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What is Cloud Computing?

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Cloud is often vague…

..but is a key business transformation for the future of Telcos

Agenda

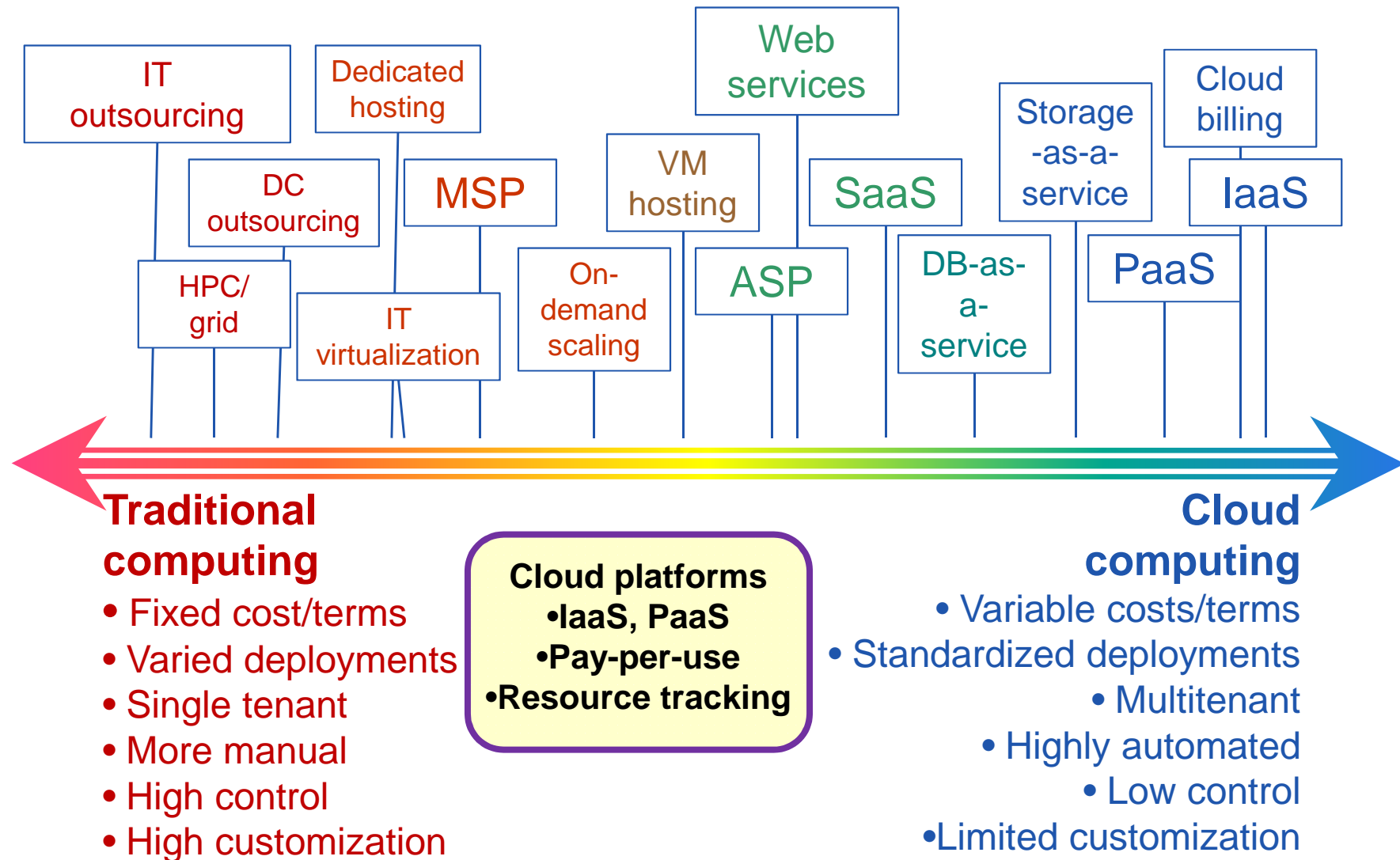- **Cloud Definitions**

- Cloud Maturity and adoption

- Questions and Answers

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Definition: cloud computing

- A standardized IT capability (services, software, or infrastructure) delivered in a pay-per-use and self-service way

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Not everything is cloud . . . and shouldn't be

IT outsourcing

Dedicated hosting

Web services

Storage-as-a-service

Cloud billing

DC outsourcing

MSP

VM hosting

SaaS

IaaS

HPC/ grid

IT virtualization

On-demand scaling

ASP

DB-as-a-service

PaaS

Traditional computing
- Fixed cost/terms
- Varied deployments
- Single tenant
- More manual
- High control
- High customization

Cloud platforms
- IaaS, PaaS
- Pay-per-use
- Resource tracking

Cloud computing
- Variable costs/terms
- Standardized deployments
- Multitenant
- Highly automated
- Low control
- Limited customization

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Forrester's Full Cloud Computing Taxonomy

Level of sharing (vertical axis, top to bottom):

- **Public cloud**
- **Hosted (virtual private) cloud**
- **Private cloud**

Hybrid spans from Public cloud to Private cloud.

	Infrastructure	Middleware	Applications	Information and processes	
Public cloud	IaaS	PaaS	SaaS	BPaaS	Pure cloud market
	NaaS CaaS				
Hosted (virtual private) cloud	Dynamic infrastructure services	Integration-as-a-service	Dynamic apps services	Dynamic BPO services	Extended cloud market
Private cloud	Infrastructure virtualization tools	Middleware virtualization tools	Apps virtualization tools	BP virtualization tools	

Business value →

July 2010 **"The Evolution Of Cloud Computing Markets"**

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The personal cloud: a definition

An Internet-based digital service for individuals and their employers that acts as a permanent and flexible resource to:

1. Organize and preserve personal information, documents, media, and communications.

2. Deliver that information on demand to any device or service.

3. Orchestrate the integration of personal information across all digital devices and services.

Source: July 6, 2009, "The Personal Cloud" Forrester report

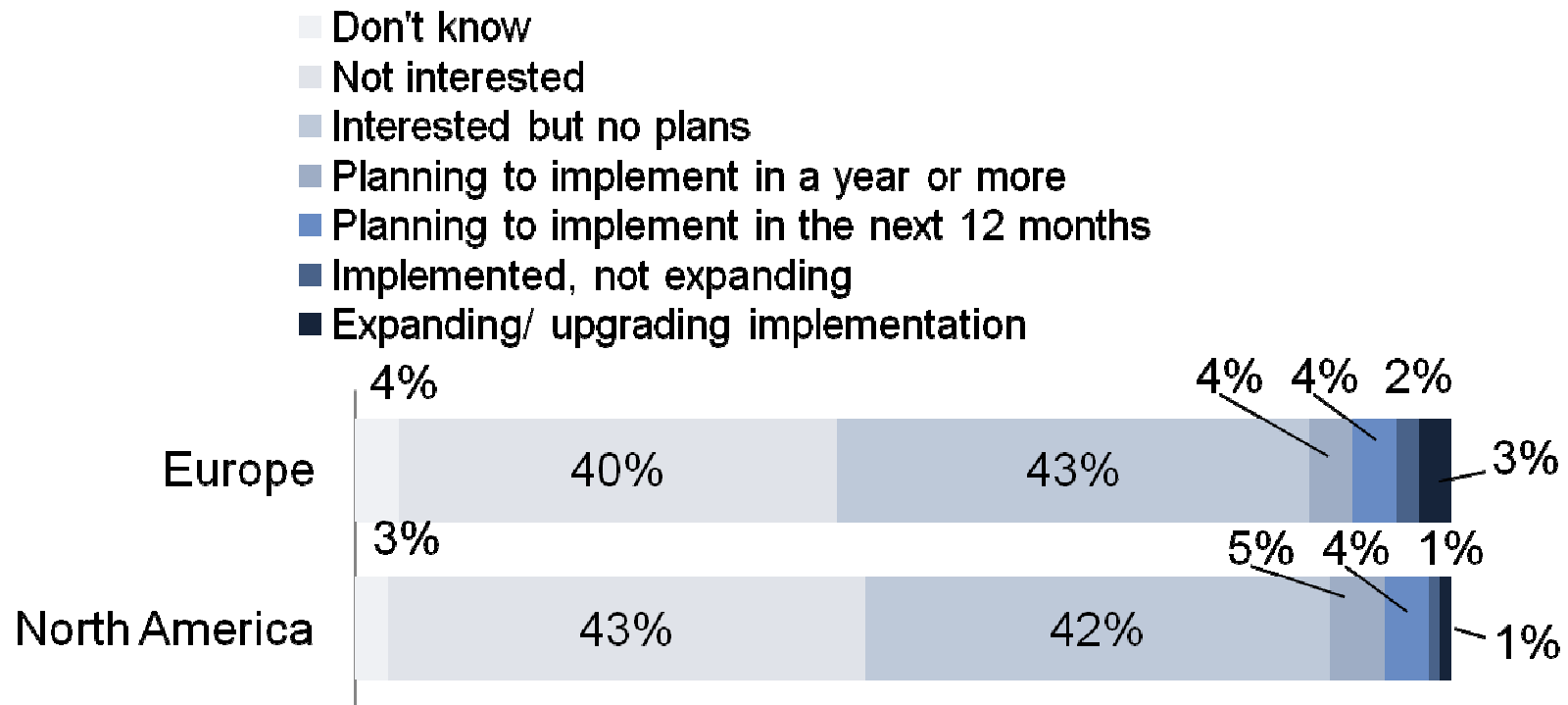FORRESTER®

Personal cloud offerings will:

- Coordinate digital lives across many devices, platforms, and services.

- Permanently archive a broad range of personal information from diverse devices and services.

- Host massive data volumes and transform for access to diverse and obsolete formats.

- Bridge access across work and personal domains.

Source: July 6, 2009, "The Personal Cloud" Forrester report

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Cloud adoption is slightly higher in Europe

What are your firm's plans to adopt pay-per-use hosting of virtual servers (also known as cloud computing) at service providers such as Amazon Web Services, Savvis, or Rackspace/Mosso?

- Don't know
- Not interested
- Interested but no plans
- Planning to implement in a year or more
- Planning to implement in the next 12 months
- Implemented, not expanding
- Expanding/ upgrading implementation

Europe: 4% | 40% | 43% | 4% | 4% | 2% | 3%

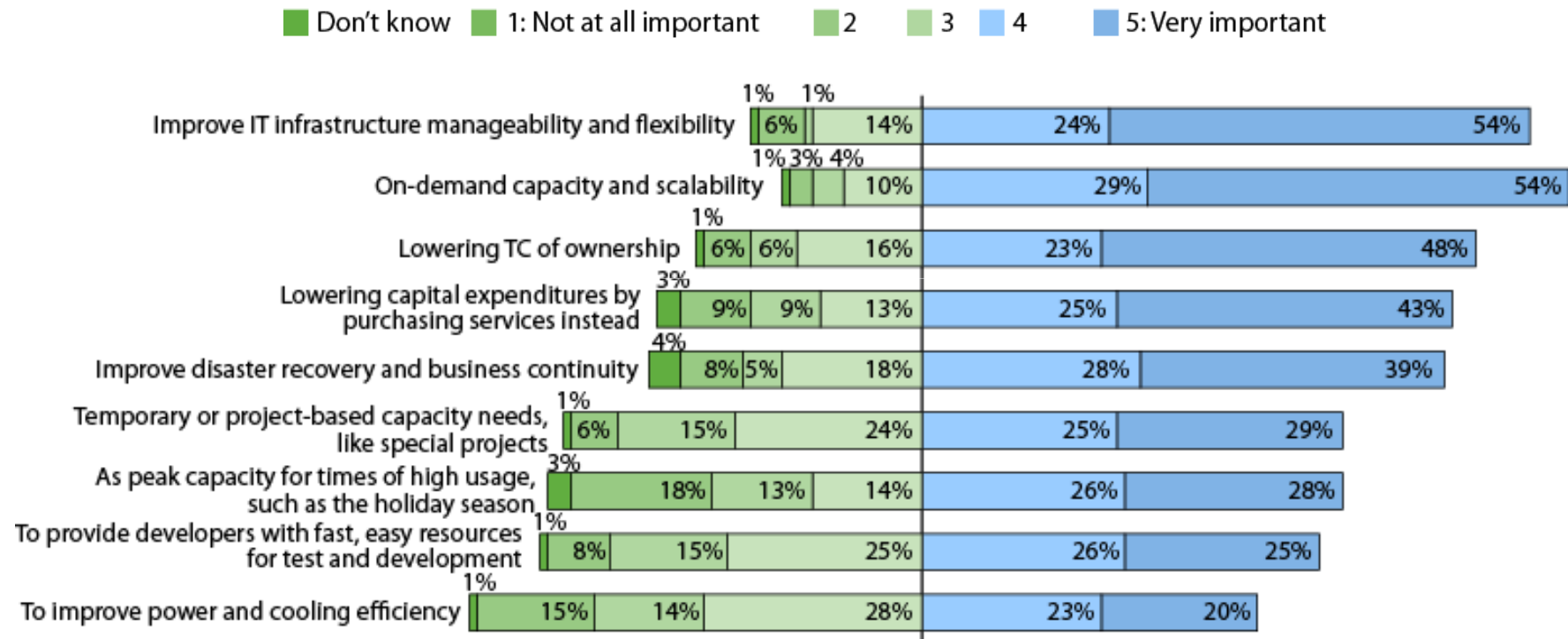**North America:** 3% | 43% | 42% | 5% | 4% | 1% | 1%

Base: 937 North American Enterprise and SMB hardware decision-makers
335 European enterprise and SMB hardware decision-maker

Source: Enterprise And SMB Hardware Survey, North America And Europe, Q3 2009

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Enterprises cite flexibility and on demand over cost reasons

"How important were the following in your firm's decision to adopt pay-per-use hosting of virtual servers (also known as cloud computing)?"

Legend: ■ Don't know ■ 1: Not at all important ■ 2 ■ 3 ■ 4 ■ 5: Very important

Category	Don't know	1	2	3	4	5
Improve IT infrastructure manageability and flexibility	1%	1%	6%	14%	24%	54%
On-demand capacity and scalability	1%	3%	4%	10%	29%	54%
Lowering TC of ownership	1%	6%	6%	16%	23%	48%
Lowering capital expenditures by purchasing services instead	3%	9%	9%	13%	25%	43%
Improve disaster recovery and business continuity	4%	8%	5%	18%	28%	39%
Temporary or project-based capacity needs, like special projects	1%		6%	15%	24%	25%	29%
As peak capacity for times of high usage, such as the holiday season	3%		18%	13%	14%	26%	28%
To provide developers with fast, easy resources for test and development	1%		8%	15%	25%	26%	25%
To improve power and cooling efficiency	1%		15%	14%	28%	23%	20%

Base: 80 enterprise hardware decision-makers

(numbers/percentages may not sum to the total shown because of rounding)

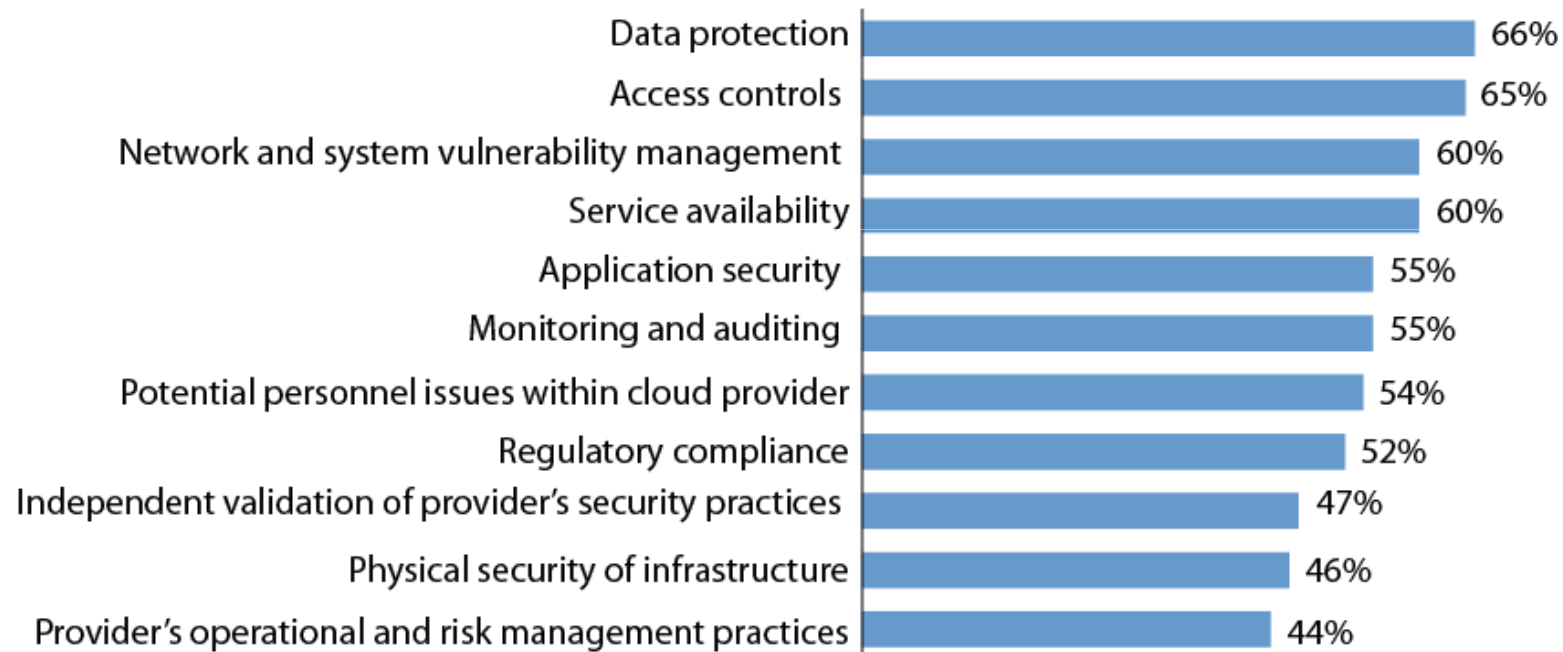Source: Enterprise and SMB North America and European Hardware Survey, Q4 2009

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Some IT Professionals Remain Wary Of Cloud Computing (Cont.)

IT security professionals rank data protection top of all cloud security concerns

"How concerned is your firm about the following aspects of cloud computing platforms such as salesforce.com, Amazon Web Services, or Microsoft Azure?"
(4 and 5 on a scale of 1 [Not at all concerned] to 5 [Very concerned])

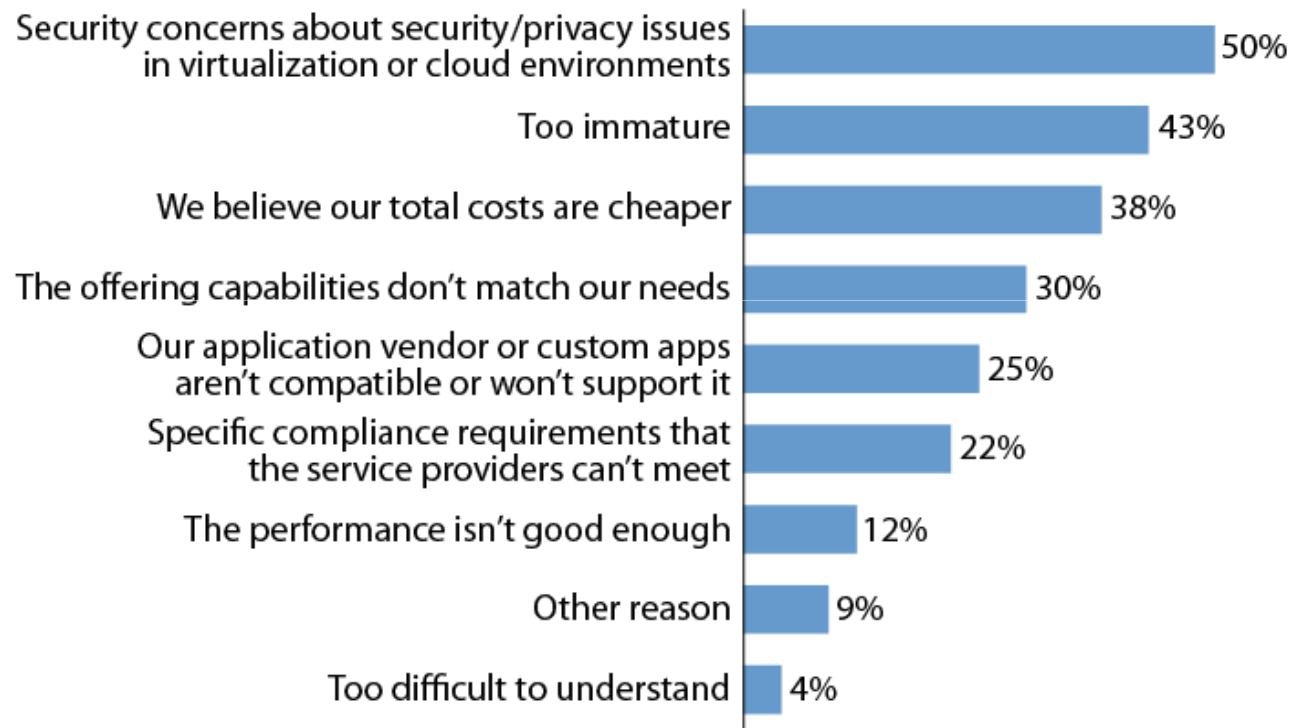|	
Data protection	66%
Access controls	65%
Network and system vulnerability management	60%
Service availability	60%
Application security	55%
Monitoring and auditing	55%
Potential personnel issues within cloud provider	54%
Regulatory compliance	52%
Independent validation of provider's security practices	47%
Physical security of infrastructure	46%
Provider's operational and risk management practices	44%

Base: 1,059 North American and European enterprise and SMB IT decision-makers

Source: Enterprise And SMB Security Survey, North America And Europe, Q3 2009

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February 2010 **"Infrastructure-As-A-Service (IaaS) Clouds Are Local And So Are Their Implications"**

Some IT Professionals Remain Wary Of Cloud Computing

Security and privacy issues are top concerns for data center decision-makers

"Why isn't your firm interested in pay-per-use hosting of virtual servers (also known as cloud computing)?"

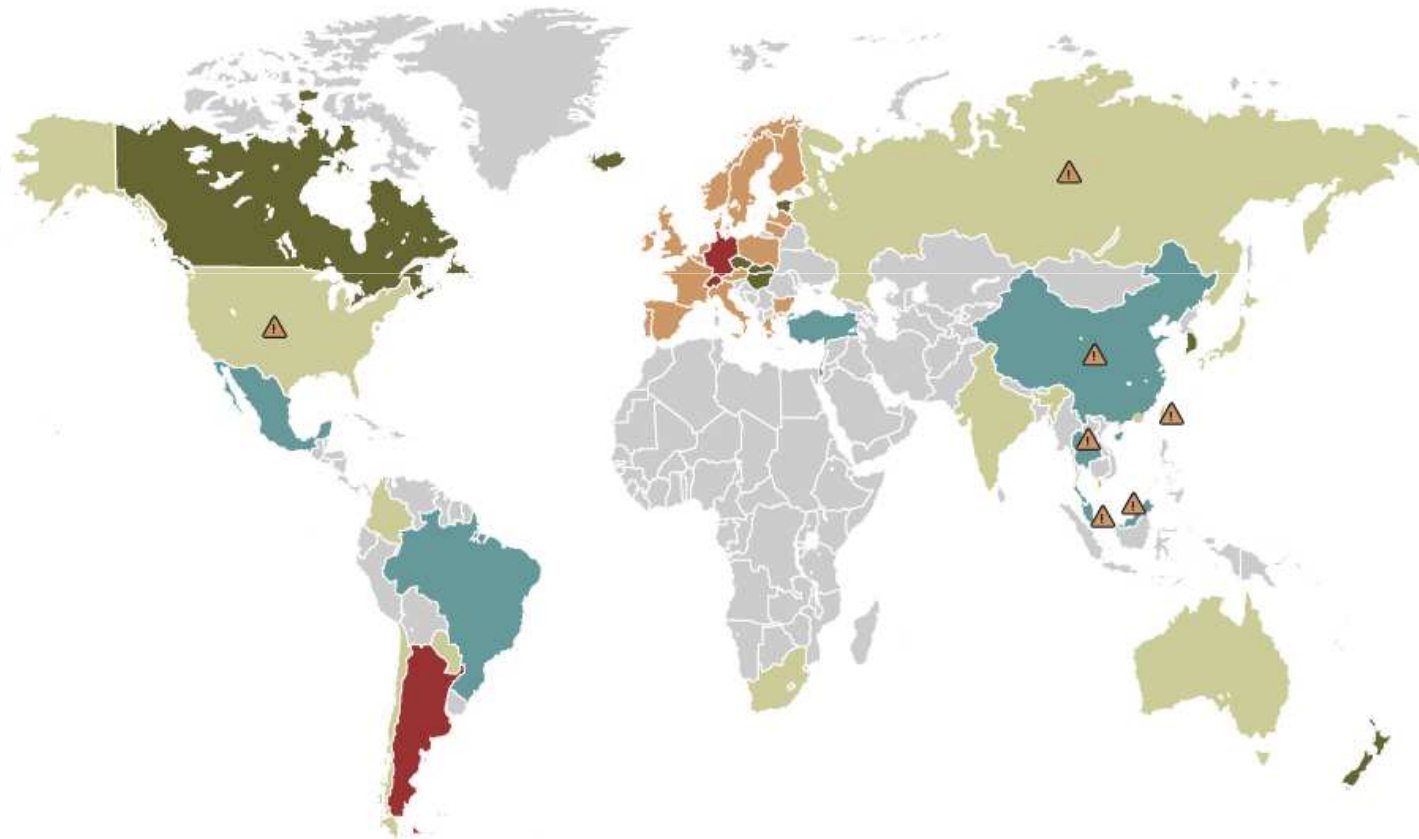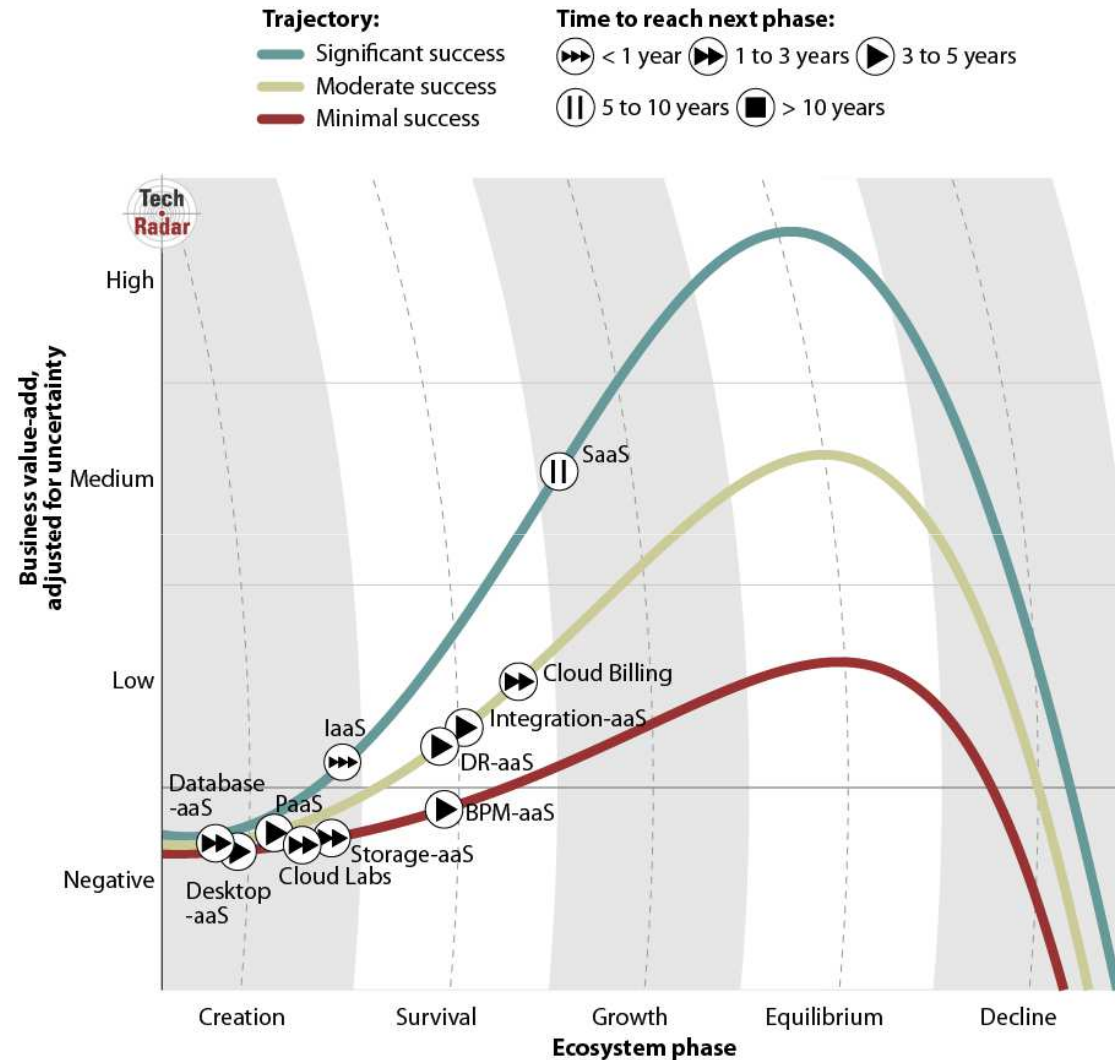| Reason	Percentage
Security concerns about security/privacy issues in virtualization or cloud environments	50%
Too immature	43%
We believe our total costs are cheaper	38%
The offering capabilities don't match our needs	30%
Our application vendor or custom apps aren't compatible or won't support it	25%
Specific compliance requirements that the service providers can't meet	22%
The performance isn't good enough	12%
Other reason	9%
Too difficult to understand	4%

(multiple responses accepted)

Base: 542 hardware decision-makers at companies with 500 or more employees

Source: Enterprise And SMB Security Survey, North America And Europe, Q3 2009

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February 2010 **"Infrastructure-As-A-Service (IaaS) Clouds Are Local And So Are Their Implications"**

Country Level Regulations Affect Compliance Management

Legend: Most restrictive | Restrictive | Some restrictions | Minimal restrictions | Pending legislation | No legislation or no information

⚠ Caution due to government surveillance

Source: US Department of Commerce and country-specific legislation

February 2010 **"Infrastructure-As-A-Service (IaaS) Clouds Are Local And So Are Their Implications"**

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Forrester's cloud computing TechRadar™

SaaS market maturity

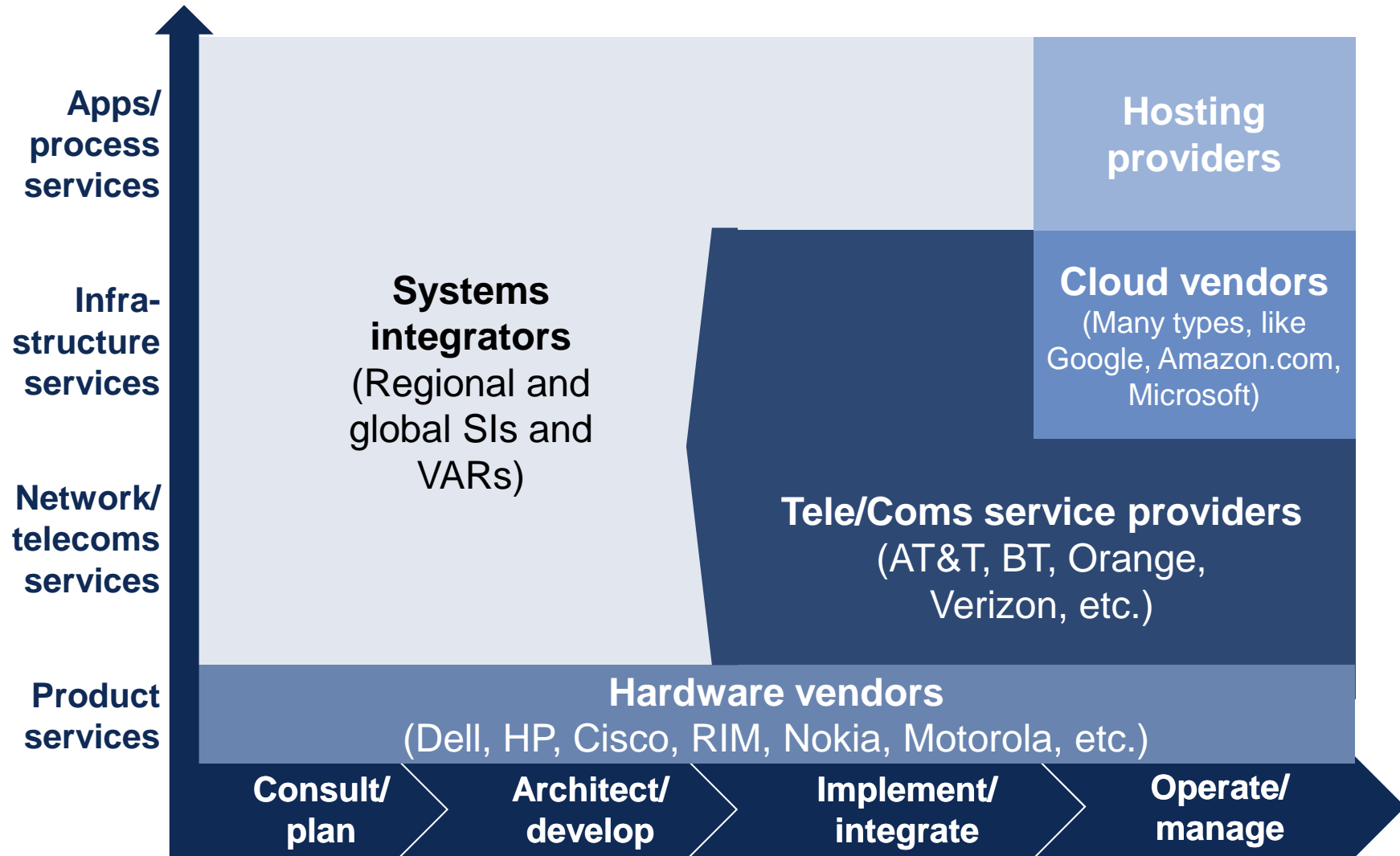Source: March 12 2009, "TechRadar™ For Sourcing & Vendor Management Professionals: Software-As-A-Service"
Forrester report

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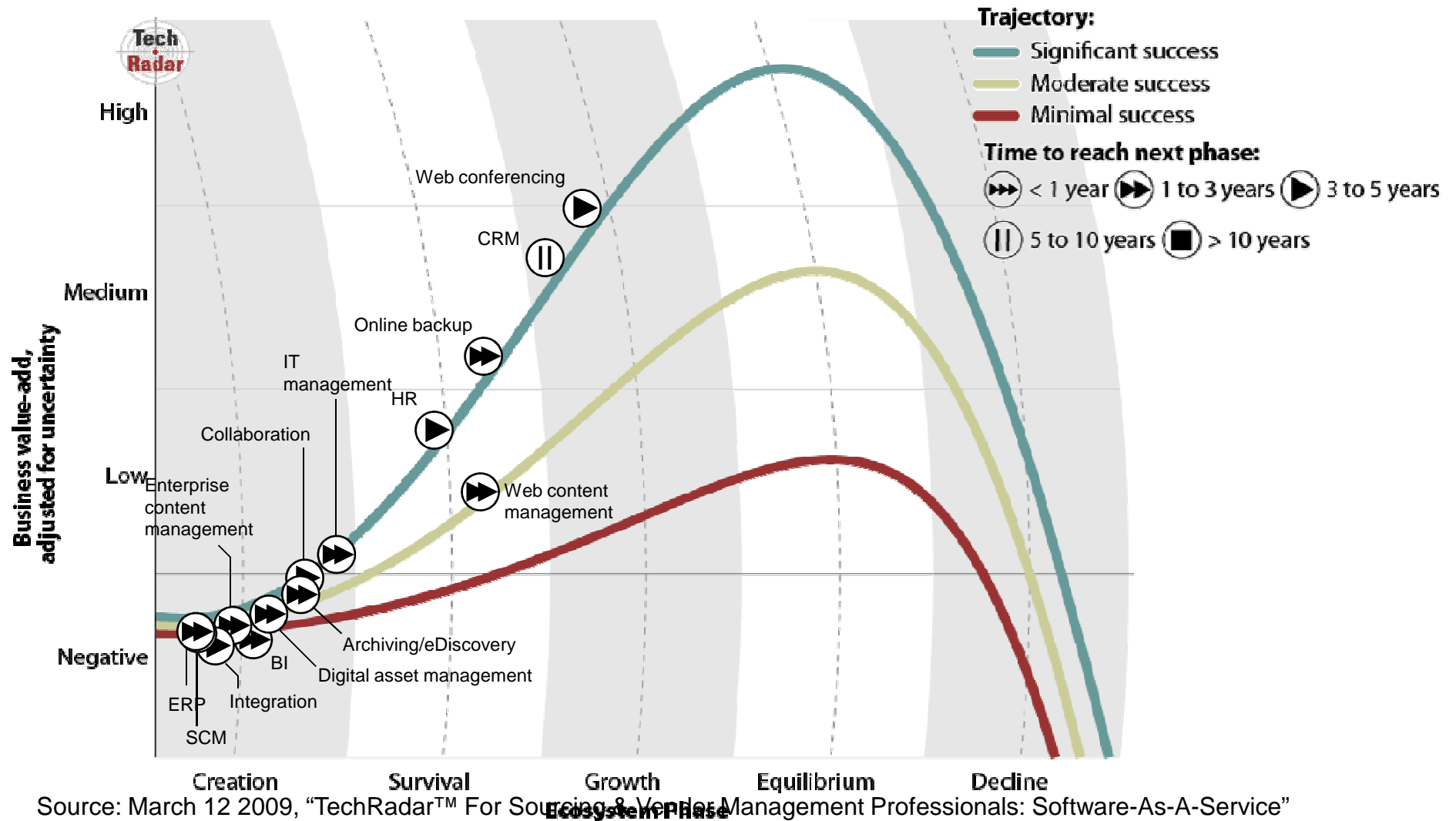
Maturity synthesis

- The customers seem ready to adopt…

- … But different Cloud domains have different maturity…

- … And the benefits also vary widely

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Service provider landscape shifts with tele/Coms as-a-service/cloud

Apps/process services

Infra-structure services

Network/telecoms services

Product services

Hosting providers

Systems integrators
(Regional and global SIs and VARs)

Cloud vendors
(Many types, like Google, Amazon.com, Microsoft)

Tele/Coms service providers
(AT&T, BT, Orange, Verizon, etc.)

Hardware vendors
(Dell, HP, Cisco, RIM, Nokia, Motorola, etc.)

Consult/plan > **Architect/develop** > **Implement/integrate** > **Operate/manage**

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Thank you

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