



Internet 2014, Sevilla, Spain

Panel Discussion INTERNET/COLLA

Facebook, Google, Twitter Is this the Internet of the future?

Moderator

Steffen Fries, Siemens AG, Germany

Panelists

Kazuyuki Shimizu, Meiji University, Japan

Dirceu Cavendish, Kyushu Institute of Technology, USA/Japan

Eugen Borcoci, University "Politehnica" of Bucharest (UPB), Romania

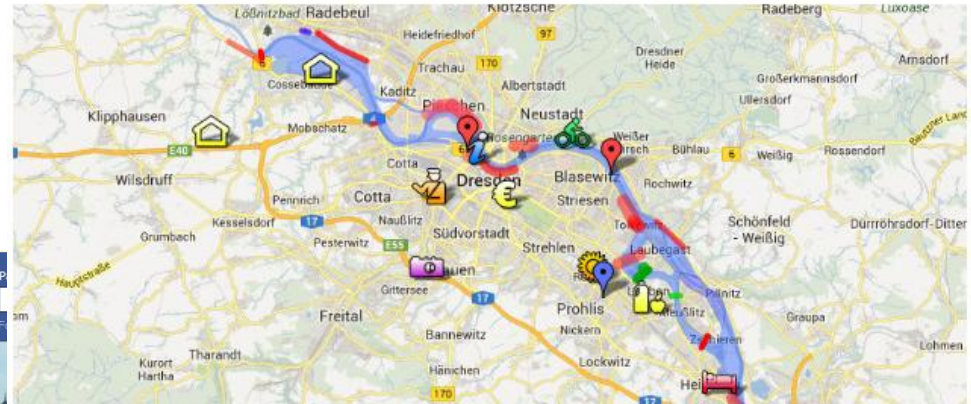
Marcelo Augusto Rauh Schmitt, IFRS - Campus Porto Alegre, Brazil

Antonio Capodiecì, Università del Salento, Italia

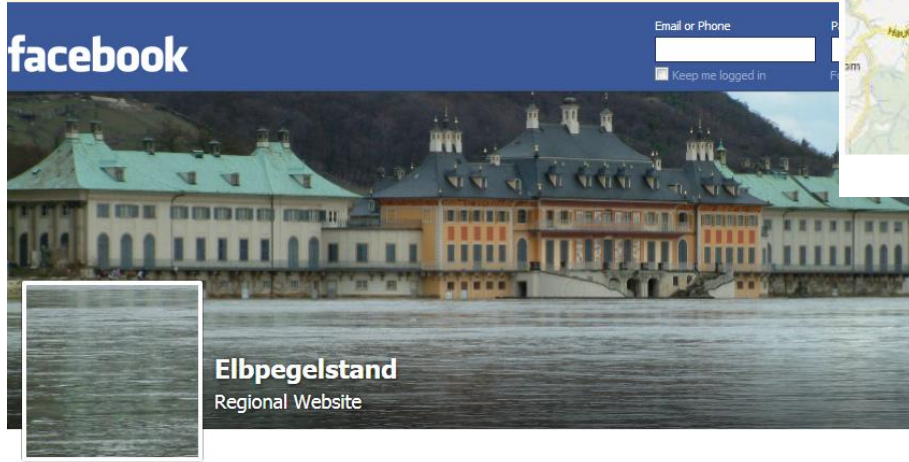
June 23rd, 2014

just two thoughts

providing support during river Elbe flood in 2013



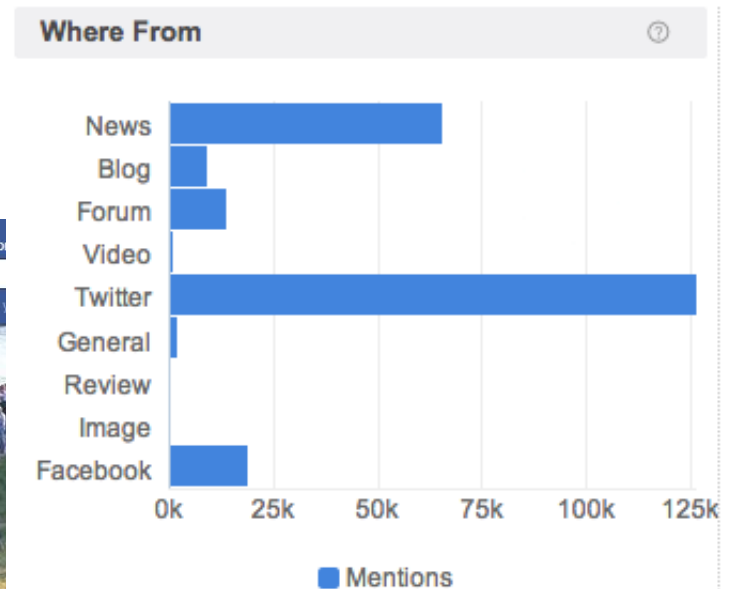
Ausschnitt der interaktiven Google-Map "Hochwasserhilfe Dresden"



Elbpegelstand
Regional Website



Dresden
Fluthilfe Dresden
Regional Website



the flipside – potential issues ?

Data Mining

Privacy



**CYBER
BULLYING**

statements & topics from the panelists

Kazuyuki Shimizu, Meiji University, Japan:

“Similarity between Page Rank and Smith's sympathy”

Dirceu Cavendish, Kyushu Institute of Technology, USA/Japan:

“Internet Owners: who are they?”

Eugen Borcoci, University "Politehnica" of Bucharest (UPB), Romania

**“The Internet of the Future: Applications versus technologies” &
“FI (networking) technologies - support for social networks applications”**

Marcelo Augusto Rauh Schmitt, IFRS - Campus Porto Alegre, Brazil

“New Internet Law in Brazil - how our society worries about Internet power and regulated it.”

Antonio Capodici, Università del Salento, Italia

“How the internet and web 2.0 can enhance collaboration among workers and to Improve the efficiency of the organization”



Internet 2014 Panel

Internet Owners: Who are they?

Dirceu Cavendish, Kyushu Institute of Technology, Japan



Internet Active Players



Players

- Infrastructure providers
 - Network operators; Internet access providers
- Retailers
 - Amazon; B&M stores;
- Internet Services
 - Google; Facebook
 - Video delivery;
 - Cloud computing/storage;
- Consumers: Colored Internet
- Regulatory agencies
- Hackers

Diverse Goals and Motivations



Goals/Motivation

- Network providers: maximize revenue/bit, minimize CAPEX/OPEX
- Retailers: scale sales up, minimize OPEX
- Internet Services: maximize site exposure; monetize service access
- Consumers: streamline day-to-day activities; enhance lives
 - entertainment, work, leisure, travel
- Regulatory agencies: arbitrate diverse interests on behalf of common good
- Hackers: disrupt status quo for self advantage

Internet Steering



- Netflix impact on Internet bandwidth utilization
- Network operators differentiated handling of traffic
- Google scanning of emails/Facebook privacy
- Security Agencies eavesdropping/privacy regulating
- Heartbleed security vulnerability affecting server authentication

Internet Steering: Content Providers



■ Netflix impact on Internet bandwidth utilization

Netflix Remains King of Bandwidth Usage MAY 14, 2014 | 01:00AM PT

The No. 1 subscription VOD service accounted for 34.2% of all downstream usage during primetime hours, up from [31.6% in the second half of 2013](#), according to network-[equipment](#) vendor Sandvine. Peak period is defined as 7 p.m. to 11 p.m. on Sandvine's reports.

<http://variety.com/2014/digital/news/netflix-youtube-bandwidth-usage-1201179643/>

Video data dominance

- Large amounts of data
- Volatile
- Customized
- Recurrent

Content providers vs Net operators



- Netflix impact on Internet bandwidth utilization
- Network operators differentiated handling of traffic

Netflix's faux neutrality [Commentary]

The video provider's CEO may be trying to confuse Internet issues to his company's benefit

So Netflix chose to interconnect directly with the ISP Comcast, which had already invested heavily in the infrastructure to handle large volumes of content. Although Netflix pays Comcast for interconnection, it has reportedly saved a ton of cash in cutting out the middleman — and increased its speeds by 65 percent.

Net neutrality, on the other hand, addresses the issue of discrimination on the last-mile networks owned by Comcast and other ISPs. In essence, it seeks to prohibit unfair treatment of unaffiliated content traveling within an ISP's network. Under the new proposed rules, according to reports, if an ISP decides to provide premium speeds to Netflix over its last mile facility, it can't deny that same quality of service to Netflix's competitors.

http://articles.baltimoresun.com/2014-05-14/news/bs-ed-netflix-neutrality-20140514_1_netflix-net-neutrality-content-delivery-networks

Netflix's formal response to Verizon's cease-and-desist is another boatload of snark

The blow comes in response to a Verizon [cease-and-desist letter](#) sent to Netflix last week. In the letter, Verizon demanded that Netflix stop telling users that drops in streaming performance was the result of congestion on Verizon's network — and threatened to sue if Netflix didn't provide evidence backing up its claims.

Now Netflix has refused to comply with Verizon's data request, instead reiterating arguments that Verizon hasn't done enough to accommodate its subscribers' requests for streaming video.

<http://www.washingtonpost.com/blogs/the-switch/wp/2014/06/09/netflixs-formal-response-to-verizons-cease-and-desist-is-another-boatload-of-snark/>



Service Providers' crowdsourcing



- Google scanning of emails
- Facebook effects on peoples' lives

Gmail does scan all emails, new Google terms clarify

The search company has modified its terms of service to specifically state that 'automated systems analyse your content'

<http://www.theguardian.com/technology/2014/apr/15/gmail-scans-all-emails-new-google-terms-clarify>

Facebook Knows Everything About You, And If You Don't Believe Us, Here Is the Proof

The campaign called "[Digital Shadow](#)", which currently is available only in the US, requests permission to access a user's account and then pulls information to build a comprehensive dossier of the user as if he or she were an assassin's target. And we do mean *comprehensive*.

Digital Shadow first shows users the photos they've tagged as public, then it moves on to examine their friends. It shows users which of their Facebook friends they interact with most, which interact with them the most, which they don't interact with at all, and (gulp) which friends they've been stalking that haven't been stalking them back. (Those who've been keeping tabs on their exes should avoid this section at all costs.)

http://www.huffingtonpost.com/2014/04/22/watch-dogs-facebook-privacy-settings_n_5191237.html

How to Prevent Facebook's Graph Search From Costing You Your Job

There is a flip side to Graph Search: Because Facebook is organizing your public data, it is possible for you to be associated with results you never realized existed or have been taken out of context. Employers, coworkers and general acquaintances are now seeing information that you thought was only being seen by friends and family. Graph Search allows your work place and associates to find results that include you and how they pertain to your job.

http://www.huffingtonpost.com/julio-fernandez/graph-search-privacy_b_2539709.html



Regulatory agencies



■ Security Agency eavesdropping/privacy regulating

EU says firms like Google and Facebook must meet privacy rules

(Reuters) - Companies based outside the European Union must meet Europe's data protection rules, ministers agreed on Friday, although governments remain divided over how to enforce them on companies operating across the bloc.

The agreement to force Internet companies such as Google (GOOGL.O) and [Facebook](#)(FB.O) to abide by EU-wide rules is a first step in a wider reform package to tighten privacy laws - an issue that has gained prominence following revelations of U.S. spying in Europe.

<http://www.reuters.com/article/2014/06/06/us-eu-dataprotection-idUSKBN0EH1ER20140606>

Details of Every American's Call History

First, the government convinced the major telecommunications companies in the US, including AT&T, MCI, and Sprint, to hand over the "call-detail records" of their customers. According to [an investigation by USA Today](#), this included "customers' names, street addresses, and other personal information." In addition, the government received "detailed records of calls they made—across town or across the country—to family members, co-workers, business contacts and others."

Real Time Access to Phone and Internet Traffic

Second, the same telecommunications companies [also allowed the NSA to install sophisticated communications surveillance equipment](#) in secret rooms at key telecommunications facilities around the country. This equipment gave the NSA unfettered access to large streams of domestic and international communications in real time—what amounted to at least 1.7 billion emails a day, [according to the Washington Post](#). The NSA could then data mine and analyze this traffic for suspicious key words, patterns and connections. Again, all of this was done without a warrant in violation of federal law and the Constitution.

<https://www.eff.org/nsa-spying/how-it-works>



Hackers



■ Heartbleed security vulnerability affecting server authentication

Hackers Use Heartbleed Bug to Attack 'Major Corporation'

Hackers took advantage of the Heartbleed vulnerability to break into a major corporation's network, less than a day after the bug was brought to the public's attention, security experts told The New York Times. Heartbleed is a serious security flaw in OpenSSL, the software that a huge number of websites use to encrypt and transmit data. Hackers exploiting the bug can gain access to sensitive private information such as usernames and passwords.

To date, much of the discussion about Heartbleed has focused on an attacker using the vulnerability to steal private encryption keys from a Web server. The case cited by Mandiant exposed another danger: the potential for hijacking user sessions while employees are logged on to a corporate network.

<http://www.nbcnews.com/tech/security/hackers-use-heartbleed-bug-attack-major-corporation-n84521>

Future Internet: Owners & Features



Current players: evolving goals/motivation/behavior

- New generation consumers
 - anti-social net? Privacy conscious?
- Network service providers
 - encryption services; new data delivery models;
- Internet service providers
 - Selective data gathering/data usage; Customer data auditing
- Regulatory agencies
 - Explicit rules for eavesdropping (electronic fast warrants?)

New Owners?

- Internet of things will change Internet infrastructure landscape
 - Sensor devices may provide new data on which new Internet protocols may rely upon, changing experience on: accessibility; connectivity; services
- Emerging services
 - Expert systems/Specialized Oracles (e.g. IBM Watson)
- New regulatory agencies/rules?
 - Investigative/regulatory agencies for consumer protection



Internet/Colla **PANEL**

**Facebook, Google, Twitter...: Is This the
Internet of the Future? ...**

***Social Networks – Information Centric Networking
support***

Eugen Borcoci

University Politehnica Bucharest

**Electronics, Telecommunications and Information Technology Faculty
(ETTI)**

Eugen.Borcoci@elcom.pub.ro



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- **Online Social Network (OSN) today:**
 - Facebook, Twitter, Google+, LinkedIn, ...
 - High volume percentage in the global Internet traffic
 - High number of users: $10^{**5} \dots 10^{**7}$
 - Trend: still increasing volume in the next years (especially in mobile area)

- **OSN services:**
 - Publishing info, interacting with friends, connecting interest-based groups, multimedia object sharing
 - **Strongly related to content generation, storing/caching, distribution, transport**

- **Current Internet usage “shift”:**
 - browsing information → online consuming and sharing different types of content , including UGC

- ***ICN: can it offer enough attractive support for OSN?***



- **Information/Content Centric Networking (ICN/CCN)**
 - propose major **changes** for TCP/IP networking
 - claiming advantages in the perspective of Future Internet
 - Motivation: : Current applications **evolve more and more to information/content distribution and retrieval**

- **ICN main concepts** summary
 - IP networking : focused on location (addresses) – host centric
 - ICN: focused on names- content centric
 - Major changes : **where** → **what**
 - **Content is treated as a primitive**
 - *decoupling location from identity, security and access*
 - *retrieving content by name*
 - **Routing named content**, (derived from IP), allows native capabilities as:
 - Multicast, Mobility
 - **Caching** becomes a main function of network nodes

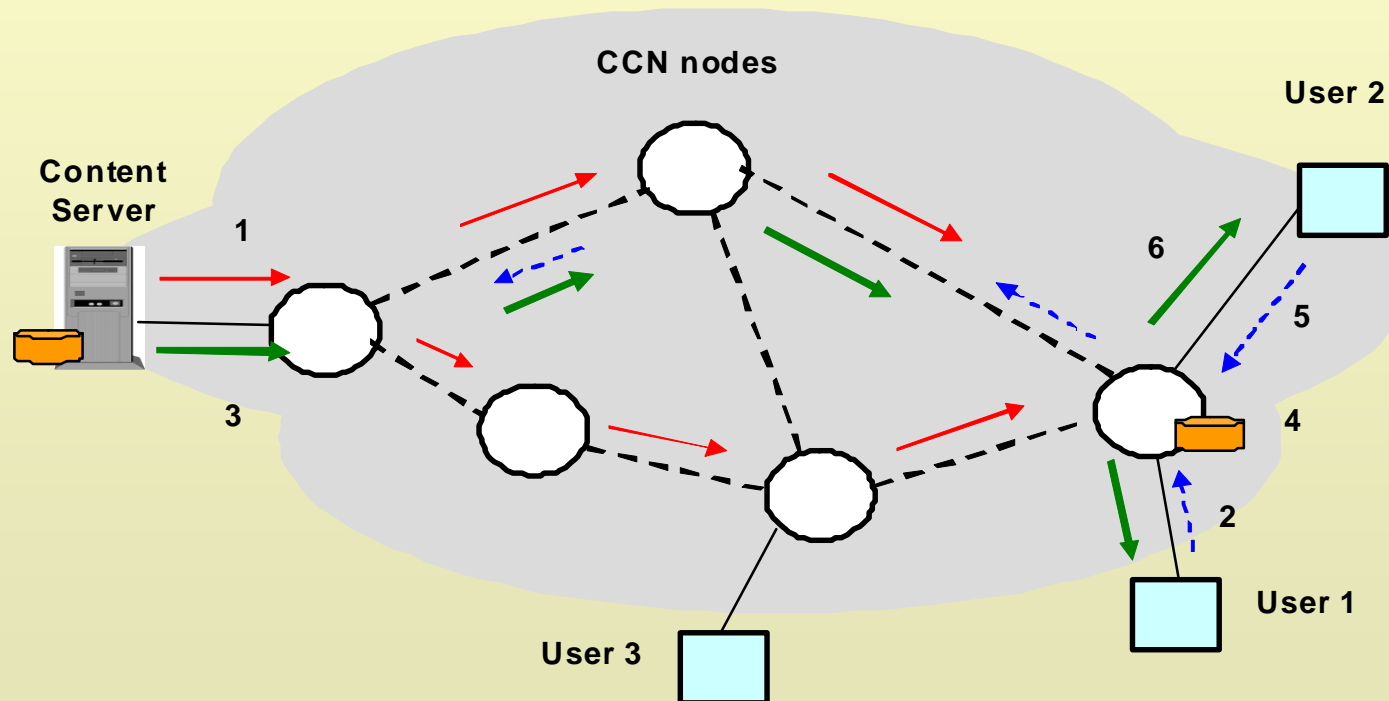
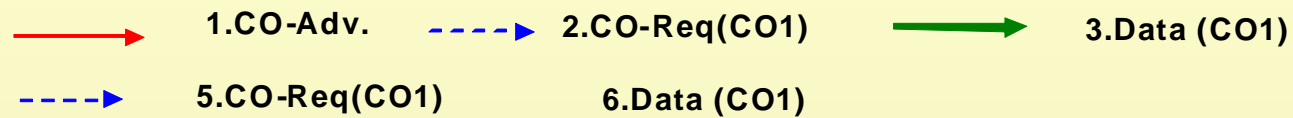


- **ICN/CCN entities**
- **CCN example [1]**
 - **Messages (Packets):**
 - **Interest** (Content_object)
 - **Data** (Content_object)
 - **Data structures in a network CCN node:**
 - **Forwarding Information Base (FIB)**- based on advertised names
 - **Pending Interest Table (PIT)** – store unsolved requests
 - **Content Store (CS)** - caching store for content objects passing through that node

*[1] CCN Source: Van Jacobson Diana K. Smetters James D. Thornton Michael F. Plass, Nicholas H. Briggs Rebecca L. Braynard, **Networking Named Content**, Palo Alto Research Center, Palo Alto, CA, October 2009*



■ CCN – simplified example





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- **ICN/CCN support for Social Networks (1/3)** [2], [3], [4]
- **ICN CCN *content orientation* → brings additional values for OSNs, (content naming, caching, routing, multicast, mobility, etc.)**
- **Few examples :**
 - Sending one tweet (or generally Content Object) to many followers actually means: **multicast delivery + caching**.
 - ICN can do : **delivery** of COs + content **caching** on the path + providing it to requesters.
 - Similar actions are valid also for delivery of Facebook or Google+ data
 - (e.g., new photos or announcements updates and sending to friends).
- **Simple Example 1 - Content delivery-** e.g. in Twitter
 - **Classic** : Server—> n individual connections to followers : large load on core network
 - **CDN usage:** (having a copy server closer to the group of users)- still high load on the local/edge networks)
 - **ICN/CCN:**
 - lower load due to distributed caching in ICN/CCN nodes;
 - caching can be more dynamic than in conventional CDNs



- **ICN/CCN support for Social Networks (2/3)**
- **Simple Example 2:**
- Establishing the relationships between people by using ICN/CCN primitives
 - CCN-architecture for Twitter [4]
 - There exist central servers to propose a naming scheme, in CCN style
 - **each user can be considered a CCN object**
 - named with the id. */twitter/ID_@user* (the prefix *twitter* ensures global uniqueness of names)
 - An user message can be named */twitter/ID_@user/time - stampmsg*
 - Such messages can be naturally forwarded by using CCN name based forwarding
 - E.g User A sends *Interest (UserB_id, UserC_id, UserD_id)*
 - The CCN node will forward these requests, or if it already has cached that Data, then it will immediately answer



- **ICN/CCN support for Social Networks (3/3)**
 - **Some conclusions**
 - **ICN/CCN are well adapted to OSN needs**
 - Given the named content orientation
 - **However: ICN/CCN Open issues**
 - Scalability issues (related to high number of content objects and FIB dimensions)
 - Additional processing tasks for ICN nodes (w.r.t conventional network node)
 - Caching policies (recent studies have shown that caching everywhere does not bring so much additional efficiency)
 - Incremental deployment possibility
 - Cooperation ICN/CDN/ Cloud computing
 -



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Thank you!



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References

- [1] Van Jacobson, Diana K. Smetters, James D. Thornton Michael F. Plass, Nicholas H. Briggs, Rebecca L. Braynard, **Networking Named Content**, Palo Alto Research Center, Palo Alto, CA, October 2009
- [2] IETF Draft: **Information-centric Networking: Baseline Scenarios draft-irtf-icnrg-scenarios-02**, 2014
- [3] Giuseppe Piro, Luigi Alfredo Grieco, Gennaro Boggia and Periklis Chatzimisios, **“Information-centric networking and multimedia services: present and future challenges”**, *Trans. On Emerging Telecom. Technologies* (2013)
- [4] Bertrand Mathieu, Patrick Truong, Wei You, and Jean-François Peltier **“Information-Centric Networking: A Natural Design for Social Network Applications”**, *IEEE Communications Magazine*, July 2012

Regulating Internet Example - Brazil Internet Law

Marcelo A. Rauh Schmitt

As Internet use grows regulatory issues emerge

- From governments
 - Protection against espionage
 - Market regulation
 - Legal liability
 - Market protectionism
 - Censorship

 - From citizens
 - Privacy
 - Fair market
-

Dilemma

- Internet is a global and borderless network
 - Countries want to regulate it
-

Example of regulation by a court

- Court of Justice of the European Union (13 May 2014)
 - Right to be forgotten
 - *An internet search engine operator is responsible for the processing that it carries out of personal data which appear on web pages published by third parties*
-

Brazil Internet Law

- Motivation
 - Protection against big players
 - NSA espionage
 - Ideology – nationalism / populism

Main principles

- ▣ Net neutrality
 - ▣ User privacy
 - ▣ Data retention
 - ▣ Intermediary liability
-

Controversial points

- Brazilians' data must be maintained on servers in Brazil
 - Brazilian law is extended to any internet service provider with Brazilian users.
-

The future

- ▣ More interference by law?
- ▣ International structure would need international laws ?



COLLA 2014

The Fourth International Conference on Advanced
Collaborative Networks, Systems and Applications
June 22 - 26, 2014 - Seville, Spain

Panel Discussion: INTERNET/COLLA Facebook, Google, Twitter Is this the Internet of the future?

Antonio Capodieci
University of Salento (Lecce - Italy)
antonio.capodieci@unisalento.it



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COLLA 2014

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How Internet and Web 2.0 tools can enhance collaboration among (knowledge) workers and improve the efficiency of the organization.

Panel Discussion:
INTERNET/COLLA Facebook, Google, Twitter Is this
the Internet of the future?





Introduction

- Companies base their success on the use of established business practices to ensure efficiency and effectiveness in the activities related to their core business.
- Business practices can help to solve ***recurring problems*** through ***proven solutions*** coming from ***past experiences***.
- The leadership's goal is to enhance the worker's productivity.





Introduction

Knowledge Worker



one who works primarily with information or one who develops and uses knowledge in the workplace



He/she operates on multiple tasks at the same time. They have different working contexts and different channels to deliver information

Knowledge workers *are involved in many parallel “knowledge processes” that, very often, are:*

- *not codified in formal procedures,*
- *unstructured or semi-structured*
- *collaborative and continuously changing*



Web 2.0 and Organization

- Recently, the use of Web 2.0 Communication tools (Chat, blog, email, wiki, etc.) has increased in companies and public administration organisations.
- New technologies permit companies to cost-effectively increase their productivity and their competitive advantage.
- To increase their productivity, companies could integrate emerging technologies (mainly coming from web 2.0) in the traditional business process.
- This phenomenon, known also as "Enterprise 2.0", has, de facto, modified common organisational and operative practices





Web 2.0 and Knowledge Workers

- The use of web 2.0 tools is particularly intensive among the Knowledge Workers.
- The use of web.2.0 tool can increase the productivity of the Knowledge Workers.
- The Knowledge Workers want to freely use the tools that they prefer.





Some problems:

- Unfortunately, these tools have not been integrated with existing enterprise information systems, a situation that could potentially lead several problems:
- **Data Security**
- **Loss of information**
- **Loss of Knowledge**
- **Information overload**





Data Security

- Confidential or sensible businesses data may pass through external systems and then to be distributed in an uncontrolled way.





Loss of information

- During their activities the knowledge workers may lose information that previously had with no chance of finding this information just because the tools used are not supported by the company.



Information overload

- Information overload refers to the difficulty a person can have understanding an issue and making decisions that can be caused by the presence of too much information.
- It is very important that the new organizational and technological contexts must prevent information overload, using appropriate methods for a more accurate management information.





Loss of Knowledge

- We know that, especially in the Information Age, the knowledge is an important part of the share capital of a company.
- The workers, during collaborative activities, produce knowledge. Due to the use of external tools such knowledge risks being lost by the company.





Goal

Model Enterprise 2.0
Information System



That provide flexible support collaborative human processes.



Informal activities are often **collaborative** and typically they are **not codified** or **elicited as business practices**

Our Goal is to formally describe the collaboration and coordination processes in which knowledge workers are involved, integrating them into the information system in order to derive process models



efficiently (i.e. consuming less resources and time)

effectively (i.e. at a high quality to meet specific needs)



Our solution

We decided to have a smaller impact on the overall organization, modeling only recurring business practice atoms.

We adopt the concept of business process patterns

The solution coming from the use of business process patterns is very helpful in the information system field and it is an important step towards a structured and systematic way to manage business practices

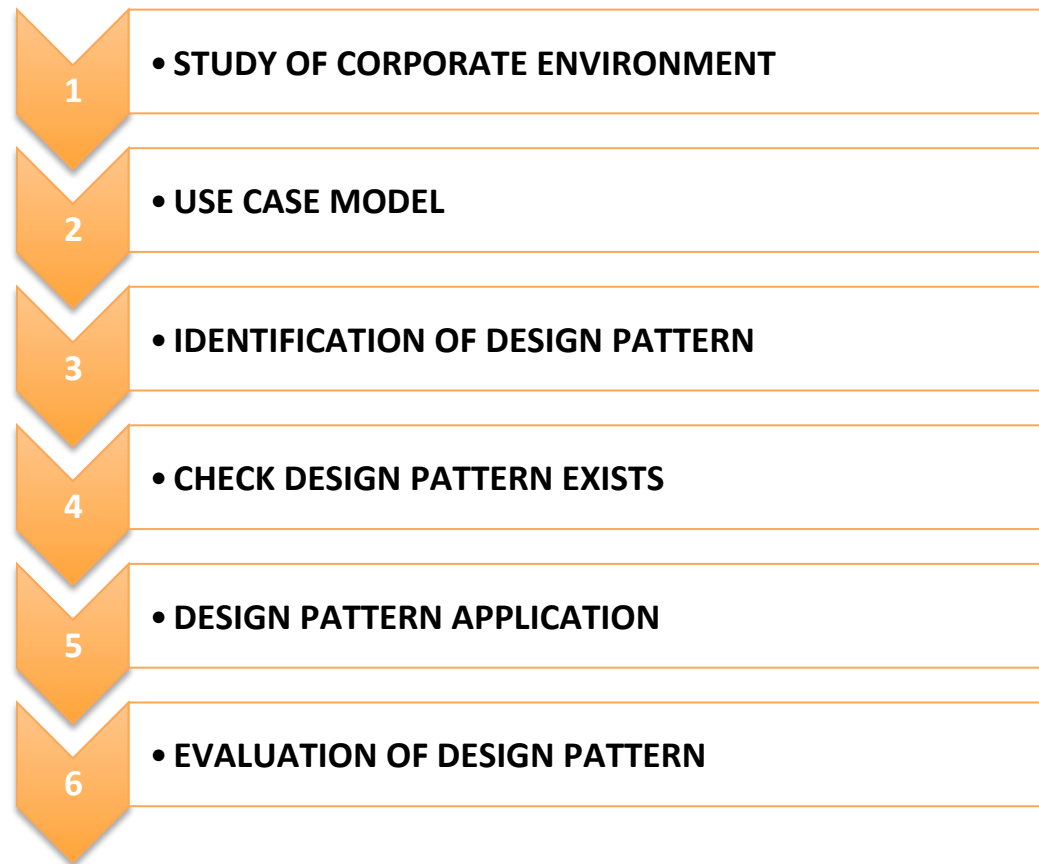
Through different real case study, we defined a set of design patterns (Coordinate Contribution, Retrieve Contribution, Escalation, Deadline Agreement) patterns able to model collaborative activities and cooperative activities.





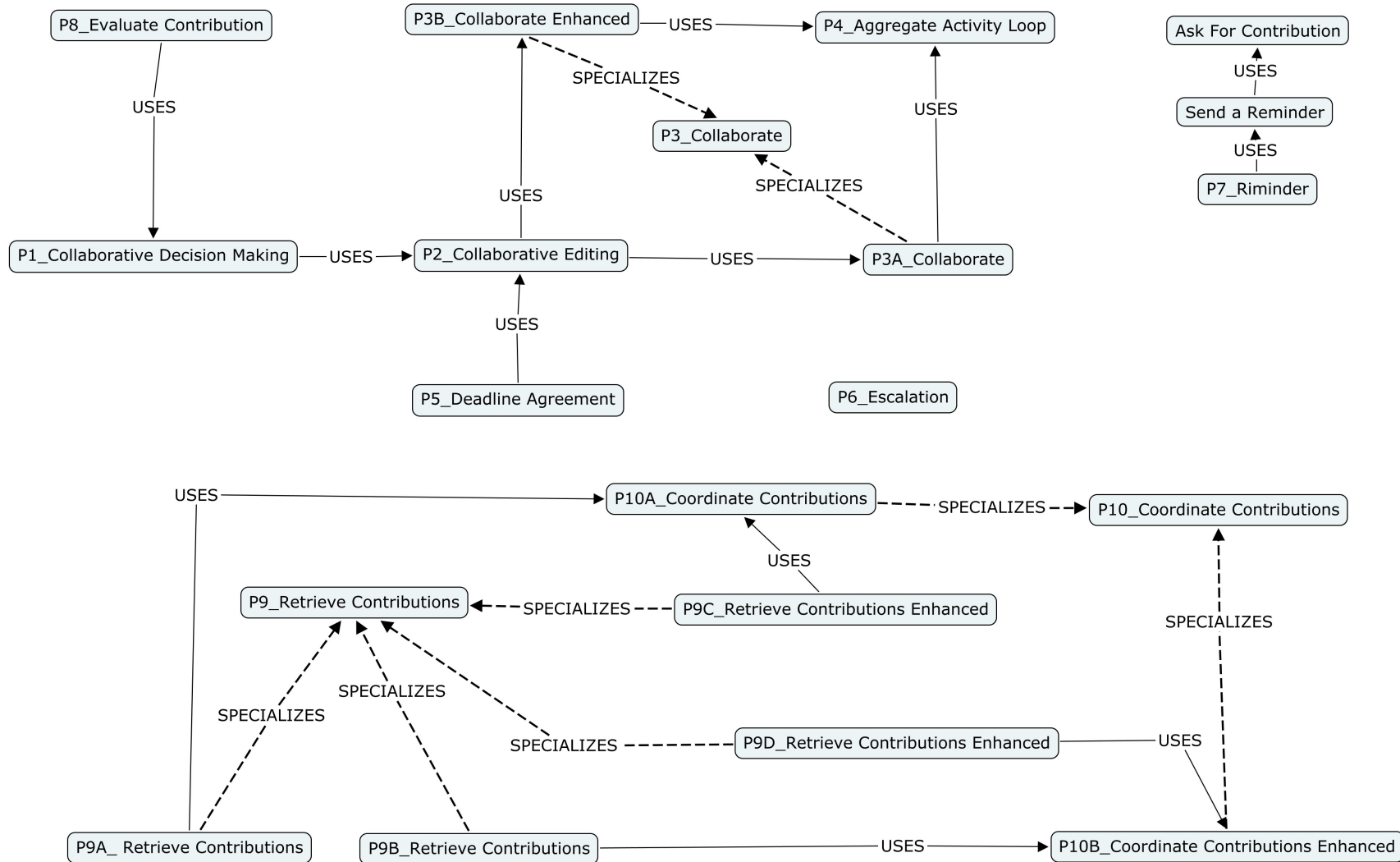
The Methodology Used

In order to identify and apply the patterns of collaborative processes, you have to adopt an approach that considers the needs of the organisation as well as the best currently available practices for the identification and application of model patterns.





Catalog of Collaborative Patterns





Implementation of a test system

- To experiment and evaluate new business practices in organizing the tasks assigned to knowledge workers, a software demonstrator, (named Kpeople), of an Enterprise 2.0 information systems has been deployed, exploiting collaborative web 2.0 tools, dynamic process composition methods, and semantic engines.
- The Kpeople system was built upon an event-driven architecture, which is **able to trace and store** events generated by traditional (legacy) information systems, communication tools (e-mail), Unified Communications and Collaboration Systems (VoIP, instant messaging), and web 2.0 facilities.



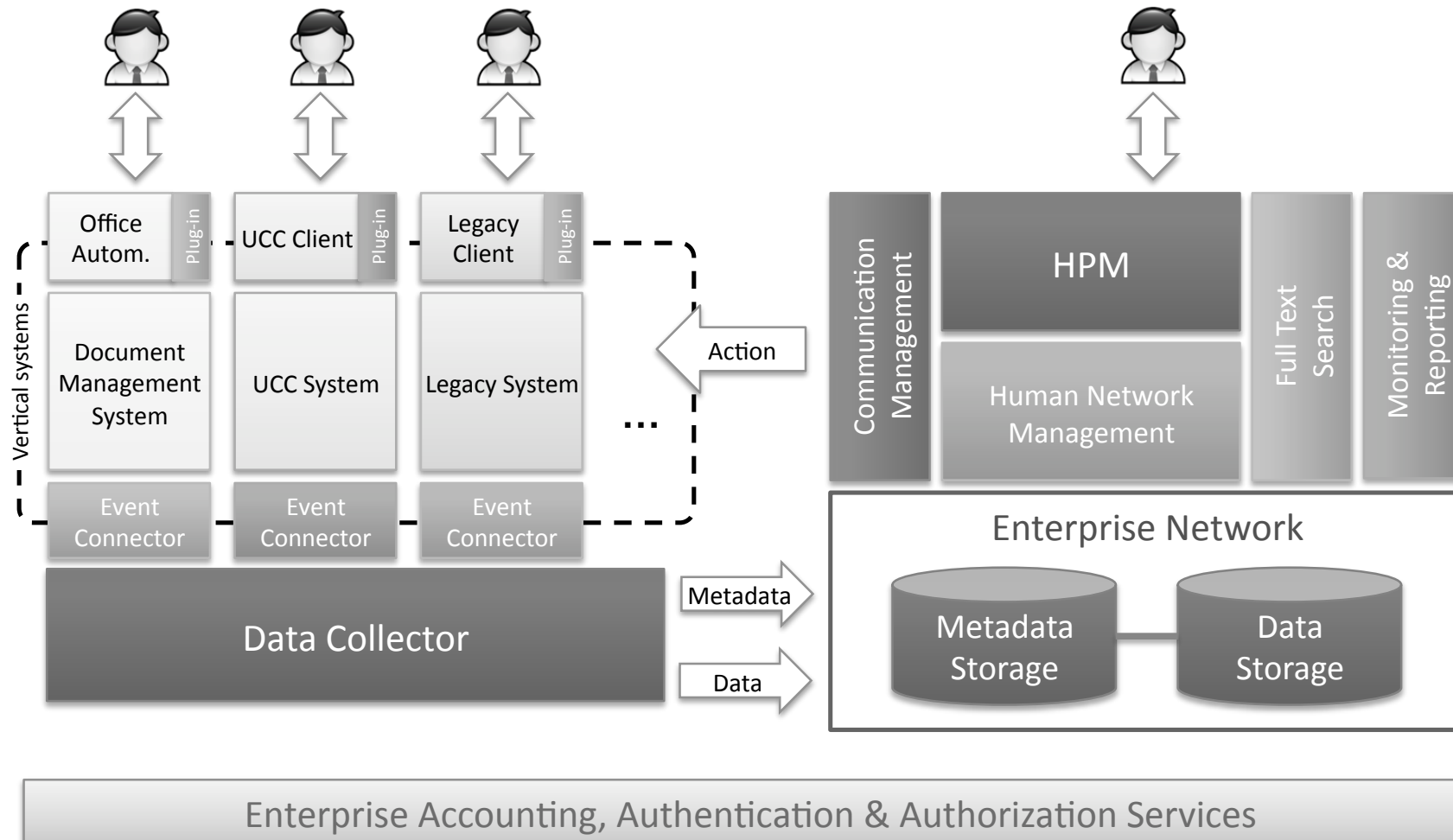


Implementation of a test system

- The Kpeople system focuses on unstructured and complex processes within a networked enterprise environment (such as decisional, collaborative, and creative contexts).
 - Kpeople aims at improving the management of information and communication and at optimizing workspace, recovering the time spent in low-value activities, in particular to find relevant information to execute knowledge tasks, and integrating collaborative workspaces to individual productivity tools (office automation, email, etc.).
- The Kpeople system enables organizations configuring a set of business patterns and supporting the automatic enactment of their workflows.
- Knowledge workers can collaborate with colleagues by exchanging information, files and tasks through the HPM (Human Process Management) tool that allows users to apply patterns and examine the progress of the processes, the activities to be completed, the flow of communication, documents and emails exchanged, and a set of indicators useful to evaluate performances and to identify bottlenecks.



The Kpeople system architecture





Conclusion

- We applied our approach to model Information System in different constest:
 - ICT Company
 - Public Administration
 - Bank
- If properly modeled enterprise information systems may provide sufficient support to knowledge workers for their collaborative activities.





**Thank you!!
Any Question?**



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Kazuyuki Shimizu

School of Business Administration, Meiji University
1-1 Kanda Surugadai, Chiyoda, Tokyo, Japan
Email shimizuk@meiji.ac.jp

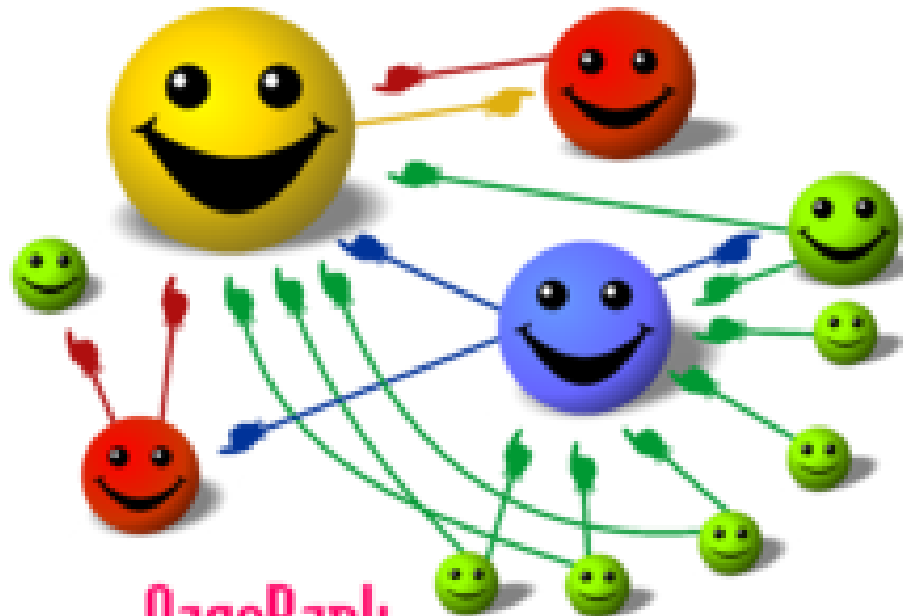


Similarity between “PageRank” and Smith's “sympathy”

2. Theory of Moral sentiment (1759)



- PageRank is an algorithm used by Google Search to rank websites in their search engine results.



PageRank

<http://en.wikipedia.org/wiki/PageRank>

“Collective intelligence” or “the Hive mind”

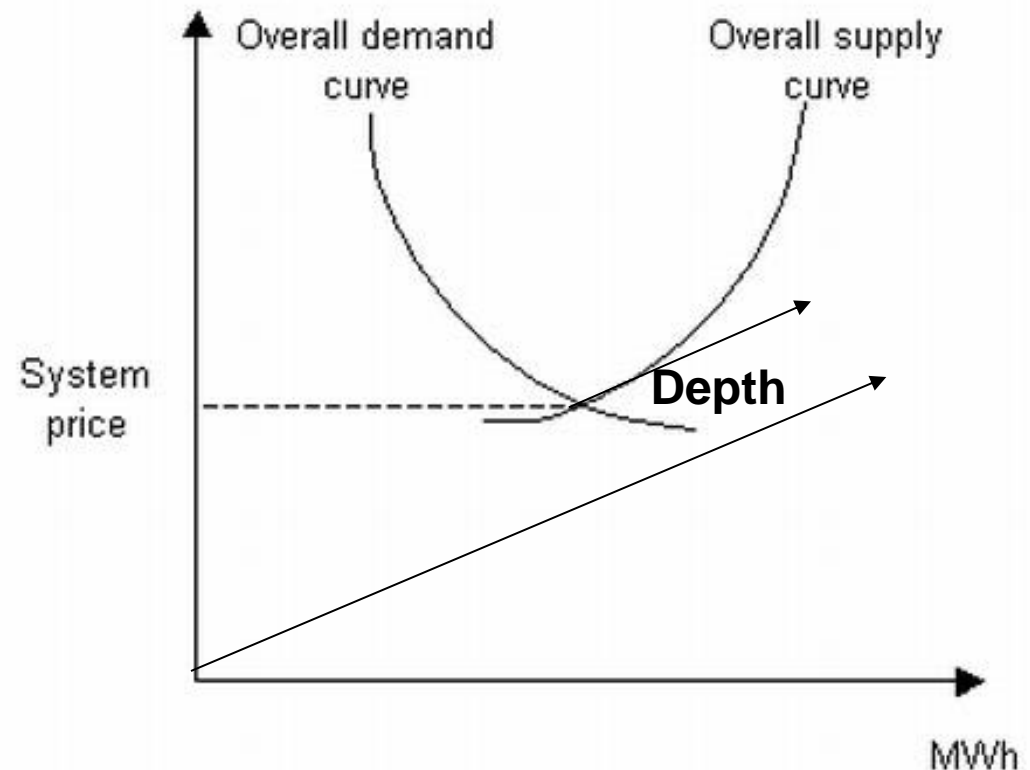
The logic is almost identical to A. Smith-style capitalism.

Millions buyers and seller,
together produce more
goods, more efficient

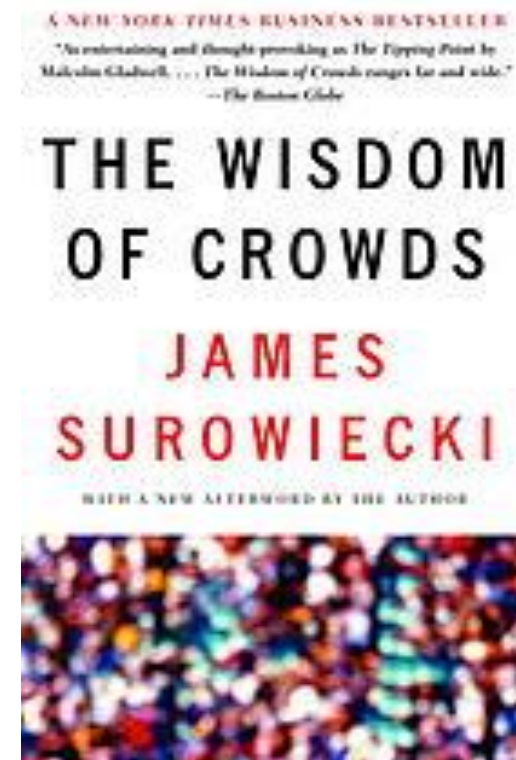


<http://en.wikipedia.org/wiki/PageRank>

NOK/MWh



- “The Wisdom of Crowds: Why the Many Are Smarter Than the Few and How Collective Wisdom Shapes Business, Economies, Societies and Nations”, published in 2005.
- This book is written by James Surowiecki.
- The aggregation of information in groups, resulting in decisions that are often better than could have been made by any single member of the group.



http://www.ted.com/talks/james_surowiecki_on_the_turning_point_for_social_media

- Millions of bloggers create links to other sites and thereby cast marketplace votes for the relevance of those sites. Thousands of editors refine each other's entries in Wikipedia. Together, these and other suppliers of collective intelligence can create more knowledge, with less bias and over a wider span of disciplines, than any group of experts could.

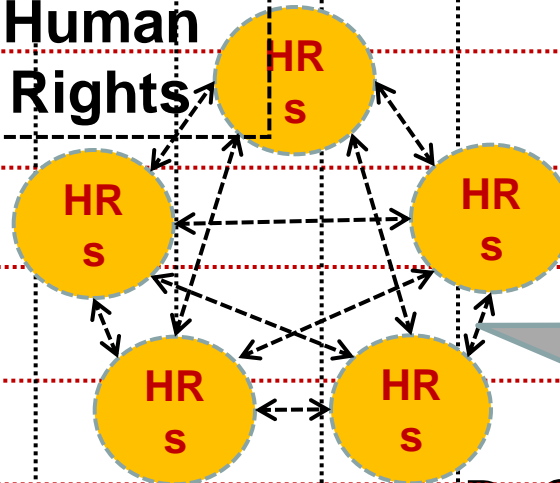




A. PageRank idea

(Spectator or Observer)

B. Human Rights



E. (Neo-) Liberal

Freedom

C. Sympathy

D. Control

- As we know this “Price system” is not best mechanism, however...
- Nash equilibrium
- Other system
- CIA, NSA, E., J., Snowden; Privacy?
- Democracy vs Technology
- Human use of Human being. N., Wiener