From Enterprise Search Engine to Cloud-based Knowledge Services - Tracking a decade's evolution of KM and Innovation tools

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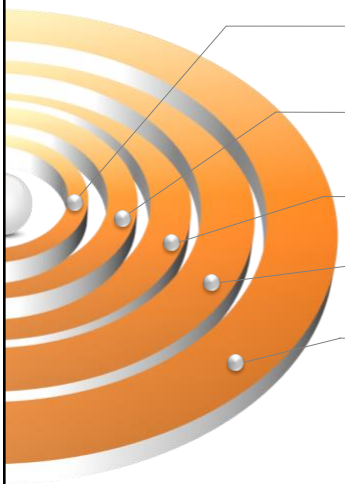
Associate Director
Knowledge Management & Innovation Research Centre
The Hong Kong Polytechnic University

Presentation Agenda



- Knowledge Management System
- KMS – 1990 to 2000
- KMS – 2000 to 2007
- KMS – 2008 to present
- KMS in the future

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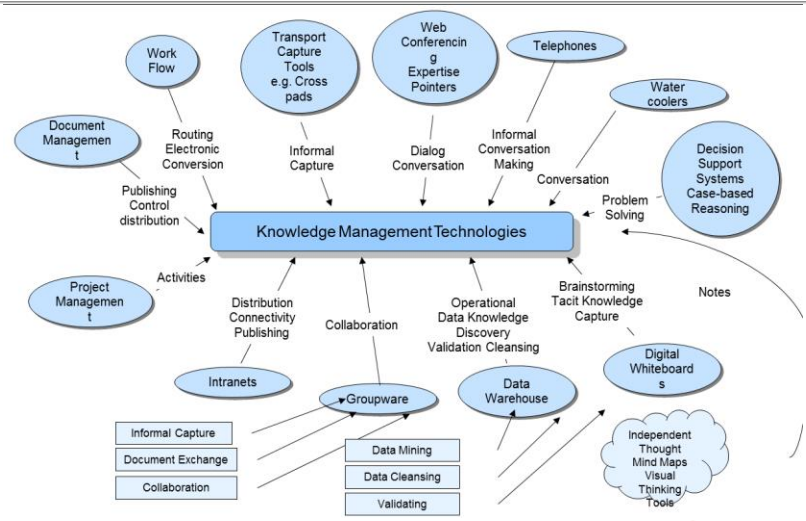
Knowledge Management System

1. Not necessary a technical system
2. Multiple KMS exist in an organisation
3. Not all are integrated

Various kinds of KMS in an organisation

(Source: Tiwana, 2002)



TIMELINE FIVE YEAR PLAN

Eras of KMS

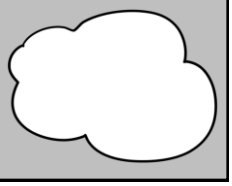
1990-2000 | 2000-2007 | 2008-Now | 2013- | Future

Knowledge Management processes | Social systems | Collective wisdom, Innovation & Learning

01 Standalone, Web-based

02 Collaboration & Networking

03 Cloud Computing



European KM Framework

(Source: Heisig & Iske, 2003)

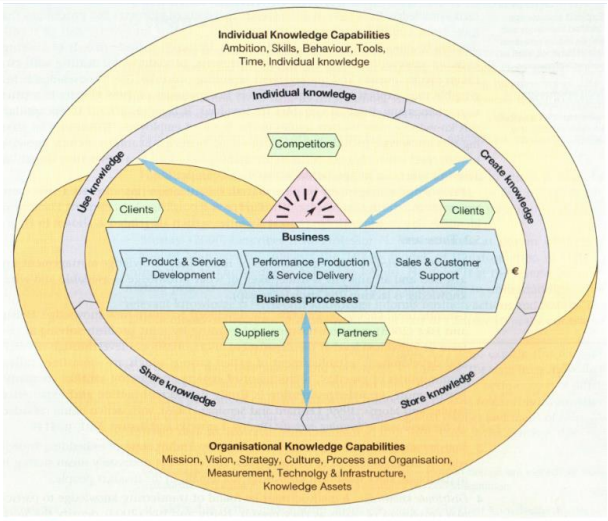


Figure 5.2 The European Knowledge Management Framework

Source: Heisig and Iske (2003)

Knowledge Processes, Systems & Technologies
(Source: Mertins, Heisig & Vorbeck, 2010)

KM Processes and Systems, and Associated Mechanisms and Technologies

KM Processes	KM Systems	KM Subprocesses	Illustrative KM Mechanisms	Illustrative KM Technologies
Knowledge Discovery	Knowledge Discovery Systems	Combination	Meetings, telephone conversations, and documents, collaborative creation of documents	Databases, Web-based access to data, data mining, repositories of information, Web portals, best practices and lessons learned
		Socialization	Employee rotation across departments, conferences, brainstorming retreats, cooperative projects, initiation	Video-conferencing, electronic discussion groups, e-mail
Knowledge Capture	Knowledge Capture Systems	Externalization	Models, prototypes, best practices, lessons learned	Expert systems, chat groups, best practices, and lessons learned databases
		Internalization	Learning by doing, on-the-job training, learning by observation, and face-to-face meetings	Computer-based communication, AI-based knowledge acquisition, computer-based simulations
Knowledge Sharing	Knowledge Sharing Systems	Socialization	See above	See above
		Exchange	Memos, manuals, letters, presentations	Team collaboration tools, Web-based access to data, databases, and repositories of information, best practices databases, lessons learned systems, and expertise locator systems
Knowledge Application	Knowledge Application Systems	Direction	Traditional hierarchical relationships in organizations, help desks, and support centers	Capture and transfer of experts' knowledge, troubleshooting systems, and case-based reasoning systems; decision support systems
		Routines	Organizational policies, work practices, and standards	Expert systems, enterprise resource planning systems, management information systems

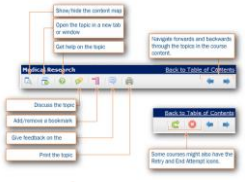
Common KMS "projects" during that era

Digitisation of codified knowledge

Documenting Best Practices & LL

Document/Knowledge Repository

Search Engine & Navigation



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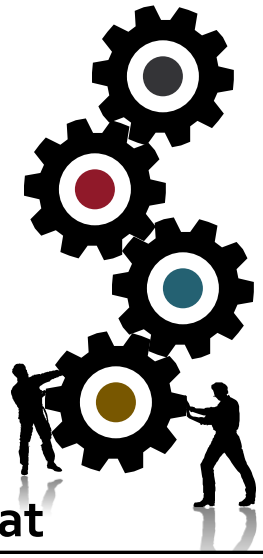
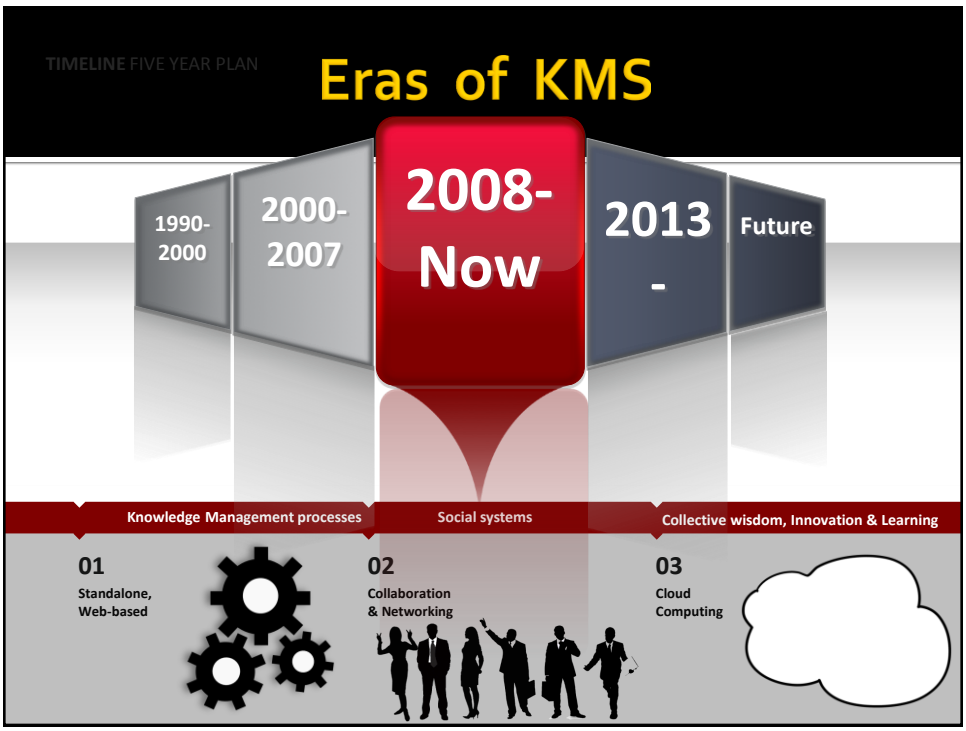
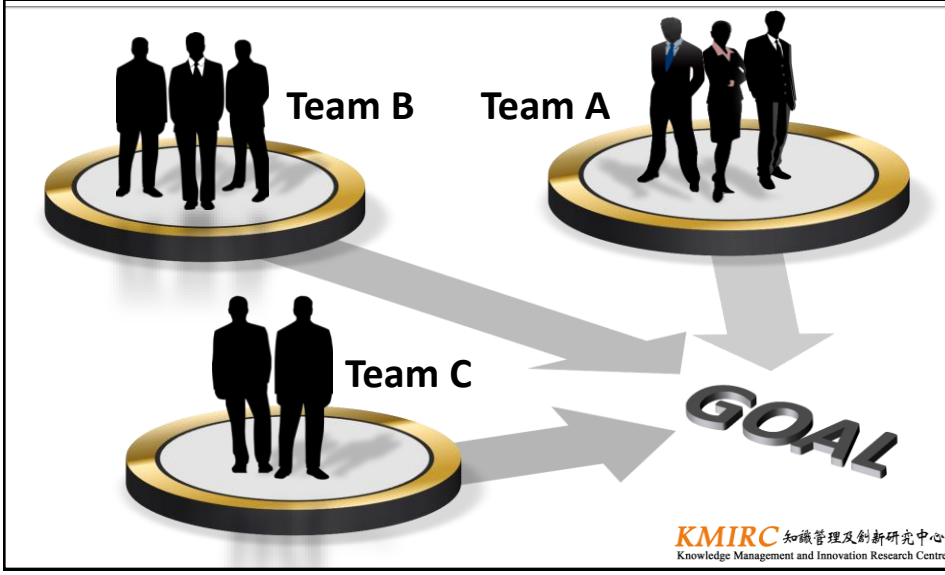
Characteristics of KMS 1900-2000

- KM Process-based
- Standalone
- Individual user sessions
- Connect people with information
- Some are web-based
- Lack of integration
- Proprietary database/format

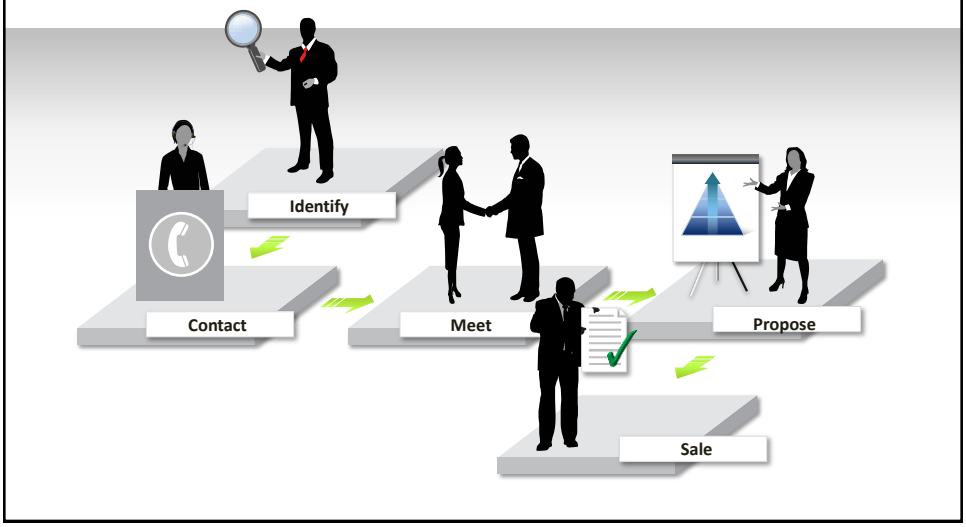




Collaboration



A typical process from Business Development to Sales



Some local installations of Enterprise Knowledge Portals

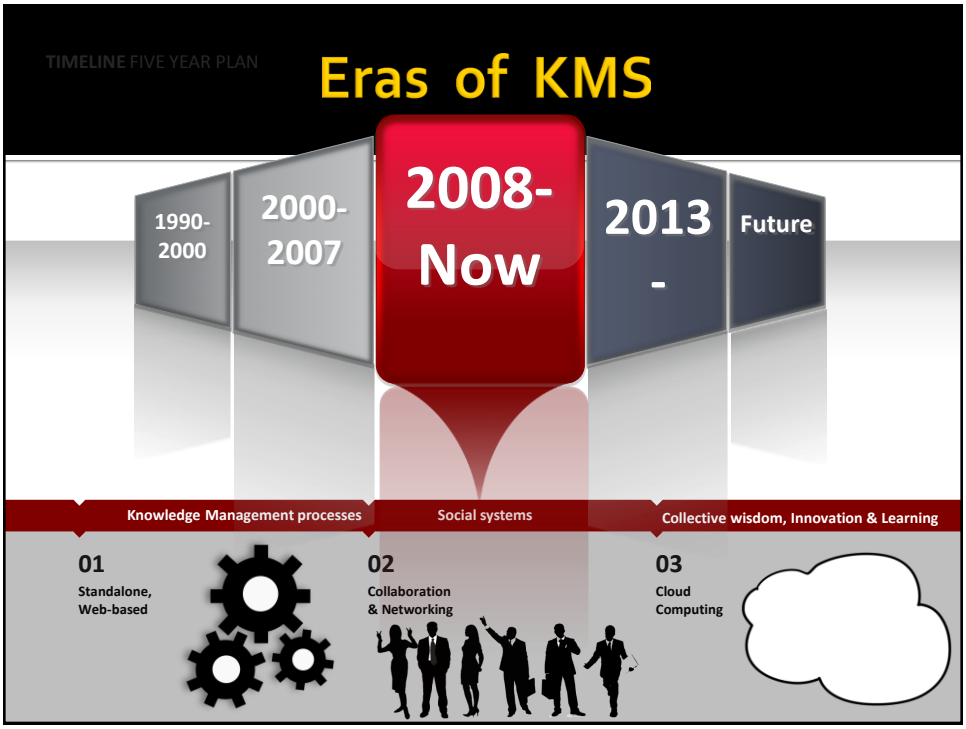
Typical KMS 2000-2007

- Web-based collaboration system
- Web/Video conferencing system
- Electronic Document Management System
- Content Management System
- Instant Messaging System
- Project/High Performance Workspaces
- Enterprise Portals
- Scenario authoring & simulation system
- Learning Management System

Lessons Learnt over 100+ KM projects

Some observations on the deployment & user adoption of KM technologies in HK

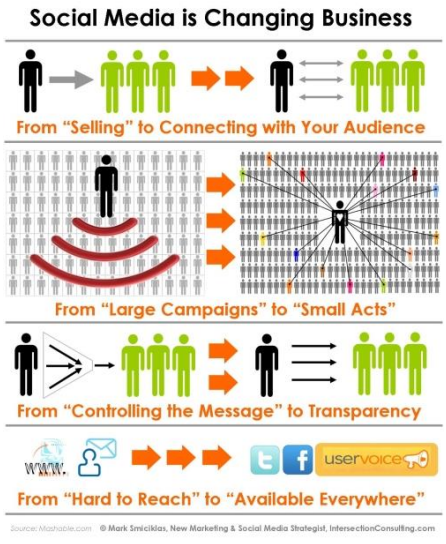
- (Affected by) the Business, IT divide – insufficient end-users, Subject Matter Experts input
- *Technologies ahead of the KM Strategy; under-leverage on soft KM tools/techniques*
- KM systems often treated as only static repositories; many interpret KM systems as E-mail systems and EDMS
- *Over emphasis on the containers than the identification of critical knowledge assets/flow and people connections*
- KM often executed as a project rather than a *j o u r n e y*
- *Lack of enterprise/departmental-wide focus on taxonomy; under-leverage of meta-data and controlled vocabularies*
- Inadequate user training/awareness on search engines
- Time lag between requirements elicitation and procurement
- *Content Management not treated as a lifecycle process*
- Commitment on some out-dated technologies
- *Lack of a holistic view to KMS; multiple functions exist*



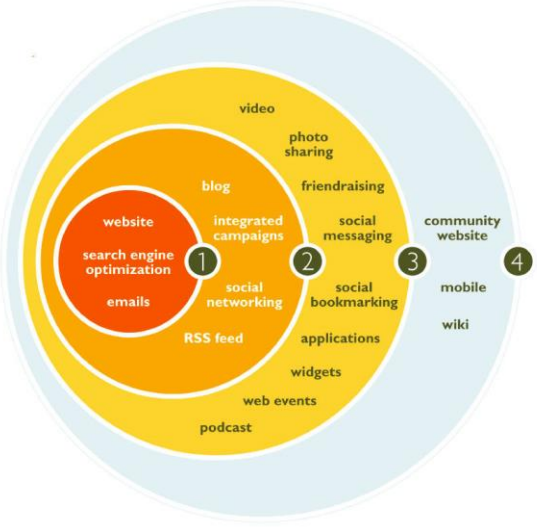
Typical KMS 2008-now

- Web 2.0 / Enterprise 2.0 tools
  - Blogging / Microblogging
  - Wiki
  - RSS
  - Social Networking
- Enterprise Portals (extended with above)
- Learning Management System (extended with above)
- Mobile devices & mobile applications

How businesses are using Social Media?



Using social media to enhance communications
(Source: Farra Trompeter, Bigduck)

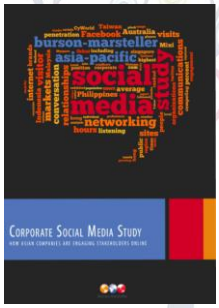


Cathay Pacific's use of social media

Cathay Pacific - Media & Influencer Relations

Source: http://blog.cathaypacific.com/

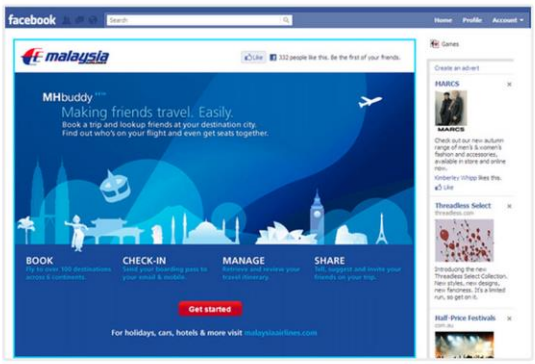
Cathay Pacfiic use a mix of social media channels, including a corporate blog (pictured), to tell the Cathay corporate story, as well as to announce product news and promotions, and answer customer questions. Cathay also encourage users to share their Cathay experiences with other customers using videos and photos.



Online booking & checkin using FB

Malaysia Airlines lets you book on Facebook

By Irene Mickaiel | March 2, 2011 | 1



(Screenshot by CBSi)

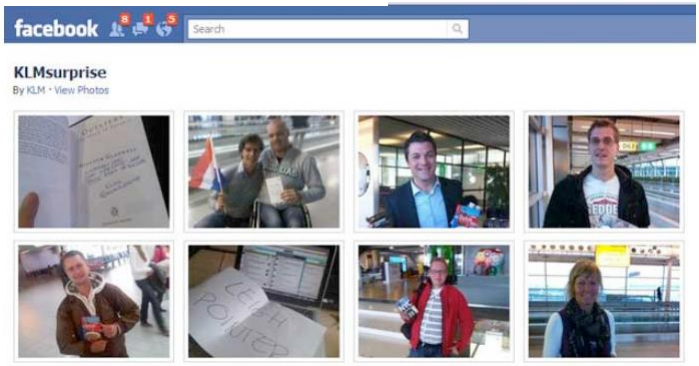
Malaysia Airlines takes social media to an all-new high, by allowing people to book their flights and check-in with the airline through Facebook.

MHbuddy on Malaysia Airlines' Facebook page lets you book, check-in, manage and share your flights via the social network. The Facebook page also lets users know if one of their friends are travelling on the same flight or going to the same destination.

KLM's personalised gifts for travellers
(Source: Chess Media Group, 2011)

KLM Airlines recently experimented with an interesting campaign taking advantage of this. The airline decided to use this multitude of available social data to surprise their passengers waiting at Airport Amsterdam Schiphol with personalized gifts. KLM monitored the social web for passengers that checked-in through Four Square or Twitter. They then searched their social profiles for information such as their favorite activity and interests to obtain gift ideas.

Then they set out to locate the passenger, either at their departure gate or again through information shared through social networks. Through online conversations about its brand, and based on data that passengers shared, KLM found the passengers and surprised and delighted them with the personalized gifts.



KLM's Inflight Matchmaker service

TRAVEL

The airline that lets you choose a seatmate using Facebook

Coming soon: The "meet and seat" — at least if you're flying KLM Royal Dutch Airlines

POSTED ON DECEMBER 16, 2011, AT 2:39 PM

Flying can be a nightmare — just ask Alec Baldwin. But would the ability to select whom you'd be sitting next to make hours of airtime more bearable? That's the premise behind Dutch airline KLM's new "meet and seat" initiative, designed to let passengers share Facebook and LinkedIn profiles with the rest of the flight's passengers beforehand in the hope of pairing up agreeably. Here's a quick briefing:

If KLM goes ahead with its proposed "meet and seat" program, passengers will be able to choose their seatmates in advance using social media sites like Facebook and LinkedIn. *Photo: CC BY: Pigpen_71*

What exactly is "meet and seat"?

Essentially, a "matchmaking service," says David Millward of Britain's *Telegraph*. Most airlines already allow passengers to choose a seat by perusing a chart of the airliner's seats on the internet. KLM, which admits it has many details to work out, would take that process a step further by letting you click seats adjacent to the one you're considering to see if those travellers had made their Facebook profiles available. Theoretically, the system would let you choose a fellow passenger with "like minded interests to while away the time on a long or boring flight."

KLM to Introduce In-Flight Matchmaker Service 'Meet & Seat'

SHARE Text Size

By MARK JOHANSON: Subscribe to Mark's RSS feed
December 14, 2011 4:54 PM EST

Ever wished you could choose your seatmate on a long overseas flight? Hate getting stuck next to the screaming baby or the burly seat hog? Dutch airline KLM is introducing a new program that will allow travelers to choose who they sit next to according to social media profiles.

(Photo: REUTERS / Morris MacMatzen)
Choose your seatmate in KLM's new social experiment.

SHARE THIS STORY

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The idea is simple. Link your social media profile to your check-in information and choose a seating partner presumably by assessing similar likes and dislikes.

KLM spokesperson Mina Jarvis confirmed to the International Business Times that its social seating tool, called "Meet & Seat," will launch at the beginning of next year. However, she could only provide limited information about the program because it is still in the development phase.

The matchmaking service will be available to all passengers, but those who would prefer to keep their headphones on and their laptops out can choose not to make their profile publically available.

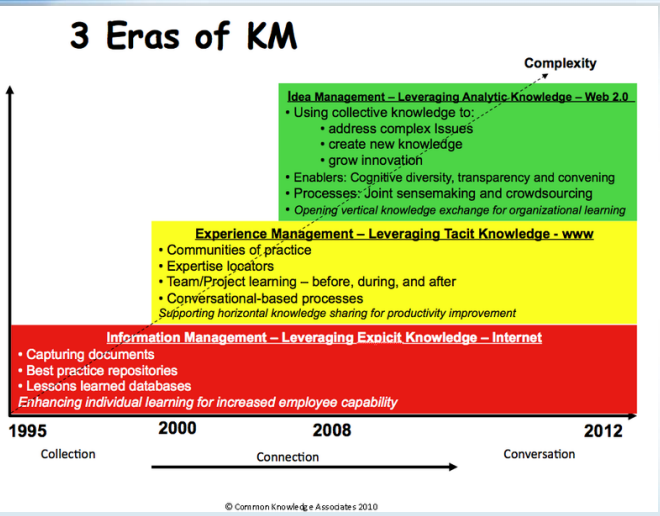
The idea is that passengers will be able to pick people with the same interests for a seatmate, but access to the Web sites will also allow them to buddy up based on professions or even looks.

Characteristics of KMS 2008-now

- Top-down & Bottom up input
- High degree of interactivity
- Intra-department, inter-department & inter-organisation
- Collaboration, Networking, Decision Making & Learning
- Pervasive & Ubiquitous
- Massive & rapid accumulation of data
- Harness collective intelligence

Nancy M. Dixon's 3 eras of KM

(Replay Webinar at http://goo.gl/zU7aG)



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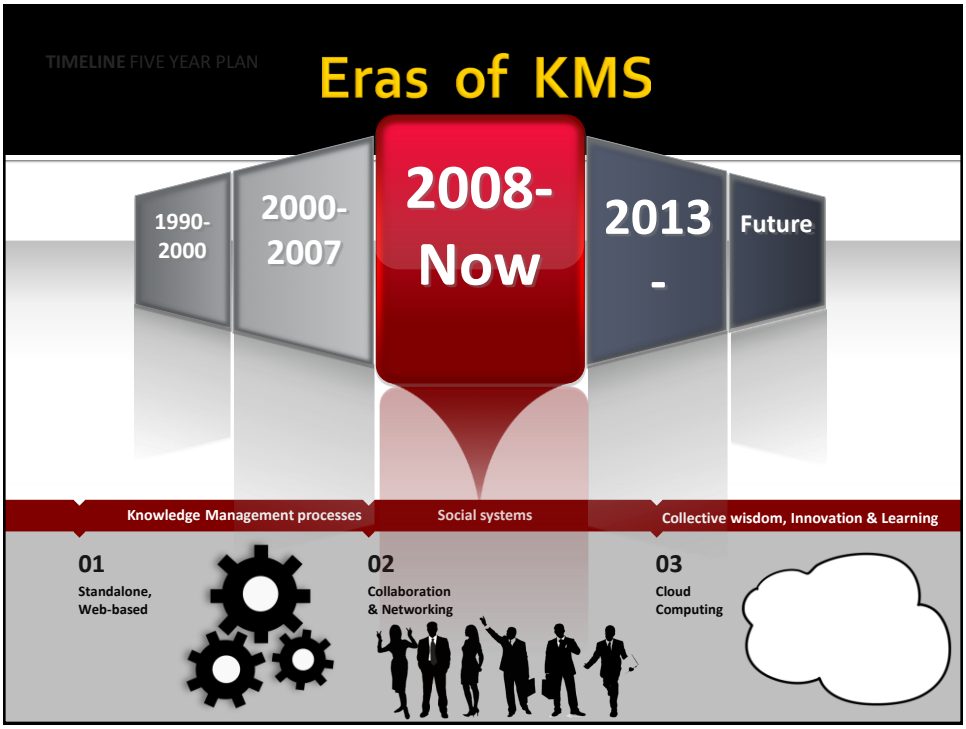
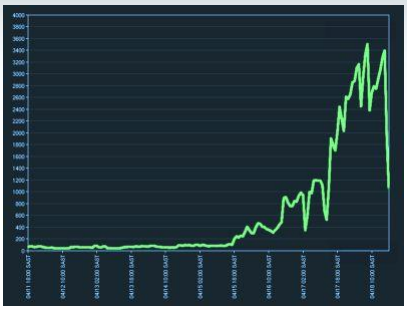


Definition of Cloud Computing

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

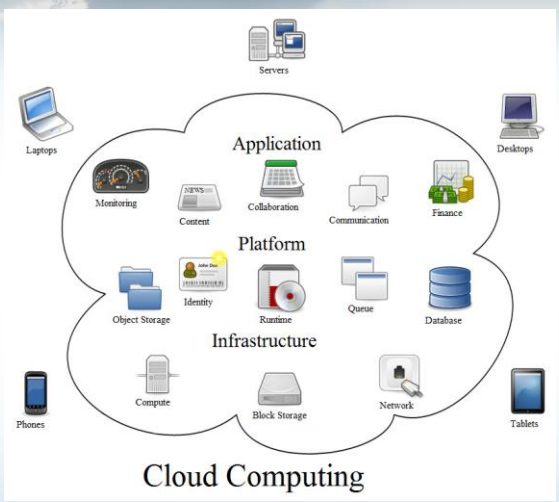
"Cloud computing is a model for enabling convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction."

Animoto's use of an elastic cloud



The company's average 5,000 users a day spiked to 750,000 in three days. At one point, 25,000 people used Animoto in one hour.

The Adolescent Cloud



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Data to drive cloud maturity

By Dylan Bushell-Embling | 2013-01-30

As cloud technologies edge towards maturity and adoption rates pick up steam, 2013 is shaping up to be a landmark year for the cloud, according to Ovum.

The research firm has published a series of reports predicting that cloud maturity will take strong strides in 2013, and that data will be the new oil that drives the market.

Fellow analysts Gartner meanwhile expect that cloud computing will have a substantial impact on the IT security sector, and are predicting that 10% of IT security

Cloud computing reaching adolescence

vendors achieve the key IT challenge of simultaneously reducing costs while improving innovation, two goals that were previously irreconcilable.

This year will also see the emergence of a true cloud computing ecosystem, Ovum predicts. Public clouds are already increasingly serving as "ecosystem hubs" for both cloud service providers and consumers.

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The Knowledge Cloud

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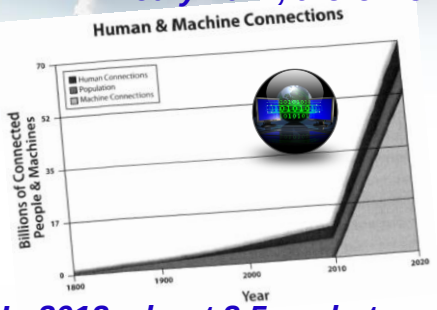
70 billions connections & 1/3 of consumer digital content in the cloud by 2020 & 2016 respectively

In July 2012, there were 955m users in Facebook



EXPECTED GROWTH OVER THE NEXT 10 YEARS

10x	50x	1.5x
The number of real and virtual servers worldwide	The number of bytes managed by enterprise data centers	The number of IT professionals in the world

Source: IDC

Gartner: One-third consumer digital content to store in cloud by 2016

By Asia Cloud Forum editors 25-Jun-2012

Cloud storage of consumer content in 2011 accounted for just seven percent. By 2016, this will grow to 36%, according to Gartner's latest research findings.

Thanks to the consumerization of IT, more consumers desire to share and access content on multiple devices like camera-equipped smartphones and tablets. As storage increasingly becomes part of the personal cloud, Gartner advises online storage and sync companies to strategically rethink about their future approach.

In 2012, about 2.5 exabytes are created every day and is expected to double every 40 months. An exabyte is 10,000 times of a petabyte (approx 20 million filing cabinets)

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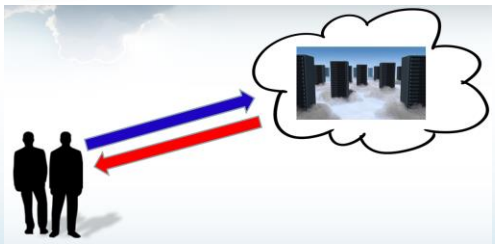
Human-machine cooperative problem solving

3. Connected Machines Drive New Insights

The "Internet of things" has arrived and it will continue to grow to meet specific industry requirements. According to a Gartner report, "In 2011, over 15 billion things on the Web with 50 billion+ intermittent connections will grow by 2020 to over 30 billion connected things, with over 200 billion with intermittent connections."

Machine-to-machine (M2M) connections now cover much more than smart energy delivery and smart cars. For example, elaborate networks of sensors with direct machine-to-machine connections now underpin connected health care and the first consumer-ready wave of automotive telematics.

The ability to collect, store and analyze overwhelming volumes of data will define which enterprises extract the best insights and make the most agile decisions, to their competitive advantage. As a result, all enterprises – both business and government – will need to work with vendors having strong and global ecosystems.



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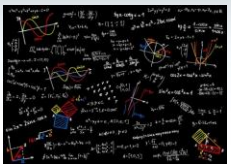
Harnessing Wisdom of the Crowd

- Polymath
  - Online discussions about mathematical problems
- GenBank
  - World's online repository of genetic data
- GalaxyZoo
  - 200,000 online volunteers to help astronomers classify galaxy images



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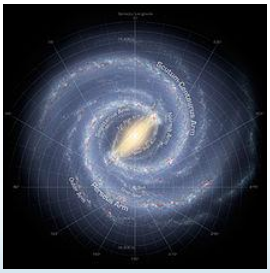
Any spiral? Which direction?



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Amazon Mechanical Turk

Human Intelligence Tasks

amazonmechanical turk
Artificial Artificial Intelligence

Your Account | HITs | Qualifications

Already have an account? Sign in as a Worker | Requester

Introduction | Dashboard | Status | Account Settings

Mechanical Turk is a marketplace for work.
We give businesses and developers access to an on-demand, scalable workforce.
Workers select from thousands of tasks and work whenever it's convenient.

74,997 HITs available. View them now.

Make Money
by working on HITs

HITs - *Human Intelligence Tasks* - are individual tasks that you work on. Find HITs now.

As a Mechanical Turk Worker you:

- Can work from home
- Choose your own work hours
- Get paid for doing good work

Find an interesting task → Work → Earn money

Find HITs Now

or learn more about being a **Worker**

Get Results
from Mechanical Turk Workers

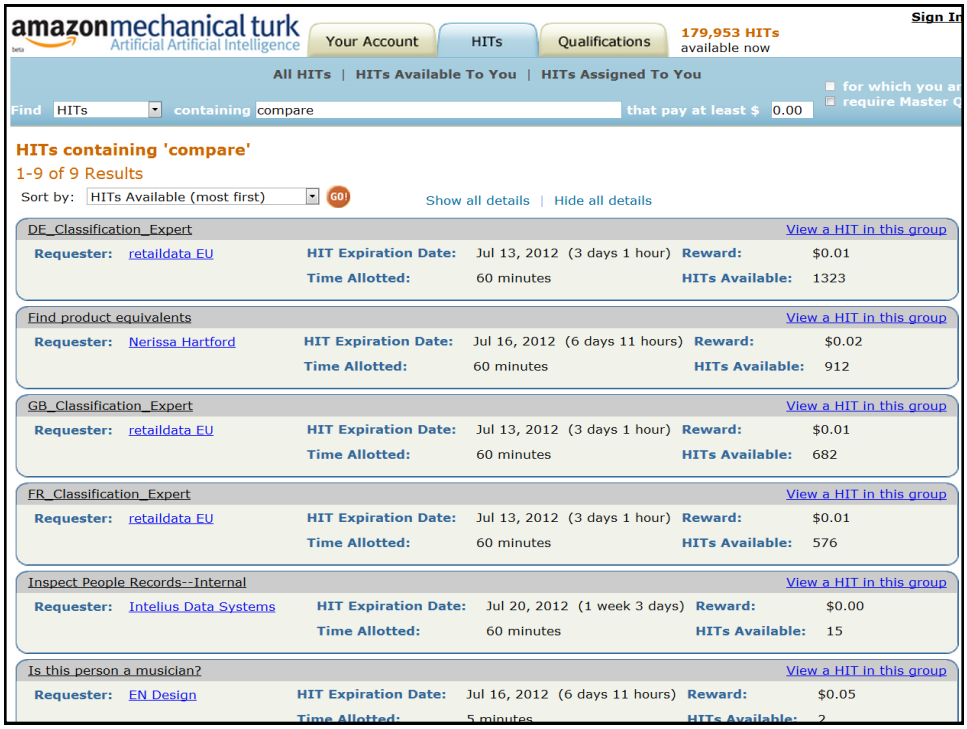
Ask workers to complete HITs - *Human Intelligence Tasks* - and get results using Mechanical Turk. Register Now

As a Mechanical Turk Requester you:

- Have access to a global, on-demand, 24 x 7 workforce
- Get thousands of HITs completed in minutes
- Pay only when you're satisfied with the results

Fund your account → Load your tasks → Get results

Get Started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179,953 HITs
available now
All HITs | HITs Available To You | HITs Assigned To You
Find HITs containing compare that pay at least $ 0.00
HITs containing 'compare'
1-9 of 9 Results
Sort by: HITs Available (most first) GO!
Show all details | Hide all details
DE_Classification_Expert
View a HIT in this group
Requester: retaildata EU
HIT Expiration Date: Jul 13, 2012 (3 days 1 hour)
Reward: $0.01
Time Allotted: 60 minutes
HITs Available: 1323
Find product equivalents
View a HIT in this group
Requester: Nerissa Hartford
HIT Expiration Date: Jul 16, 2012 (6 days 11 hours)
Reward: $0.02
Time Allotted: 60 minutes
HITs Available: 912
GB_Classification_Expert
View a HIT in this group
Requester: retaildata EU
HIT Expiration Date: Jul 13, 2012 (3 days 1 hour)
Reward: $0.01
Time Allotted: 60 minutes
HITs Available: 682
FR_Classification_Expert
View a HIT in this group
Requester: retaildata EU
HIT Expiration Date: Jul 13, 2012 (3 days 1 hour)
Reward: $0.01
Time Allotted: 60 minutes
HITs Available: 576
Inspect People Records--Internal
View a HIT in this group
Requester: Intelius Data Systems
HIT Expiration Date: Jul 20, 2012 (1 week 3 days)
Reward: $0.00
Time Allotted: 60 minutes
HITs Available: 15
Is this person a musician?
View a HIT in this group
Requester: EN Design
HIT Expiration Date: Jul 16, 2012 (6 days 11 hours)
Reward: $0.05
Time Allotted: 5 minutes
HITs Available: 2

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Docs
Login
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Instantly hire millions of people to collect, filter, and enhance your data.
RTFM
Real Time Foto Moderator
Crowdsourced image moderation with a simple real-time API.
Senti
Sentiment Analysis
Fast, accurate human review of user-generated social media content.
Real-time Crowd Labor
1 judgments/sec
current velocity
516,563,209
total judgments
On-Demand
Pay for only what you need when you need it.
Accurate
Guaranteed quality with rich analytics.
Fast
100x faster than traditional methods.
Experienced
Creating crowdsourcing solutions since 2007.
"Our partnership with CrowdFlower gives us a way to quickly structure the data we need, when we need it, with scalability and accuracy that we can rely on."
— EpidemicIQ
Custom solutions
Big-data services
Our team will develop custom solutions to solve your problems.
Builder
Create your own crowdsourcing jobs
Solve your unique problems with our platform.
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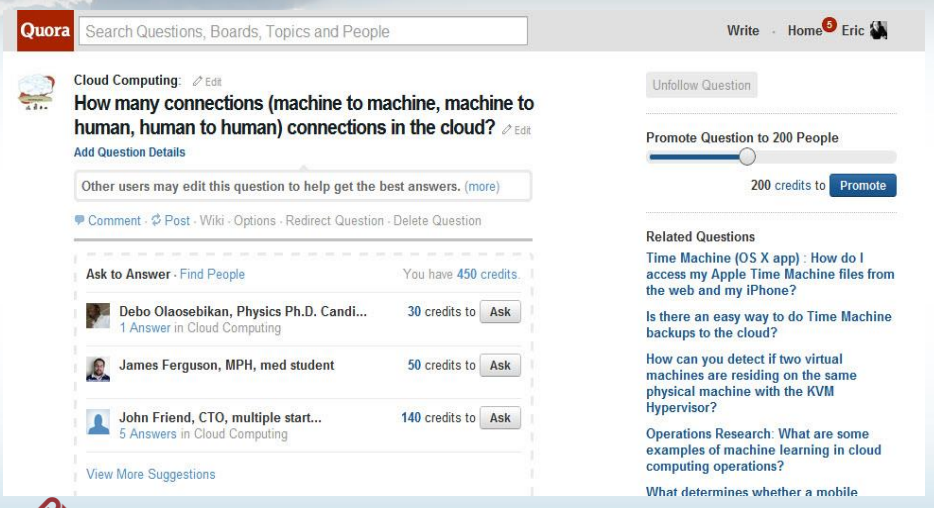
Knowledge Management and Innovation Research Centre

Human Cloud – Knowledge Centre
www.Quora.com



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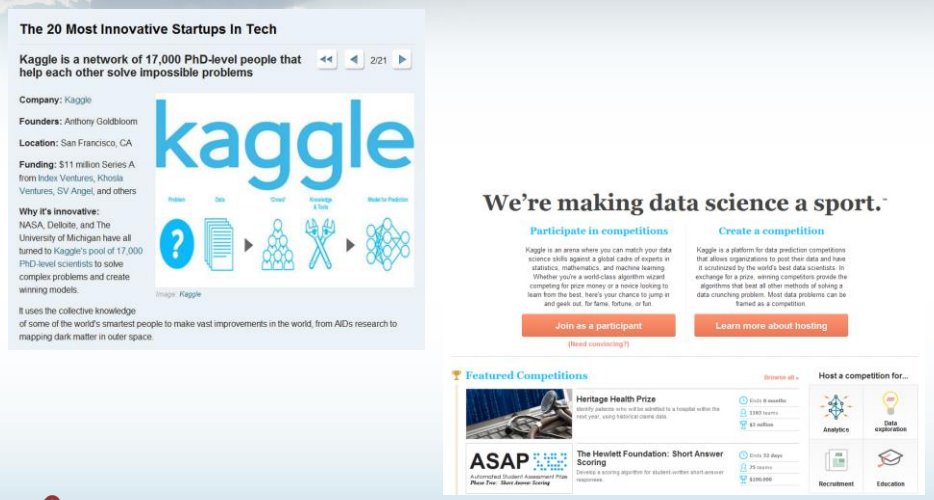
www.Kaggle.com



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Characteristics of Cloudsourcing

A completely new business model !!!

- Harness micro-expertise from individuals rapidly, ad hoc & routinely
- Expertise ranges from novices to specialists
- Match expertise with problems & with scale
- Perform checks to filter out invalid responses
- Tools & processes provided to track progress
- Remunerate by hour, by task, by competition as well as by non-financial rewards

More problems are being solved

(by "designed/situated serendipity")

Low latency, low risk & massive contributions

Netflix taps into Open Innovation via offering a contest

InformationWeek
THE BUSINESS VALUE OF TECHNOLOGY

Netflix's Cloud Contest: More Companies Should Follow Suit

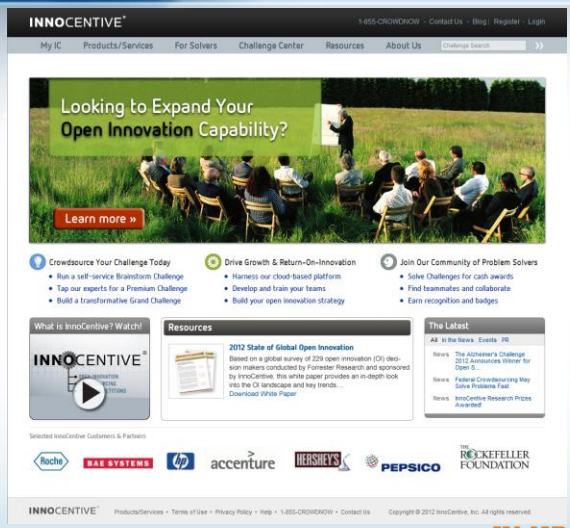
The economics of open innovation are too compelling to ignore.

By Joe Weinman, InformationWeek
March 27, 2013
URL: http://www.informationweek.com/global-cio/interviews/netflixs-cloud-contest-more-companies-sh/240151747

Netflix recently announced the $100,000 Netflix Cloud Prize, dedicated to advancing cloud computing in 10 categories. (Disclosure: I am one of the prize judges.) Another *InformationWeek* article argued that Netflix is "ruining cloud computing" by focusing its innovation in a way the author, Joe Masters Emison, is concerned could "derail real IaaS competition." In my view, Netflix is free to select whichever partners they choose, and as far as the Netflix Cloud Prize is concerned, more companies should be looking to mimic its approach: leveraging the economics of contests, enhancing their own services and sharing core technology advances with everyone.

Human Cloud – www.innocentive.com

https://www.youtube.com/watch?v=7eaV1-mKxbk&feature=youtube_gdata_player



Open Innovation Network – www.ninesigma.com

Open Innovation Network – www.openideo.com

Four types of Human Cloud platforms

(Source: Sloan Management Review, Winter 2013)

PLATFORM MODEL	DESCRIPTION	EXAMPLES	TYPICAL USE CASES	KEY BENEFIT	AVERAGE NUMBER OF SUPPLIERS ON THREE LARGEST PLATFORMS
Facilitator	Connects suppliers and buyers directly through a bidding process	Freelancer, Elance, oDesk, Coffee & Power	Any service	Access to a large pool of suppliers and tools to facilitate the engagement	3,700,000
Arbitrator	Engages multiple suppliers through competitions	crowdSPRING, 99designs, MediaPiston, InnoCentive, Witmart	Logo design, graphic design, idea generation	Ability to choose from among multiple completed projects	80,000
Aggregator	Aggregates hundreds or thousands of microtasks performed by multiple suppliers	MechanicalTurk, MobileWorks, CrowdFlower, CloudFactory	Transcription, content generation, categorization, Internet search	Ability to have large quantities of standardized work completed quickly	400,000
Governor	Provides project governance and certifies supplier quality	TopCoder, Trada, uTest, 10EQS	Software development, sales and marketing, software testing	Assurance of qualified coordination and management of complex projects	50,000

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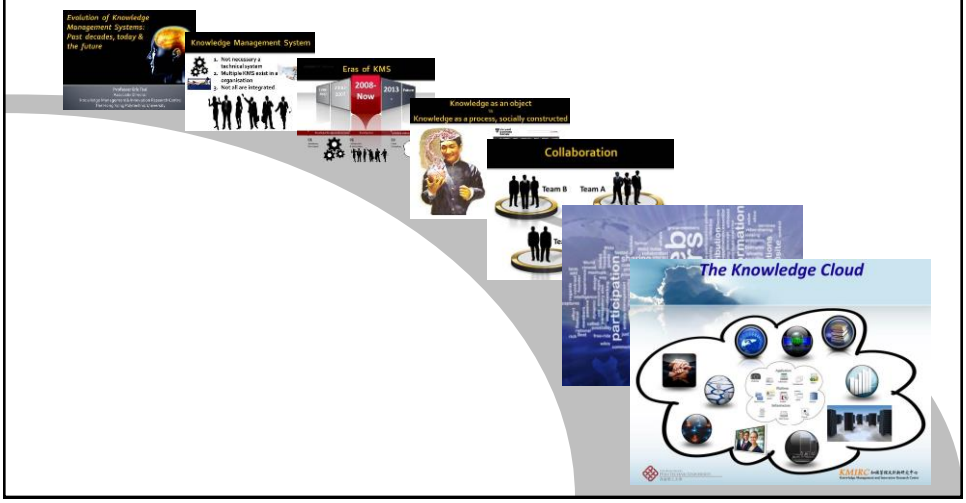
KMS' journey into the future

TEMPLATES

Pre-designed presentations with 22 slides



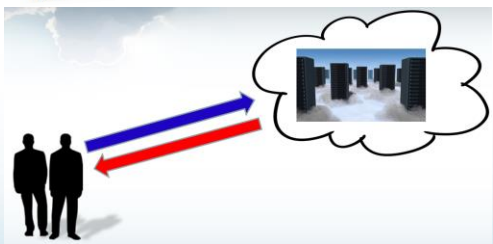
Human-machine cooperative problem solving

3. Connected Machines Drive New Insights

The "Internet of things" has arrived and it will continue to grow to meet specific industry requirements. According to a Gartner report, "In 2011, over 15 billion things on the Web with 50 billion+ intermittent connections will grow by 2020 to over 30 billion connected things, with over 200 billion with intermittent connections."

Machine-to-machine (M2M) connections now cover much more than smart energy delivery and smart cars. For example, elaborate networks of sensors with direct machine-to-machine connections now underpin connected health care and the first consumer-ready wave of automotive telematics.

The ability to collect, store and analyze overwhelming volumes of data will define which enterprises extract the best insights and make the most agile decisions, to their competitive advantage. As a result, all enterprises – both business and government – will need to work with vendors having strong and global ecosystems.



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Cloud logic defined

The term "cloud logic" refers to logical inference systems that reside at remote servers rather than on client machines. Remote inference systems can distribute logical inference tasks over many cores at remote sites or distribute inference tasks across widely distributed machines and collect the results together to complete a client's query. *(Source: John Fisher, http://www.csupomona.edu/~jrfisher/cs515/cloudlogic.html)*

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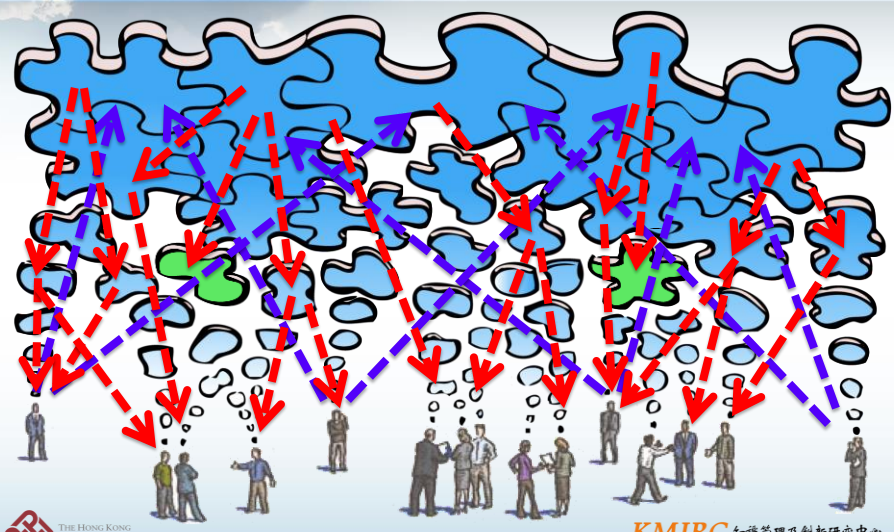
Cloud Intelligence in action



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Human-Machine co-operative problem solving

Would you like to design & operate computers to perform knowledge work?

Artificial intelligence: Job killer or your next boss? | ZDNet »

As software automates an increasing number of tasks, is it time to reassess traditional workplace roles and create an office that suits both man and machine?

Would you like to be instructed by computers to carry out routine/transactional work?