in the process of merging IT services with Islington and Haringey. This is described as a 'journey of convergence' towards a shared service for three boroughs, with ambitious expectations for using the cloud. There are currently eight data centres across the three councils, and the plan is to move to two data centres plus the cloud. The main driver is 'transformation across the three organisations', together with an expectation that savings of £6m will be possible. So far, some soft market testing has been undertaken.

Shiraji explains that one of the big difficulties is understanding, defining and documenting all the activities that councils undertake in order to map all of the systems and technologies that underpin its services. 'Mapping the systems and what they do as a baseline is a significant challenge; then you also need to be in a position to have conversations about the lifecycles of those products going forward', says Shiraji. 'Translating that into what services you move to the cloud and the timing of that is the next difficulty. These are the big issues, and even more challenging when you are working across three councils'.

"Costing the base-line is also difficult", says Shiraji:'In my experience organisations typically have gone through different processes of IT centralisation, decentralisation and recentralisation. IT costs have been shared and pooled, and then reallocated. Mostly assets have been funded from capital, but not all. Many of these assets have depreciated to zero value but are still in use. Plus, not all of the IT costs are in the IT budget. Coming up with robust base-line costs can be really difficult'.

Financing

It is important to distinguish between the financial appraisal and the financing of the solution. Cloud computing can appear to create challenges for organisations as it means that software and technology are now purchased 'as a service', with expenditure probably moving from capital to revenue. The use of whole life costing should allow for proper option appraisal and comparison between capital and revenue based procurement but there can remain a perceived difference in the attractiveness of capital compared to revenue funding because of public sector funding models. Whilst capital expenditure will ultimately feed into financing costs, the direct charge to the revenue account arising from service based contracts can be seen more explicitly as a call on scarce resources, an issue which is particularly pertinent when future revenue streams are subject to a degree of risk.

In local government, the advent of the Prudential Code for Capital Finance in Local Authorities has led to a more lifecycle cost approach to capital investment.[17] Plus, guidance on Minimum Revenue Provision[18] means that borrowing to reflect the acquisition of assets should more directly reflect the asset lives of capital projects, which means that capital charges will be more comparable to revenue projects. The aim is to look at the value provided by projects over the life of the project and then use the flexibility to invest in capital assets or revenue services as to which provides the best value. In other sectors, for example the NHS, there may be issues around access to capital rather than revenue resources (accepting that both are under severe pressure).

There are also issues about the costs of transition and how these can be funded. Within local government, for example, funding is available for transformation projects, allowing capital receipts to be used to fund these. As noted above, the introduction of new cloud computing services is usually part of a wider transformation project.

VAT

As part of the consultation exercise, some organisations asked if there are VAT implications in moving to the cloud and a SaaS model. This can be a complex area and organisations would need to take specialist advice from their own tax advisors if they have any concerns or particular issues. CIPFA's Tax Advisory Service[19], operated in conjunction with Deloitte, signposted the following broad information.

VAT and local councils

VAT is unlikely to be a significant issue for local authorities as they can recover both the VAT payable on cloud services as well the VAT payable on software and equipment purchases, and operating a data centre. The implications of a move from traditional IT or from capital to revenue expenditure are therefore more likely to impact on cashflow rather than budgets and overall costs.

Some asked if a move to the cloud could impact on a local authority's partial exemption calculation and de minimis limit. The background to this is that HMRC require local authorities to complete a partial exemption calculation every year to show how much of the input tax that they have claimed back in the year relates to the exempt supplies. There is a 'de minimis limit' set, which is 5% of the total input tax that was reclaimed in the year. If the amount of input tax that relates to making exempt supplies is below that limit, the council is entitled to keep the exempt input tax (which has already been reclaimed during the year). However, if the limit is exceeded, all input tax that has been reclaimed in relation to exempt supplies would have to be repaid to HMRC. The most likely impact for a typical council is that the additional input tax that it will recover as a result of using cloud services will mean the de minimus level will rise slightly (ie it will be 5% of a greater number) – for most councils the impact is expected to be minimal.

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> **We have already reduced our IT costs from £60m to £34m over the last few years. We now need to use the cloud to streamline public services and move to more collaborative IT services.** ❞
>
> **David Wilde,** CIO and Chief Digital Officer, Essex County Council.

VAT and government departments and NHS bodies

The position for government departments and NHS bodies is more nuanced and requires more detailed investigation and interpretation. Broadly the position is that VAT can be recovered on contracted out services where there has been the capability to perform the service in-house (within Government or NHS). The VAT Government and Public Bodies Manual[20] provides specific advice on this topic under COS Heading 14. The origins of this heading lie in the outsourcing of entire IT systems by central government to the private sector. For this reason, the heading does not cover in isolation the procurement of software or web services. The important element is that the department or NHS trust is procuring an IT system designed to its specifications (or to wider government or NHS specifications). Whether ownership of the hardware is or is not in the public sector, whether there is one supplier or several suppliers, whether the servers are or are not remote, does not affect this basic position. The advice specifically <u>includes</u> the recovery of VAT paid on:

- the provision by one or more suppliers of a fully managed and serviced computer infrastructure either using the recipients' own hardware or hardware provided by the supplier as part of the infrastructure

- software support which forms part of a fully managed and serviced computer infrastructure

- the development, implementation and support of bespoke software

- hosting computing services, archiving communication services, data communications services, data lines and cloud computing.

But it specifically <u>excludes</u> recovery for:

- the supply and support of off-the-shelf software

- licence fees except where integral to the provision of bespoke software or a fully managed and serviced computer infrastructure

- the hire, installation or purchase of hardware alone

- hire of computer consultants to add expertise to in-house IT teams.

Corporation tax

Corporation tax is only likely to become an issue if special purpose vehicles are used to supply services, for example using a limited company to provide shared services to several organisations. In such cases, you would expect to take specialist tax advice at the early stages of considering these types of corporate structures.

"

Coming up with robust base-line costs can be really difficult.

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Omid Shiraji, Interim Chief Information Officer, London Borough of Camden

NHS Choices

NHS Choices (www.nhs.uk) is one of the largest websites in the UK with over 580 million visits a year. It includes hundreds of videos, more than 20,000 regularly updated articles on health and wellness, plus hundreds of thousands of entries to help visitors find, choose, and compare the health services available to them. The site also incorporates interactive tools to compare, rate, and comment on services such as hospitals, doctors, care homes, and dentists. The HSCIC (now called NHS Digital) was managing a hosted datacentre with 30 servers and required a more cost-effective platform, especially as the existing site traffic was almost at capacity and a sharp increase in traffic was expected. Since moving to the cloud, the NHS Choices website has been able to handle record traffic levels and has reduced annual hosting costs by 40%.

Sources: http://blogs.nhs.uk/choices-blog/2016/01/06/nhs-choices-traffic-in-2015/ and http://www.technologyrecord.com/Article/azure-platform-helps-to-improve-nhs-choices-website-in-england-46250#.WLQAQt-yqUk

SECTION 5

design
and plan

Preparing → Option appraisal → Financial appraisal → **Design and plan** → Getting the best from suppliers → Moving forward

Implementation plan

At this stage, an organisation will want clear answers to questions such as – where do we start, how do we develop a plan for migration, and how will this change the ways that we operate and communicate? The finance team will also want to ensure that there is good governance in place and that there are clear:

- Roles and responsibilities - especially for design, specification and procurement of services.

- Proposals for monitoring, reporting and supervision.

- Milestones identified and specified.

- Review processes to check costs and benefits against those set out in the business case.

- Identifiable requirements that will lead to review and revision of the business case.

- Risk management plans that are compatible with the timetable for further decisions and refinement of plans.

Derby City Council

After the Council Cabinet ratified the cloud approach, **we identified four key activities** that we needed to fulfil as the final part of the planning stage:

- Develop a **communication plan** for the Staff, both council and our service partner's staff to explain the process and map out how and when this will involve them

- Develop a new **Target Operating Model** that identifies how the information systems service will operate in future and an initial mapping exercise between how we operate now and how we plan to operate

- **Source a supplier**, using the G-Cloud framework, to assist with the final verification of the cloud approach, provide high and lower level designs for use in the cloud implementation procurement and to add some flesh to the soft market testing

- **Build a more detailed cost model** for the implementation and operation of the new cloud first service model.

Source: Extracted from *Journey to the Cloud – Four Years in the Making*, a blog by Nick O'Reilly, CIO

Target operating model

As part of the design process your organisation will need to understand how to integrate between different clouds and how to integrate between cloud and on-site solutions. The graphic below provides an example of a high-level target operating model developed by Derby City Council. The detail is not important for the purposes of this report, it does however provide an insight into the complexity and potential relationships. In this example a series of components have been defined, with the blue elements to be provided internally, orange to be sourced, and the green based on demand and not core funded.

Fig 3: Derby City Council target operating model

Service integration and management		Programme office	Supporting services

Strategy

Support and service delivery

Call mgt and 1st line

IT service desk

| Helpdesk | Self-service and targeted content | IT asset management |

2nd line

End user computing	Application maintenance and support		
Support	LOB ("core") apps	Supported apps	Corporate enabling systems
Provision	Interface/API's		

3rd line/ 3rd party

| External warranties/ repair | External application providers | Non-supported apps |

Programme office column:

Implementation/ development services

Professional services

Sourcing/ fulfillment

IS and application development

Innovation, R&D, ROI

Supporting services column:

Procurement management

HR

Finance

Legal

Corporate governance

Connectivity

| Mobile telephony | Fixed telephony | Network and telecomms |

Hardware and software

Hosting	SaaS
	PaaS
	Iaas

Infrastructure

Traded services (incl. schools)

Security, compliance and architecture

Source: Extracted from *Journey to the Cloud – Four Years in the Making*, a blog by Nick O'Reilly, CIO

In developing the target operating model the IT team will probably talk in terms of being guided by SIAM principles and the ITIL service management framework. Service Integration and Management (SIAM) is the set of principles and practices that facilitate collaborative working relationships between service providers to maximise the benefit of multi-sourcing. IT Infrastructure Library (ITIL) is a set of practices for IT service management (ITSM) that focus on aligning IT services with the needs of the organisation. ITIL and SIAM work together with ITIL providing practices for service definition activities and SIAM helping to source from multiple service providers.

Communications and engagement plan

As with any major change project, a plan is required to engage, update and encourage all stakeholders, particularly staff affected by the change. An essential element of the plan is to develop it into a 'change story'. This helps to establish a shared understanding of the pressures and drivers at all levels of the organisation, and explain why the transition to the cloud is 'necessary' and 'appropriate'. The changes need to be presented positively and honestly; for many this means new opportunities – new skills and doing new things, and where necessary positive support to redeploy staff and help them to move on in their careers. This will help to overcome resistance and concerns. Time and effort devoted to effective staff communications and engagement has a big impact on how smoothly projects progress, as well as overall morale and commitment to the organisation and its goals. Identify effective ways to strengthen communication, such as newsletters, blogs, message-of-the-day and posters. Also, recognise that you will need to regularly repeat key communications as people often only hear certain things that will impact on them, and it is easy to assume incorrectly everything has been communicated effectively. The communications plan also needs to align with the type of culture and aspirations that you are trying to establish, as well as the arrangements and processes for performance management.

Processes

Public sector business processes can sometimes be more complicated than they need to be, which can lead to expensive bespoke solutions rather than simplifying the processes. As one accountant explained: 'quirky processes cost money'. Adopting simple generic processes wherever possible will generally help to reduce both costs and risks.

how to get the best from suppliers

| Preparing | Option appraisal | Financial appraisal | Design and plan | Getting the best from suppliers | Moving forward |

As procurement and implementation get underway, more information will become available on the likely cost to be incurred, as well as a more refined statement of benefits and risks. It is important that these changes are captured and the business case is updated to reflect them. It is also important to recognise that cloud procurement processes usually provide more options and a greater ability to negotiate.

As one CIO put it, 'most people's brains explode when they look at pricing schedules and options, and try to make sense of them'. Modelling options to balance the risk of under usage against lower unit costs through volume discounts, and knowing when to lock-in pricing can be challenging, particularly for complex cloud migrations. Generally, if your requirements are relatively static and predictable, you can lock in prices, whereas if you are undergoing major changes of structure, have unpredictable levels of activity or anticipate big changes in your storage requirements, you will need more flexibility. Some suppliers are willing to agree multi-year deals in return for discounts or defer making any payments for three, six, nine or possibly even 12 months, so that savings can be realised before payments are made. If you are having difficulty deciding on the most appropriate pricing option and do not have the skills in-house, you might want draw in partners to help obtain the best deal.

Be clear about an exit strategy. Some organisations fear that if they place their data in the cloud they may become locked into one supplier. The organisation will need confidence that it can move relatively easily to another supplier, taking all data, intellectual property and processes. A good supplier will recognise these requirements and have a simple policy and process that they will share.

Any procurement process will most likely include Digital Marketplace and the G-Cloud framework (see Section 1). The G-Cloud framework contracts provide a lot of transparency around contracting and avoiding lock-in, however they are generally for one or two years only, consistent with their commodity approach to purchasing cloud services, which may be shorter than some organisations would wish.

Get assurances about the security and resilience of the services offered. Individual cloud suppliers will not remain in business if there are any doubts in these areas. The big suppliers have world class teams working on these issues to retain trust and confidence, and invest much more in these areas than most individual organisations could contemplate.

Think about how to monitor the performance of the cloud supplier(s). Be aware that monitoring cloud performance is different to traditional IT performance management. For example, tradition upgrades to applications are usually irregular, costly and take time to test and accept. In the cloud these can be implemented relatively seamlessly, with little impact on the user and IT team.

SECTION 6

moving forward

Preparing → Option appraisal → Financial appraisal → Design and plan → Getting the best from suppliers → **Moving forward**

The journey to the cloud is about more than just cost savings. Importantly, the cloud can become a catalyst for modernisation, innovation and collaboration, as illustrated by the quote from Essex County Council.

"Business cases will often talk in general terms about the efficiency gains that come from mobile working. The real business case is that mobility releases assets. If mobile working means that you can reduce 125 buildings to 25 buildings, that is a massive capital receipt, together with savings in operating costs and utilities. That is the real prize that comes from mobile working. Imagine then the benefits of moving to multi agency working and sharing administrative buildings, the benefits for the public sector can be huge, not to mention the benefits that come from organisations like health, local government and police working collaboratively."

David Wilde, CIO and Chief Digital Officer, Essex County Council.

Big data and analytics

In the digital world, data is a valuable asset that can acquire greater value based on how it is used. Data provides the power to drive organisations and the oil to lubricate its processes. Using the cloud to capture and analyse your data can provide insights into customers, services and processes, and help your organisation understand better relationships such as 'cause' and 'effect'. This will improve cost control, performance monitoring and risk management; all topics where CFOs have strong interests.

Innovation and experimentation

Many organisations are looking to cloud services to support innovation and experimentation. The cloud provides agility and the ability to experiment – a 'try it – and fail or succeed fast' approach. As one CIO explained: 'You can spin-up a virtual data centre and experiment with large-scale data analytics or artificial intelligence (AI). You pay for the IT you use and somebody else does the heavy-lifting in IT terms, enabling you to concentrate on learning and developing new skills. Scaling these innovations then helps to modernise your services and add further value to your data'. Another said: 'We are not yet ready for AI, chat boxes and the Internet of things, but using the cloud means that we will have a platform that enables us to integrate them when we are ready.'

Data sharing and interoperability

The cloud makes sharing and collaboration easier. The integration of health and social care, for example, requires a whole-systems approach, with care professions and organisations each having a full picture of the person being cared for, and the patient also taking a greater role in the co-ordination of their own care. Linked to this, the NHS Five Year Forward View[21], commits to fully interoperable electronic health records, with patients also having full access and the ability to write into them. A shared, cloud-based care record system could quickly deliver to a care professional all the information that is relevant to a patient's treatment, at the point of care, without having to sign on to different systems. It is estimated that NHS trusts could perhaps save 5%[22] of their annual budgets through the resulting improvements in efficiency and effectiveness.

Top tips for moving forward

Focus on outcomes:

Start by defining your digital ambition. Be clear about the outcome that you want to achieve

Prioritise people:

Prioritise your investment in skills, show that you want to re-skill you people and carry them with you. You will probably need fewer more highly skilled people. Invest in the skills to understand better the technologies and how to get the best out of your suppliers. Explain what you are doing and why.

Documentation:

Get your documentation in order – know what your IT estate looks like. Be clear about existing costs, contracts and timings, eg know when renewals makes sense and when they don't.

Keep it simple:

Keep it simple and use generic processes and tools. Don't reinvent the wheel, learn from others, collect their experiences, and be prepared to share what you have learnt.

Ensure high level backing:

Ensure support and commitment from senior executives and political support where appropriate.

"

If mobile working means that you can reduce 125 buildings to 25 buildings, that is a massive capital receipt.

David Wilde, CIO and Chief Digital Officer, Essex County Council.

"

synopsis of key points

Developing the business case

- Think of the cloud not as a technology, but more of a strategy.

- An organisation should be clear about what it is trying to achieve and why.

- Potential benefits include ongoing savings; easier to remain up-to-date; simpler and more flexible remote working; and, improved security.

- Ensure everyone understands the respective advantages and implications of the public, private and hybrid clouds.

- Ideally, start with an expectation that all systems can be moved to the cloud, then adapt this expectation in the light of more detailed information on feasibility and timescales.

- Identify existing contracts that might reduce flexibility, impact on timing, or involve additional costs.

- Work with the IT team to develop several scenarios for cloud migration, factoring in as appropriate the use of *Infrastructure as a Service* (IaaS); *Platform as a Service* (PaaS); and, *Software as a Service* (SaaS).

- Aggressive plans will potentially save more earlier, but these potential saving need to be weighed against greater risk and higher migration costs.

Financial appraisal

- Establishing the baseline can be more complicated than expected due to past structural changes such as centralisation and decentralisation of IT, outsourcing and changing financing polices – work with the best information available.

- Whole life costing is usually the best way to compare options and support informed decision making, including comparing capital and revenue based procurement.

- It is important to distinguish between the financial appraisal and the financing of the solution, these are different.

- The introduction of new cloud computing services is usually part of a wider transformation project, with wider longer term benefits.

- VAT – government departments and NHS bodies should review HMRC guidance at an early stage to ensure compliance. VAT is unlikely to be a significant issue for local authorities.

- Corporation tax is only likely to become an issue if a special purpose vehicle is used to supply services, for example, using a limited company to provide shared services to several organisations.

Getting the best from suppliers

- Model the options, balancing the risk of under usage against the lower unit costs available through volume discounts.

- An organisation should be clear about the exit strategy to ensure that it can move relatively easily to another supplier, taking its data, intellectual property and processes with it.

- Check the security and resilience of the services offered.

- Contract monitoring is different to traditional IT contracts, an organisation shoudl work with the most suitable metrics.

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recycle

INVESTORS
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