

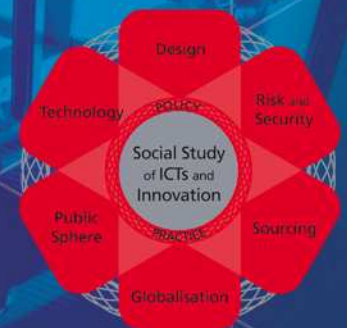


**INFORMATION SYSTEMS
AND INNOVATION GROUP**
Department of Management

Using Cloud Computing to Drive Innovation: Technological Opportunities and Management Challenges

Edgar A. Whitley

Based on work with Leslie P Willcocks
and Will Venters





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Cloud and the Future of Business: From Costs to Innovation

By Professor Leslie Willcocks, Dr. Will Venters, Dr. Edgar Whitley
The Outsourcing Unit, Department of Management
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Part One: Promise

• Consulting • Technology • Outsourcing



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Part Two: Challenges

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Part Four: Innovation

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What is cloud computing?

- “Cloud computing refers to both the applications delivered as a service over the internet and the hardware and systems software in the data-centre that provides those services” (Armbrust et al 2010)

Cloud ...

- ... is a “transformation that’s going on in the computing world”
 - Steve Ballmer, Microsoft CEO Speaking at LSE 5 October 2010
- ... “lowers the barriers to actually getting the business what they want”
 - Tim Barker, Salesforce, Interview 22 September 2010

Our research suggests
executives are taking the
cloud seriously

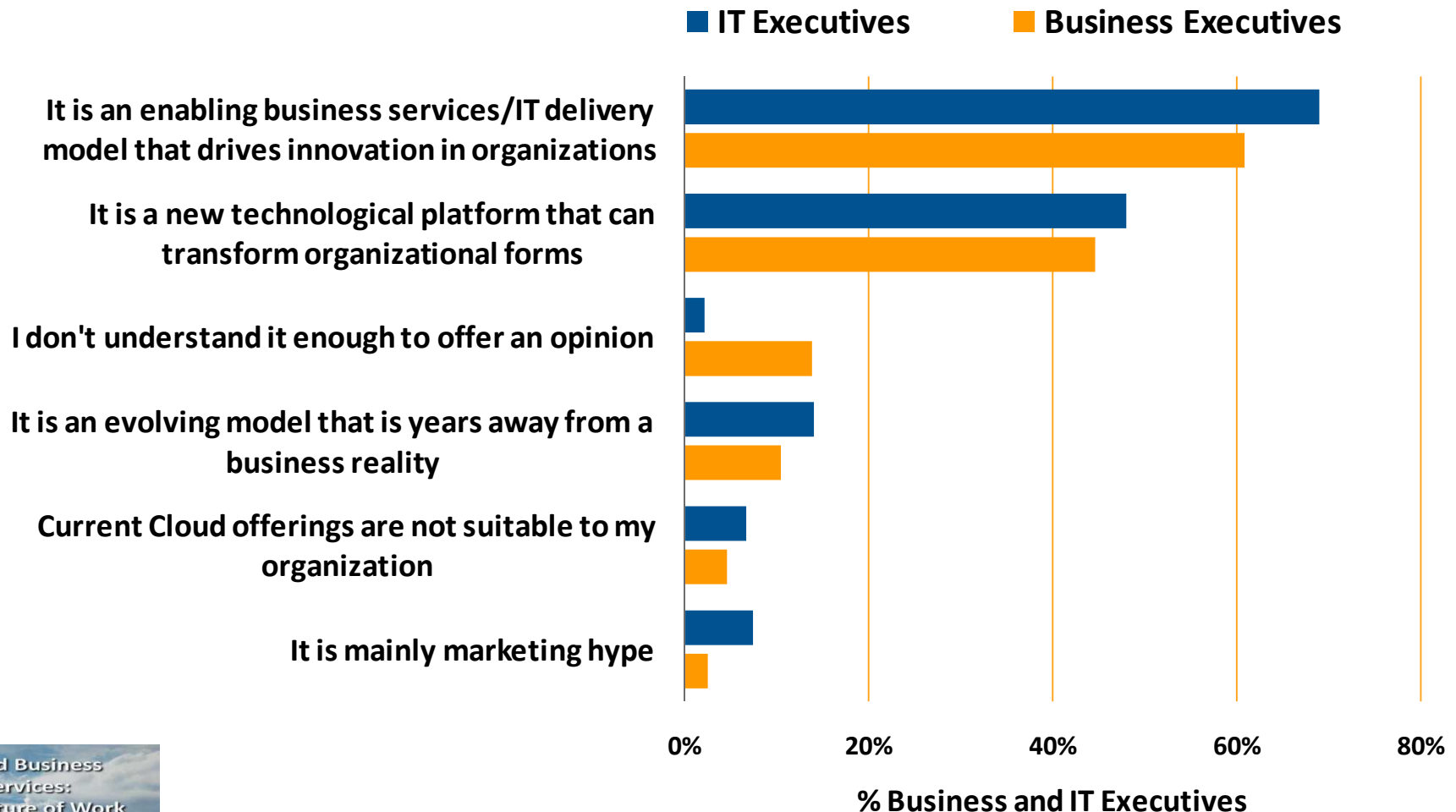
Survey

- A joint research study of over 1050 global enterprises
- Conducted by HfS Research, November 2010



Business & IT Professionals view Cloud Business Services as Innovative

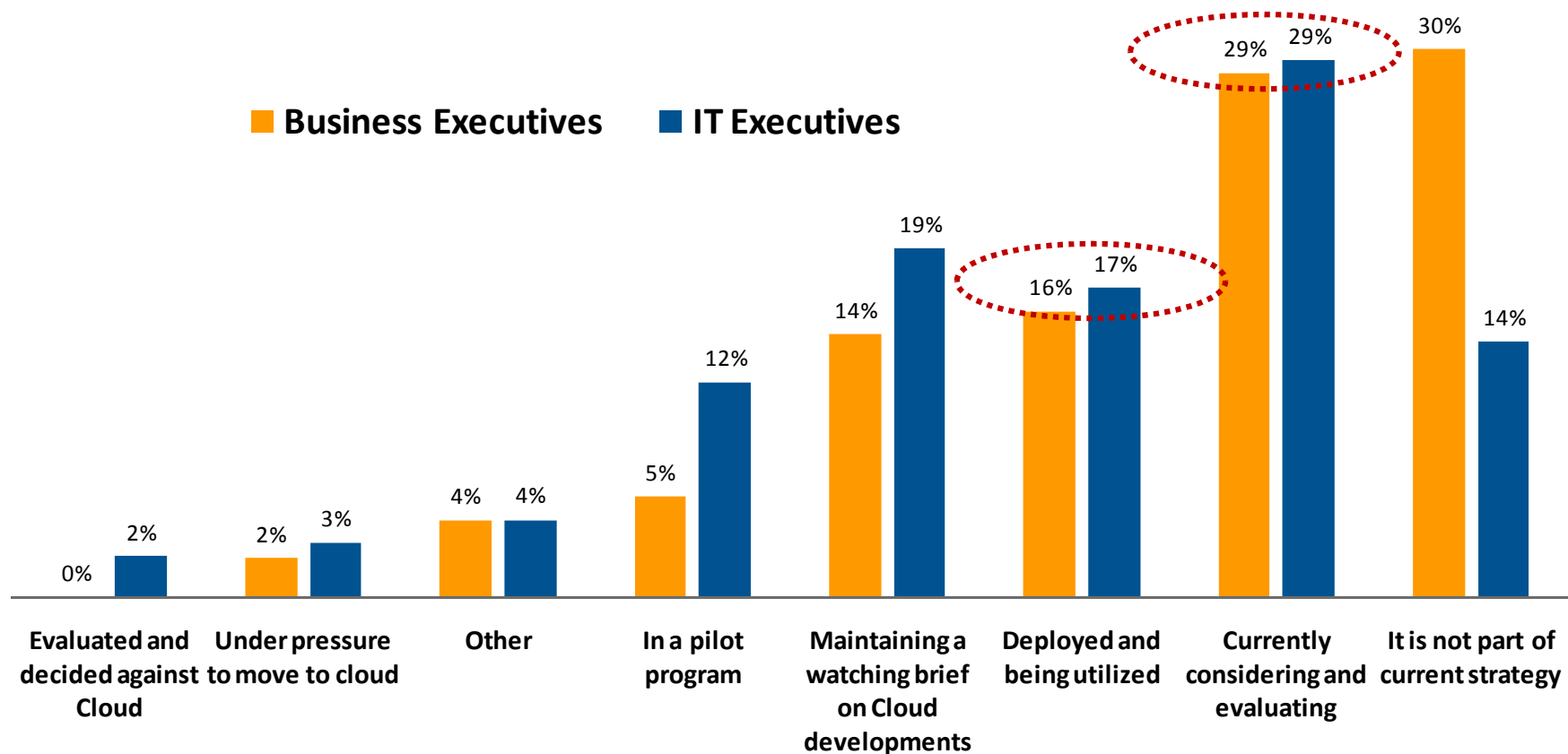
What is your general opinion about Cloud Business Services?



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

Heavy evaluation interest from business and IT executives

What is the current status of Cloud deliberations/evaluations across key business processes within your organization?

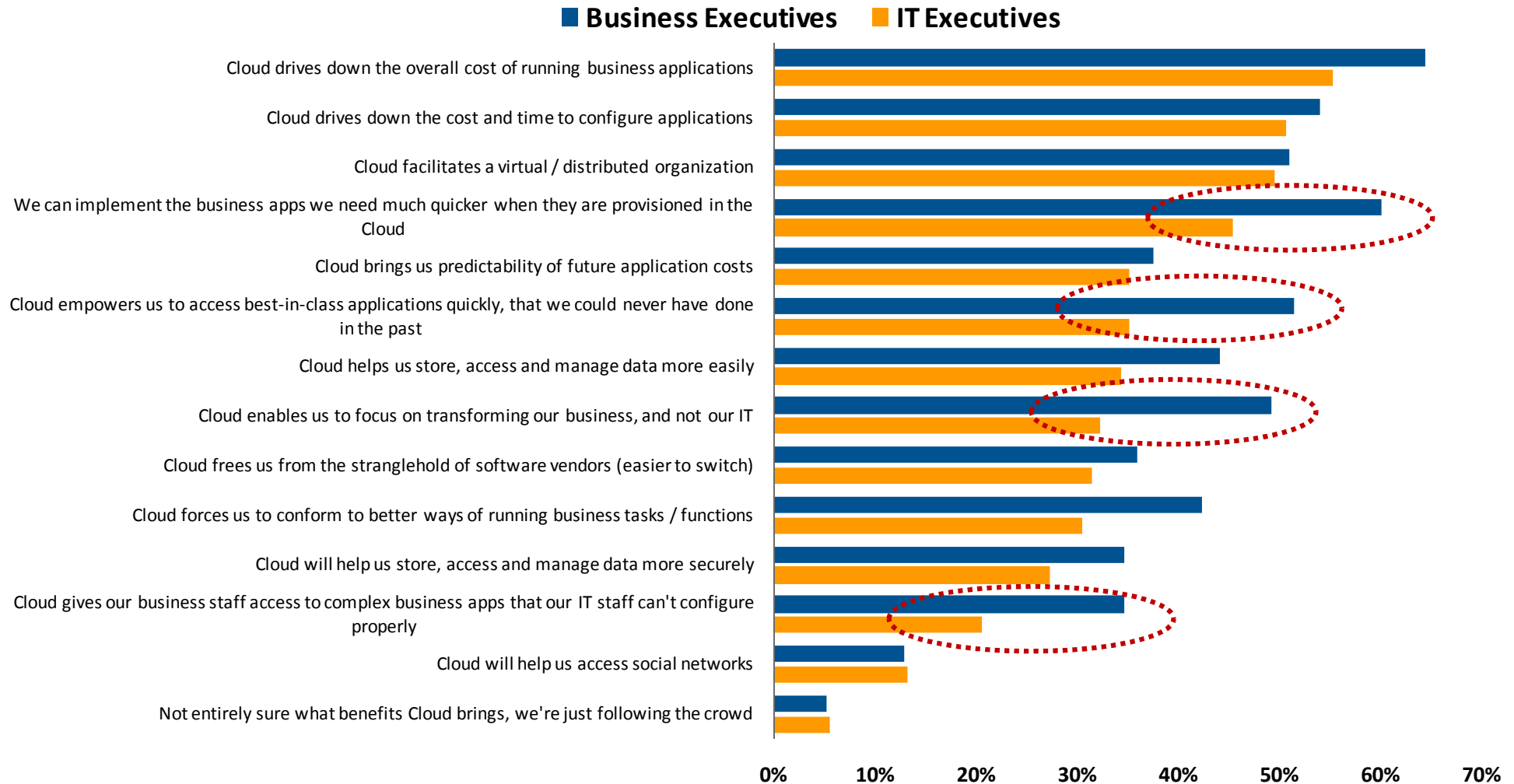


Source: HfS Research and The Outsourcing Unit at the London School of Economics, November 2010

Business execs enthusiastic with the potential of Cloud's business impact, however the appeal to the IT community is also strong

To what extent do the following aspects of the "Cloud" value proposition appeal, as it pertains to your job?

Answer selected: "Appeals to a great extent"



Source: HfS Research and The Outsourcing Unit at the London School of Economics, November 2010

What are the drivers of cloud computing?

Technical

- Virtualisation
- Bandwidth
- Elasticity / data-centre architecture

Organisational

- Pressure on costs, lack of control over IT, data-analytics, data-centre renewal, green-IT

Social

- “Millennials”
- Social networking
- Mobility, open innovation

Different levels of cloud

- Software as a Service (SaaS)
 - Application provided by cloud vendor
 - Salesforce.com / Google Apps
- Platform as a Service (PaaS)
 - Configured platform provided by cloud vendor
 - Microsoft Azure / Force.com

- Infrastructure as a Service (IaaS)
 - Virtualised computing resources
 - Amazon's Elastic Compute / Rackspace
- Hosted services
 - Data centre consolidation

Cloud 'Desires' Framework

Equivalence	The desire to provide services which are at least equivalent in quality to that experienced by a locally running service on a PC or server.
Abstraction	The desire to hide unnecessary complexity of the lower levels of the application stack.
Automation	The desire to automatically manage the running of a service.
Tailoring	The desire to tailor the provided service for specific enterprise needs.

	Equivalence	Abstraction	Automation	Tailoring
SaaS	Defined by functional requirements	At the level of the application	High degree of automation	Limited by application
PaaS	If aligned to existing development practices	To the level of integrating components	Core management tasks automated	Through assembly of "lego" components
IaaS	Close to that of server	At the hardware level	Limited to hardware management	Complete application stack with networking
Hosted Services	Equivalent to server ownership	No abstraction	Limited management	Complete application stack

What can cloud offer?

Opportunities of cloud

- Cost reduction
 - E.g. Through data centre consolidation
- Innovating business services
 - IT is no longer the business prevention unit

What organisations
want

Cost/Rationalisation

Agility

Innovation

Simplicity

What the cloud offers
that's new

Elasticity

Consumerisation

Example: RAPP

- Unknown demand for video streaming associated with movie launches
- “Pay-as-you-drink” use of video streaming in the cloud
- Rapidly scaleable- up or down

Innovation

- Innovation becomes a 'low friction' activity
 - Easy to experiment with innovative processes
 - Easy to cancel unsuccessful experiments
- Transforms the risk profile of innovation

Service innovation

- “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.”

Cloud providers

- With a service model of computing they earn their business “every quarter or every month you know, when subscriptions or renewals are due”
- Forced to align their “entire business to the success of that project and the success of the customer”

Challenges of the cloud

‘Traditional’ challenges

- Legal and regulatory compliance
 - Security, privacy, disaster recovery
- Managing contractual relationships
 - Lock-in
 - Dependency
 - Bundling
- Managing the flexibility

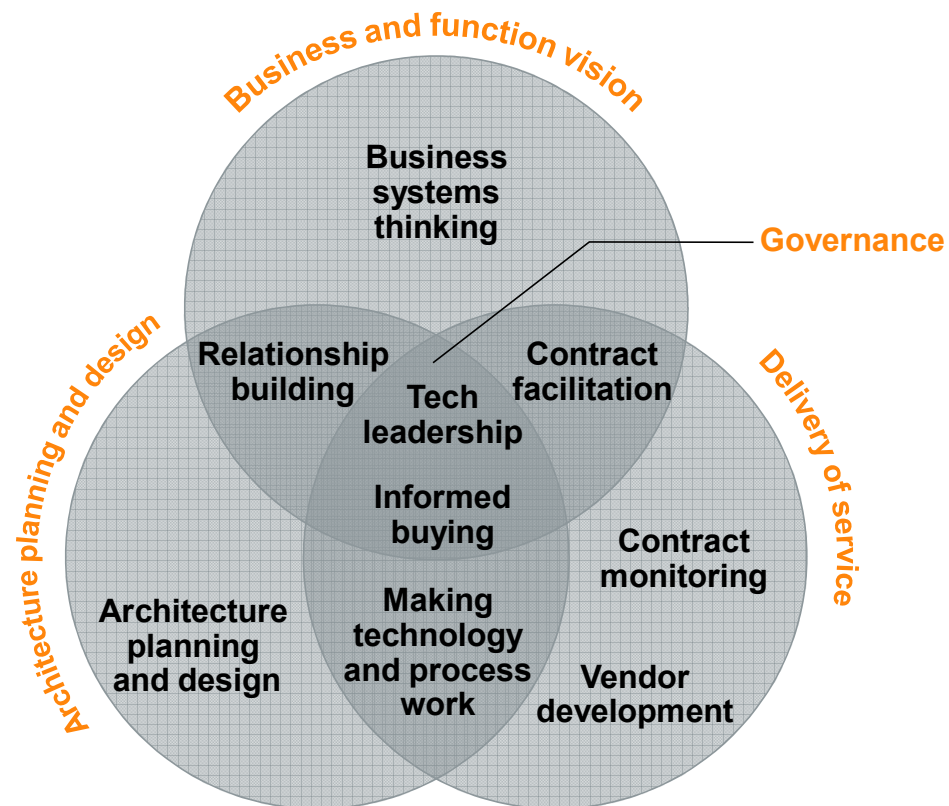
Technological considerations

- Multi-tenancy risks
- Statistical-multiplexing can lead to failures if demand patterns change
- Network latency between cloud provider and enterprise

Client questions to ask cloud providers

- How does the cloud provider manage its growth?
- How well does the cloud provider's strategic ambition for service quality align with your desires for service quality?

Skill sets for the cloud



Role	Description
Leader	Integrates the technology–cloud effort with business purpose and activity
Business Systems Thinker	Ensures that technology–cloud capabilities are envisioned in every business process
Relationship Builder	Gets the business constructively engaged in operational technology–cloud issues
Architecture Planner and Designer	Creates the coherent blueprint for a technical platform that responds to present and future needs
Technical Fixer	Rapidly trouble–shoots problems which are being disowned by others across the technical supply chain

Role	Description
Informed Buyer	Manages the technology–cloud sourcing strategy to meet the needs of the business
Contract Facilitator	Ensures the success of existing contracts for external technology–cloud services
Contract Monitor	Protects the business’s contractual position present and future
Vendor Developer	Identifies the potential added value from technology–cloud service suppliers

Summary

Cloud is ...

- ... Something new
- ... Faces many of the same challenges as traditional outsourcing
- A transformation, not a revolution

Some predictions

Cloud escalates greatly the
importance of service
performance in the external IT
and business services industry

Cloud leads to reconfiguration
of the supply industry

Cloud supports moves towards
the ambidextrous agile business

Cloud accelerates the existing
shift from IT-based products
to business services

Cloud signals significant
changes in functions and
roles for internal IT

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