

Leveraging Web 2.0 and the Cloud to enhance collaboration and learning

Professor Eric Tsui

Knowledge Management Research Centre

HKPolyU



HK's transformation into a KBE

Hong Kong's competitiveness
ALtered States
The Hong Kong government seeks private sector support
Digital 21 Strategy
2008 Digital 21 Strategy > Targets and Choices
Progress Report on the 2008 Digital 21 Strategy
Action plan for building an inclusive economy
Hong Kong's changing workforce
HK employing more researchers
The Hong Kong government seeks private sector support
Digital 21 Strategy
2008 Digital 21 Strategy > Targets and Choices
Progress Report on the 2008 Digital 21 Strategy
Action plan for building an inclusive economy
Hong Kong's changing workforce
HK employing more researchers



Nature of Knowledge Work

- Increasingly less routine, more analytical and cognitive skills are needed
- Highly unstructured, unpredictable, disruptive yet often come with a sense of urgency
- Not only requires data and information but also knowledge and experience of the individual
- Group/Collaborative task execution, decision making and problem solving
- A different set of metrics for performance measurement is needed
- A huge amount of data and information to deal with
- Often more than one way to solve a problem, collaboration, reflection and a learning environment are crucial

Support for performing Knowledge Work

- Automate routine tasks/processes as much as possible
- *Tools to coordinate ad hoc tasks among workers*
- Tools to identify and connect with subject matter champions; codify and share tacit knowledge
- *Tools to discover, aggregate, analyze and visualize document/information/discussion summary, trends, work tasks etc.*
- Leverage on input and preferences from trusted peers
- *Knowledge Repository for keeping core assets*
- Powerful Search mechanisms (proactive, multi-modal, multiple search modes, visualisation,...)
- *Create a Personal and Organizational Learning Environment*
- Personalization (role type, multi-generational workforce, mobile workers, content, tools, networks etc.)

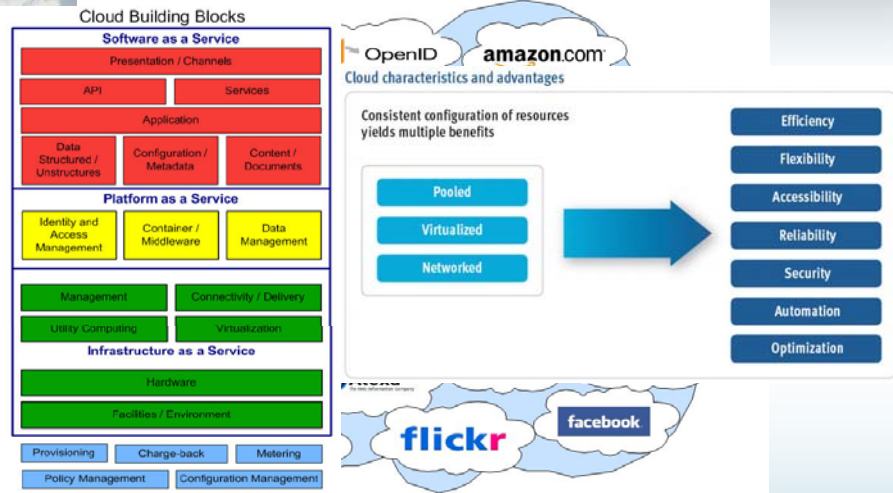


Definition of Cloud Computing

A widely adopted, formal definition comes from the National Institute of Standards and Technology:

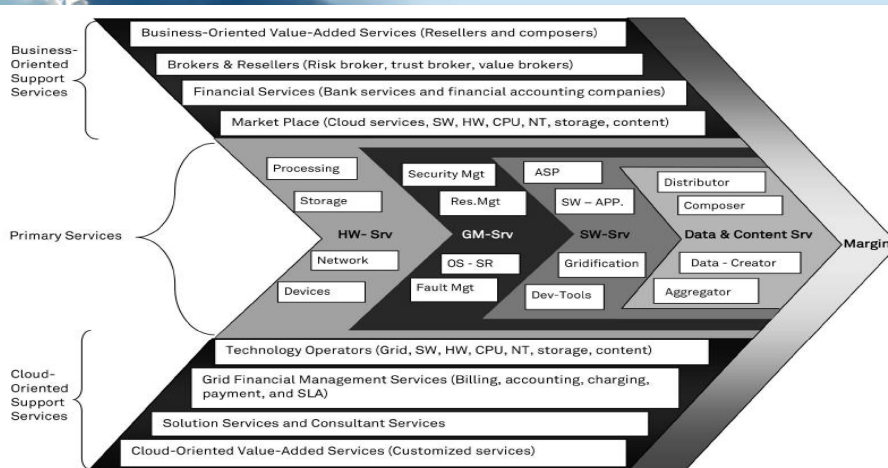
“Cloud computing is a model for enabling convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction.”

Cloud applications, building blocks (Oracle) & benefits (EMC)



Cloud Value Chain

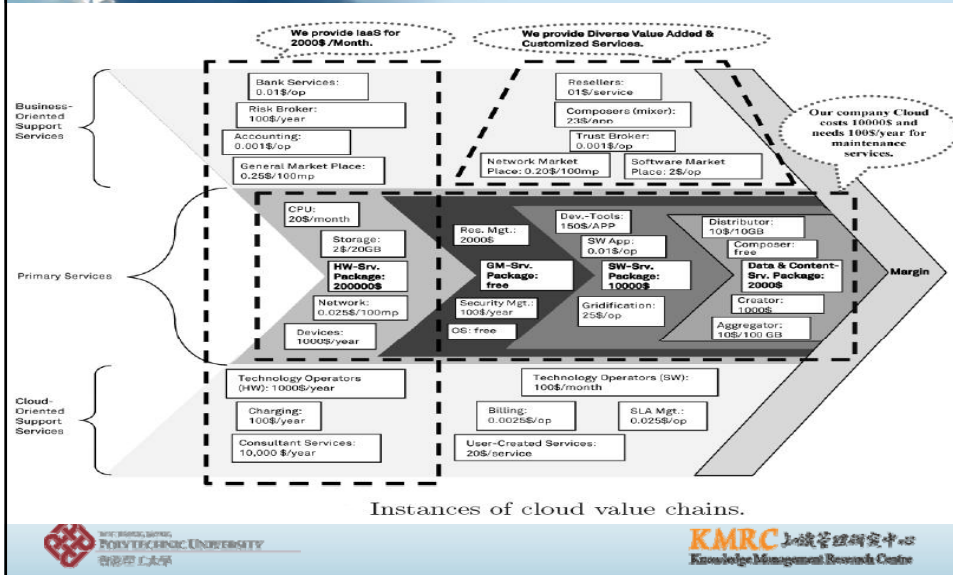
(Source: A.B. Mohammed, J. Altmann and J. Hwang (2009); Cloud Computing Value Chains: Understanding businesses & value creation in the chain, Economic Models & Algorithms for Distributed Systems, 2009.)



Cloud value chain reference model.

Cloud Value Chain (cont.)

(Source: A.B. Mohammed, J. Altman and J. Hwang (2009); Cloud Computing Value Chains: Understanding businesses & value creation in the chain, Economic Models & Algorithms for Distributed Systems, 2009.)



Opportunities brought about by the cloud



Aiming beyond the primary set of benefits?

Cloud characteristics: Ubiquity, Connectivity across platforms, Perpetual storage, Accessible by/to the masses



Benjamin Edwards - The Cloud (Among the Towers), 2010
Unique digital print drawing on paper, 29 x 20 inches



Secondary benefits

- Upgrade management
- Spams and virus threats
- Value-add functions provide by a S-a-a-S provider
- Integrated data management
- ...



Cloud Intelligence

(Sources: Nova Spivack, presenter at The Singularity Summit, 2010 & Tom Koulopoulos, author of Cloud eBook & presenter at ILA 2010)

1. Collective intelligence

- Crowds -> Groups -> Meta-selves

2. Re-factoring



Cloud Intelligence expanded

- Mining for patterns and new knowledge embedded in very large structured and unstructured datasets
- Decompose a problem into smaller ones for parallel processing (aka Grid Computing)
- Allocate/Divert resources to meet a surge in demand
- (Re-)Prioritise tasks and resources for high gain areas/applications
- Elicit human input on a massive scale (aka Web 2.0+)
- ...



Cloud Intelligence in action



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Singapore's Smart Traffic Cloud (Source: FutureGov, Dec 2010)

SMART TRAFFIC CLOUD ROAD TESTED

Singapore is trialing a traffic management system that could improve the monitoring of the citystate's roads by using geo-location data captured from drivers' smart phones.

GPS sensors in drivers' smart phones can determine the location, direction of travel and speed of vehicles, and the data, captured in real-time, is hosted on a cloud platform that the Land Transport

Authority can use to monitor – and predict – traffic conditions.

"It would be very costly to deploy sensors all over the city. We only have sensors on highways and major roads, so why not make use of GPS sensors in drivers' mobile handsets?" said Dr Lim Hock Beng, Programme Director, Intelligent Systems Centre, Nanyang Technological University, who leads the research team behind the initiative.

The smart traffic cloud platform, a joint effort by LTA, NTU, the Infocomm Development Authority and SingTel, will be available for government and private sector service providers to use the data to develop location-based services.

Singapore has been working in collaboration with the University of Berkley, which is testing the same concept in the San Francisco Bay area.

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Amazon Mechanical Turk

Human Intelligence Tasks

amazonmechanicalturk Artificial Intelligence

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Sign in as a Worker | Requester

Your Account | **HITS** | Qualifications

Introduction | Dashboard | Status | Account Settings

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74,997 HITS available. [View them now.](#)

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- Choose your own work hours
- Get paid for doing good work

Find an interesting task

Work

Earn money

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No upfront costs, pay only for completed work

Recent Projects

- Provide Summary answers to questions - [OnDemand006](#)
- Provide Summary answers to questions - [Jeff](#)
- Review web/mobile search queries - [OnDemand006](#)
- Spanish - Compare short answers to questions - [OnDemand006](#)

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Cloud Marketplace: SpotCloud



Cloud computing
A market for computing power



The awakening



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SpotCloud
Best Providers. Best Price

Select Language | Home | About Us | Contact Us | Helpdesk | Feedback

SpotCloud Technology



Built on Google App Engine and the Enomaly ECP platform (as well as other cloud infrastructure platforms in the near future), SpotCloud is an easy to use, structured cloud capacity marketplace where service providers can sell their excess computing capacity to a wide array of buyers and resellers.

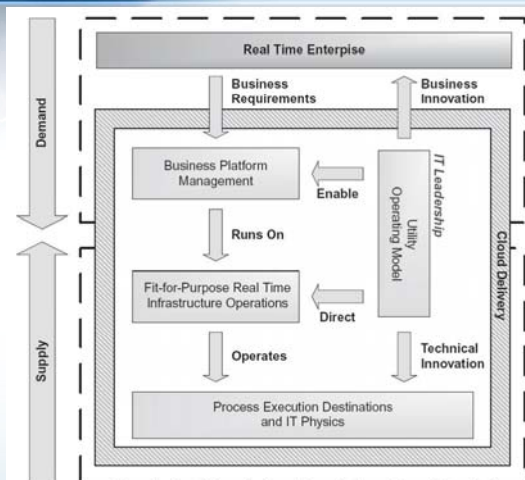
SpotCloud Workflow

1. Buyers deposit an initial credit into the SpotCloud platform. (Pay as you go model)
2. Buyers create a VM appliance using the Enomaly SpotCloud package builder
3. Then upload a "VM appliance using the SpotCloud management interface
4. Sellers can dynamically define hardware profiles, location information, duration of available capacity and associated resource costs.
5. Buyers select providers based on a cost and location.
6. VMs are automatically delivered to sellers "cloud infrastructures where the VM packages are run according buyers requirements.
7. SpotCloud monitors and debits buyers on an hourly utility basis with a notification sent when credits drop below minimum threshold.
8. At the end of the month, sellers are paid directly for any capacity utilized via the SpotCloud marketplace.

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Real Time Enterprise

(Source: Delic & Riley, 2010)

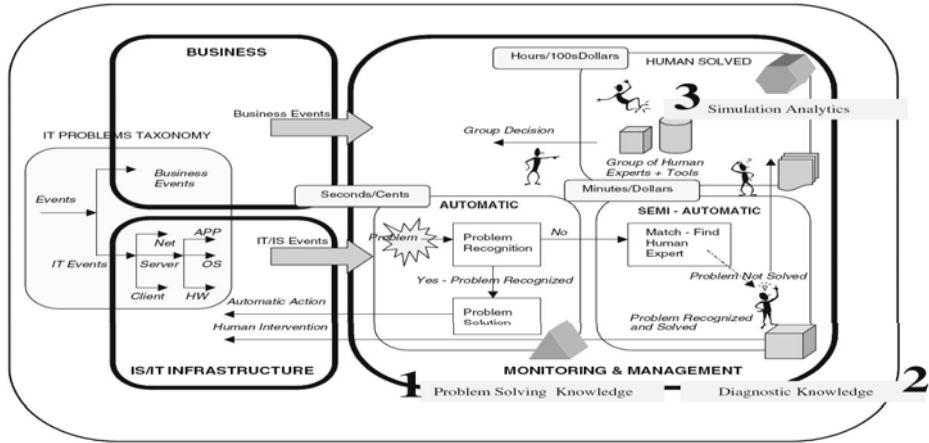


Aligned demand and supply enabled via a cloud delivery model

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Example of an IT support environment

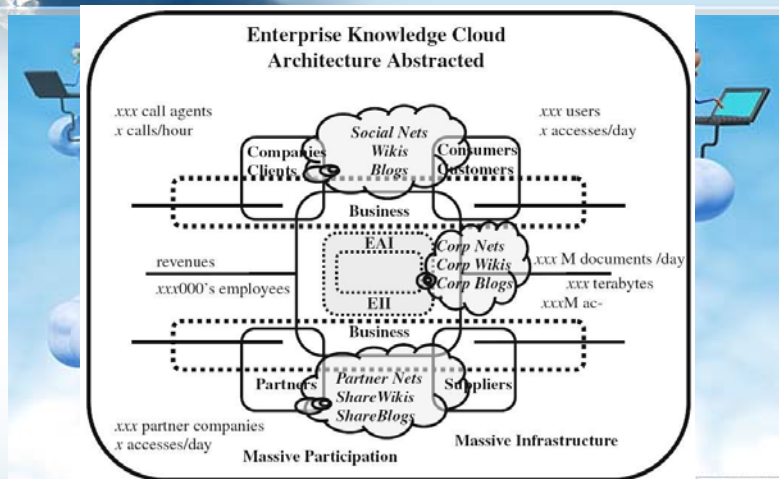


Knowledge for IT problem solving

Source: Furth & Escalante, Handbook of Cloud Computing

Enterprise Knowledge Cloud

(Source: Delic & Riley, 2010)



Enterprise knowledge cloud: architectural view

Biomedical Knowledge Cloud

(Source: Ken Buetow, National Cancer Institute, USA, 2009.)

The slide features a central graphic of a cloud with various icons and text. On the left, it asks "What is the cancer knowledge CLOUD?" and lists "PERSPECTIVES" and "FEATURES". On the right, a circular diagram shows stakeholders like "Clinical Communities", "Underwriters", "Discovery Science", and "Information Technology" all feeding into the "Biomedical Knowledge Cloud".

What is the cancer knowledge CLOUD?
It's a means of using the Internet to connect a massive amount of individual and organizational knowledge of data, software, applications with which to create and analyze patterns, data, and the computational management to do the work.

PERSPECTIVES:
Hear Ken Buetow, Ph.D., Director of the National Cancer Institute's Center for Biomedical Informatics and Information Technology speak about the Cancer Knowledge Cloud. [Click here to listen.](#)

FEATURES:
Modern technology has made the world flat and the clouds are not just clouds, and our common horizontal boundaries of time and space, in sequence. Clouds feel open. In sequence. Clouds feel open. In sequence. Clouds feel open. In sequence.

caBIG **BIGHEALTH CONSORTIUM**

Biomedical Knowledge Cloud

Stakeholders: Clinical Communities, Underwriters, Discovery Science, Information Technology, etc.

Logos: FORTYTECHNIC UNIVERSITY, KMRC 知识管理研究中心 Knowledge Management Research Centre

IT-Tude project (Source: ERCIM News, October, 2010)

The diagram illustrates the IT-Tude project workflow. It starts with "Prior Knowledge" (Problems, Platforms, Patterns, Solutions) feeding into "BUSINESS ANALYST TEAMS" and "TECHNICAL EXPERT TEAMS" (CROSS-SECTOR EXPERT TEAMS). This leads to "VERTICAL MARKET SECTOR SPECIFIC BUSINESS EXPERIMENTS", which then feeds into the "IT-TUDE KNOWLEDGE AND TOOLSET REPOSITORY".

Flow:
 - **Input:** Prior Knowledge (Problems, Platforms, Patterns, Solutions)
 - **Process:** BUSINESS ANALYST TEAMS / TECHNICAL EXPERT TEAMS (CROSS-SECTOR EXPERT TEAMS) ↔ VERTICAL MARKET SECTOR SPECIFIC BUSINESS EXPERIMENTS
 - **Output:** IT-TUDE KNOWLEDGE AND TOOLSET REPOSITORY

Key Interactions:
 - Business Analyst Teams provide Templates, ReqEng, and Procedures to Business Experiments.
 - Business Experiments provide Elicited Reqs and Design Patterns/Guidelines to Business Analyst Teams.
 - Business Experiments provide Revised Design Patterns and Feedback to Business Analyst Teams.
 - Business Experiments provide Ref. Implementation, Design Patterns, Component Profiles, and Best Practice Guidelines to the Repository.
 - Business Experiments provide Baseline Technology, Core Components, Design Patterns, and Processes to the Repository.
 - Business Experiments provide Domain Specific Component Technology Demo, SW Documentation, and Case Studies (Business Model, Architectures, etc.) to the Repository.

As a consequence, 98 organisations from all across Europe united in what was the FP6's largest Grid project. Grouped into 25 different pilots, each with an end-user, Grid provider and specialist, they focused on the real business problems faced by the end user and built a solution around them. Each was highly autonomous in their solutions: some used GRIA, others Globus, Glite or Unicore. Some were open source, others proprietary. Some were to be delivered as SaaS, others used in-house.

ERCIM NEWS Special theme: **Cloud Computing** Platforms, Software and Applications

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Opportunities and impact of CC on

1. Business Process Management
2. Taxonomy building & maintenance
3. e-Discovery
4. Open Innovation
5. Personal Knowledge Management & Learning

Knowledge Management Vs Personal Knowledge Management

	Google Search “Knowledge Management”	Google Search on “Personal Knowledge Management”
2001	About 500,000	18
March 2010	About 8,400,000	About 39,400


[“personal knowledge management” - Personal Knowledge Management – Up in the Cloud « The N00B](#) 08/08/2010

Personal Knowledge Management – Up in the Cloud « The Technical N00B

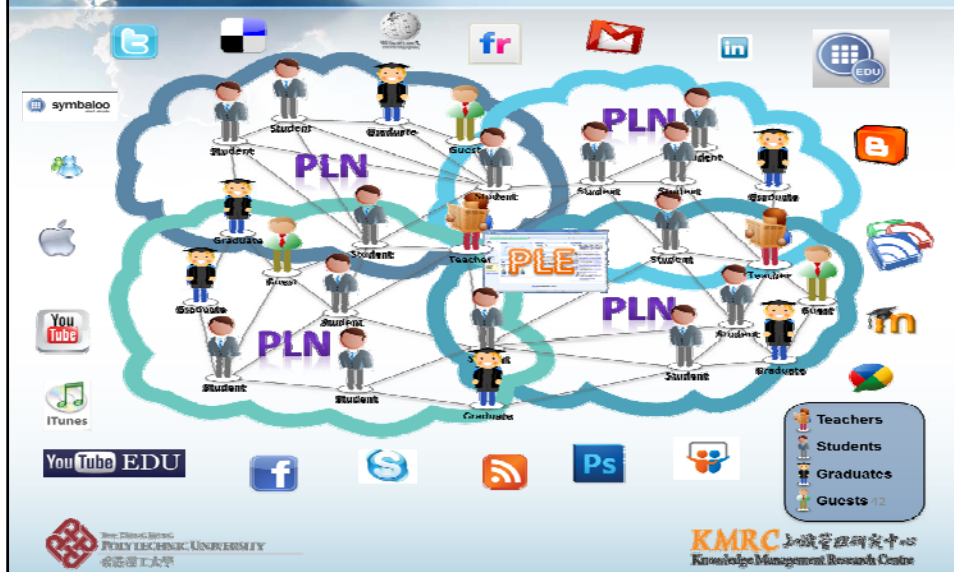
from [“personal knowledge management”](#) - Google Blog Search by steffenhood

And here's what it comes down to folks, **personal knowledge management**. This concept applies to not only credentials and passwords, but to all data that we access, manipulate, share, and present. Keeping important information in a ...

A PLE needs to address these challenges & more

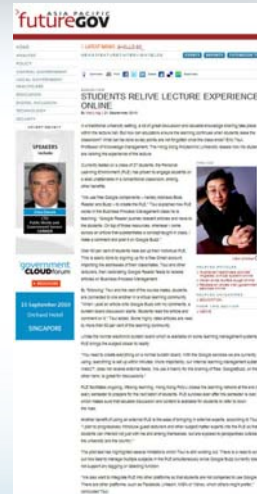
- Information Overload
- Content authoring by the masses
- Sustainability & quality of contributions
- Knowledge Classification & Navigation
- Development & tracking of personal competencies
- No single platform can fulfil all the need

Personal Learning Environment (PLE) & Personal Learning Network (PLN)



Use of RSS feeds, tagging, Google Buzz to create a co-learning environment

- Selective RSS feeds, filters & aggregators to better target incoming information
- Tagging & annotation of articles
- Sharing, searching & navigation of articles by tags
- Ongoing discussions in Google Buzz
- Suitable for learning, marketing, intelligence gathering & research



Ongoing discussions in Google Buzz

Eric Tsui - Buzz - Private 11/19/10 [Comment](#) **Re-instating a point in class**

This article reinforces what we discussed in class regarding how to introduce BPM into an organisation. Edit

[BPM.com - Getting Started With BPM: Introduction | Featured Articles](#)
BPM.com - The authoritative Source for Business Process Management News and Information. Download White Papers and read Articles and Commentary from some of the leading experts in the industry.

How & where to start & grow BPM in an organisation | (Dimitris H. Soudis) (view.)
I look for small success stories in process with high-visibility, low-risk projects with immediate application, integration, visibility, ROI, Web connectivity, and other characteristics.
...
I also emphasize the importance of having a clear vision of what the company is doing and how to implement it with standards for process management and a centralized process repository.

[Comment](#) [Like](#) [Reshare](#) [Email](#)

Eric Tsui - Google Reader - Private 11/13/10 [Comment](#) **Relating theory to practice**

Efficiency Unit implements BPM together with records management and collaboration software.
[HK Govt Efficiency Unit creates collaborative work setting - Google Alerts - 'business process management' and 'hong kong'](#)
... employees prompted the Hong Kong SAR government to look at better collaboration. ... records management suite, business process management software, ...

Delete

19 previous comments from Ricky Tong, Roy Chu, retina mak and 15 others

Tak Shing Lee - ISE 457
I also agree my classmate Frankie's recommendation that the acceptance by top-management can be a solution to for the senior employee to learn and use new stuff. Having knowledge/experience sharing in working under a brand new BPM in a learning group among them can actually reduce their "imaginary" / "induced" stress. Hence making the whole process of passing knowledge more smooth and efficient.

Eric Tsui - Buzz - Private 11/30/10 (edited 11/30/10) [Comment](#) **A graduate & practitioner sharing his experience**

Ivan Cheung is a graduate of ISE some years ago and is now working as a Business Process Analyst. In this podcast, Ivan shares his views about the core activities of a BP Analyst as well as recommends how to best prepare for a career in BPM.

Please copy the following link and paste it into IE to replay. Enjoy. Edit

Donald Chiu - <http://hk.pumvs.polyu.edu.hk/public/ise457/ivan%20Cheung%20on%20BPM.wmv> 11/30/10

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Potential usages in the corporate world

- Marketing department monitors industry trends, customer preferences and competitive intelligence
- Corporate communications department monitors all news about the company
- Research department keeps abreast of business and technology trends
- Human Resources department monitors, evaluates and selects appropriate courses for learning & development
- Staff engage in collaborative filtering and focus on reading and/or discussing the received articles

The Personal Learning Environment (PLE)

- Leverages on public domain tools to combat information overload, filter information and foster ongoing collaborations
- Only minutes to set up and virtually no maintenance effort; it is ongoing and perpetual
- Highly personalised for the individual yet support a co-learning among peers
- Harness the collective wisdom of all participants
- A core intellectual asset of the organisation

Challenges in delivering knowledge services in the cloud

- Security / Privacy, Data location, compliance
- Integration with legacy systems
- Service Level guarantee
- Customisation of vendor-specific tools & applications
- Portability of applications across clouds (especially PaaS & SaaS)
- Discovery, de-duplication and selection of services & data
- Advancements & adoption of Semantic Technologies
- Paradigmatic change to PAGO model, work style and workplace
- ...

Service, Service, ...Everything as a Service (Source: HP)

	Cloud 1 e-business	Cloud 2 IT as a Service	Cloud 3 Everything as a Service				
WHY forcing function	<ul style="list-style-type: none"> • Internet-based supply chain integration and e-commerce 	<ul style="list-style-type: none"> • Consumerized Internet services • Low-cost IT 	<ul style="list-style-type: none"> • Pervasive business and consumer service 				
WHAT technology orientation	<ul style="list-style-type: none"> • Web-based app design • EAI and message bus integration • Internet protocols • 3-tier architecture 	<ul style="list-style-type: none"> • Web 2.0 and SOA app design • Virtualization • Cloud-based technology platforms 	<ul style="list-style-type: none"> • Data-oriented, context-aware services • Vertical and horizontal ecosystems 				
HOW IT organization design	<ul style="list-style-type: none"> • Organized around technology domains • Technology-centric 	<ul style="list-style-type: none"> • Organized around service supply chain • Service-centric 	<ul style="list-style-type: none"> • Organized around value networks • Service-centric 				
	1990	1995	2000	2005	2010	2015	2020

The Crowd To Cloud Journey



President Hu on China's service innovation

Hu Jintao, President of China, stated at the country's top academic conference in June, 2010, "*The rapid development of Internet, cloud computing, Internet of things, knowledge services and intelligent services offers a powerful tool and a favorable environment for service innovations.*"



Source: CCID Consulting, 23 Dec 2010

*Leveraging Web 2.0 and the Cloud to
enhance collaboration and learning*

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