Advancing public cloud computing: What to do now?

Priorities for industry and government

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World Economic Forum
The World Economic Forum is an independent, international organization integrating business, political, intellectual and other leaders of society into a community committed to improving the state of the world.
Reality check

$55 billion\(^{(1)}\)
Forecasted worldwide revenue from public IT cloud services by 2014, a compound annual growth rate of 27.4%.

33\% \(^{(2)}\)
Global companies have deployed or are piloting the more mature layer of cloud, SaaS. 23% of high performing IT companies have already deployed SaaS

25\% \(^{(3)}\)
Global companies which will be deploying cloud computing for critical applications within 2 years

44\% \(^{(3)}\)
Executives from global companies who believe cloud computing can provide their company with a lasting competitive advantage

30\% \(^{(1)}\)
The rate at which cloud computing will grow in 2011, or more than 5 times the rate of IT industry as a whole

2.3 million jobs \(^{(4)}\)
The net new jobs created by cloud on a cumulative basis over the period 2010 to 2015 across the top five EU economies

2.1\% \(^{(4)}\)
The average improvement in efficiency of an average employee because of cloud

Sources: \(^{1}\)IDC [Worldwide and Regional Public IT Cloud Services 2010 – 2014 Forecast, June 2010], \(^{2}\)Accenture [“Mind the Gap - Insights from the 3rd global High Performance IT research study, Nov. 2010], \(^{3}\)Accenture [Cloudrise: Rewards and Risks at the Dawn of Cloud Computing” Nov. 2010], \(^{4}\)Center for Economics and Business Research [The cloud dividend”, Dec. 2010]
Potential benefits of public cloud

- Long-term benefits
  - accelerate innovation
  - transform R&D and science
  - contribute to GDP growth
  - create new jobs / businesses
  - empower individuals
  - improve competitiveness
  - transform education
  - promote sustainability
  - level playing field
  - provide leapfrogging opportunities

- Immediate benefits
  - better services for citizens
  - lower cost of failure
  - improve government effectiveness
  - drive productivity gains
  - improve IT / business process efficiency
  - enhance collaboration
  - facilitate business agility
  - enhance user experience
  - reduce IT costs
  - improve IT / business process efficiency
  - increase IT flexibility
  - improve government effectiveness
  - drive productivity gains
  - improve IT / business process efficiency
  - increase IT flexibility
Challenges: clouds about cloud

1. Data governance
   - Data location & jurisdiction
   - Privacy & confidentiality
   - Data ownership

2. Security
   - Authorized access
   - Integrity & availability
   - Data loss
   - Data destruction

3. Business environment
   - Interoperability & portability
   - Reliability
   - Service level commitment
   - Ecosystem maturity
Eight prioritized areas

1. Explore and facilitate the realization of cloud benefits

2. Advance understanding and management of cloud related risks

3. Promote service transparency

4. Clarify and enhance accountability across all relevant parties

5. Ensure data portability

6. Facilitate interoperability

7. Accelerate adaptation and harmonization of regulatory frameworks related to cloud

8. Provide sufficient network connectivity to cloud services
Examples of tangible actions

- Experimental programs to document empirical evidence about cloud’s **positive social and economic impacts**
- Industry investment in **research into system-wide security risks**
- Service providers reaching agreement on **minimum transparency best practices**
- Telecoms providers working to **identify connectivity needs** by geography
Thank you

For further references

Advancing Cloud Computing: What To Do Now?

Exploring the Future of Cloud Computing
Backup slides
What is the Cloud?

“Cloud computing refers to both the applications delivered as services over the Internet and the hardware and systems software in the data centers that provide those services”¹.


¹ a) Access to the cloud can be provided via multiple technologies (Internet or other)
   b) “Services” can include processing, storage, access to applications, and business processes
Cloud impact across sectors

HEALTH CARE

- Massive and flexible computing power for drug discovery
- Shared platform for health and insurance services
- Real-time health monitoring and alert distribution
Cloud impact across sectors

MANUFACTURING

- Collaborative design with suppliers and customers
- Improved manufacturing processes
- Supply chain coordination
Cloud impact across sectors

EDUCATION

- Highly interactive / collaborative learning
- Access to teaching resources from all over the world
- Low-cost simulation
1. Data Governance

**Data location & jurisdiction**

It is not always clear which legal jurisdiction data in the cloud falls under – especially if the data is split up and stored in multiple locations.

**Privacy & Confidentiality**

In the cloud, data is stored on remote machines which are shared with other users. Concerns about data privacy & confidentiality restrict some users’ willingness to use cloud for sensitive data.

**Data Ownership**

When a client moves data to the cloud, it is not always clear what rights the cloud service provider gains to access, modify or distribute that data.
2. Security

Users are concerned that data in the cloud is more susceptible to cyber attacks, as aggregating multiple users’ data and services on a single platform makes it a more attractive target.

When users store their data in the cloud, it is not always clear who is accountable if the data is corrupted, lost or temporarily inaccessible. As many users’ data may be shared on one machine, users are concerned about the possibility of problems with one user’s services affecting another’s.

Data deletion is more challenging in the cloud, because cloud providers are the only ones with access to the physical infrastructure on which users’ data is stored, and often data may be mirrored on multiple machines.
3. Business Environment

**Interoperability & Portability**
Government and users have lock-in concerns. Industry is concerned that a premature focus on standardization to promote interoperability & portability could hold back innovation.

**Reliability**
Many users perceive that the reliability of cloud solutions is not yet sufficient for them to trust the cloud with their mission-critical needs. Industry believes that the market will quickly adapt.

**Service level commitment**
Users are held back by the lack of clear commitments from providers regarding such issues as uptime, response times, bandwidth, reliability and security – or by the lack of stipulated penalties.

**Ecosystem maturity**
There are some concerns about cloud evolution, which include lack of understanding about cloud; speed, reliability and availability of network access; availability of expertise; underdevelopment of insurance solutions; threats to intellectual property.
Governments are ready to act...

“...I want to make Europe not just "cloud-friendly" but "cloud-active""

Neelie Kroes, European Commission, Davos 2011

“ Industry could take the initiative for a cloud “code of conduct” and regulation could then review it

Viviane Redding, European Commission, Davos 2011
...and Industry is eager to move forward

There is **a need to be transparent with roles, relationships, locations, and ownership of data.**

*Industry Participants, Brussels 2010*

To create fair global competition, there is a need for **a globally coordinated effort**

*Industry Participants, London 2010*
### A few real benefit cases

<table>
<thead>
<tr>
<th>Cost reductions and savings</th>
<th>The <strong>Swedish Red Cross</strong> estimates return on investment into switching to cloud within 2 years and 20% in overall cost savings over the next 5 years</th>
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</thead>
<tbody>
<tr>
<td>New innovative business models</td>
<td><strong>Evernote</strong> (a service that allows capturing of all sorts of notes - such as text, scans, and snapshots)</td>
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</tbody>
</table>
| Solving complex social problems | **Wokai** is a cloud-based non-profit organization that links up donor money with microfinance institutions in rural China  
**NASA** uses “crowd-sourcing” to help it analyze its large collection of photos of the surface of Mars |
| Empowering research and innovation | **Stanford University** School of Medicine found that in the long run cloud computing can support clinical researchers who need to analyze large datasets |
| Reducing the environmental impact | Users of different **Microsoft** cloud services can reduce energy consumption per computing user by 30% to 90%, a study found |
## A few industry-specific benefit cases

<table>
<thead>
<tr>
<th>Industry</th>
<th>Description</th>
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<tbody>
<tr>
<td>Healthcare</td>
<td>With services such as HealthVault, electronic health records can follow patients from doctor to doctor, allowing more coordinated care</td>
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<tr>
<td>Retail</td>
<td>Laser Red app allows consumers to scan product barcode and instantaneously find out if product is cheaper somewhere else, online or brick-and-mortar</td>
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<td>Banking</td>
<td>The split-the-bill app allows diners to divvy up the check from their individual accounts electronically</td>
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<td>Energy</td>
<td>Cloud-based applications are now available that can automatically monitor video footage and apply logic to assess risks and accordingly trigger alerts</td>
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<td>Government</td>
<td>Institutions will have the IT power to use data analytic techniques to detect data errors and potential fraud quickly and easily</td>
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<td>Media &amp; Entertainment</td>
<td>Analytics for one-to-one marketing—Pandora and Genius for iTunes—can aggregate and analyze user feedback in real time at the volume necessary requires the cloud</td>
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