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Cloud and the Future of Business: From Costs to Innovation

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Part Four: Innovation

• Consulting • Technology • Outsourcing



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Introduction

Our previous paper pointed to three major disruptive impacts associated with the increasingly rapid development and deployment of cloud technologies—service performance, cloud as a business service, and radical changes in the supply industry. The changing technological base¹ together with these three big disrupters will channel many innovating practices towards service, the development of business services, and reconfiguration of the supply industry.² But these trends will also free up creative space for further innovations in client businesses and indeed other sectors. In this paper we consider what these innovations might be, and the likely trajectory they will take.

Speed of innovation will be shaped by four key antecedent factors. The *first* of these is attributes of the innovation itself. Research shows that key issues are: Does it give relative advantage? Is it compatible with existing ways of operating? What is the risk level? Is it too complex or is it administratively feasible? Is it easily trialable with tangible outcomes? Is technical support given? Is there potential for reinvention?³ As they find positive answers to these questions, in the context of cloud, organisations will pursue:

- **IT operational innovations**—technology and IT operational and personnel changes that do not impact firm-specific business processes
- **Business process innovations**—that change the way the business operates in some important ways

- **Market (business product/service) innovations**—that significantly enhance the firm's product/service offerings for existing customers or enable entry into new markets⁴

The innovation trajectory with cloud will be cumulative, starting mainly with IT operational innovations then gathering pace over time on business process and market innovations.

The *second* antecedent factor is that in pursuing such innovations, organisations, suppliers and suppliers' partners will need to become much more collaborative than ever before. Collaboration is here defined as a cooperative, commercial arrangement in which two or more parties work jointly in a common enterprise towards shared goals. Our ongoing research in outsourcing has identified a very strong correlation between the levels

of collaboration and innovation within and across organisations. Simply put, superior performance through innovation is made feasible by cloud developments, but this will require a step-change in client-supplier and supplier-supplier relationships in terms of objectives and behaviours. This step-change needs to be towards new forms of collaboration involving mutual flexibility, trust, reciprocity, risk sharing and investment in resources and time.⁵ Such a step-change has been observable amongst a small number of outsourcing arrangements where the payoffs from the three types of innovation have been considerable.⁶ Innovation through cloud, we suggest, would come from an acceleration of such collaborative tendencies, but, as we have found in more traditional outsourcing arrangements, this will be a challenge to many client and supplier organisations alike.

The *third* antecedent factor is the speed with which diffusion through informal unplanned communication and influence moves to formal, planned dissemination. There are already clear signs that with cloud, there is a real uptake across the supply industry and all other major economic sectors on this antecedent factor.

The *fourth* antecedent factor is the innovation implementation process, that is the range of factors that support or slow an innovation's progress from design to adoption, diffusion, and usage, through to exploitation. Key issues here are: 1. sectoral structure, absorptive capacity for new knowledge, and sectoral receptiveness to change; 2. adopter attributes; 3. organisational readiness for innovation 4. How easy is the innovation to assimilate—is it a complex, non-linear process, with many "soft" elements? and 5. quality of organisation's implementation processes.⁷ Our cloud research suggests that these challenges are very real, cannot be assumed away, and may well be particularly significant for large organisations with a large legacy of IT investments, infrastructure, and outsourcing contracts. There are also cultural, structural and political legacies that will shape and determine the speed of implementation, exploitation and reinvention.

Of these four antecedent factors, only the third is unequivocally supporting cloud adoption and exploitation, though speed is gathering pace in the other three areas. On one scenario there could be a rapid acceleration in innovation if the supply side is ready with manifestly advantageous new services, and if both sectors and client organisations see those advantages

and apply them quickly and in a wholesale manner. A recent study suggests this may be the case, predicting that the adoption of cloud computing has the potential to generate 763 billion euros of cumulative economic benefits over the period 2010–2015 across five European economies of France, Germany, UK, Italy and Spain.⁸ The benefits would come from business development opportunities, business creation, net cost savings and indirect gross value added (GVA). The study also suggests an additional direct and indirect job creation impact of nearly 2.4 million jobs.

Our own research at the organisational level reviews the status of the four antecedent factors listed above and suggests that these claimed benefits are somewhat overstated. The challenges are larger and there is more friction associated with the adoption of cloud. Cost savings will come through, but the business benefits needing an eight- to ten-year rather than a five-year horizon to come to fruition. We also anticipate initially more process innovation—associated with net job losses—as a result of cloud, before job creating product innovations come through, and would therefore predict much smaller net job creation from the cloud, especially for the 2011–15 period.

These introductory remarks frame our study findings on what innovations clients will be anticipating and seeking from their moves to cloud. We distill our findings into three areas: innovation through infrastructure and service; executive support for the cloud innovation agenda; and long term moves to what we call the "Cloud Corporation".



Cloud Innovation Through Infrastructure and Service

Despite a common myth suggesting that cloud computing is mostly about an alternative payment/subscription model, two critical cloud streams—flexible infrastructure and service—do offer novel opportunities for innovation. The service-based, infrastructural flexibility of cloud promotes the possibility of “seed and grow” type activities, where the capabilities of the cloud are demonstrated through the rapid development of prototype systems.

Some of our respondents talked about this capability in terms of “low friction” activities, echoing the language of transaction cost economics. Whereas previously a decision to prototype a new system might involve the procurement and installation of new hardware (with the associated checks and delays that conventional purchasing requires), cloud provisioning can be implemented rapidly and at low cost.⁹

Such low friction approaches allow a business to experiment and innovate, according to Accenture’s Jimmy Harris:

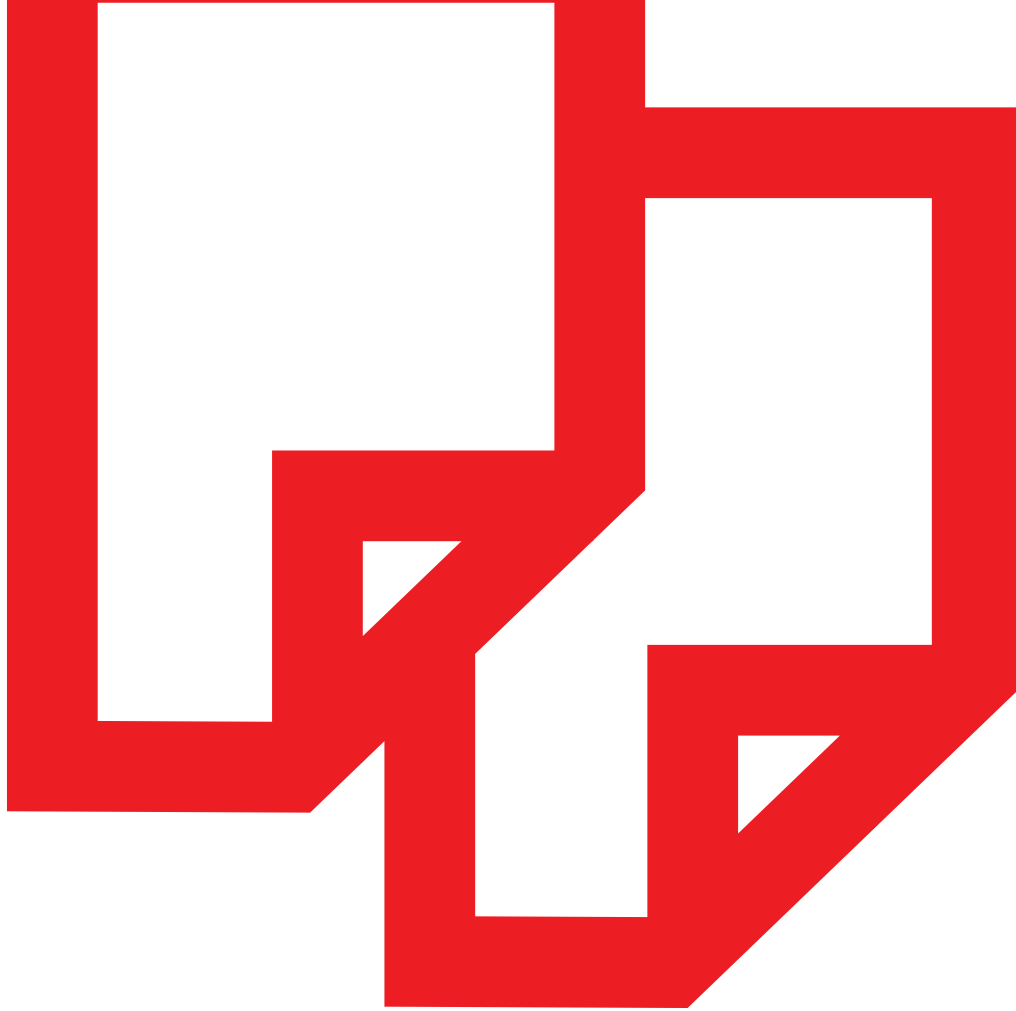
“Because you’ll be able to acquire these services, use them where it makes sense, and then de-commission and get rid of the services when you no longer need them.”¹⁰

The flexibility of cloud services changes the risk profile associated with innovation. Projects and processes that would have been too risky to attempt if they required a capital investment (say, hiring two servers on two-year contracts) become worth attempting if unsuccessful experiments can be decommissioned easily. The speed of a project in terms of time to market is also affected if it is implemented in the cloud.

Whilst there are numerous examples of rapid prototypes being used to capture the imagination of a corporate board about cloud services, what is less clear is how the organisation makes the transition from experimenting with using the cloud as a demonstrator to using the cloud for “production” systems that, in many cases, have much more stable demand patterns.

As is the case with IT outsourcing, there will be distinctive skills required from the in-house IT function, from existing system integrators and from outsourcing partners to make the most effective use of cloud computing. For example, when specifying their computing requirements, they will be making their requests in terms of “power at this rate, computing at this rate, at this level of security, with this compliance requirement, this level SLA”.¹¹ The skills required to specify and procure cloud in this way will be discussed in more detail in our fifth report.

Perhaps the most distinctive feature of cloud computing from a service perspective is the possibility for innovation that it offers by, in one way, confirming Nicholas Carr’s argument that “IT doesn’t matter”. In cloud computing, IT does, of course, matter, but a service perspective allows business to think much more about



what it needs (or would like to have) without having to worry about whether their IT function (or outsourcing partners) have the requisite skills, hardware or resources to deliver them. As Jimmy Harris notes:

"If you take it to its logical conclusion and a place most people, if you describe it to them, would want to be is that the acquisition and deployment of IT would be secondary. What you would acquire and deploy would be a business process or it would have a business services orientation."¹²

To illustrate this, consider an organisation's desire to acquire sales support. That is, the organisation recognises that it needs "the ability to track contacts, the ability to manage the pipeline, the ability to convert our

pipeline into sales, the ability for sales to be recognised as revenue."¹³ This does not (or perhaps should not) mean that the organisation knows it wants to go out and buy a particular package. Instead:

"What you would provision in effect is probably a combination of a salesforce.com, some of the functions from an ERP system or financial management system, etc., and for any given employee they have a certain usage profile, they would have access to certain functions and you would provision that employee with sales support."¹⁴

Steve Furminger of RAPP, another of our respondents, made a similar suggestion when discussing how they used cloud services to provide solutions for their own (media) customers:

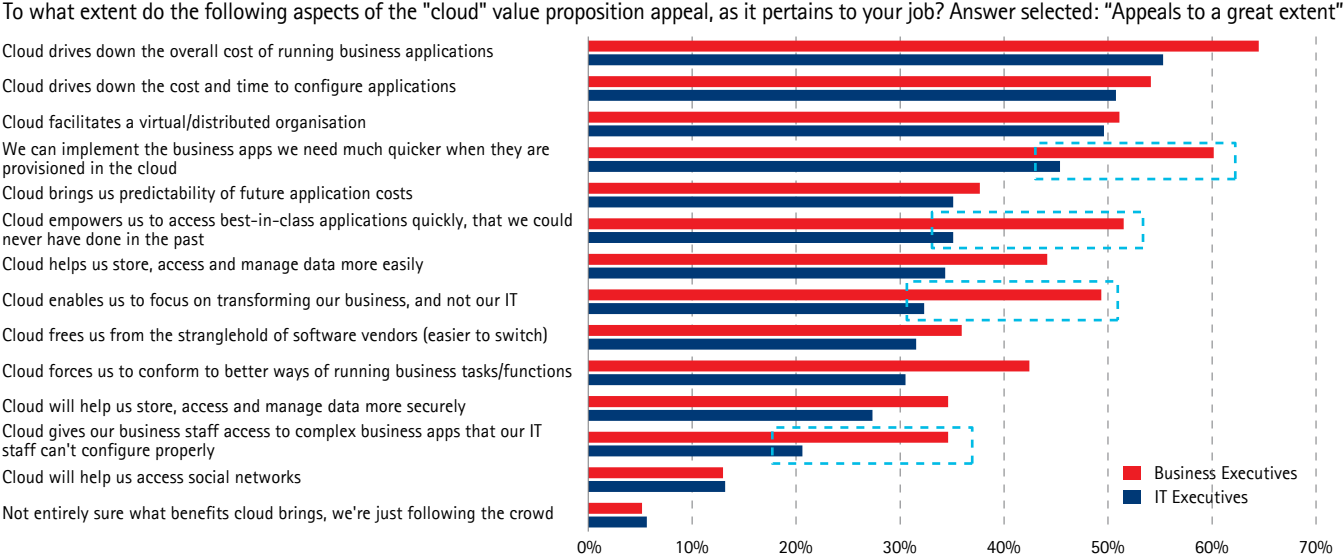
"It's providing us with the ability to create much more, produce many more solutions without having to worry how are we going to do that. Where four or five years ago, or even two or three years ago, that was a massive concern. Now we can almost forget the technology and just think this is what we're going to do."¹⁵

The management of cloud services from a cloud provider's perspective also offers opportunities for innovation as there are current shortfalls, as Kevin Lees notes, in terms of "orchestration, monitoring, performance monitoring, capacity management monitoring and capacity management modeling and capacity planning."¹⁶ Others, including Jim Rivera and Russell Marsh, see the scope for business process automation and integration¹⁷ and automated marketplaces¹⁸ for provisioning.



Executives and Cloud: Support for an Innovation Agenda

Figure 1. Business executives are enthusiastic with the potential of clouds's business impact; however, the appeal to the IT community is also strong.



Source: HFS Research and The Outsourcing Unit at the London School of Economics, November 2010. Sample: 628 Enterprises

Cloud computing appeals to business and IT executives. In our survey (see Figure 1), around 65 percent of business executives believe that cloud drives down the overall cost of business applications, 50 percent believe that it facilitates a virtual/distributed organisation and 60 percent of these executives believe that business applications can be provisioned far more quickly when they are in the cloud.

Whilst the business appeal of cloud might appear to be driven solely by cost and efficiency savings, our survey also provides strong support from business executives for the claim that "Cloud enables us to focus on transforming our business and not our IT" (50 percent). As one of our respondents noted:

"These technologies are enabling companies to do things they never could have imagined before. It changes the financial model of the company. It changes the talent model. It changes just about everything."¹⁹

Cloud computing allows the business to focus on the tasks it needs and wants to perform, not how they are going to be performed:

"They're going to get a form to fill out that says, I want to run this workload, I want to run it at this cost, I need this level of performance, this level of availability."²⁰

Cloud offers the opportunity for the focus to be truly put back on the business function, not the technology constraints. The business user, as has

always really been the case, does not care and does not want to know how the computing is provided.

Some of our interviewees made a comparison to the Net generation's use of the Internet²¹ and smart (phone) mobile devices:

"Now increasingly [devices like] my iPad, are becoming oxygen for how I need to operate. And I've got an expectation that I can access my business information in real time wherever I am. So I think when IT organisations look to the next ten years, they need to look at the consumer trends that are hitting us right now and start to think about, from an IT strategy, how am I going to adapt my business to this trend in consumerisation."²²



"End-users are now expecting, I think we all expect, that we can use multiple devices during the course of a day to access the information we need to do our jobs, right? I've an iPhone and an iPad, I have got a computer, in fact three or four computers. I can go log into my friend's computer, get online, get my stuff that I need. I can access my information from everywhere. And so older applications and older systems that were very locked into only being accessible through terminals and stuff, is quickly fading away."²³

These users want the high levels of service that they have come to expect but tell us they do not know (and do not care) how it is provided.

Another common thread from a business perspective is **frustration with the limitations of the existing, in-house IT function**. For most organisations IT is just a means to an end rather than an end to itself. Some estimates suggest that 70 percent of the IT function is being devoted to "keeping the lights on." It is therefore unsurprising that the IT function is frequently seen as unresponsive to changing business needs, that it is perceived as performing poorly, and, typically, has large backlogs of unimplemented applications.²⁴

If technology deployment (and the day-to-day management of the IT infrastructure) is moved to the cloud, then arguably some of this unresponsiveness and backlog can be addressed. Whilst this shift might cause short term disruption for the IT function, long term it offers the opportunity for the (remaining)

IT function to become increasingly aligned with the business needs of the organisation and provide innovative, sustainable advantage to the enterprise.

Indeed, some of our respondents argued that **the shorter cycle times offered by cloud enabled, indeed required, the IT function to be more closely aligned with business needs**. Even cloud providers recognise that with a service pay-per-drink model of computing they earn their business "every quarter or every month you know, when subscriptions or renewals are due," as Tim Barker puts it. This forces them to align their "entire business to the success of that project and the success of the customer."²⁵

From a cloud provider perspective, there is also the question of how flexibly they can provide their services, as Jim Spooner notes:



"Whether the billing is down to a day, a week or a month it ultimately kind of defines how mature you are in cloud."²⁶

From a technology perspective, cloud computing offers distinct advantages that are recognised by IT professionals. Although moving to the cloud may be disruptive to the existing IT function, it does allow the forward-thinking, business-focused CIO to have meaningful answers to board level questions about the current organisational IT environment, including how much it costs and how quickly new services can be provisioned:

"I guess the wise CIOs of today have started to think about how much do their services cost and how can they leverage these models within their business or how they can actually terminate

existing models to be able to deliver these kind of levels of services internally. And I think we're seeing that in the kind of commercial sector people are approaching this as a financial thing, wondering about how they can drive costs out of their business and use these services."²⁷

A technological benefit of cloud computing is the more detailed provisioning and planning that managed services can provide. For example, cloud providers can build in detailed performance metrics that can be utilised by clients to optimise their performance. Alternatively, the cloud model allows the IT function to manage its own service level requirements by building redundancy into its cloud provisioning. Therefore, rather than

having the IT function worry about providing 100 percent uptime capability from its in-house equipment, it can provide this capability by sourcing the same functionality from a variety of independent cloud providers. In so doing, cloud also offers novel disaster recovery solutions that address many of the pressing concerns of the modern CIO.

Although most IT functions are currently not charged for their consumption of electricity (to power their computers and provide necessary air conditioning), as costs continue to be trimmed across the organisation, it is likely that the IT function will begin to be charged for its power consumption. Consolidation of IT through cloud computing therefore has the potential to offer significant environmental savings, for example, by locating the cloud service in a zero-carbon facility in Iceland. This also increases the green credentials of the organisation.

Innovating the Business: Towards the Cloud Corporation

Our predictions in earlier papers envisage changes in the IT supply market and in the internal IT function. This suggests a medium term situation in which organisations (and consumers) collaborate and interact through configured business services provided from the cloud. CIOs would then consider BPaaS as real services to the business—not assessed as SLAs but against key business performance indicators and profit.

Once in place, the amorphous nature of such BPaaS would allow third parties to be directly integrated within them—accountants, suppliers, regulators, for example. The traditional role of the systems integrator might thus become, in effect, that of a business integrator—connecting real business services together through BPaaS—rather than worrying about technology.

For most organisations, such a change would improve their processes, free IT staff time to have a business and strategy focus, and allow a much easier relationship with suppliers of services. Such a change is an evolution rather than revolution—what have been termed “incremental innovations” on the existing outsourcing path, albeit with certain “architectural innovations” which improve processes and technologically advance the organisation’s business.

Most organisations must be, to some extent, ambidextrous.²⁸ Alongside incremental innovations they must also continually seek to explore new ground. As a radical innovation in technology, cloud computing thus offers organisational units a chance to alter radically their business services—most probably through the innovation and collaboration beyond the enterprise as we identified earlier. For, as John Seely Brown reminds us,²⁹ Nicholas Carr’s pronouncements that “IT doesn’t matter” ignored the fact that each new computing facility creates new possibilities and options—that can be exploited for market advantage.

We believe therefore that, for innovative organisational units, cloud computing may provide a platform for radical innovation in business process. A summary of the possibilities is shown in Figure 2.

We see glimpses of this today—Avon, whose case study is described in our third paper, Cloud Impacts, exploits a Facebook application to allow its Sales Leaders to socially network. Jim Rivera of salesforce.com describes the strategy:

“Avon did a fascinating thing where they built a Facebook application on [the salesforce] platform and on the Facebook platform, and largely kind of just plug in external applications quite easily...They built this custom application to help manage their network of Avon ladies within Facebook. So now as an employee of Avon, as an Avon Lady, all I do is sign into Facebook. You get all the promotions coming to you. You’re understanding

Figure 2. Cloud computing as the infrastructure for business services within an "ambidextrous" and agile organisational form

Innovation Focus	Proposition	Cloud Services
Incremental Innovation	Cost control through consolidation and virtualisation. Direct replacement of Apps with SaaS	Virtualisation, Hybrid Clouds, IaaS, SaaS
Architectural Innovation	Improvement in business processes; increasing mobility; increasing usability and elasticity	Mobilisation, consumerisation, PaaS, IaaS, SaaS
Radical Innovation	Skunk-work IaaS, collaboration (intra- and inter-organisational)	Elasticity, consumerisation, market-based, PaaS, SaaS

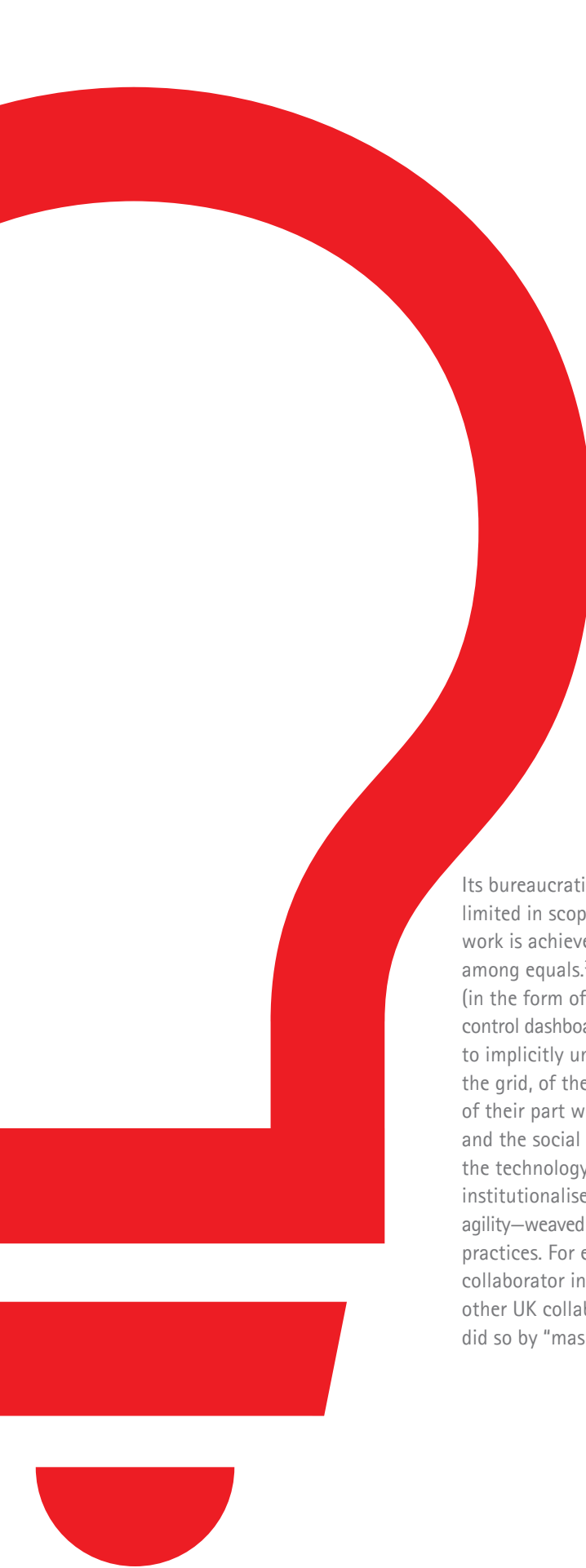
what the new products are, what things you should be pushing, and then within the same application, you turn around and you start to push that out into your network. And it's amazing. So they've actually used that as their portal for their sales people in Facebook."³⁰

Here Avon's Sales and Marketing business processes extend into Facebook, and through that into the social networks of their customers. Their processes have moved outside the traditional organisational boundary to create amorphous collaborations, through Sales Leaders, with customers and their social networks.

Such collaborative, innovative relationships, supported by BPaaS, hint at a new organisational form—amorphous, agile, ambidextrous (in focusing on delivery but also on radical innovation)—a form we term the Cloud Corporation. Knowing what such an organisation might look like is difficult—few commercial enterprises are yet in the position to collaborate and integrate business services sufficiently. We therefore need to look beyond the commercial enterprise. One example exists among the particle physicists working at CERN on the Large Hadron Collider (LHC).

In order to analyse the staggering 15 million gigabytes of data that are being produced every year by the LHC's experiments, there was a need to create a global organisation of over 140 computer centres (each part of a university or research facility) working together to pool their computing into a Grid Computing Infrastructure.³¹ This infrastructure—a kind of globally distributed PaaS service and the bedrock of many cloud technologies—was developed, and is run, collectively by this loosely organised group of physicists and their data centres.

Interestingly though, this new organisation connects the computer centres through loose memoranda of understanding and business processes (particularly around support, data-analysis and technology upgrades).



Its bureaucratic hierarchies are very limited in scope and power and most work is achieved through collaboration among equals.³² Crucially, technology (in the form of monitoring, support and control dashboards) allows collaborators to implicitly understand the state of the grid, of their collaboration, and of their part within it. The technology, and the social networking around the technology, is taken for granted, institutionalised, and is part of their agility—weaved within their management practices. For example, when Steve, (a collaborator in the UK), wished to steer other UK collaborators' actions he did so by "mashing-up" a new BPaaS

which showed, hour by hour, elements of the Grid infrastructure which he felt were deficient. Called "Steve's Jobs" this new BPaaS provided an incentive and direction to other collaborators to change their work, and innovate around "Steve's Jobs."³³ Particle physicists at CERN are unusual—they have highly collaborative tendencies³⁴ (which they invented the Web to support); however, we believe they provide a first glimpse of how an agile, innovative global organisation can be created when founded upon collaboration and shared cloud-based technology.

Conclusion

The reality is that cloud computing cannot achieve the plug-and-play simplicity of electricity, at least, not as long as the pace of innovation, both within cloud computing itself, and in the myriad applications and business models it enables, continues at such a rapid pace. While electric utilities are held up as models of simplicity and stability, even this industry is not immune from the transformative power of IT.

Innovations like the “smart grid” are triggering fundamental changes at a pace not seen since the early days of electrification. The real strength of cloud computing is that it is a catalyst for more innovation. In fact, as cloud computing continues to become cheaper and more ubiquitous, the opportunities for combinatorial innovation will only grow. It is true that this inevitably requires more creativity and skill from IT and business executives. In the end, this not something to be avoided, but should be welcomed and embraced.

The distinctive features of cloud computing also offer many potential opportunities for business innovation, particularly given its service (and service quality) focus, coupled with the flexibility that new technology delivery mechanisms provide. These features serve to change the risk

profile of business innovations to the extent that it is now increasingly possible to specify new business processes and their associated required service levels, experiment with them for a short time and either disband them if they are unsuccessful or rapidly scale those that have potential.

The pattern therefore may well follow past diffusions of other potentially powerful technological innovations, including the Internet itself. The technology innovations will move in packs covering base technology, and technical service and process innovations. With cloud these innovations in combination are likely to be radical and disruptive, if over a longer time period than many are anticipating. From a business perspective, these technology innovations will have a cumulative impact on the possibilities for more business-focused innovations,

though these will be through the filter of the four antecedent factors discussed in this paper. From a business executive perspective, the innovation plan then is relatively easy to state, but much more difficult to make the right choices on: navigate the hype, test out the capability, find the useful application, ensure the capability to leverage, and learn further how to exploit the innovation for strategic, business purpose. And move from cost gains through incremental, architectural and radical innovation to the cloud-based, agile, ambidextrous organisation.

A Note on Methodology

This paper, and our four related papers, draw on three main sources—an interview base, industry and academic reports, the LSE Outsourcing Unit 1,600 organisation database, and a large-scale survey. We undertook thirty five initial interviews with leading industry players across the cloud supply chain. These will be added to during 2011, following the same procedures outlined below and the additional insights will inform papers 2-5. We interviewed providers of cloud infrastructures and services, system integrators and users of cloud services. In terms of roles, we spoke to CEOs, CIOs, marketing managers 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.³⁵

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 report.³⁶ The selection process was guided by the need for a 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 Research³⁷ 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 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 are available on the HfS site.³⁸ 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 percent 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.

Contributing organisations

The Cabinet Office, UK

Glasshouse

RAPP

SpiritMedia

VMWare

GridPP

SAP

Microsoft

Accenture

EMC

Salesforce

Cable & Wireless

CERN

PA Consulting

Logica

Royal Sun Alliance

RightNow

Fujitsu

Qantas

Avon

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Endnotes

1 A recent paper shows that information technology innovations often move in packs, and this seems to be the case with cloud. It is the interactions between base technology innovations, technology service innovations and technology process innovations that made internet computing, and will make cloud a disruptive, radical IT innovation. See Carlo, J., Lyytinen, K. and Rose, G. (2011) Internet computing as a disruptive technology: The role of strong order effects. *Information Systems Journal*, 21, 91-122.

2 Recent research sees the cloud disruptive sequence being 1. new delivery models, 2. technology disruption, 3. restructuring the IT industry and 4. disruption of other industries. See Hagel, J. and Seeley Brown, J. (2010) *Cloud Computing - Storms on the Horizon*. Deloitte Centre for the Edge, USA. We see technological disruption being cumulative and on-going. Clearly cloud does introduce new delivery models that we see as maturing over time. Here we are particularly interested how these delivery models will need to grow the service dimension and produce business services. Undoubtedly there is already underway disruption of the IT supply industry, as documented in our previous paper. In this paper we focus on how businesses and government agencies will innovate in their practices, structures, processes and market offerings.

3 See Greenhalgh, T., Glenn, R., MacFarlane, F., Bate, P. And Kyriakidou, O. (2004) Diffusion of Innovation in Service Organizations: Systematic Review and Recommendations. *The Milbank Quarterly*, 82, 4, 581-629. The authors also point to fuzzy boundaries, task issues and the nature of knowledge required being lesser issues emerging from research studies.

4 See Willcocks, L. and Craig, A. (2009) *The Outsourcing Enterprise: Collaborating To Innovate*. Logica, London.

5 See Willcocks et al (2011) *The Outsourcing Enterprise: From Cost Management to Collaborative Innovation*. Palgrave, London. op. Cit. Especially chapter 5.

6 We studied 26 organisations who had moved to what we call 'collaborative innovation in their outsourcing relationships. All experienced IT operational innovation while 21 were getting business process, and seven business product/service innovations. These findings come from additional research carried out in 2011 by Willcocks L. And Whitley, E. and are the subject of an unpublished working paper under journal review.

7 Greenhalgh et al (2004) op.cit. provide a comprehensive review of all innovation studies and these factors emerge strongly from their work.

8 See Centre for Economics and Business Research (2011) *The Cloud Dividend - Part Two*. CEBR/EMC, London.

9 One famous case is of a pharma company where they paid for capability with a credit card and got the results of the analysis sooner and cheaper than the formal request for computing resources.

10 Interview with Jimmy Harris, Accenture, November 2010.

11 David Leyland, Glasshouse, interview July 2010.

12 Interview with Jimmy Harris op. Cit.

13 Interview with Jimmy Harris, op. Cit.

14 Interview with Jimmy Harris, op. cit.

15 Interview with Steve Furninger, RAPP, December 2010.

16 Interview with Kevin Lees, VMWare, November 2010.

17 Interview with Jim Rivera, salesforce.com, September 2010.

18 Interview with Russell Marsh, RAPP, December 2010.

19 Interview with Jimmy Harris, op Cit.

20 Interview with Steve Beck, VMWare, December 2010.

21 Barzilai-Nahon K and Mason RM (2010) How executives perceive the net generation. *Information, Communication and Society* 13(3), 396-418.

22 Interview with Tim Barker, salesforce.com, November 2010.

23 Interview with Mike Dino DiPetrolo, VMWare, November 2010.

24 See Willcocks, L. Et al. (2003) *Making IT Count: Strategy, Delivery and Infrastructure* (Palgrave, London) for a detailed assessment of how IT is managed, and the TYPICAL problems IT functions face.

25 Interview with Tim Barker, op Cit.

26 Interview with Jim Spooner, Glasshouse, November 2010.

27 Jim Spooner interview, op. Cit.

28 See O'Reilly III, C. and M. Tushman (2004). "The Ambidextrous Organization." *Harvard Business Review* 82(4): 74-81.

29 Brown, J. S. (2003). "Does IT Matter? Letter to the Editor." *Harvard Business Review* (July): 109-112.

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