The Future of the Australian ICT Industry

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CSC Australia | Asia
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What will be the next high-growth information and communications technologies?

What opportunities...

..and DISRUPTIONS..

lie ahead?
# Broad Technology Trends

<table>
<thead>
<tr>
<th></th>
<th>From</th>
<th>To</th>
</tr>
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<tbody>
<tr>
<td><strong>Core Infrastructure</strong></td>
<td><strong>Expensive, Fragile, Labour Intensive</strong></td>
<td><strong>Robust, Agile, Cheap, Invisible, As-a-Service</strong></td>
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<tr>
<td><strong>Network</strong></td>
<td><strong>Brittle, Messy, Non-Secure, Inconsistent</strong></td>
<td><strong>Secure, Reliable, Wireless, Broadband, Ubiquitous, As-a-Service</strong></td>
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<tr>
<td><strong>Devices</strong></td>
<td><strong>Power Hungry, Limited Functions, Corporate Provisioned</strong></td>
<td><strong>Always-On, Connected, Smart, Personal Choice As-a-Service</strong></td>
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<tr>
<td><strong>Application Development</strong></td>
<td><strong>Expensive, Complex, Time-Consuming, Non-Intuitive</strong></td>
<td><strong>Fast, Cheap, Standardised, Visualised, As-a-Service</strong></td>
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<tr>
<td><strong>Applications</strong></td>
<td><strong>Expensive, Monolithic, Rigid, Occasional Disruptive Upgrades</strong></td>
<td><strong>Cheap, Modular, Standardised, As-a-Service</strong></td>
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What Really Happened!

1. Implementing/Improving Business Intelligence
2. Upgrade/Enhance Core Business Applications
3. Upgrading/Replacing/Front-ending Legacy Systems
4. Refine Sourcing Strategies (alternative delivery models)
5. Upgrade Servers/Storage (consolidate, virtualize)
6. Upgrade networks to support higher bandwidth rich content and mix of Voice/Data (VoIP)
7. Continue efforts in SOA cross-enterprise (integration)
8. Continue to improve IT security systems
9. Improve management of infrastructure (tools, ITIL processes…)
10. Implement collaboration technologies
The Locus of Innovation in IT has Changed
Consumerised IT: Areas of Focus in the Enterprise

- **Browser-based apps**
- **Mashups/Mashapps**
- **Virtualisation & Cloud**
  - servers
  - storage
  - desktops
  - networks
- **Collaboration**
- **Employee choice & responsibility**
- **Policies, Monitoring, Reporting**
- **Rather than Bans and Controls**
- **Redraw the firewall**
- **Internet standards & open source**
- **Mobility, Remote, Distance, Devices**
Infrastructure Challenges

Server CapEx

Source Power technology

Grid From Fossil

Grid From Fossil and Renewables
With some Distributed Generation, some of which is Renewables

Cooling technology

Room based cooling

Rack based cooling

Component based liquid cooling

Server OpEx

200-400Kg per Rack

2-4 Kw per Rack

25-40 Kw per Rack

1500Kg+ per Rack

2005

2000

2008

2012

2015

Highly virtualised & optimised Private Cloud Computing
# Defining the Cloud Computing Model

Cloud computing is a model for enabling on-demand network access to a shared pool of configurable computing resources that can be rapidly provisioned and released with minimal management effort or service provider interaction OR simply “Low Cost Flexible Entry and Exit”

## Characteristics

<table>
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<tr>
<th>Feature</th>
<th>Description</th>
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<tr>
<td>Service-based</td>
<td>Consumer concerns are abstracted via service interfaces</td>
</tr>
<tr>
<td>Metered by use</td>
<td>Services tracked by usage metrics that enable multiple payment models</td>
</tr>
<tr>
<td>Scalable and elastic</td>
<td>Services flex on demand to add or remove resources as needed</td>
</tr>
<tr>
<td>Shared</td>
<td>Services dynamically allocated from a pool to gain economies of scale</td>
</tr>
<tr>
<td>Broad Network Access</td>
<td>Using Standard Internet Protocols</td>
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## Service Types

- **Business Process as a Service (not part of NIST)**
  - Entire Business process as a service in the cloud, usually involving people
  - Likely procured by BU Executives

- **Software as a Service**
  - Finished applications that you rent and customize
  - Likely procured by BU, IT Executives

- **Platform as a Service**
  - Developer platform that abstracts the infrastructure, OS, and middleware for developer productivity
  - Likely procured by Development

- **Infrastructure as a Service**
  - Deployment platform that abstracts the infrastructure
  - Likely procured by IT

## Deployment Models

### Public
- **Public Cloud**
- Enterprise

### Private
- **Private Cloud**
- Enterprise

### Community
- **Community Cloud**
- **Enterprise 1**
- **Enterprise 2**
- **Enterprise 3**

### Hybrid
- **Private Cloud**
- **Public Cloud**
- Enterprise
Cloud Computing – IT Value Directly Connected to Business

- Actual Load
- Allocated IT capacities
- Reduction of initial investments
- Reduction of "over-supply"
- No "under-supply"
- Possible reduction of IT-capacities in case of reduced load
- Time
- IT CAPACITY
- Load Forecast
- OpEx

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CSC Technology Trends
Some Tech-enabled Business Trends

- **Open Innovation and Co-Creation**
  - Involving customers, partners, suppliers – the broad eco-system of the business
  - Taking advantage of Web 2.0 concepts
  - Extend beyond full-time employees for assistance

- **Global Collaboration and Delivery**
  - Broadband-enabled video conferencing, telepresence
  - Real time translation capabilities (text and ultimately voice)
  - Offshore, onshore, nearshore, at home pools of talent

- **Trillions of connected ‘things’**
  - RFID, devices, chips, sensors, actuators – all connected
  - Assets, products, physical items, people – remote, mobile
  - The underpinnings of the ‘smart’ economy

- **Sustainability**
  - Replace atoms with bits
  - Leverage Green IT, broadband networks
  - Carbon-based accounting systems
# Some Tech-enabled Business Trends

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<th>Analytics and big data</th>
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<tr>
<td>A tsunami of incoming data leading to capability and insight gaps</td>
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<tr>
<td>New techniques for handling ‘big data’ become mainstream</td>
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<tr>
<td>Analytics, predictive forecasting, data mining services proliferate</td>
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<th>Emerging market ‘blowback’</th>
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<td>Innovation at the ‘bottom of the pyramid’ moves upwards</td>
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<td>What works in constrained economies can work even better in developed markets</td>
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<th>Everything is a ‘service’</th>
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<td>Opex, pay-as-you-go, standardised, automated, abstracted, self-service</td>
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<tr>
<td>Different types of public cloud: high-availability, low-cost, secure, close, high performance, ITIL-ESM integrated, vertical industry specific, commercial, consumer, test and development, high-bandwidth...</td>
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<th>Intelligent devices</th>
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<td>Intuitive, interactive, fun, visual – dizzying array of form factors, features</td>
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<tr>
<td>Augmented reality, un-tethered workforce</td>
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# Australia’s ICT SWOT

## Strengths
- Strong Education system
- Early adopters of technology
- Highly skilled work-force
- Proximity to Asia
- Good infrastructure (but can be better)
- Low risk environment
- First world legal and administrative systems
- Cultural affinity with America, Asia and Europe

## Weaknesses
- Local IT firms lack critical mass, international presence
- No Australia ‘ICT’ branding
- Too easy to be comfortable just in Australia
- Tax system relatively unfriendly towards innovation
- Low profile of tech industry, declining graduate intake
- Few role models outside of sport, celebrity
- Geographic isolation from US and Euromarkets
- High labour costs relative to Emerging Asia
- Curriculums vs lateral think, questioning education
- Extremely weak R&D by Australian business

## Opportunities
- Industry, academic and government collaboration
- IT Services, BPO & KPO
- Potential for NBN to inspire
- Consumer-oriented web/mobile-based offerings
- Vertical and niche software solutions
- Exploit FTA opportunities
- Services-based experiences for Asia
- Leverage huge funds under management

## Threats
- Competition from emerging economies
- Currency volatility/rose against others
- Exclusion from regional trading blocs
- Risk of global and regional instabilities
- Continual brain drain (Australians adapt well)