

Cloud Sourcing: Implications for Managing the IT Function

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1 Introduction

Our research points to the considerable promise of Cloud [1]¹, and the even bigger opportunity waiting to be grasped. However, this is all before us in a future still undetermined, despite confident predictions of very large revenues and business benefits from cloud technologies within 2-3 years. If *'the mark of a successful technology is that it vanishes,'* [2] then cloud computing has a long way to go. Not only has it been the most visible technology by far in the last three years, but this looks likely to continue for the next three. Leaders in industry and governments worldwide find themselves on the cusp of potential major deployment of these technologies but find themselves at a key **Stop, Think, Act** moment. In the face of business demands, technological developments and the maturing of external services, CIOs, in particular, need to be thinking about, and revisiting, what their technology organizations need to look like three to five years out. Managing cloud deployment on a project-to-project or six months-to six months basis, is not going to achieve technological integration, optimize cloud deployment, or deliver on the agenda businesses are setting for cloud. CIOs will be looking at their strategy, capabilities, operating model and ability to execute, how cloud fits with their existing technologies and organization, and its implications for *this* industry, and *this* business – because there is no single cloud, and it is going to be different for every organization. Ultimately it is management that will make the difference. And for management, there is a (very large) sting in the tail. In the face of the forthcoming data explosion, the problems organizations have always had with optimizing their use of information are just about to get much, much, more difficult. This brings to the fore the need for organizations, and their technology functions, to resist the old compulsion to merely straightjacket the data explosion with superior technology, and instead rethink themselves as digital businesses, and address the importance of business analytics for guiding strategic action and operations [3].

¹ Cloud benefits we point to are: speed, payment based on consumption, lower costs, clearly defined services managed to appropriate services levels, on demand availability and scalability, simplicity (complexity hidden from view), allowing a focus on business requirements and strategy and innovation with the business, away from day to day maintenance and technology issues.

This forward vision will seem ambitious. But it actually represents a convergence whose emerging shape we have been tracking through a range of research studies stretching back to commercial development of the internet from the mid 1990s [4]². How can this world be managed into existence? What retained capabilities will be needed to run the technology function? What specific management capability challenges and worry-points are coming to the fore with cloud deployment? How can the technology function, and business readiness, be evolved to leverage cloud, the technology platform and applications for business advantage? These are the questions our research in this paper sets out to answer.

2 The Research Base

Our research has drawn on three main sources – an interview base, industry and academic reports, the LSE Outsourcing Unit 1,600 organization database, and a large-scale survey. We undertook thirty five initial interviews with leading industry players across the cloud supply chain. These were added to during 2011, following the same procedures outlined below. By late 2011 we had interviewed 56 providers of cloud infrastructures and services, system integrators, analysts, and users of cloud services. In terms of roles, we spoke to CEOs, CIOs, marketing and operational managers, strategists, consultants, analysts and service directors. Interviews were normally undertaken by one person and were held over the phone. They typically lasted at least one hour, with some running to over two hours.

Each interview was then transcribed and the transcripts shared amongst the research team. Each interview was then coded by one member of the team. Initially codes were used to simply classify each element (“quotations”) of the interview. For example, some parts of the interviews related to “hybrid clouds” others to “lock-in” or “pay-as-you-drink models”. As the interviews were being coded, a parallel process of consolidation took place.

The first step towards consolidating codes into analytically distinct segments that can be examined together both within and between interviews involved tidying up the initial codes, for example by combining codes that covered the same concept but were labeled slightly differently. For example, codes initially labeled as “pay-as-you drink” and “pay-per-drink” models were merged. This process of analysis was also based on, and contrasted with, themes from the cloud and outsourcing literatures [5]. The process involved an iterative reading, coding and cycling through the codes. The validity of the coding and analysis was constantly checked by searching for counter examples and nuances in the text and codes. The resulting codes and associated quotations were then shared with the remainder of the project team. This resulted in further insights and themes to explore. Finally, a selection of the coded quotations was selected for presentation in the current paper [6]. The selection process was guided by the need for a

² Our research in 2000-2002 documented developments in application services provision which was, in retrospect, the prototype for the emerging cloud landscape, but at the time lacked the further necessary developments and convergence in technology, large-scale supplier investment and multiple large client take-up.

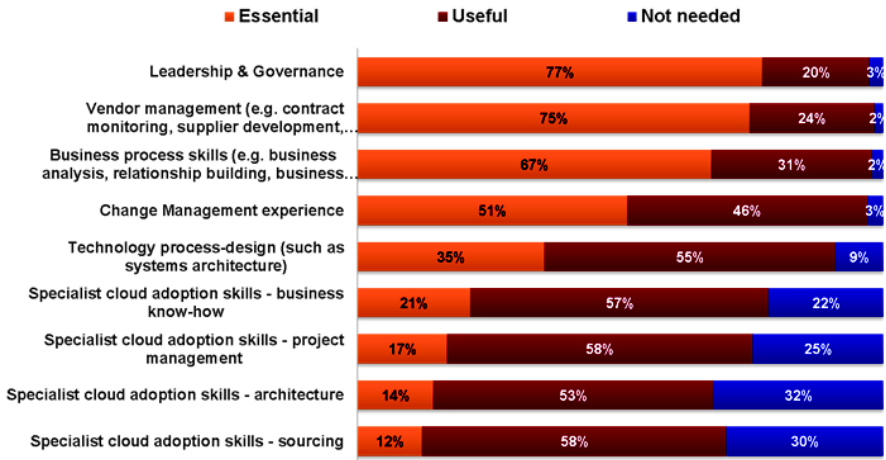
coherent narrative flow in the paper. In addition to reviewing the academic literature and associated industry reports, a distinctive feature of the work reported is the inclusion of results from a large-scale survey of IT industry practitioners. The survey was undertaken by HfS Research [7] in conjunction with the LSE Outsourcing Unit. HfS Research is the foremost research analyst firm and social-networking community that is focused on helping enterprises make complex decisions with their global sourcing strategies. It has 120,000 monthly visitors and 37,000 subscribers and leverages this community of sourcing professionals to deliver rapid insights on the global sourcing industry. The survey ran between October and November 2010. Many of the key results from the survey are presented in this *Cloud and The Future of Business* report. Other views on the data and, an updated survey for October 2011, are available on the HfS site [8]. The survey was conducted online and disseminated across a broad number of networks and media to collect a random sample of 1. business (non-IT), 2. IT executives' and 3. technology vendors, advisors/consultants and service providers of Cloud-based services. The survey was sent in a number of outgoing emails and was also available live on a number of popular websites and blogs. Three separate question sets were developed that were tailored to these three groupings. Each question set was completed via a 12-minute web-based questionnaire. IP addresses were collected to ensure duplicate responses were deleted. Networks were spread across multiple technology blogs and media, largely ZDNet blogs, Global Services Media, Shared Services & Outsourcing Network and the HfS Research subscriber-base (accounting for 75% of respondents). 1035 responses were collected, 214 from IT executives, 414 from business executives 407 from Technology vendors, advisors/consultants and service providers of cloud-based services.

3 Cloud: From Expectations to the Art of the Possible

Business executive expectations on in-house IT staff to deliver on cloud are high. Our survey found 80% looking to rely on in-house staff. But business executives also expect much more use of external services for supporting the move to cloud with 40-50% surveyed recognising benefits for governance support, business process transformation, change management and communications and IT maintenance and support. IT executives also emphasise external assistance with mainly technical issues - IT configuration and integration, data security, data management and governance³. The overall message is: the IT function cannot do it by itself. However, there is widespread recognition that it needs to retain key capabilities. Our recent outsourcing survey gives adviser insights into what these need to be, though their perceptions underrate the role of cloud skills because many customers were not yet making significant moves into cloud (see Figure 1). At the same time our, and other, research shows many CIOs and IT functions lacking the adequate knowledge to move decisively into cloud computing.[9] In practice we found this to be one major reason for organizational delays in moving to cloud.

³ Horses for Sources and LSE Outsourcing Unit survey of cloud computing November 2010.

In your view, how important is it for your clients to have the following inhouse skills/capabilities for managing outsourcing relationships? (Outsourcing advisers)



Source: HfS Research and the London School of Economics Outsourcing Unit, July 2011
 Sample: 318 outsourcing advisers and 544 outsourcing suppliers

Fig. 1. Management of Outsourcing Relationships

In fact, for internal IT, Cloud signals significant changes in functions and roles. The IT function has been on a journey for two decades from being a back-office technical function to a service-oriented provider that delivers business value operationally, and that is managed by business and technology leaders as a strategic business resource. A much touted purpose of outsourcing, and now of cloud, has been to accelerate this process, freeing up internal capability to become more business focused and strategic in contribution⁴. This conclusion is reached through reviewing our ongoing research in four streams. This suggest four converging journeys that technology leaders need to pursue if the potential endpoints, in terms of management capability to deliver and run an integrated technology-with-cloud platform, is to be realised.

Our work on the evolution of the IT function (stream 1) establishes that the IT shop needs to evolve from a competent technical service, through acting as strategic partner with the business, to a small high performance management team organized into retained core capabilities. By then the CIO role will split, with the CIO being more business/big data/innovation focused and the CTO being more architecture and service focused. However, technology cannot be leveraged strategically and for business innovation without a) senior executives and business units being fully engaged in funding, and playing pro-active roles in designing, developing and deploying these

⁴ See Willcocks, L. Cullen, S. And Craig, A. (2011) *The Outsourcing Enterprise: From Cost Management to Collaborative Innovation* (Palgrave, London) for the most recent detailed account of this history, and a description of the retained core capabilities needed by clients to run IT and back-office functions.

Developments 2011-16

Management changes by
2016

Stream 1- Evolution of the IT Function

Willcocks and Craig 2009
Reynolds Willcocks Feeny MISQE 2008
Willcocks Cullen Craig 2011

- CIO as Business Innovator
- Chief Technology Officer
- Strong middle tech-cloud management

Stream 2 -Evolution of Outsourcing

Lacity and Willcocks 1998, 2001, 2006, 2009...
Willcocks Cullen Craig Lacity 2005, 2006, 2007, 2008, 2011.

- Business senior execs. pulled in as outsourcing comes closer to core
- Tech-cloud leaders focused on collaborative innovation

Stream 3 - Moving To The Cloud

Seddon, Reynolds Willcocks 2009, 2010, 2011
Venters, Whitley Willcocks 2011
Lacity and Willcocks, 2012

- Tech-cloud management develops as 'business savvy sourcing architects on steroids'

Stream 4 -Towards the Ambidextrous
Organization

Willcocks and Craig 2009
Seddon, Reynolds Willcocks, 2011
Venters, Whitley Willcocks 2011

- Organizational/tech-cloud capabilities needed
- Organizational architect critical
- Technology group leads on flexible tech-cloud architecture and consumerization of service

Fig. 2. Cloud and Management: History of the Future⁵

technologies and b) IT achieving a step-change in its outsourcing maturity towards collaborative innovation with suppliers (stream 2). Cloud developments (stream 3) fit this context by bringing new technological capabilities and related challenges and opportunities (see our previous papers) that will, as this final paper demonstrates, require major shifts in internal management, skills and capabilities.[10, 11] But for cloud technologies to be fully exploited for business advantage, the rest of the business will also need to develop new organizational IT and organizational architecture capabilities. These will fit with the technology architecture, strategy and operations becoming increasingly imbedded in business practices, the convergence (stream 4) founding the ambidextrous, more digitally-based business [12].

If this forward vision is at all salient, then it can be seen that the IT function, and its host organization becomes highly reliant on internal capabilities, as well as external service providers. The rest of the paper looks at what these retained capabilities can be, and how they can be evolved.

4 Cloud Management and Core Capabilities: The Foundations

In the face of turbulent technologies, we consistently find that an emphasis on technology and technology-related skills guarantees adoption **but rarely exploitation**.

⁵ This research is distilled in several recent publications. See Lacity, M. and Willcocks, L. (2009) *Information Systems and Outsourcing: Studies in Theory and Practice*. (Palgrave, London; Willcocks, L., Cullen, S. And Craig, A. (2011) *The Outsourcing Enterprise: From Cost Management to Collaborative Innovation* Palgrave, London; Willcocks and Lacity, M. (2012) *The New Outsourcing Landscape: From IT to Cloud Services*. Palgrave, London; Lacity, M. And Willcocks, L. (2012) *Advanced Outsourcing Practice: Rethinking ITO, BPO and Cloud Services*. Palgrave, London.

There is a danger of a lot of cloud offerings being, so far, technology solutions in search of business problems. To get cloud on to a more strategic agenda and identify the relatively few applications that produce disproportionate business value, the Technology function needs to shift from its traditional skills, roles and values⁶. In practice, with each technology cycle, with cloud being but the latest, and with ever increasing usage of the external services market⁷, our work demonstrates that high performing Technology functions are managed by a relatively small internal team of highly capable, demand-led and primarily strategy- and business-focused people. Here we focus on the Technology function, whose role is central to cloud deployment, but the same logic applies to, for example, human resource, finance and accounting, procurement, and administrative functions).⁸ The model provides a strong foundation for managing existing technologies, and remains robust in the light of our present findings on cloud services; throughout we elaborate where it needs new emphases and more granularity. The internal group responsible for the technology platform and applications, including cloud, needs to deliver on four core tasks:

- **governance**, including leadership, organization and coordination. This involves aligning dynamically the Technology function's activities internally, and with those of the organization as a whole.
- **eliciting and delivering on business requirements**. A demand-driven task concerned with defining the systems, information and processes to be provided, and how they can be leveraged for business purpose.

⁶ We use the terminology of 'technology function' rather than the more normal 'IT function' to capture the convergence of technologies taking place, the development of cloud computing, and the role of technologists in the increasing digitisation of business. The function's role is shifting, reflected in the changing status of the CIO. This, we are finding, does not stand for 'career is over' (perhaps 'concept is over'?) but the work is changing, with possible a division going to occur into those who keep the current technology base optimal – the chief technology officer, and those who focus on strategy, business, information and innovation. Already in our model the informed buying capability has been developing to relieve the CIO of responsibilities on managing the external supply side.

⁷ In our latest survey of 347 buyers across industry sectors between 64-80% of buyers said they were going to increase their outsourcing moderately or significantly in the next year. Survey by LSE Outsourcing Unit and Horses For Sources, July 2011 see www.horsesforsources.com/research-services and www.outsourcingunit.org

⁸ In this paper we focus on management of the technology function which is central to cloud deployment. However, the retained capabilities model we detail model also applies, with minor adjustments, to IT and cloud-enabled business back-office and other functions such as human resources, procurement, accounting and finance, and sales. The supporting case research appears in Willcocks, L. and Lacity, M. (2006) *Global Sourcing of Business and IT Services* (Palgrave, London) chapters 3, 6, 7, 8. See also Lacity, M. Willcocks, L. (2011) Business Process Outsourcing Studies: A Critical Review and Future Research Directions. *Journal of Information Technology*, 26, 4, 1-38. The original core capabilities model was formulated by Feeny, D. and Willcocks, L. (1998) Core IS Capabilities for Exploiting IT. *Sloan Management Review*, 39, 3, 9-21.

- **ensuring technical capability.** A supply-focused task about defining the blueprint or architecture of the technical platform used over time to support the target systems and processes, and dealing with risks inherent in non-routine technical issues.
- **managing external supply.** This concerns arriving at and managing sourcing strategy. It requires understanding of the external services market, and the ability to select, engage and manage internal and external technology/cloud resources and services over time.

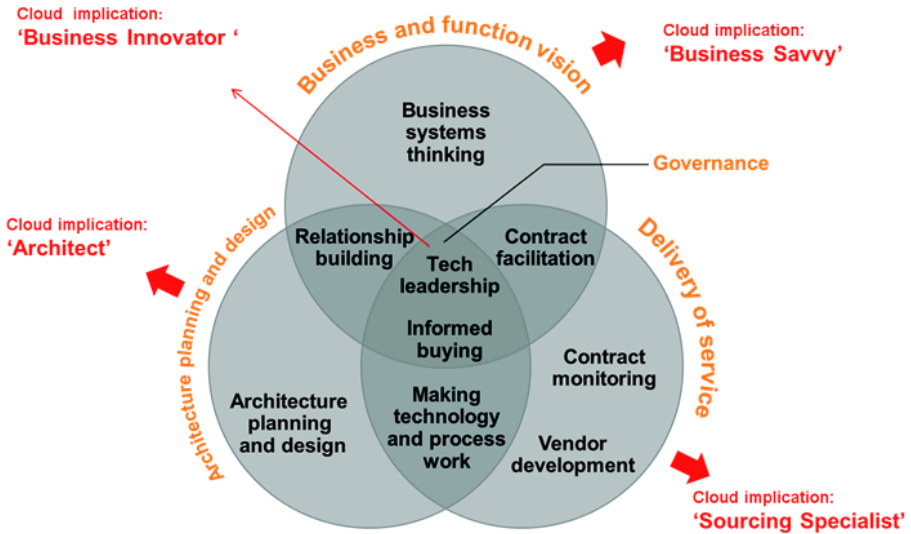


Fig. 3. Core Capabilities for High Performing Technology and Back-Office Functions

4.1 Governance

This task is delivered through Leadership and, for supply governance, Informed Buying capabilities (see below). The central **Leadership** task is to devise and engage in organizational arrangements – governance, structures, processes and staffing - that successfully manage internal and business interdependencies, in ways that ensure the Technology function delivers business value for money. The key role of the leader is also to look for value shifts, listen to the technology, and see where business value in the (cloud) technology is migrating to [13]. The CIO, as leader, will also be responsible for setting up the organisation for cloud:

‘There is a demand management component which includes the business requirement definition; there is the business case component – does it fit the architecture, is it strategically where we want to go, does it fit our financial model; then there is delivery – generic programme management, methodologies that give you more

*agility; there is the integration management component, faster, more dynamic procurement, service management - and finally the skilled people to deliver all this.*⁹

The CIO also oversees the evolution of the technology function, and is likely itself to develop with cloud, splitting into two - a more business focused, 'business innovator' job, and a more technical 'chief technology officer' type role. Parallel research into innovation has found that the *Business Innovator* role in the in-house function is key to moving any external sourcing agenda in the direction of the collaborative innovation with business - but also eventually suppliers - needed to leverage the full business potential of cloud[14]. One CIO suggested how his role may develop with cloud: *'For the CIO information is going to be more important, and becoming more intimately familiar with business processes.... indeed running some of the back office stuff. The business visionary is a potential evolution... it will vary by industry and company.'*¹⁰

4.2 Business and Function Vision

In leading practice organizations we have been studying, **Business Systems Thinkers** from the technology function are important contributors to teams charged with business problem solving, process re-engineering, strategic development and delivering e-business. Such organizations recognise that business processes should be redesigned in the light of technology, including cloud, potential. Business systems thinkers focus obsessively on aligning strategy, structure, people, process and technology. In earlier research we have found many examples of failing projects and disappointing outsourcing arrangements where such skills were not present. The danger with cloud is that organizations fail to learn from such experiences imbedded in the technology history of almost all large organizations[15]. In cloud research we are finding that business systems thinkers need to be on cloud projects, and act as conduits between business demands and the technical architects.

The **Relationship Builder** is an integrating, operational role, facilitating the wider dialogue, and establishing understanding, trust and cooperation amongst business users and technology/cloud specialists. Relationship builders develop users' understanding of technology and cloud and its potential for their lines of business. They help users and specialists to work together, help to identify business requirements, ensure user ownership and build user satisfaction with technology and cloud services. With cloud comes a further emphasis in this role on business analysis and requirement identification:

'The one role that has got the most to gain out of cloud inside the customer organization is the business analyst, with a technical appreciation'. Tim Barker, SalesForce.¹¹

⁹ Interview with Matthew Coates in discussion with Andrew and John Hindle Accenture September 16th 2011.

¹⁰ Frank Modruson, CIO Accenture. Interviewed in July 2011.

¹¹ Interview with Tim Barker of SalesForce, November 2010.

All our respondents stressed that cloud both requires more business facing skills, that is *'Business Savvy'* than ever before, but, as in the case of the relationship builder role, also meant the release of human resources from more mundane technical work to fulfil vital business-facing activities.

4.3 Architecture Planning and Design

The principal challenge to the **Architect Planner/Designer** is, through insight into technology, suppliers and business directions, to anticipate technology trends so that the organization is consistently able to operate from an effective and efficient technology platform – without major investments into major migration efforts. Planners shape the technology architecture and infrastructure through developing the vision of an appropriate technical platform, and through formulating associated policies that ensure necessary integration and flexibility in technology and cloud services. Any outsourcing arrangement provides a strong test of the value of retaining this capability.¹² When it comes to cloud, our respondents suggest that the 'Architect' capability is key. The cloud architect has to be an enterprise architect, SOA architect (most clouds use services architecture) and cloud technologist, the new role emphasis being to increasingly collaborate with business initiatives. David Linthicum of Microsoft describes it well:

'The cloud architect needs to be an expert in the existing cloud computing technology: public private and hybrid, including IaaS, PaaS and SaaS. You can't build something unless you understand the tools and materials that are available, and the same goes for bringing cloud computing technology into the enterprise to form (business) solutions.' [16]

According to one senior practitioner:

'I have worked on cloud based systems for years now and the common thread to cloud architecture is that there no common threads to cloud architecture. The complexities around multitenancy resource sharing and management, security and even version control lead cloud computing start-ups – and enterprises that build private and public clouds down some rough roads before they start to learn from their mistakes. In the world of cloud computing that means those who are smart, creative and resourceful seem to win out over those who are just smart.'[17]

¹² We saw a bank and a manufacturer give away their architects, assuming that the task of architecture planning was technical and therefore one for the suppliers. Three years into outsourcing found each of them rebuilding this capability, because they could not understand, let alone talk with and influence the suppliers about, how to address existing and fresh demand through a new technology platform with better economics. See Willcocks, L. and Lacity, M. (2012) *The New IT Outsourcing Landscape: From Innovation to Cloud Services*. Palgrave, London, chapter 7.

For Frank Modruson, CIO of Accenture:

‘The client person who can think about the enterprise data model, how all the technology and data fits together, can conceptualise, plan and implement, these are the skills going forward –more conceptual, knowledgeable and architectural. And data modelling, a sort of lost art – with cloud it’s back’.

Hong Chiong of Microsoft points to in-house capability needed in architecture planning and design on security and compliance:

‘When it comes to compliance and security, technology managed by the cloud supplier is only one fourth of the solution. You have to have a standard operating procedure that is well-documented and that people are trained to operate. That has got to come from the customer.’¹³

By listening to the technology, understanding the business and its technical configuration, the technical architect ties together cloud strategy, its links with existing technology, and develops the coherent blueprint for the migration path.

Operating in the overlap between the challenges of IT architecture design and delivery of IT services is the core capability of Making IT and Process Work. **Technology “Fixers”** are needed to troubleshoot problems and identify how to address business needs which cannot be satisfied properly by standard technical approaches. They understand the idiosyncracies of the inherited infrastructure and business applications, enabling them to make rapid technical progress – by one means or another. In outsourced environments they also assess and challenge third party suppliers’ claims about technical problems and proposed solutions. Technical staff will need not only a deeper understanding of their traditional core competencies but also a wider skill set to transcend the traditional IT silos and address the fact that cloud encompasses more than one technology. Senior Executives suggested to us, for example, that instead of employing three people who oversee storage, networking and virtualization environments, companies might hire one person whose skills span all three cloud competencies. For CIO Frank Modruson, with cloud:

‘The traditional operational roles will shrink in number, move increasingly to the supplier and cover more scale. What you call technical fixing, there will always be a need for a bit of that, for example dealing with the joins between different provider services and technologies, having know-how of in-house systems.’¹⁴

While IaaS, and SaaS require some new skills, moving to PaaS products require much tighter integration with software development and application lifecycle management to

¹³ Interview with Hong Chiong of Microsoft, October 2010.

¹⁴ Interview with Frank Modruson, CIO of Accenture, July 2011. He gave the example of Accenture’s own recruitment and selection process. Accenture is highly reliant on talent, but the secret sauce is who you attract, select, and hire, and this is not imbedded in the technology and software. As a result the organization has been on a software as a service centre for recruiting for six years.

realise maximum benefits. IT departments have to redesign application with PaaS in mind and the deployment model is largely driven by how the service provider offers its service. PaaS will almost certainly require the greater level of retraining and the skills. And technical fixing also has to take on a more business focused mindset than before. As one PaaS supplier commented:

*'Clients need to be willing to configure the network and design applications in a different way, perhaps use different size servers, and not just see cloud from a technical point of view, but get the balance right on how much it costs me to re-engineer versus the benefits and costs savings from a cloud solution... and often its the business benefit in terms of elasticity and time to market, not cost savings that are the driving factors.'*¹⁵

Stephanie Lester of Glasshouse told us:

'The cloud model of rent and virtualization, means that you will still need technical expertise, especially about your own systems and cloud 'fit' but, so far as technical 'doing' work migrates to the supplier, or becomes automated, you will need less headcount in this area.'

4.4 Delivery of Services

The fourth competency comprises the capabilities required to manage and ensure external supply. In an organization that has decided to outsource most of its technology services, the **Informed Buyer** role is the most prominent after the CIO. Informed buyers analyse and benchmark regularly the external market for IT and cloud services; select the 5-10 year sourcing strategy to meet business needs and technology issues; and lead the tendering, contracting, and service management processes. Informed buying also requires an intimate knowledge of suppliers, their strategies, financial strength, and their capabilities and incapacities in different sectors, services and regions.

Cloud requires many changes to traditional procurement. Matthew Coates of Accenture points to one reason:

*'My whole way of procuring needs to change because the whole idea of cloud is things are going to be agile.'*¹⁶

Cloud also requires the ability to source different technologies and services from a multi-supplier base, on a more dynamic, frequently pay-for-use and pay-as-you-go basis, as well as on more traditional outsourcing contracts, and shaping multiple service integration for the business unit customer. In a world that gets increasingly outsourced and cloudsourced, we are finding that client organizations still under-resource their informed buying capability, when in practice to fulfil this *'Sourcing Specialist'* role, what they need is informed buying on steroids, together with three other capabilities.

The **Contract Facilitator** is crucial for lubricating the relationship between supplier(s) and the business users, not least by ensuring that problems and conflicts are seen to be resolved fairly and promptly within what are usually long term relationships. It is an action-orientated capability. Interestingly, the need for this role is rarely spotted

¹⁵ Interview with Neil Thomas, Cable and Wireless, September 16th 2011.

¹⁶ Interview September 16th 2011, op. cit.

straight away when outsourcing. Instead, the capability tends to grow in response to on-going issues for which it emerges as an adequate response, such as:

- Users may demand too much and incur excessive charges
- The business user asks for ‘one-stop’ shopping
- The supplier demands it
- Multiple supplier services need coordinating
- Easier monitoring of usage and services is required

In the cloud context, internal product management by contract facilitators construct services from third party offerings. They also front differences in ways of operating brought in by cloud. Neil Thomas of Cable and Wireless offers one example:

‘We have debates with customers where they insist on a mutually agreed time for planned outages. Normally that’s what you do on a dedicated platform, but in a shared platform, if no customers mutually agree you never end up being allowed an outage, or there is a high overhead... that’s an example of where we and the customer have had to learn with us.. Those people you describe as contract facilitators also worry about security and faults, because it’s a shared platform, also billing systems.’¹⁷

Contract Monitoring involves making inputs into the development and maintenance of a robust contract as the basis for a sound governance framework. The role then leads on to holding suppliers to account against both existing service contracts and the developing performance standards of the services market. Not all potential issues and expectations can be identified at the onset of a relationship, and the contract will be subject to differing interpretations as issues arise. Moreover there is no standard contract, only standard headings, as each outsourcing and cloud arrangement has its own set of issues and dynamics. While all organizations we have studied recognised the importance of contract monitoring, and staffed it at the beginning of their deals, historically, they all too frequently put the wrong people in place, especially in the large deals, underestimating the dynamic nature and extent of the task. Cloud, we are finding, brings a new dynamism to the role – more, and more diverse contracts, more instant and transparent information, including from suppliers, faster response times demanded, new standards of service, and the need to deal with the immaturity of contracting in the cloud eco-system.

The **Vendor Developer** is concerned with leveraging the long term potential for suppliers to add value, creating the ‘win-win’ situations in which the supplier increases its revenues by providing services that increase business benefits. Given the prohibitive size of switching costs historically, it has been in the client company’s interest to maximize the contribution from existing suppliers. It still remains so for cloud deals, especially where, as we anticipate, these deals get larger and more complex. In the context of multiple suppliers, Poston et al. (2009) also identify the importance of the vendor developer role. Not properly managing the vendor set can lead to sub-optimal outcomes, such as loss of technology and process knowledge, lack of innovation, over-spending,

¹⁷ Interview with Neil Thomas, Cable and Wireless, September 16th 2011.

and poor quality [18].¹⁸ It is also important to guard against what we call ‘mid-contract sag,’ in cloud and other arrangements, where the supplier delivers to the contract, but only to the letter. As one aerospace IT service director describes it [15]:

‘Yes the supplier can achieve all the things that were proposed – but where is the famous ‘value-added service’? We are not getting anything over and above what any old outsourcer could provide.’

While such a concern might not be present in the initial smaller cloud deals, as these grow in complexity, there is every reason for a client to have this in-house capability, not least to service its existing non-cloud outsourcing contracts.

5 Client Retained Capabilities: New Skills, New Challenges

In Table 1 we bring together these capabilities, expressed as roles and skills. The nine roles all demand high performers who can develop into a high performance team. In contrast to the more traditional skills found in IT functions, there needs to be a much greater emphasis on **business skills and business orientation** in nearly all roles. While the exceptions used to be the ‘technical fixer’, and to some extent the ‘technical architect’ roles, we have found these two roles needing an increasing amount of business understanding and relationship building. There is a significantly increased requirement for **‘soft’ skills** across all roles, and this is accelerated by cloud, the exception being the ‘contract monitor’ role. The major shift is toward fewer personnel, but of very high quality. We are seeing cloud accelerating these developments. On **technical skills** the shift in-house, again accelerated by cloud, has been towards less ‘doing,’ more conceptual technical activity.

The mix of business, technical and interpersonal skills will vary by role. Looking at the Technology function, the Informed Buyer needs strong communication and negotiation skills, strong knowledge of the outsourcing market, and high business skills but only medium knowledge of technologies. The Technical Fixer, on the other hand will have very high technical skills and good knowledge of business systems but, unlike every other role, needs only medium interpersonal skills. The Relationship Builder, on the other hand will need high interpersonal skills, medium knowledge of the business and high technical skills. Each capability needs to be fulfilled by a distinctive mix of technical, business and interpersonal skills, and needs high performers who can work as a coordinated team across the capabilities. Cloud brings new challenges to each of these roles. Table 1 points to further skills and problem-solving capabilities needing to be developed for each where cloud deployment begins to figure significantly.

¹⁸ These authors draw lessons from how one multinational organization managed its Vendor Set in the outsourcing of software development and testing activities. They conclude that client managers who outsource to vendors need to establish the appropriate balance between building strong collaborative relationships and encouraging market competition among a set of three or more vendors to ensure best price and service quality.

Table 1. Nine Core Back – Office Capabilities as Roles

Manager Role	New Cloud Challenge/ Time Horizon	Time Horizon	Description	Skills profile
Leader	Cloud staffing Cloud business strategy Technology function redesign Cloud project oversight	<i>Present / Future</i>	Integrates the technology–cloud effort with business purpose and activity	Business–high Interpersonal–high Technical–medium
Business Systems Thinker	Cloud fit and timing Business–cloud projects Relationships with business execs.	<i>Future</i>	Ensures that technology–cloud capabilities are envisioned in every business process	Business–high Interpersonal–medium Technical–medium
Relationship Builder	Cloud operational business leverage Business education	<i>Present</i>	Gets the business constructively engaged in operational technology–cloud issues	Business–medium Interpersonal–high Technical–high
Architecture Planner and Designer	Cloud strategy Technology–business alignment Systems integration Cloud project planning New security/data issues	<i>Future</i>	Creates the coherent blueprint for a technical platform that responds to present and future needs	Business–low/medium Interpersonal–medium Technical–high
Technical Fixer	Apposite Iaas, Saas, Paas skills Broader technical skills base 'Fixing' role in cloud projects	<i>Present</i>	Rapidly trouble–shoots problems which are being disowned by others across the technical supply chain	Business–low Interpersonal–low/medium Technical–high

Table 1. (Continued)

Informed Buyer	Cloud market knowledge Matching business demand with cloud supply Cloud supplier management	<i>Present / Future</i>	Manages the technology–cloud sourcing strategy to meet the needs of the business	Business–high Interpersonal–high Technical–medium
Contract Facilitator	Cloud service development and integration Cloud product manager Service delivery	<i>Present</i>	Ensures the success of existing contracts for external technology–cloud services	Business–medium Interpersonal–high Technical–medium
Contract Monitor	Cloud SLAs Regulatory implications Cloud security issues	<i>Present / Future</i>	Protects the business’s contractual position present and future	Business–medium Interpersonal–medium Technical–medium
Vendor Developer	Developing cloud suppliers Maturing cloud relationships Securing future innovation and value added from cloud deployment	<i>Future</i>	Identifies the potential added value from technology–cloud service suppliers	Business–high Interpersonal–medium/high Technical–medium

6 Cloud: Emerging Management Challenges

The shifts in the operating model we are anticipating poses five significant challenges needing to be addressed for progress to be made.

6.1 The Human Resource Challenge

In practice, recruitment and retention of the small high quality group we have described has always been a major human resource challenge. Cloud has just made it that much harder - cloud skills were running at a 20-40% premium throughout 2011 - and the skills shortage may well slow client organizations in their ability to adopt cloud technologies, especially where they also have to compete with suppliers. Two solutions are upskilling and hiring. As one multinational oil company executive commented:

'You've got to be able to upskill your organization and to have a human resource policy which provides such training to people in your organization.' The logistics manager at a major retailer said: 'To be honest, we had to recruit a few people'. Once hired, you will need to:

- pay them at a level within striking distance of that provided by alternative employers;
- provide them consistently with the level of challenge they look for in the job;
- develop for them a career path.

We have already been seeing hybrid staff being developed in-house. For example, Xerox, Dupont, WW Grainger, and Johnson & Johnson offer job rotation paths and flexible career paths to retain their core people. Cloud adds further reasons for this.

6.2 The 'Change-in-Ethos' Challenge

The issues with more traditional IT functions, and the character of Cloud as a disruptive innovation is caught in the following observation by Jim Rivera of Salesforce.com¹⁹:

IT has been largely responsible for keeping systems up and running and the statistics are anywhere from 60% to 80% of what they focus on is really geared towards just keeping the lights on, keeping things going, and not on adding more business value. The problem is that the business changes quickly, they have their demands, and IT just simply cannot get the stuff. Of course there needs to be strong governance to make sure what people are doing is consistent in terms of architecture and security, and that people are not getting into the types of business critical systems that only IT should be touching. However, IT doesn't have to do everything anymore. With Cloud, IT can get out of the way of the business, be no longer a roadblock for certain types of systems, which the business can handle with oversight from IT

Other providers talked of needing to be much sharper on service metrics and transparency, corrective action enable by automation . Speed also requires much greater operational readiness is needed with cloud, and this passes over to client staff, not least because of internal pressure from business units to perform faster²⁰.

When it comes to cloud we are discovering that all the internal roles have to be faster acting than before. And while organizations have speeded up, they have not necessarily come up to the speed of cloud, which is instant- well almost. You have to automate the bureaucracy. Change management, for example, we used to have weekly meetings. With cloud, fast tracking is almost your everyday. And that means you need to have a robust system that makes assessments and changes really quickly. It means changes in how knowledge and processes are set up, teaming and shared knowledge

¹⁹ Interview with Jim Rivera of SalesForce, October 2010.

²⁰ Interviews with Kevin Lees of VMWare, November 2010 and Jim Spooner, Glasshouse, November 2010.

enabled by automation. On the big picture this is IT coming up to speed on service with other areas and sectors, as it should do²¹.

These changes present new opportunities for IT professionals, if they are only willing to take them:

'The Cloud, whether it be private, public, hybrid, is creating positive opportunities for IT professionals. I say to my IT people: you are going to have many more business conversations. You're going to be having more service catalogue conversations, you're talking about solutions, you're not talking about applications and stacks and the things that have traditionally been the IT lingua franca. If you are a systems administrator and you're looking at converged infrastructure today, systems, storage, network and security people will be calling at your door. Cloud requires a breadth of skills. Or you can become a Cloud architect or specialize as a Cloud professional. Alternatively, if you want to specialize, for example as a systems person, opportunities continue because now you have to go deeper into the skill set from a technology point of view and you're no longer provisioning for one application stack, you're provisioning for the Enterprise or for the Cloud. So whether you want to go into the business side of things or you want to do go deeper in technology or you want to go wider with technology, Cloud brings you some incredible new opportunities as an IT professional.' Sanjay Merchandini, EMC²²

6.3 The Project Management Challenge

Project management needs to be an **organizational** core capability, and not the preserve of one business function, therefore it does not appear explicitly in Figure 3. Candidates for the project manager role are most likely to be found amongst relationship builders and technology fixers but clearly business systems thinkers, leaders, architects, and informed buyers must have very active roles in projects with a strong technology/cloud component. As one BH Billiton senior executive told us: *we outsourced too much project management capability in our first deal, and even if you have somebody doing projects for you, you can never give up project sponsorship, ownership and accountability[19].* In practice we have seen the technology function rebuild some of its project management capability in the face of large-scale outsourcing, especially where IT-enabled business transformation was on the agenda. Large business projects dependent on cloud components will need the same hyper-active involvement of the 'Technology' roles outlined above, as well as supplier resources, but also the business

²¹ Quote by Stephanie Lester of Glasshouse, interviewed in September 2011.

²² Interview with Sanjay Mirchandini, EMC, December, 2010. Chuck Hollis, Chief Technology Officer of EMC, elaborates on this by suggesting three relatively new roles: cloud architects, process re-engineers and business enablers. The other key cloud related roles include cloud service managers, cloud capacity planners, cloud infrastructure administrators, cloud security architects, and cloud governance, risk and compliance managers. Our own model embraces these roles, using a different vocabulary, and assumes a higher degree of cloud outsourcing than at EMC.

needs to show maturity in allocating business sponsors, champions and full time business user managers to the project team, and take responsibility for outcomes.

However, cloud may well have to start small and quick at first, and this may well accelerate an already existing trend towards prototyping, agile and fast delivery of business benefits. According to Tim Barker of Salesforce²³:

'In terms of process skill, agile development, scrum methodology – the kinds of things that IT organizations are already moving towards – I see cloud computing putting this on a fast track.'

With cloud, the lines between development, testing and deployment are likely to blur even more. Mathew Coates of Accenture, indeed, sees agile development and centres of excellence as natural start-points for cloud initiatives within the technology function. On this view, in-house learning on cloud would occur on a series of small '80/20' projects (focusing on the 20% of the system/service that give 80% of the benefits) with quick business 'wins'. This would build, over time, into a strong in-house cloud knowledge and cloud 'fixing' capabilities. If this is so, and our research supports the viability of this agile development model [12, 20], then it means a shift in the ways of working not just for technology staff, but also for business managers and operational staff.

6.4 The Innovation Challenge

The Technology function model we have detailed is designed to deal with dynamic business contexts and is, amongst its other tasks, designed for innovating. If leaders, business systems thinkers and architects look after future business innovations and their technical underpinnings, the informed buyer and vendor developer innovates in relationships and what can be got from the external services market, while technical fixers, relationship builders and contract facilitators achieve micro-innovations in operational issues. However, organizations still need to make major shifts if they are to harness major innovations from technology/cloud service suppliers. Our own work shows that four fundamental practices underpin effective collaborative innovation, and the deeper the collaboration the more organizations can deliver not just IT operational, but also business process and strategic innovations [21].

Leading shapes and conditions – in fact sets up - the collaborative ethos and environment. Business and technology leaders signal through commitments, incentives, risk mitigation, the joint exploitation of opportunities. These need to be imbedded in forms of **contracting** that specify how risks and rewards provide incentives for innovation, collaboration, and high performance to achieve common goals. At the same time **organizing** for innovation requires more co-managed governance structures and greater multifunctional team working across the collaborating organizations. Technical work requiring the application of existing specialist know-how, and techniques can be outsourced relatively safely, assuming competent specialists can be hired. But as more work becomes "adaptive," [22] – as

²³ Interview with Tim Barker, October 2010.

reflected in moves to agile cloud development mentioned above - more multiple stakeholders need to be engaged with defining the problem and working together on arriving at and implementing a solution. Team working now requires the ability to collaborate within a client organization, between client and supplier and between suppliers in multi-supplier environments. Organizing for collaboration also means assigning responsibility for delivering results. These three shifts in leading, contracting and organizing enables collective delivery of high performance, innovation and superior business outcomes. But **performance** is only possible where high personal, competence-based and motivational trust has been generated amongst the parties. High trust is a key element and shaper of successful collaboration, which requires the client-supplier relationship to be open, based on learning, adaptive, flexible and interdependent. Performing as trusted partners is a key component for collaborative innovation. Although studies have noted that there is no such thing as instant trust in outsourcing, it can be built over time through demonstrable performance.

6.5 The 'Evolution-With-Cloud' Challenge

Technology functions have been evolving over the last two decades, and Figure 4 captures the phases they tend to go through.[23] After an initial period of uncontrolled, and increasingly costly and dysfunctional IT proliferation (e.g. no synergies or economies of scale), a 'delivery' phase of developing internal capability and control ensues. At this stage the IT executive needs to focus on building the reality of technical and service competence, while ensuring that business managers get a correct perception of improvements in IT performance. Building IT know-how and capability is vital during this stage. Particularly important here are contract facilitation, architectural planning and technical fixing capabilities. Given the learning needed, and the lack of skills in managing external suppliers, buying-in of external resources as needed is the better sourcing approach. With the delivery phase accomplished and providing a reliable platform, a 'reorientation' phase sees the business units needing to become more pro-active in leveraging technology strategically for business purpose, while the technology staff need to become more business-focussed. The CIO, with the help of senior business executives, will need to provide active leadership to achieve these objectives. Relationship building, business systems thinking, and contract monitoring need particular attention and development in this phase. The lack of internal capability to manage large-scale outsourcing points to incremental use of the external IT (and cloud) services market). With 'delivery' and 'reorientation' accomplished, the organization can then embark on 'reorganization'. With IT and business closely aligned, and business managers mature in their ability to fulfil their roles in leveraging IT for strategic purpose, including on innovation and change projects, many IT roles can be devolved to the business units. Meanwhile the IT function can complete its move to a high performing core capabilities model. Large-scale outsourcing (and cloud sourcing) becomes much less risky, and the strategic payoffs more likely.

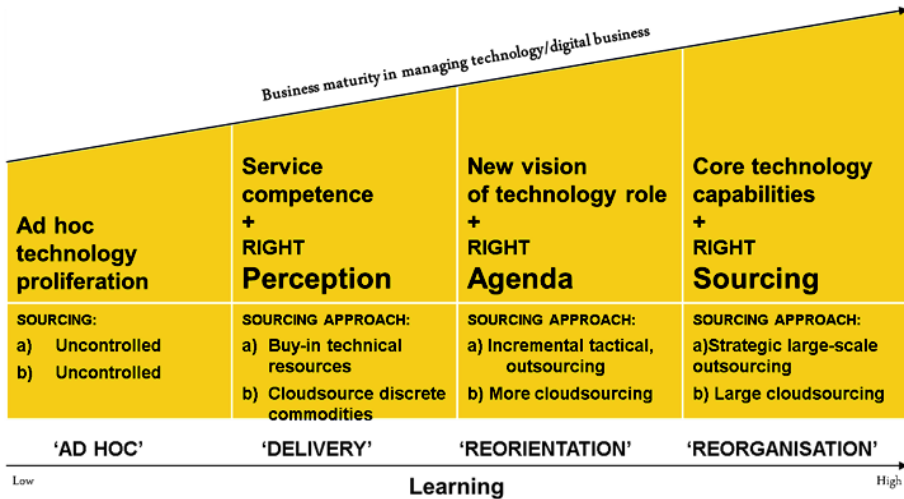


Fig. 4. Evolution of Technology Function

This phase model provides good **Stop, Think Act** ammunition because it has several large implications for cloud, and cloud supplier, adoption. As we have seen with ITO and BPO, a maturing ability with one type of service (ITO) rarely translates into the same level of competence with another, however similar (BPO). There is also the issue of the relative maturity of suppliers to deliver the specific technology and service. Figure 4 suggests managers need to pinpoint their maturity as a technology function and business, and then read their cloudsourcing capability into the phase model. We find that, with a few exceptions, in-house will be early to middle in the delivery phase. If so, they need to revisit building in-house capability over the three phases, but this time specifically for cloud. This begins with building service competence for cloud. This is where the centres of excellence concept fits:

‘The centres of excellence idea is that you pull in from across your IT organization the skilled individuals and give them some slack and scale to deliver whatever you need in cloud..... then that will grow and then you will start to think strategically about how your IT organization is going to change, and how governance needs to change in your business and IT organization.’ Matthew Coates, Accenture.

At the delivery stage, it is viable to outsource to the cloud ‘discrete commodities’ – and indeed the media is full of such examples. But cloud learning is key so buying-in resources from suppliers and consulting firms to work on issues and projects the internal group manages is an important capability building process. Our research suggests that the massive pressure from the business to deliver on cloud’s potential should be resisted, until both the technology function and business units are well into the cloud re-orientation phase. The maximum business potential from Cloud is realized when internal cloud capabilities map on to the re-organization phase. At that stage the CIO is likely to be a business innovator, with the role of Chief Technology Officer or Architect being enhanced to manage the strategic technical capability of the

organization. CIO Sanjay Mirchandani gives insight into this evolution process from an internal EMC perspective:

*'The business pressure on a CIO today is not can this be done; it's how fast we can we get this done. The compression in expectation is phenomenal.... I think most companies of our size will go through similar stages, the low-hanging fruit, the stuff IT owns, R&D, QA systems, test systems, and then you move into mission critical business, critical business supporting systems and then you can get more ambitious and say, okay, how can I provide most of the stuff in a self-service model, remembering that the bulk of the users in a hi-tech company like EMC are technical. Plus or minus, I think this is the journey that most companies will take'*²⁴.

7 Conclusion

Against the building momentum on Cloud we heard many practitioner voices sounding cautionary notes. For example:

*'Large organisations are not going to speedily move their IT estate to software as a service solutions because they have so much legacy background. And in supply chain and customer facing organizations their IT systems have become very complicated, highly automated and close knit together... you cannot just grab a bit of it and put it out to the cloud'*²⁵.

'Very few things are going to be 100% cloud. Like any wave of computing , it doesn't replace the others, it goes on top'. Fraser Kyne, technology specialist, Citrix [24].

One CIO, Frank Modruson, suggested consumers will move faster to the newer technologies, followed by SMEs: *'For large organizations we'll talk about it for a while longer, then it will show up faster than we realise... not completely, not exactly the way we might anticipate, and with some inertia.'*²⁶

But whatever the emerging pattern of take-up and speed, Cloud represents a potential crossing point. Technology has been, and continues to be a huge burden on organizations. Our research across these five papers found time and again that it just takes a huge amount of effort to make the thing work. Technology has, to a considerable extent, blinded people to what the real purpose of the Technology function was. The more technology gets moved out of the way – into the cloud, and/or supplier, the more the technology function can focus upon the real job which is how to exploit for business purpose the capability that the technologies happen to make available. Primarily, this will lie in service, information, management, business

²⁴ Interview with Sanjay Mirchandani, CIO of EMC, December 2010.

²⁵ Interview with Neil Thomas, Cable and Wireless, September, 2011.

²⁶ Interview with Frank Modruson, CIO of Accenture, July 2011. In very large organizations, he saw email, infrastructure and stand alone or isolated systems moving to the cloud quite quickly, the more deeply integrated systems such as ERP moving on a much longer time-frame because of complex requirements and difficulties in finding Cloud providers operating at the right scale.

analytics, IT enabled business innovation and digital business. In this paper we have provided a road map of management guidelines for this journey, which, our research suggests, is feasible, and would be enormously wasteful to miss.

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