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Keynote : From group collaboration to large scale social collaboration

François Charoy

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From group collaboration to large scale social collaboration

François Charoy - @charoy
Inria/University of Lorraine

EQUIPE PROJET
Coast
CENTRE Inria
Nancy Grand Est

02/09/2015

Coast Team

Inria/LORIA research team (15/20 people)

University of Lorraine

Research topic :

Web Scale trustworthy collaborative systems

teams.inria.fr/coast

@InriaLORIACoast

Inria NANCY
Grand Est

Outline

Origin and (fly over) state of art of Computer Supported Collaboration

Large scale collaboration (does it exists ?)

Perspectives and research issues

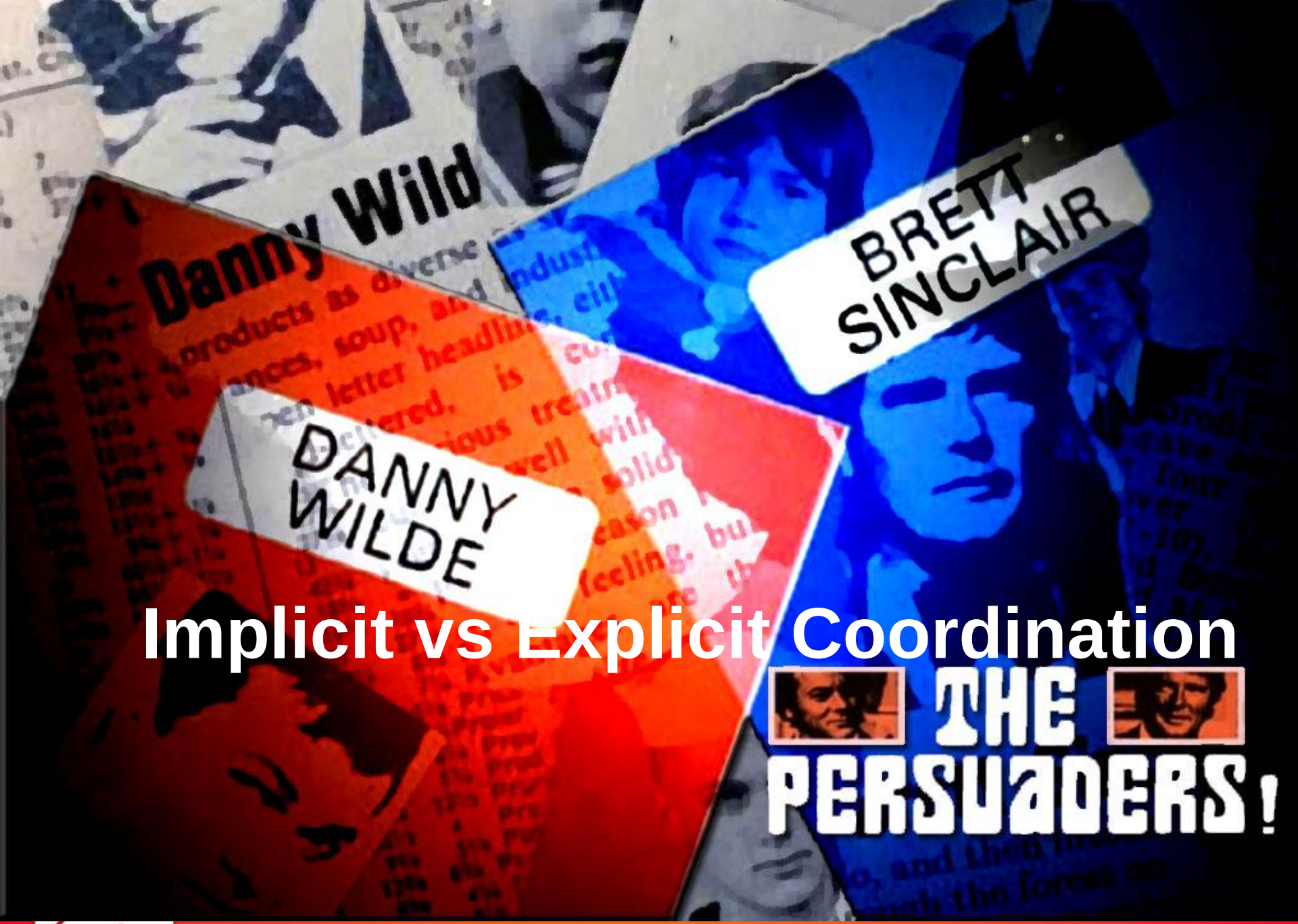
Dimensions of collaboration

Two or more people working together toward a shared goal

Communication

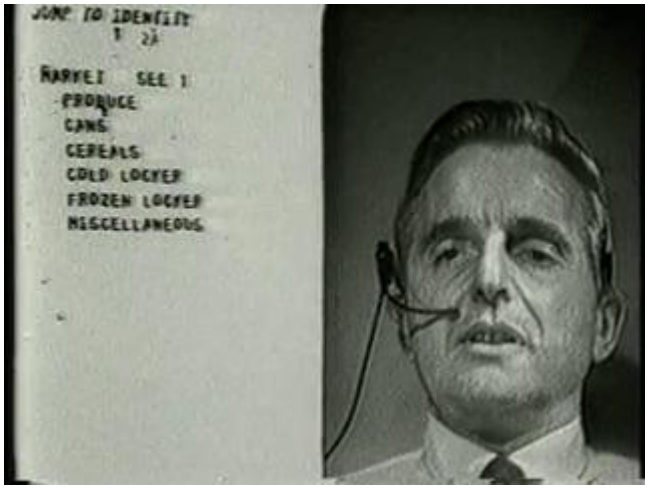
Coordination

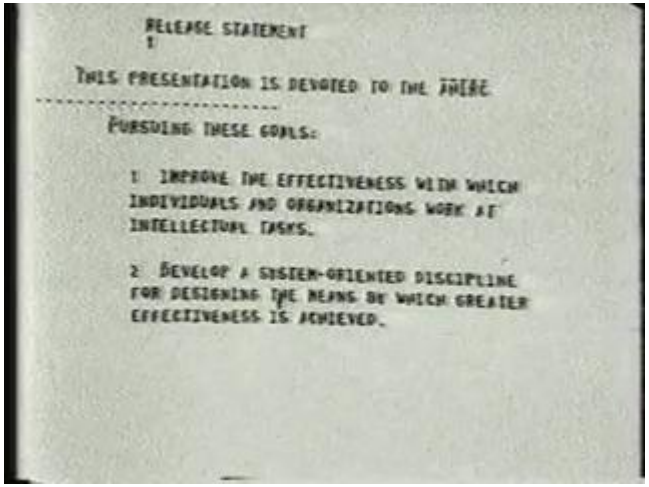
Sharing

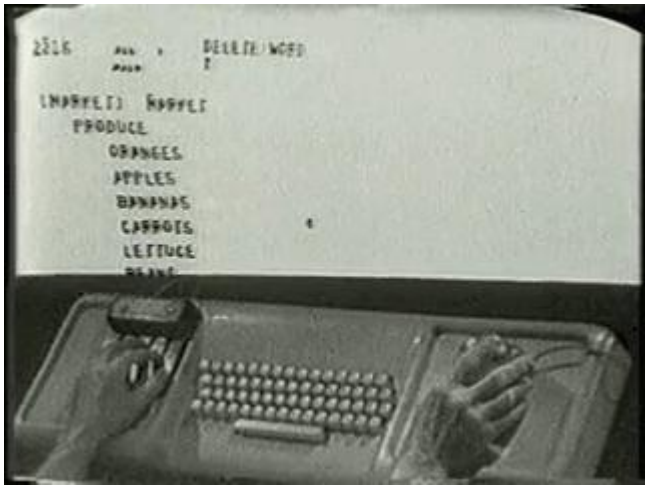


Implicit vs Explicit Coordination

Mother of all demos – 12/9/1968
Doug Engelbart Augmentation Project







http://theyear1968.tumblr.com/post/79620814201/on-december-9-1968-doug-englebart-and-his-team
https://archive.org/details/dougengelbartarchives

Clarence Ellis 5/1943 – 5/2014

- Pionneer in collaboration software and workflow systems

GROUPWARE

Groupware reflects a change in emphasis from using the computer to solve problems to using the computer to facilitate human interaction. This article describes categories and examples of groupware and discusses some underlying research and development issues. GROVE, a novel group editor, is explained in some detail as a salient groupware example.

SOME ISSUES AND EXPERIENCES

C.A. Ellis, S.J. Gibbs, and G.L. Rein

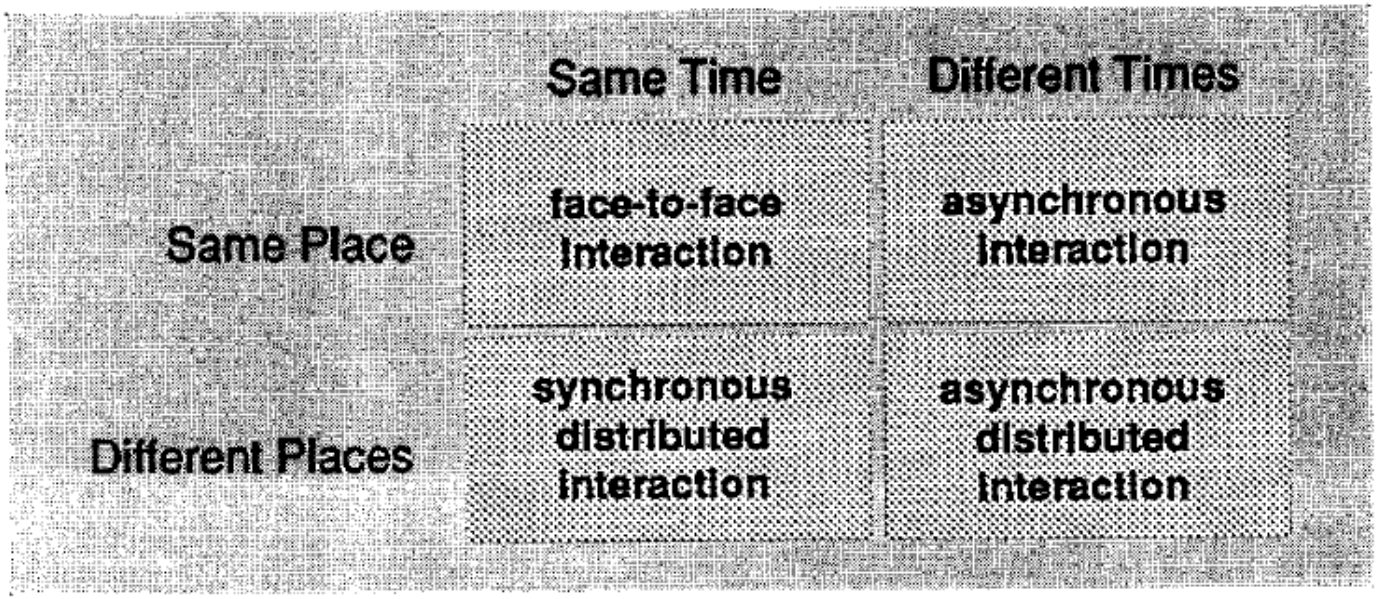
laboration of many specialists, including social scientists and computer scientists, CSCW looks at how

in this larger sense and delineates classes of design issues facing groupware developers. It is divided

COMMUNICATIONS OF THE ACM/January 1991/Vol.34, No.1

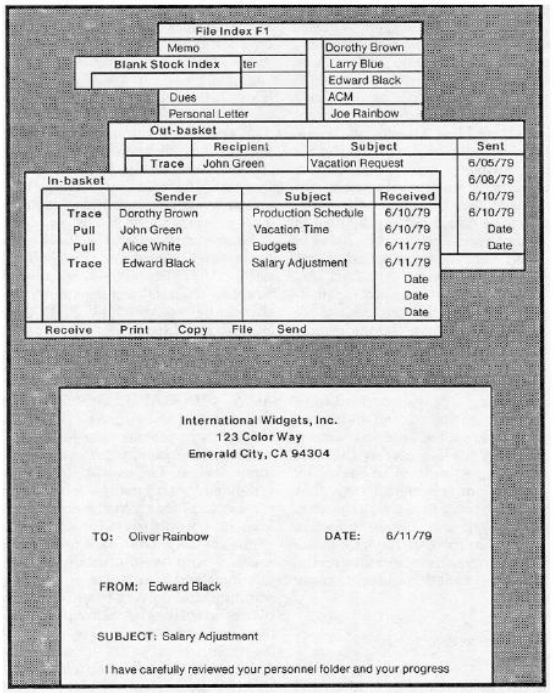
C.A. Ellis, S.J. Gibbs, and G.L. Rein

Taxonomy of Groupware



Office Automation (1979)

- SCOOP (Wharton and Sisman)
- OfficeTalk (Skip Ellis – Xerox Park)



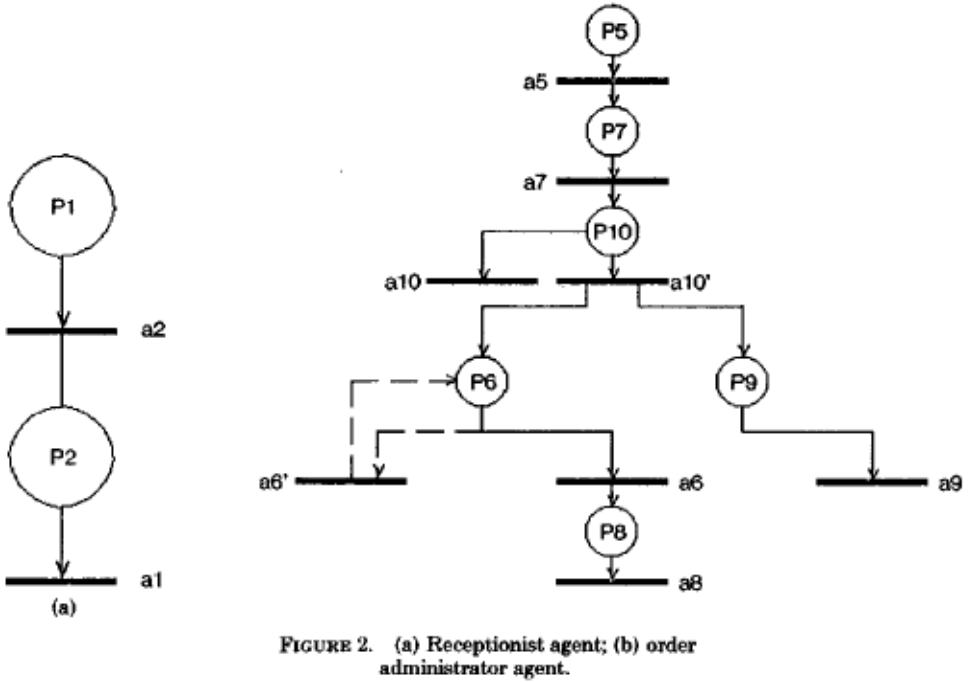


FIGURE 2. (a) Receptionist agent; (b) order administrator agent.

Challenges at the time

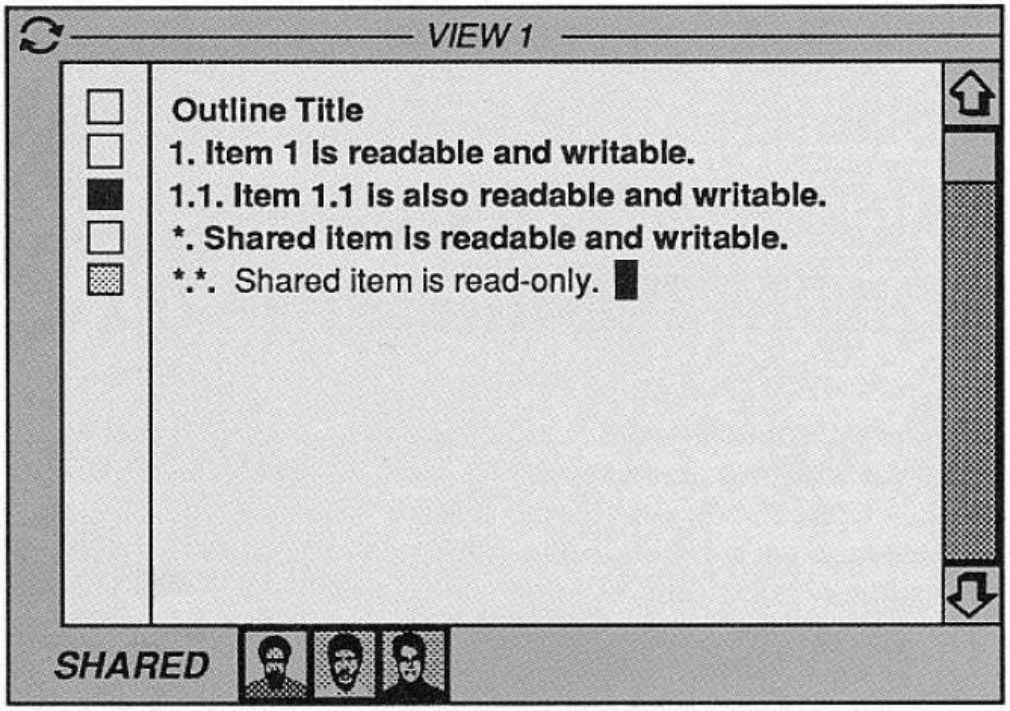
Office Information Systems and Computer Science

Clarence A. Ellis and Gary J. Nutt

- A programming language that can be **used by a Clerical worker**
- Software engineering – **modeling and validation**
- Operating Systems and database – distribution of data, **consistency and security**
- Measurement and Evaluation
- Communication - teleconferencing
- Other area – psychology, social implications

Collaborative Editor

- GROVE Group Editor



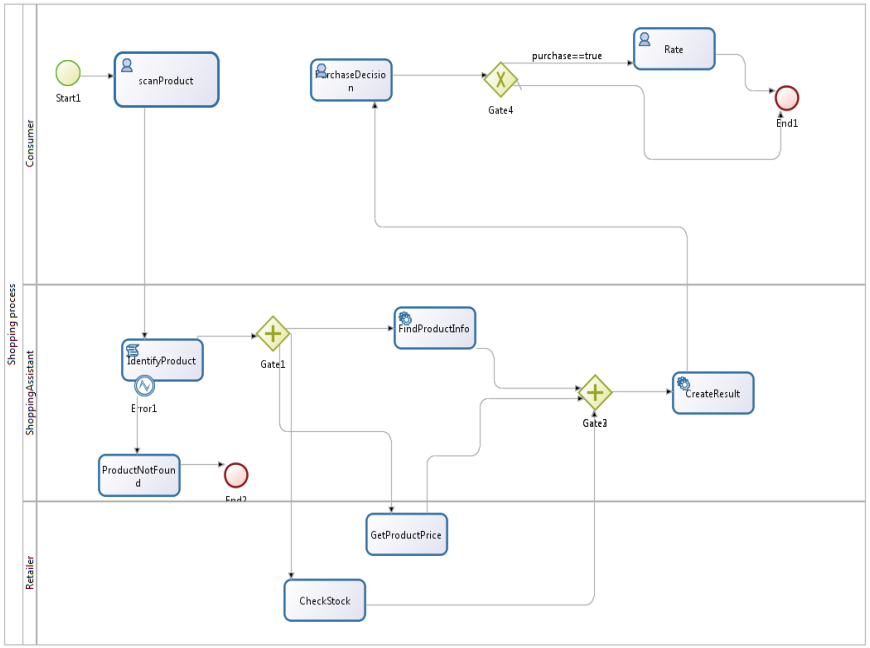
users ask "Isn't it chaotic to all edit in the same document, even the same paragraph, at the same time?" and "Why would a group ever want to edit in the same line of text at the same time?" Indeed, this editor is at

Design issues (at the time)

- WYSIWIS (What you see is what I see)
  - Relaxed vs strict
- Group Processes (Organising the collaboration)
- Concurrency Control (Optimist vs Pessimistic)
- Over issues

BPM systems

- Model and automate office processes
- Integrate Information Systems



Collaborative BPM
Social BPM

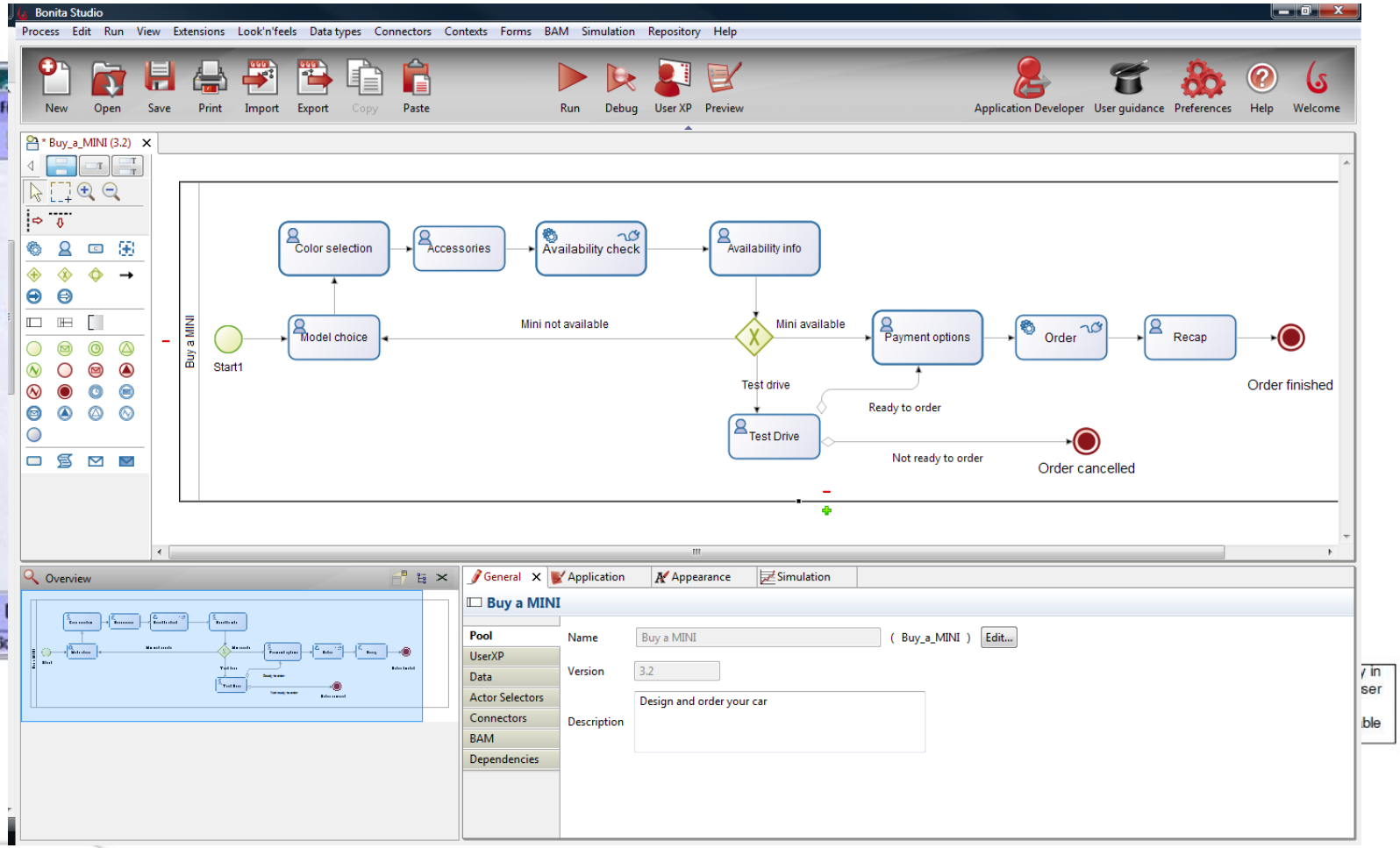
Support collaboration between people and organisations

More flexible/supports change

Allow more interactions between participant

Support for inter organisational process

BonitaBPM V6 (2015)



Inter organisational processes

The view-based approach to dynamic inter-organizational workflow cooperation

Issam Chebbi [a], Schahram Dustdar [b,*], Samir Tata [a]

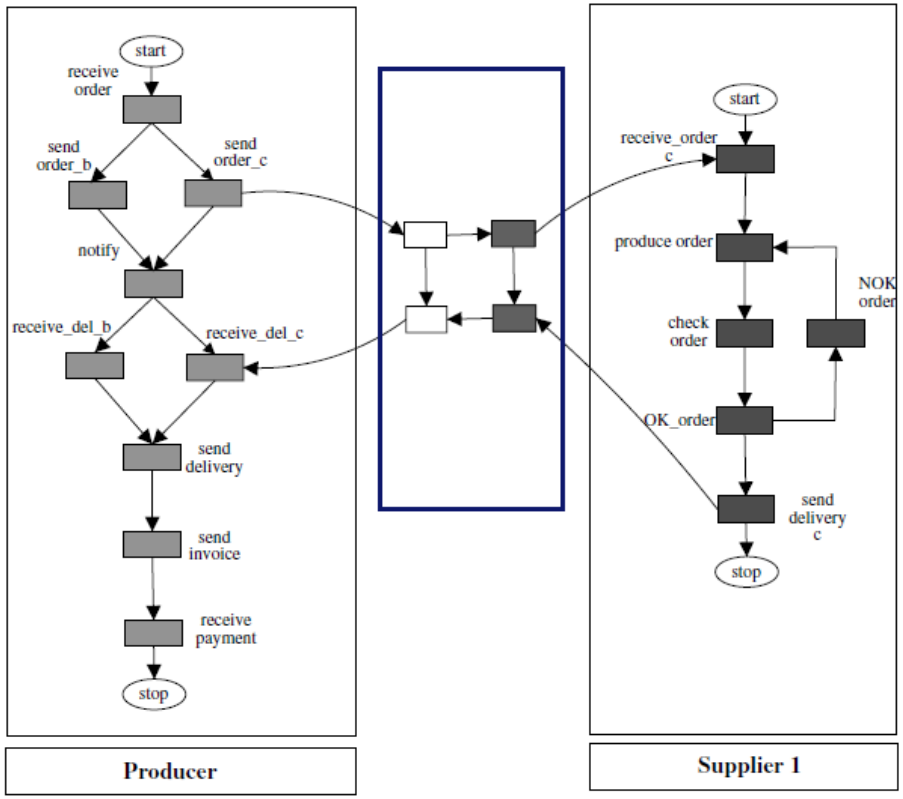
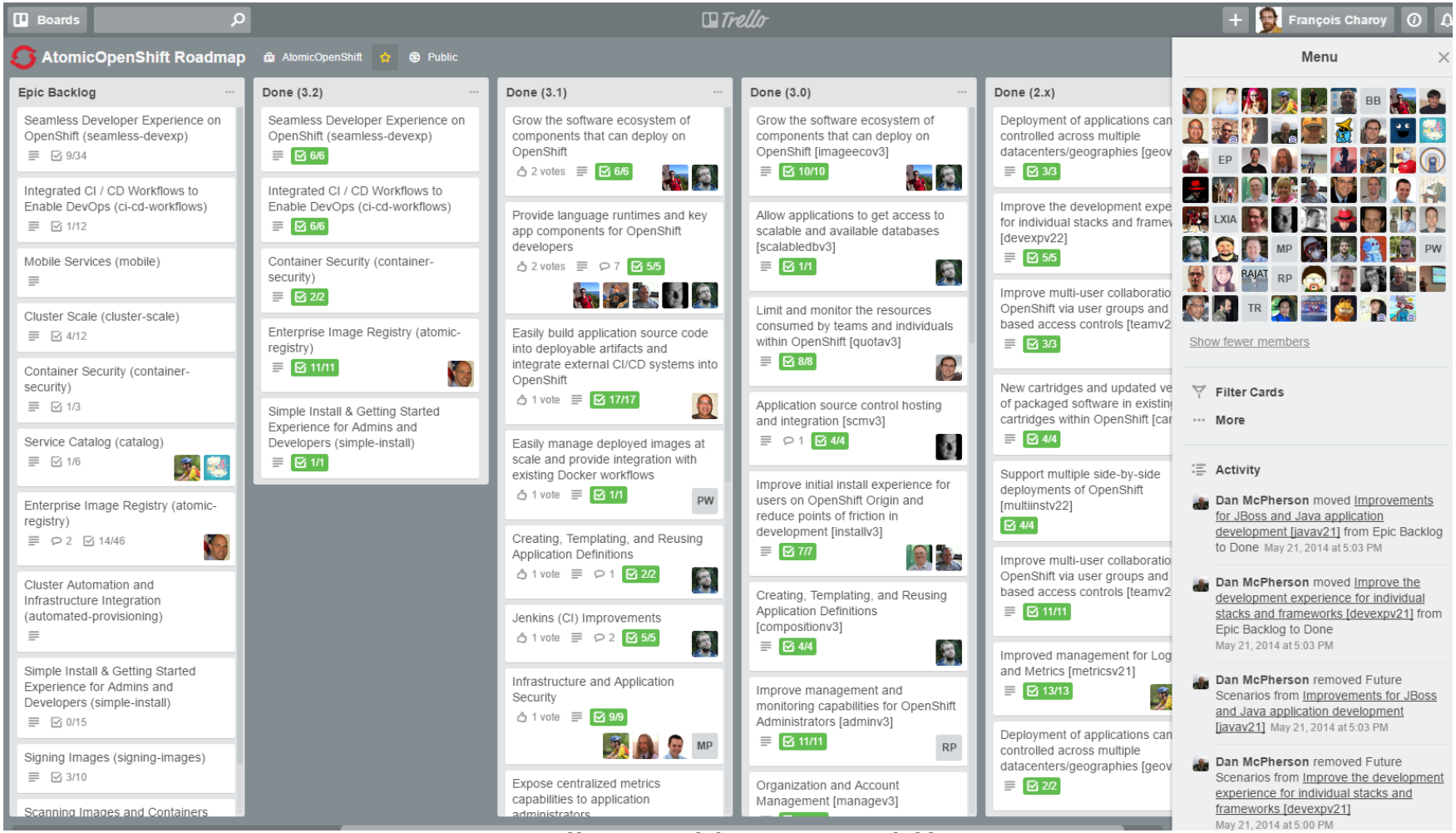


Fig. 4. Public vs. internal processes.

Coordination tool



Trello used by OpenShift

Data sharing and collaborative editing

- Version and Distributed version control Systems
- Wiki
- Synchronous collaborative editors
- File Sharing

Version Control Systems and File sharing

- CVS, SVN, Git, …

box

OneDrive for Business

Google Drive for Work

amazon WorkDocs

Dropbox

Workspace Awareness

- What are the other doing

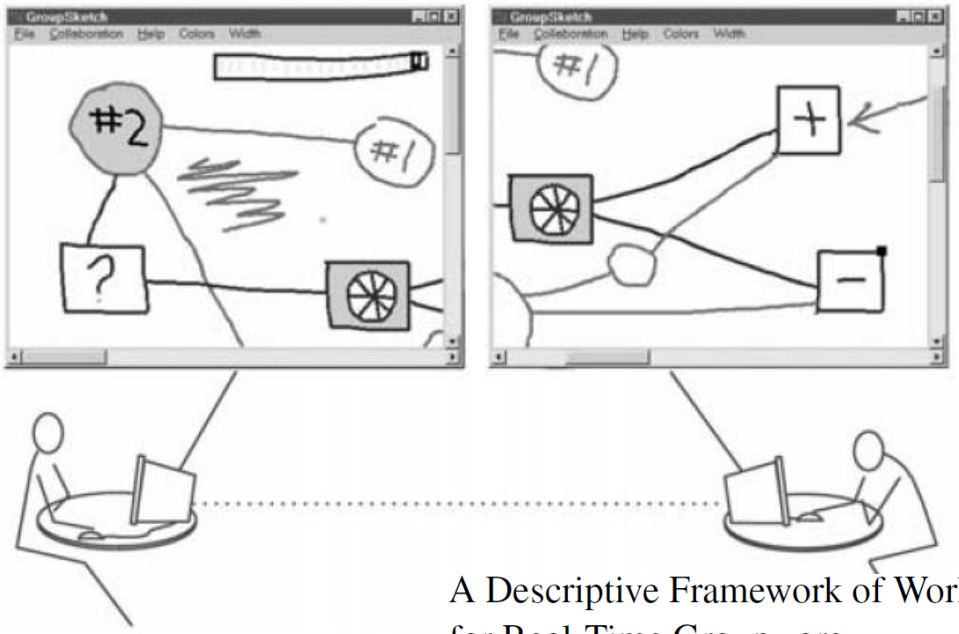


Figure 1. GroupSketchpad, a rel

A Descriptive Framework of Workspace Awareness for Real-Time Groupware

CARL GUTWIN[1] & SAUL GREENBERG[2]

Example : the Radar view

- Where are the other – what are they doing

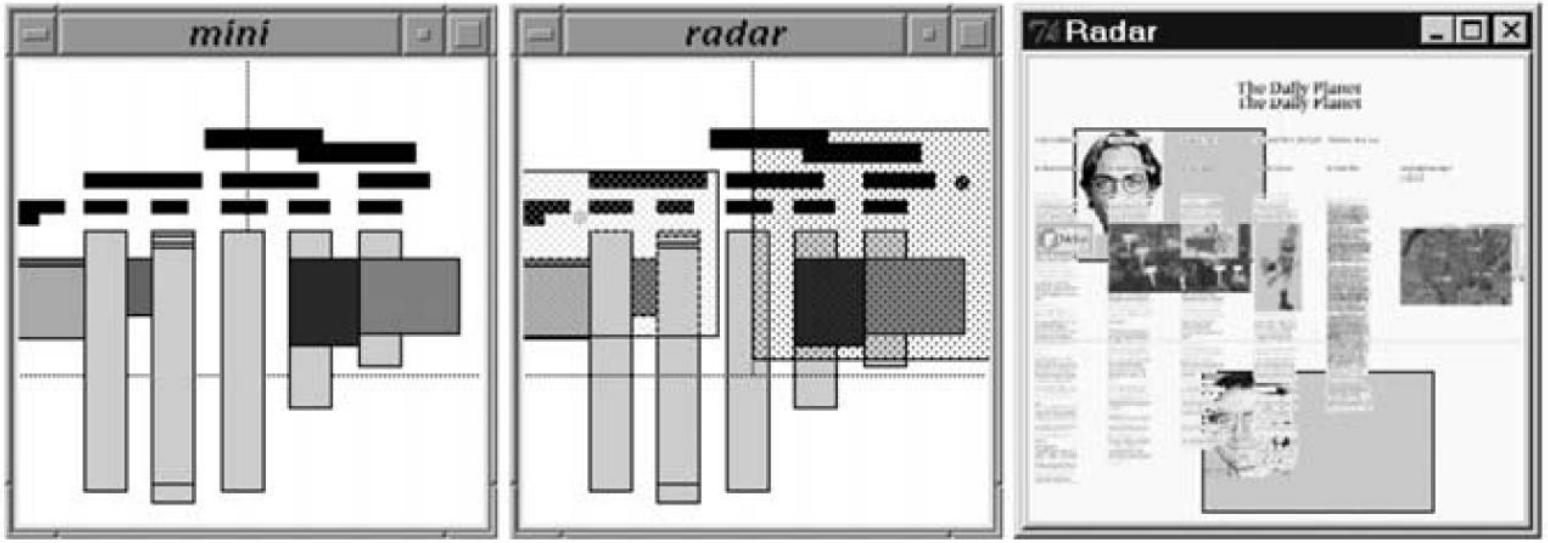


Figure 4. Three versions of the GroupKit radar view. Version 4a shows object movement only; 4b adds location information by showing each person's main view as a shaded rectangle; 4c adds photographs for participant identification.

Real time collaborative editing

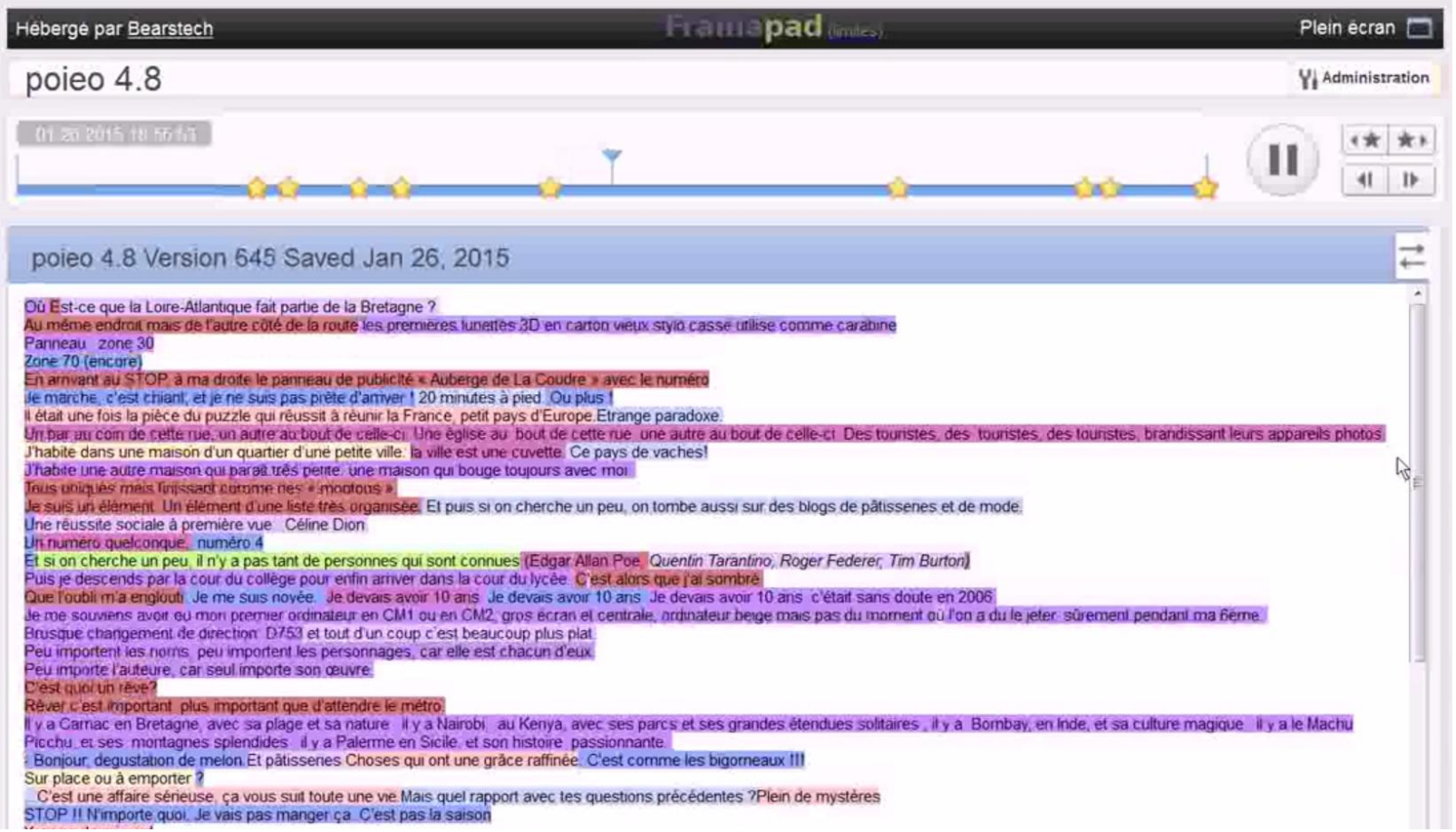
Maintaining replicas in real time

Ensure eventual consistency

Take care of user intention

Google Doc/EtherPad

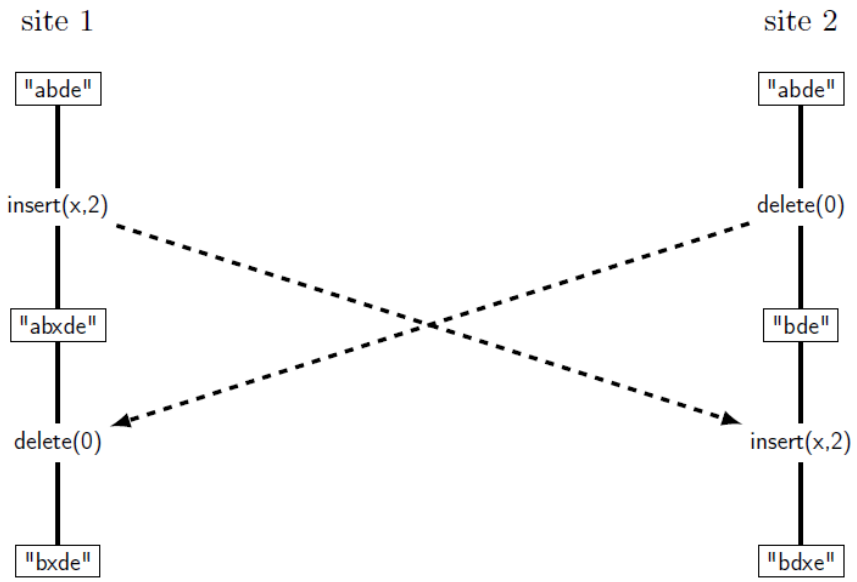
Writing workshop on Framapad

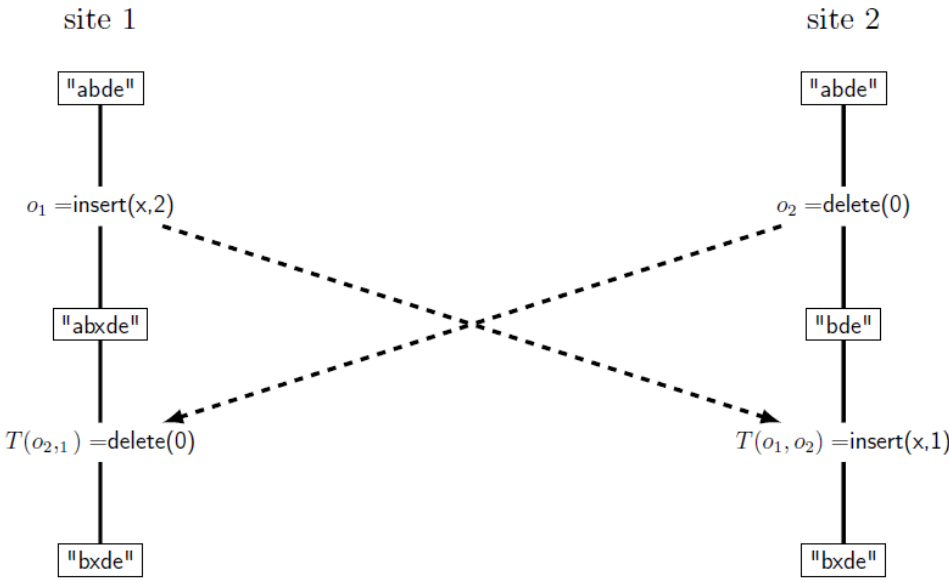


https://vimeo.com/117890611

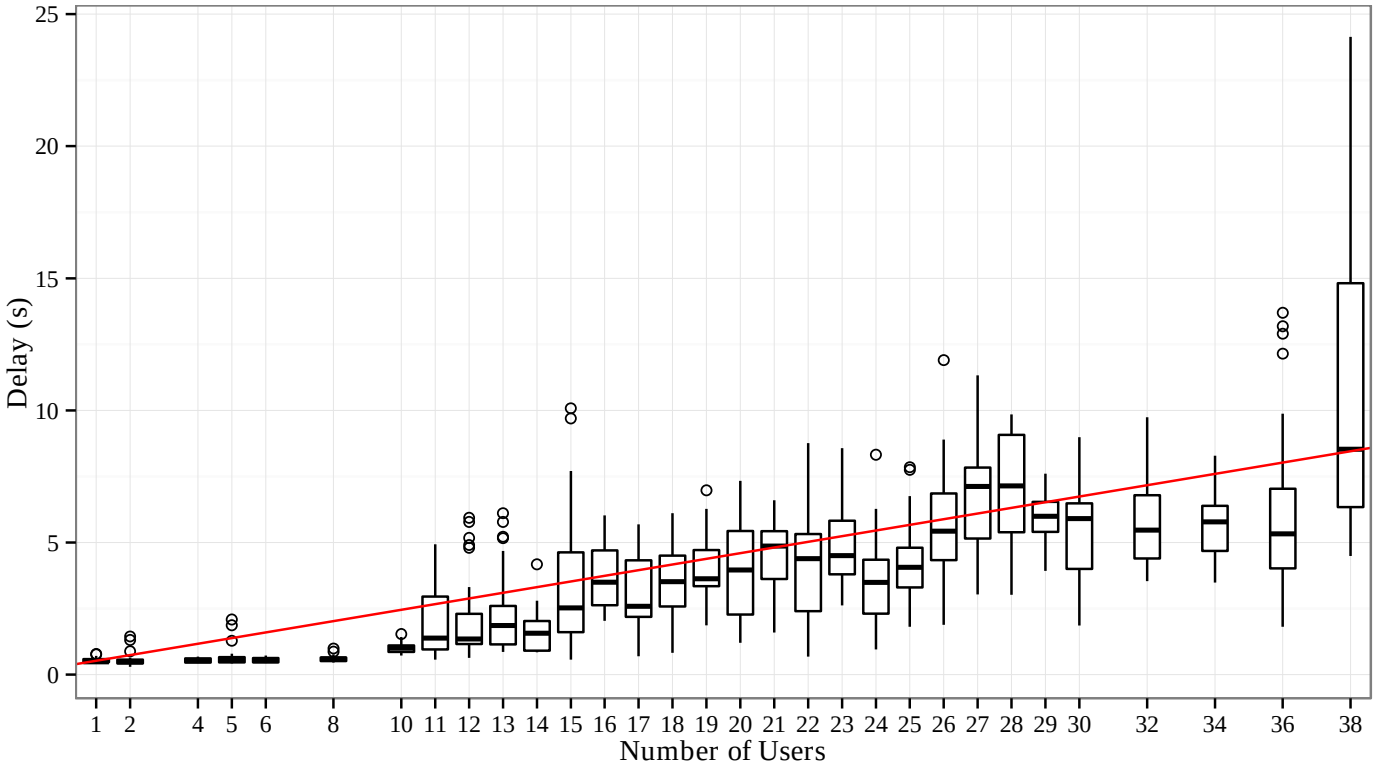
Operational Transformation

Enforce eventual consistency





Delays in GoogleDocs



Typing speed:
2 chars/sec

Conflicts management

How to avoid them when the number of users grows

40 ans d'interactions homme-machine : points de repères et perspectives
Depuis qu'il existe les ordinateurs, la question de l'interface avec les utilisateurs s'est posée. En quarante ans, l'interaction homme-machine (IHM) a permit de rendre l'informatique accessible à un plus grand nombre, d'une façon que nul ne pouvais prédire. Que serait le visage de l'informatique aujourd'hui sans les interfasses graphiques ?

pouvais

interfasses

40 ans d'interactions homme-machine : points de repères et perspectives
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pouvaitt

interfacces

What about today's topic

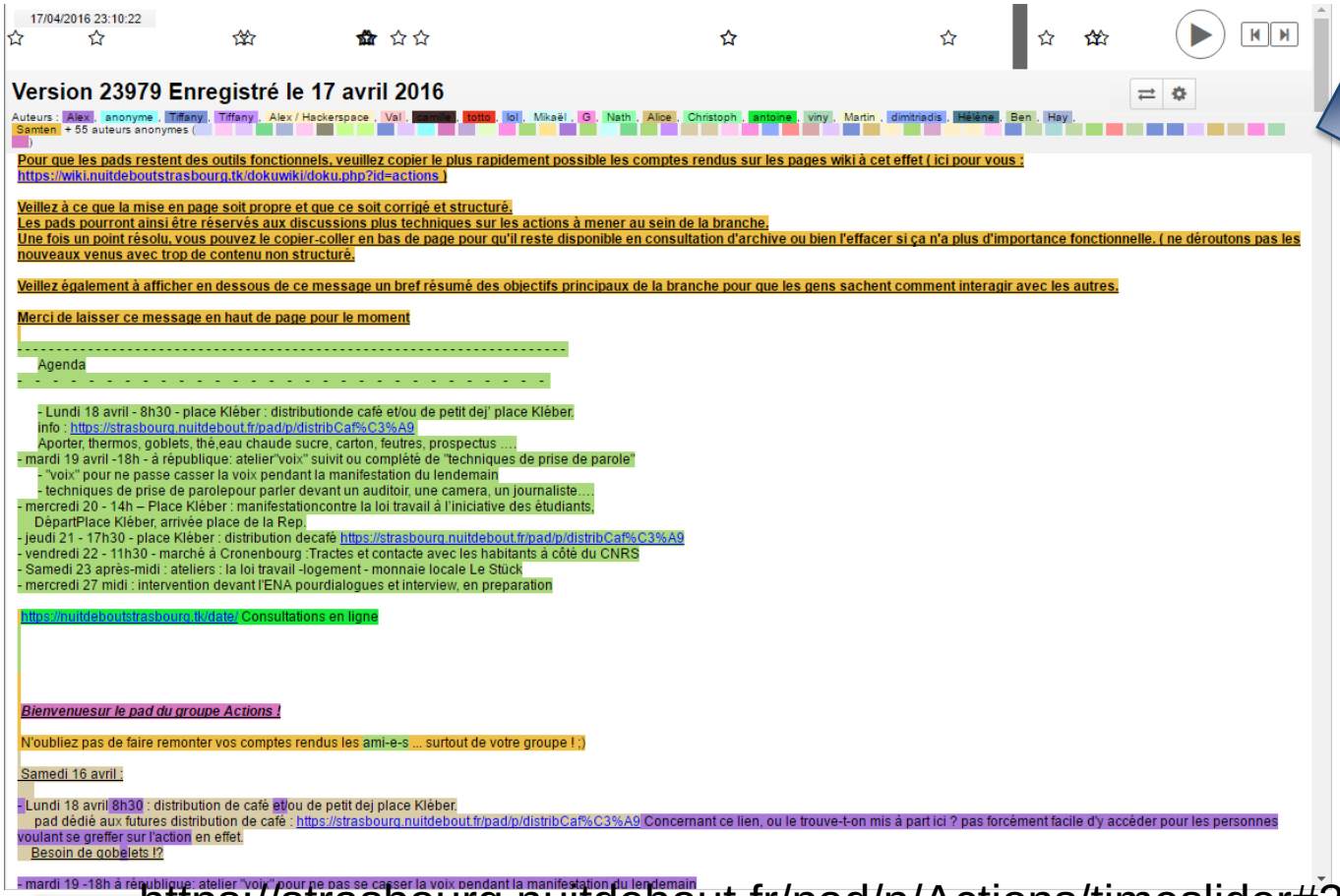
About Large SCALE

- Hundreds or thousands of people
  - Crowds, communities, social networks
- Hundreds of organisations
- Thousands of services

Large scale collaborative editing

users ask "Isn't it chaotic to all edit in the same document, even the same paragraph, at the same time?" and "Why would a group ever want to edit in the same line of text at the same time?" Indeed, this editor is at

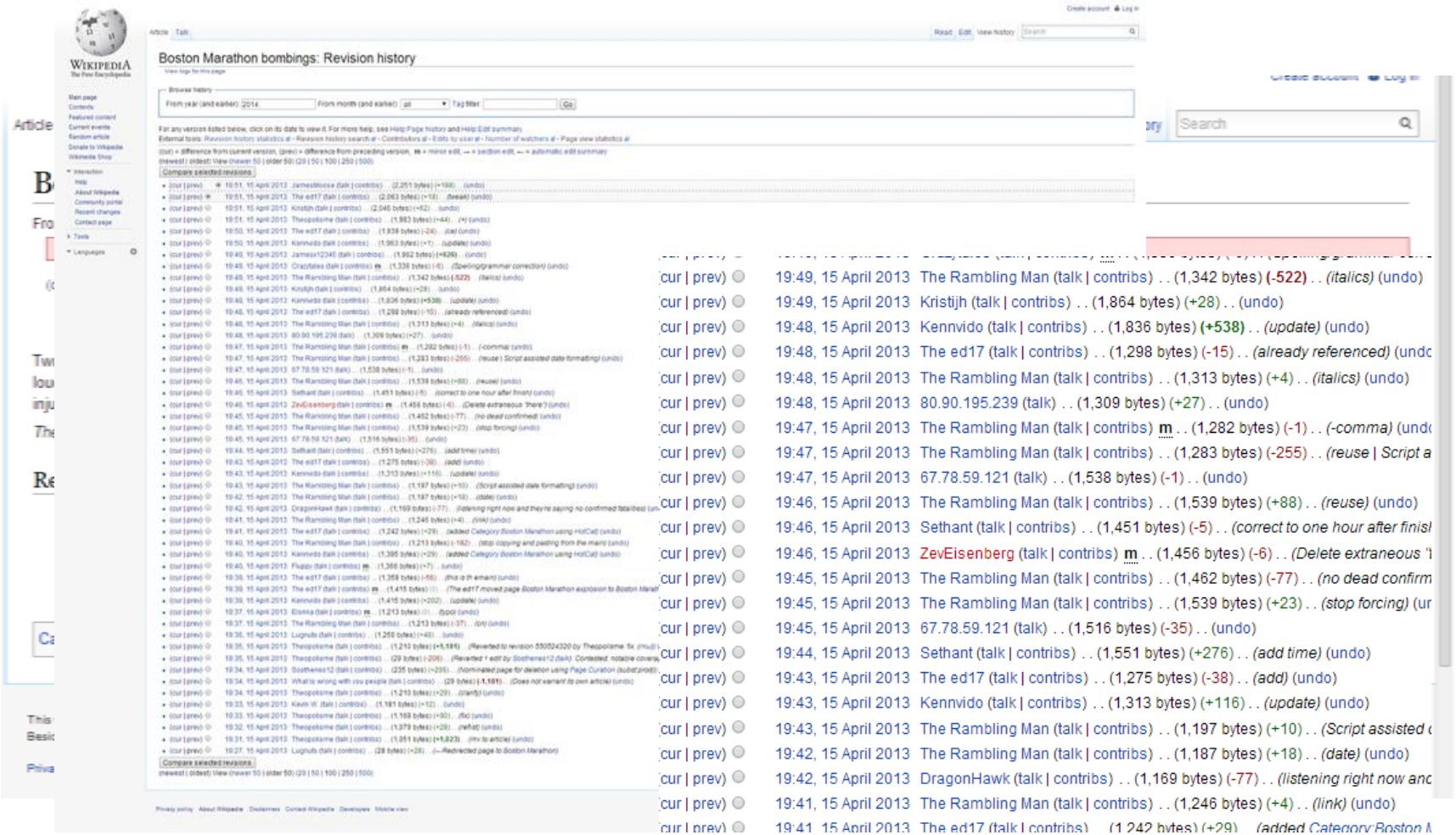
Pad strasbourg nuit debout



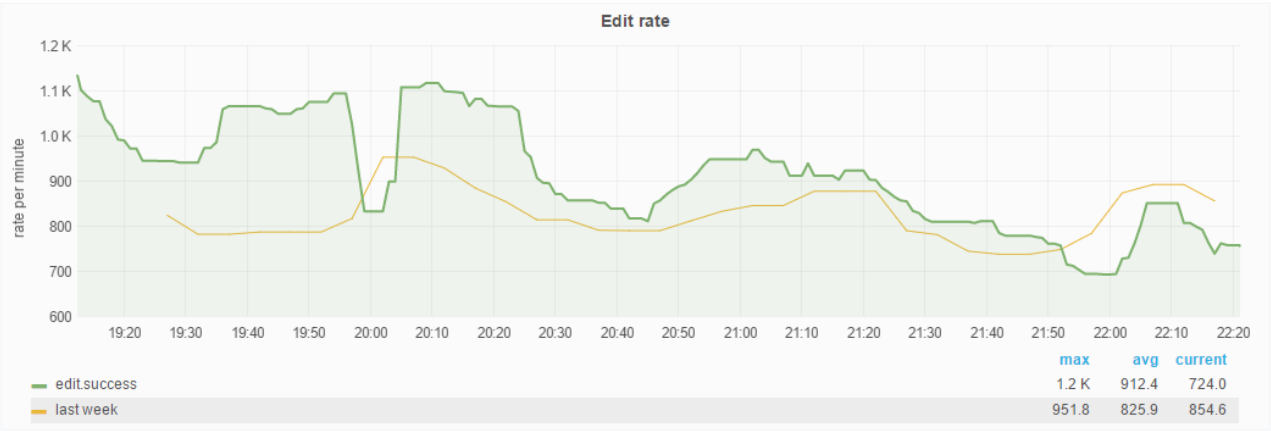
More than 70 participants

https://strasbourg.nuitdebout.fr/pad/p/Actions/timeslider#23979

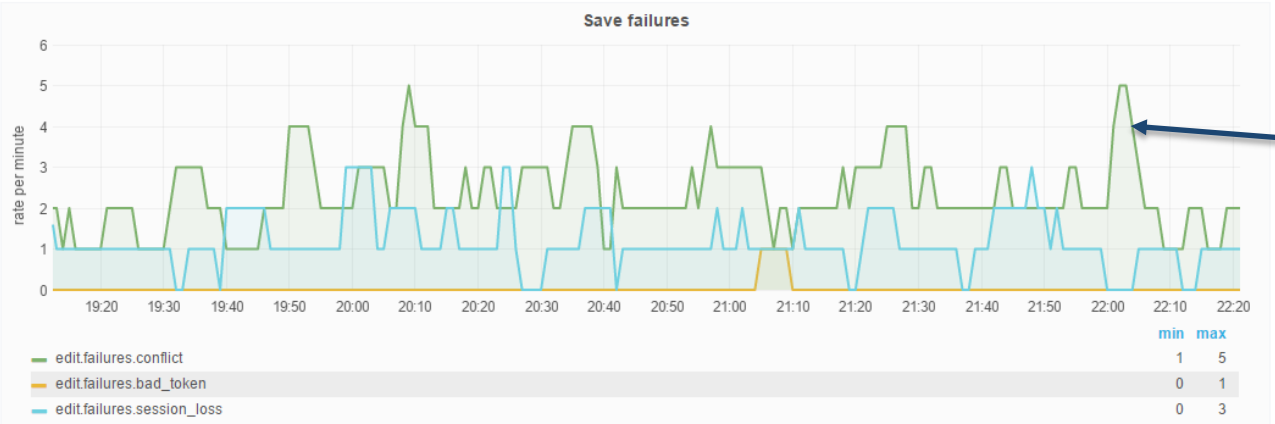
Real Time Wikipedia



Wikipedia edit conflicts



900 edit/mn



5 failure conflict/mn

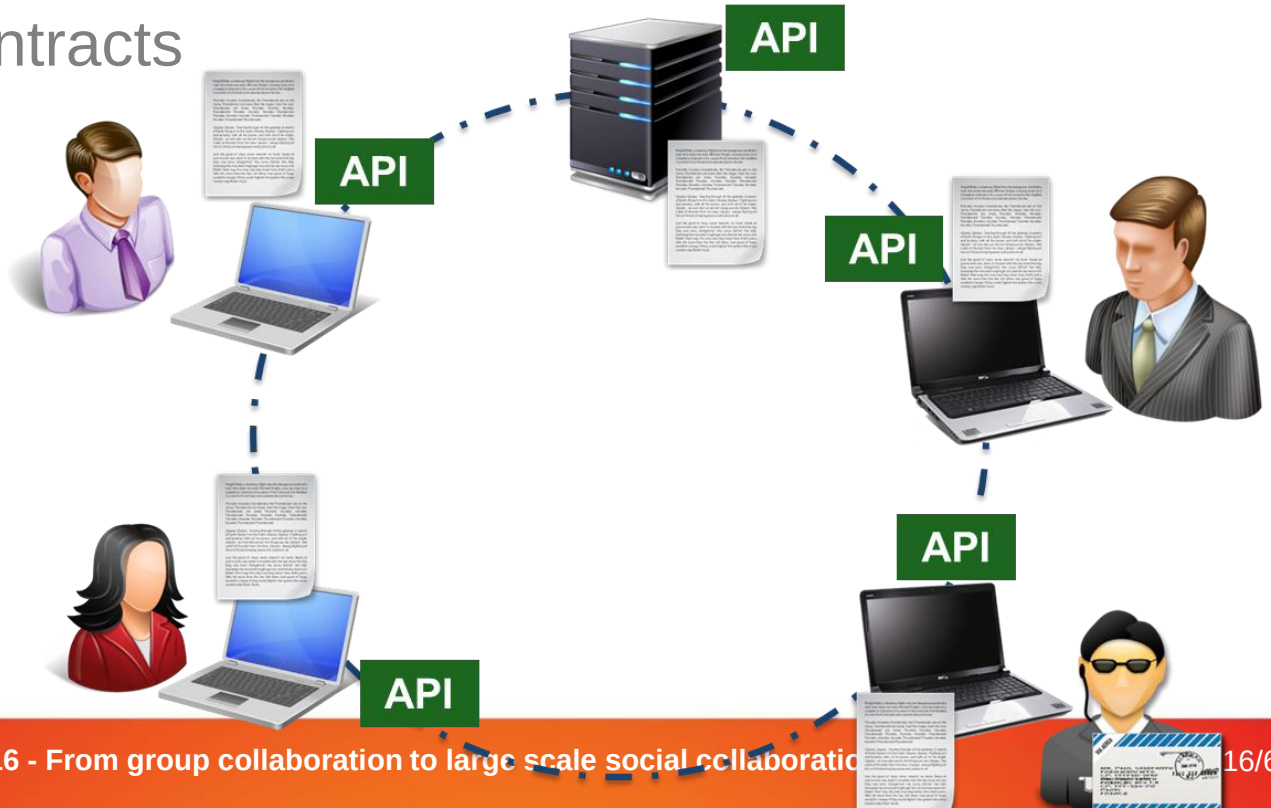
https://grafana.wikimedia.org/dashboard/db/edit-count

Centralized architecture ?

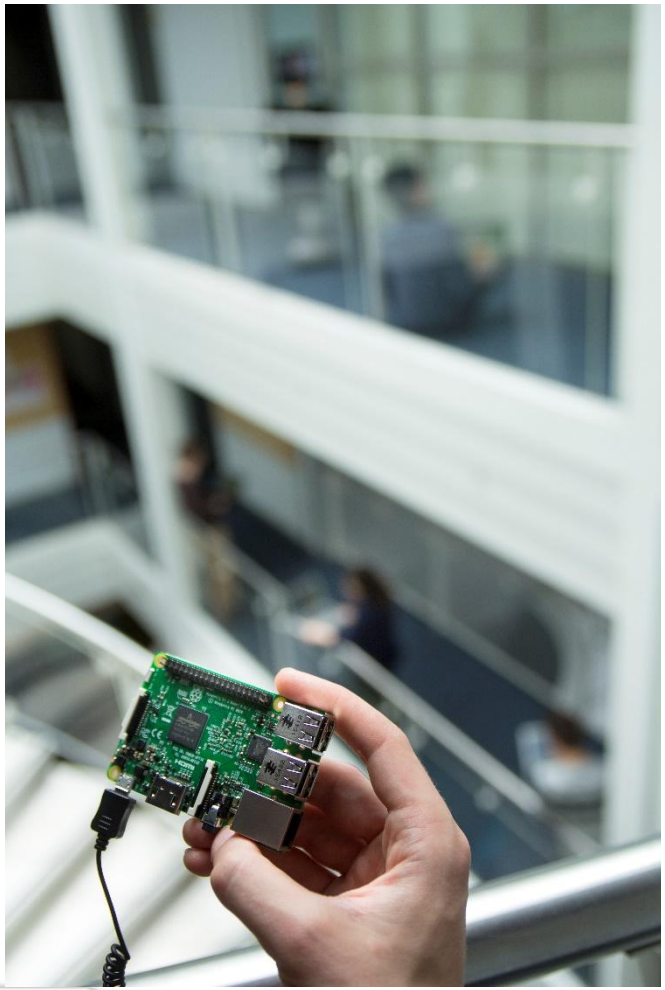
Abstract/Configurable p2p architecture

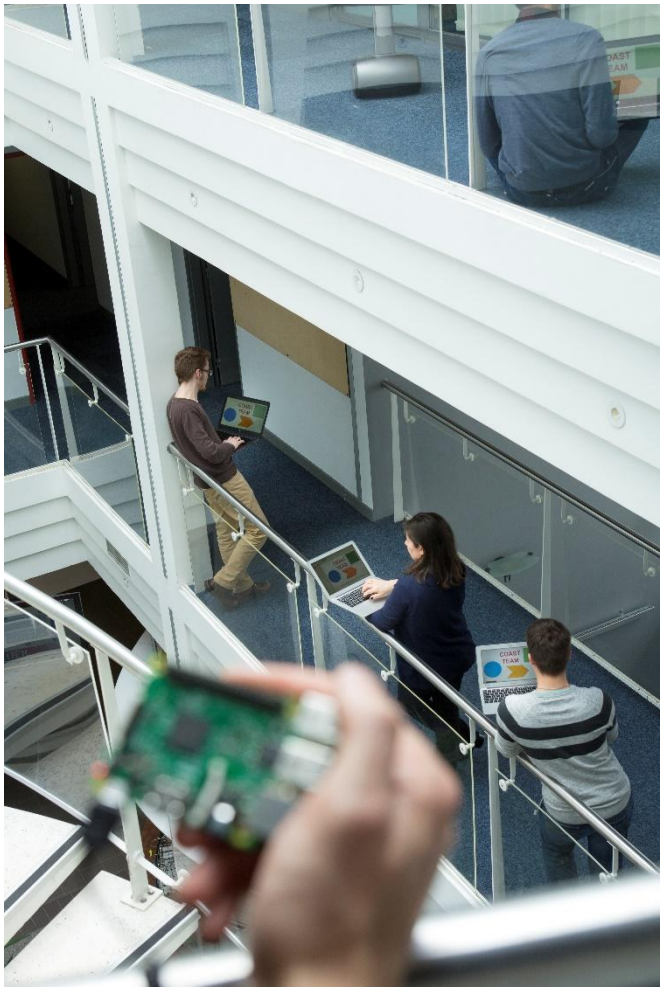
OpenPaaS::NG

- Each partner decides of the control and of the contracts



MUTE v2 – No central server

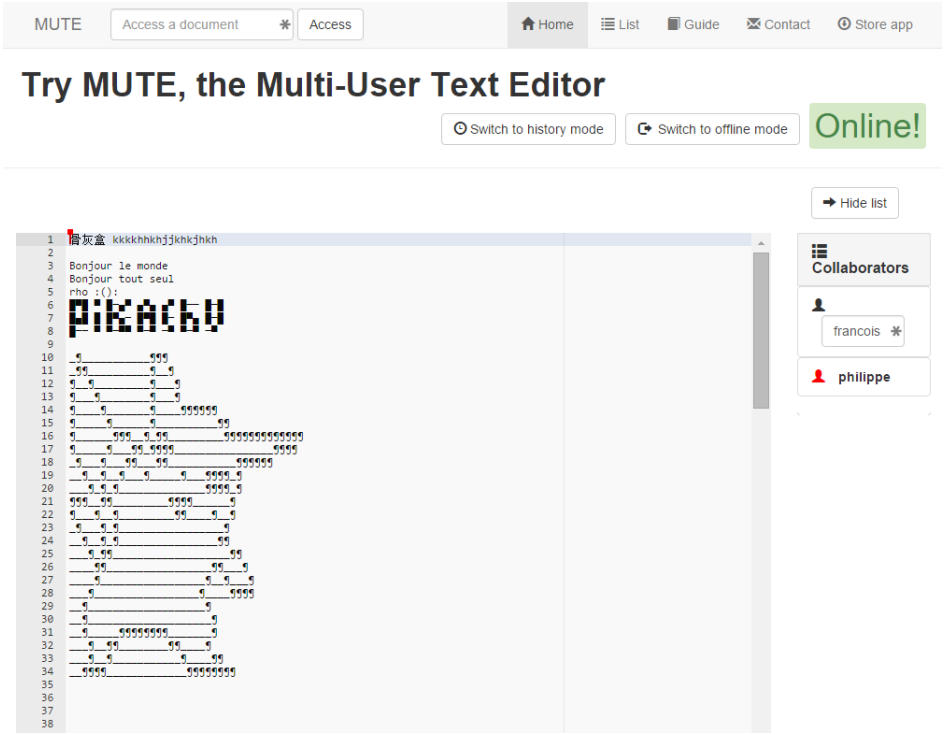


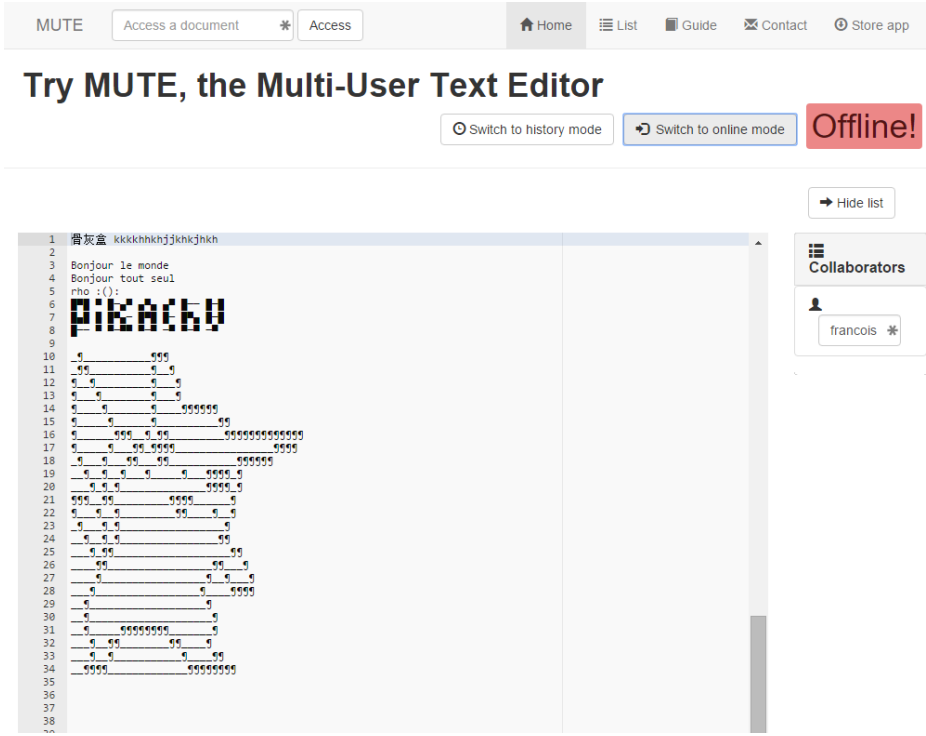


Photos Christian Morel

The Mute P2P editor

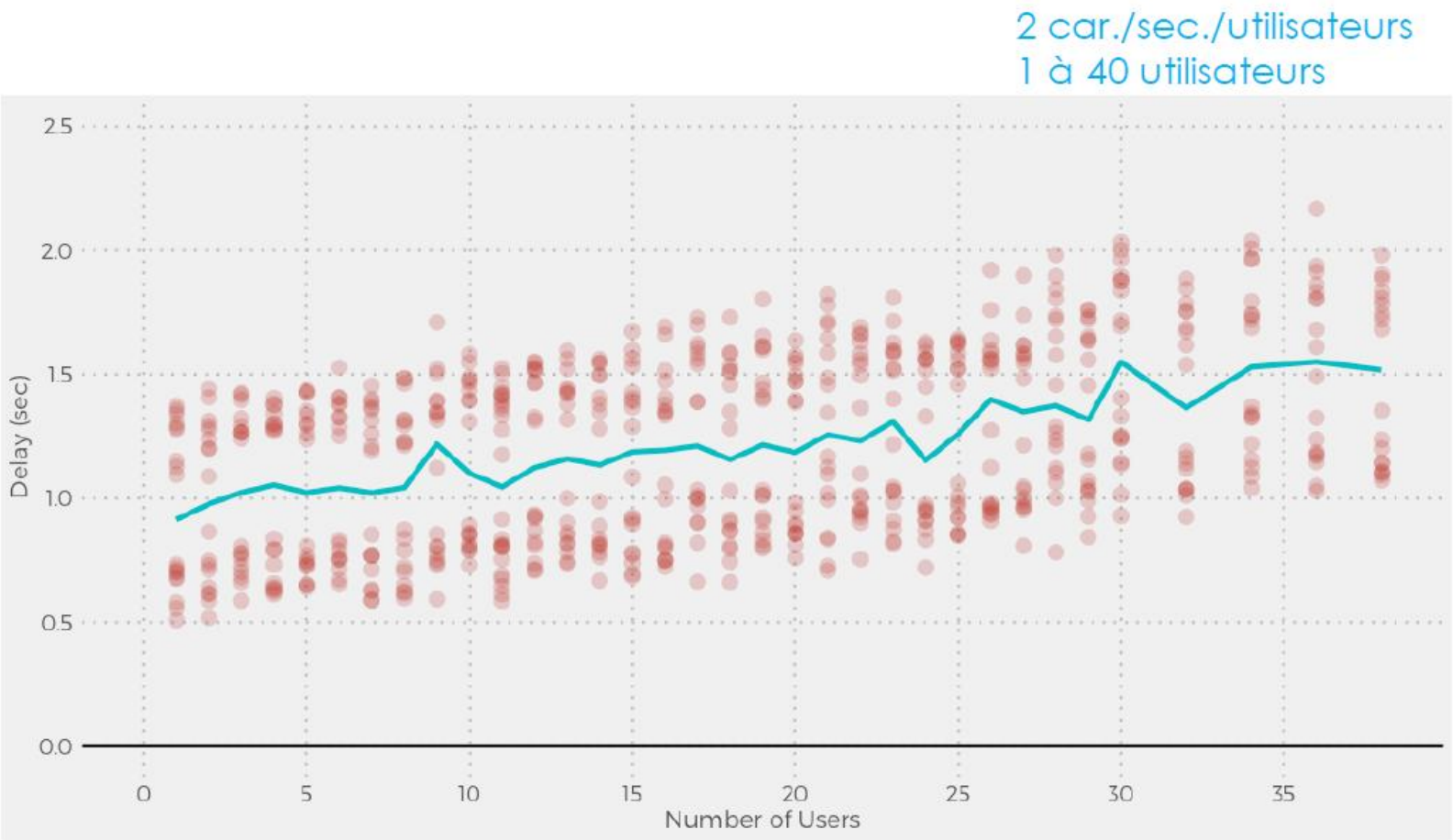
- Based on CRDT Algorithm (LogootSplit)





http://mute-collabedition.rhcloud.com/doc/wetice2016

Delays in MUTE



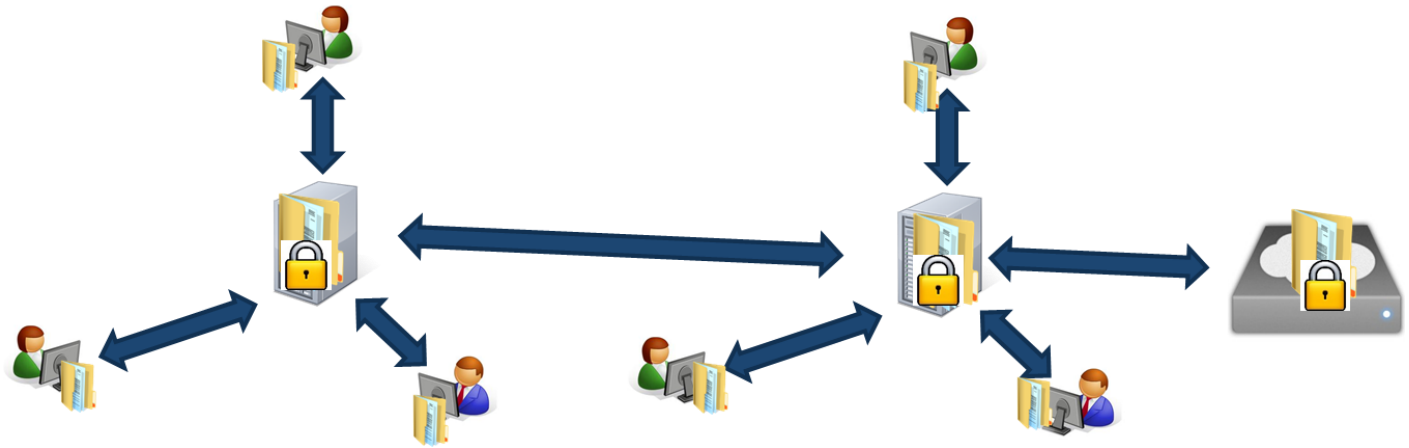
Who is doing what ?

- Awareness at a large scale

A complex challenge : security and trust

- **Who are the people I'm working with**
- Collaboration data can be encrypted and not shared on the cloud (being investigated).
- **Provides guarantees to the participants**

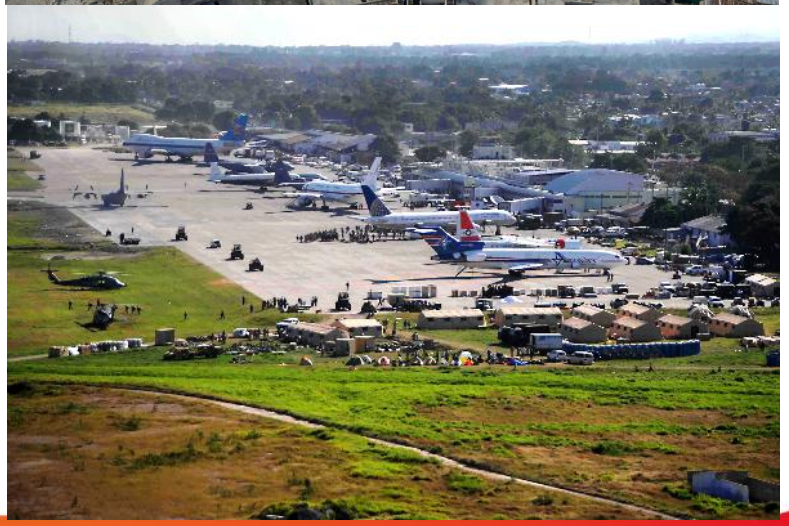
Current Issue




Coordination at a large scale

Haiti Earthquake 2006

- 7.0 Magnitude earthquake – 3.5M people affected – 220.000 death (est.)
- **Hundreds** of responding organisations



Unexpected event at an unexpected scale

- First responder : people
- Overwhelming answer from the international community (hundreds of NGO's)
- First important use of social network
- volunteer based crisis mapping
- http://www.digital-humanitarians.com/

Hurricane Katrina 2005

- Category 5 Hurricane
- Caused breaches to flood protections structures
- 80% of the city of New Orleans Submerged (1500 deaths)

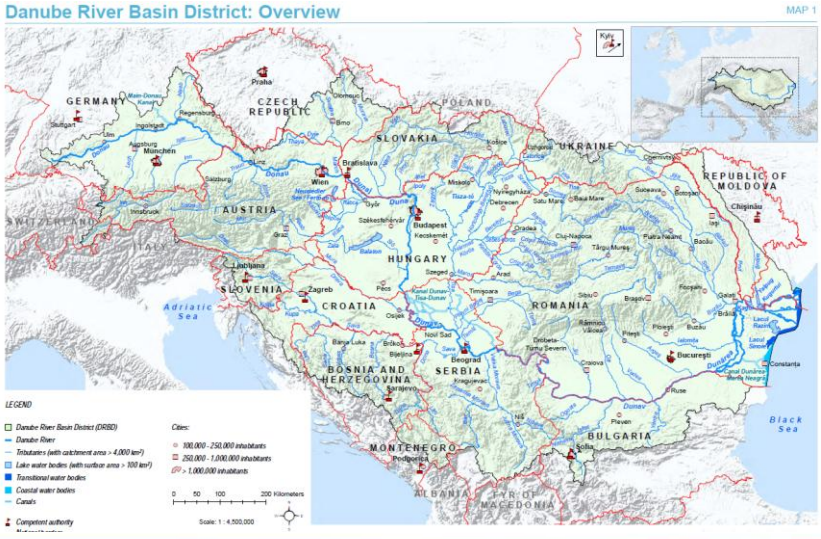
Coordination issues

- Very wide area affected

- Several political decisions level
- Coordination issues during the evacuation

The Danube floods

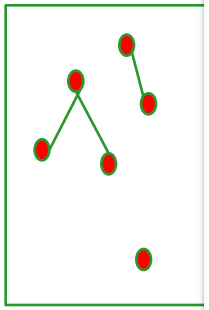
- 2002,2005,2006,…,2014
- Very common event – cross international borders
- Requires a dedicated organisation



Coordination at a large scale

- Combination of human and services activities
- Composition of hundred of services
- Duration, kind of contribution, governance
- Various domains : logistic, crisis management, software development,

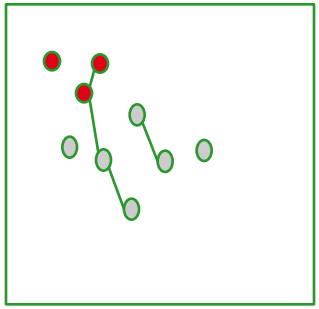
Inter organisational issues

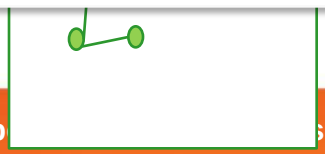


“we are exchanging text information real-time through either cell or mobile units or satellite”

[..]

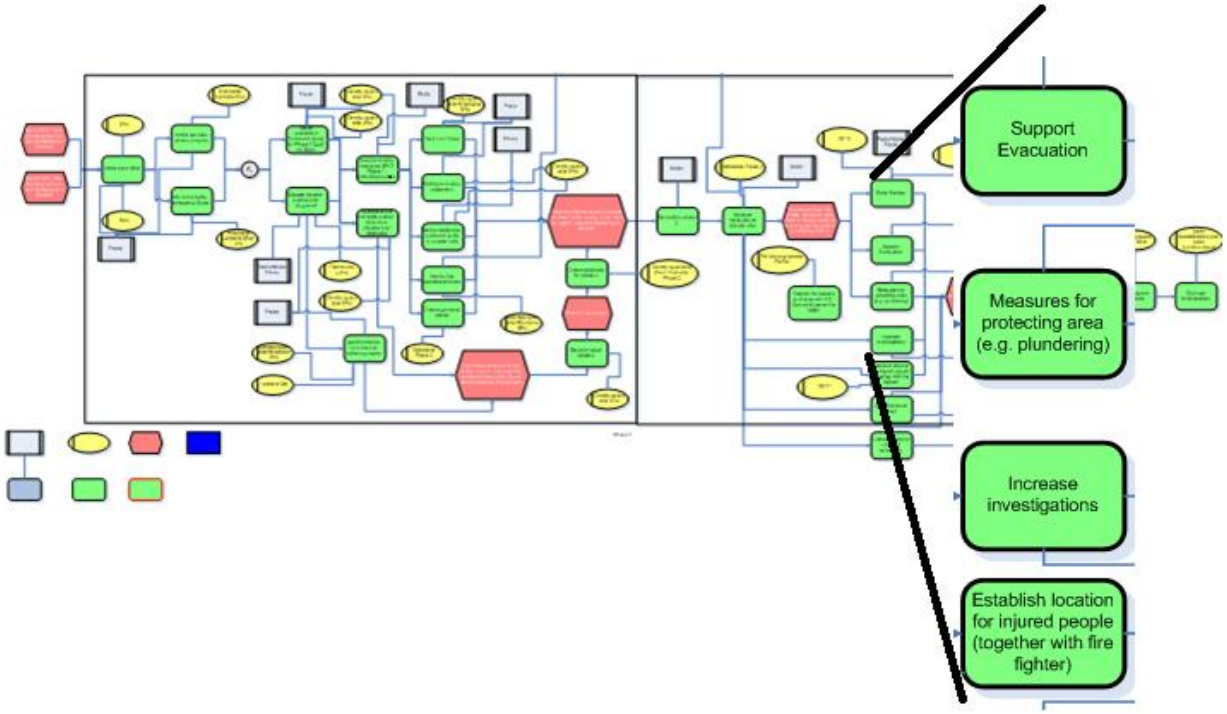
“obvious the more complex a situation gets, for instance where you may have many organizations working collectively in order to accomplish a goal, but at the same time working independently in terms of their own interests, where you get in those in situation like that, you know it get to the point, to be so complex that it would be overwhelming”





Complex BP Modeling

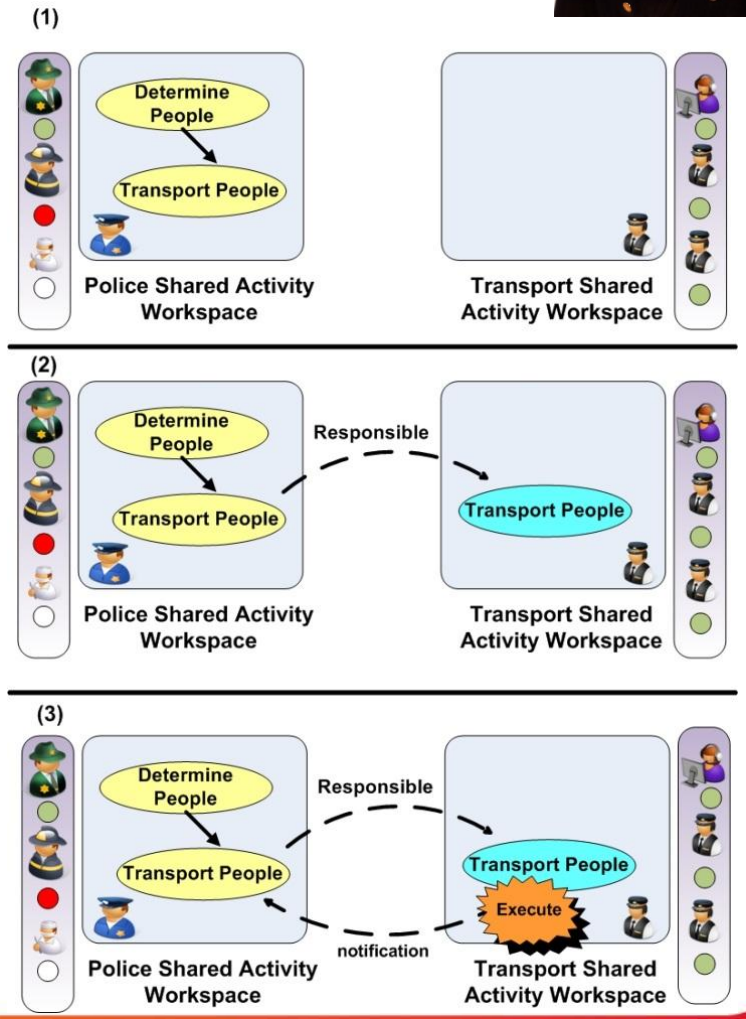
- Outcome of a workshop with Firefighters



Coordination awareness

- Activity awareness ?
- Coordination **without a central authority**
- Distribution of control
- Privacy

Still an issue today



Crowdsourcing

Coordinating very large scale/long running simple activities

Combining human task and service in a process at a large scale

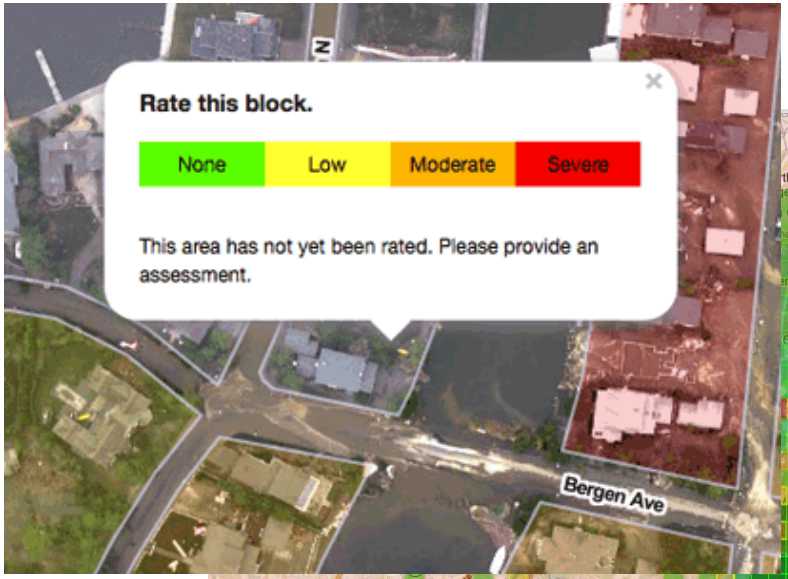
Centralised process with very distributed unknown performers

Haiti Crisis Mapping

4636 project volunteers translated 25,186 SMS messages and numerous e-mail, Web, and social media communications, resulting in 3,596 reports that were actionable and included enough relevant information to be mapped on Ushahidi.[31]

The Fletcher Crisis Mappers at work in Boston. Photo courtesy of Carol Waters.

Sandy Damage Assessment (2012)



- Crowdsourcing satellite pictures
- Results with short term validity

Industrialisation of crowdsourcing

(a) Transcribe receipt

The Foodman Cafe
250 Walnut Street
Englewood, NJ 07631
201-568-8056
08/07/2010 9:30AM CHECK NO:01001
TABLE:A PERSONS:02
SERVER:BERT

Qty		Price
1	Foodman Burger/ Medium Rare/Onions/ Lettuce/French Fries	15.00
1	Ginger Ale	1.50
1	Diet 7-Up	1.40
1	Cappucino	2.00
1	Choc Rasp. Truffles	1.50
1	Grilled Chicken/ Beefsteak Tomatoes/ Bacon/French Bread	7.95
	Subtotal >>	29.35
	Tax >>	2.42
	Pay this Amount >>	31.77

Use these two lines for advertisements, special announcements, etc. . . . . .

Company name

Address

Date

Total

(b) Check and improve

Happy Food Company
******* Customer Copy *******
1/2/2008 9:45:36 PM
Store Location
Store City ,Store State Store Zipcode
Store Country
TEL: (408) 476-8754

Employee : vincent
StoreID :store1
SystemID :POS 2
Pay By :CASH

#	Desc	Qty	Price
2	DVD Spinal Tap	2	$64.00 Y
4	Internet Manager	2	$50.00 Y

******** INOVICE ********
447

Subtotal : $114.00
Tax : $9.41 (8.25%)
Total : $123.41

CASH payment : $360.00
Total Item Sold : 4

Change Due: $176.59

Company name
Happy Food Company

Address
none

Date
01/02/2006

Total
123.41

(c) Classify receipt

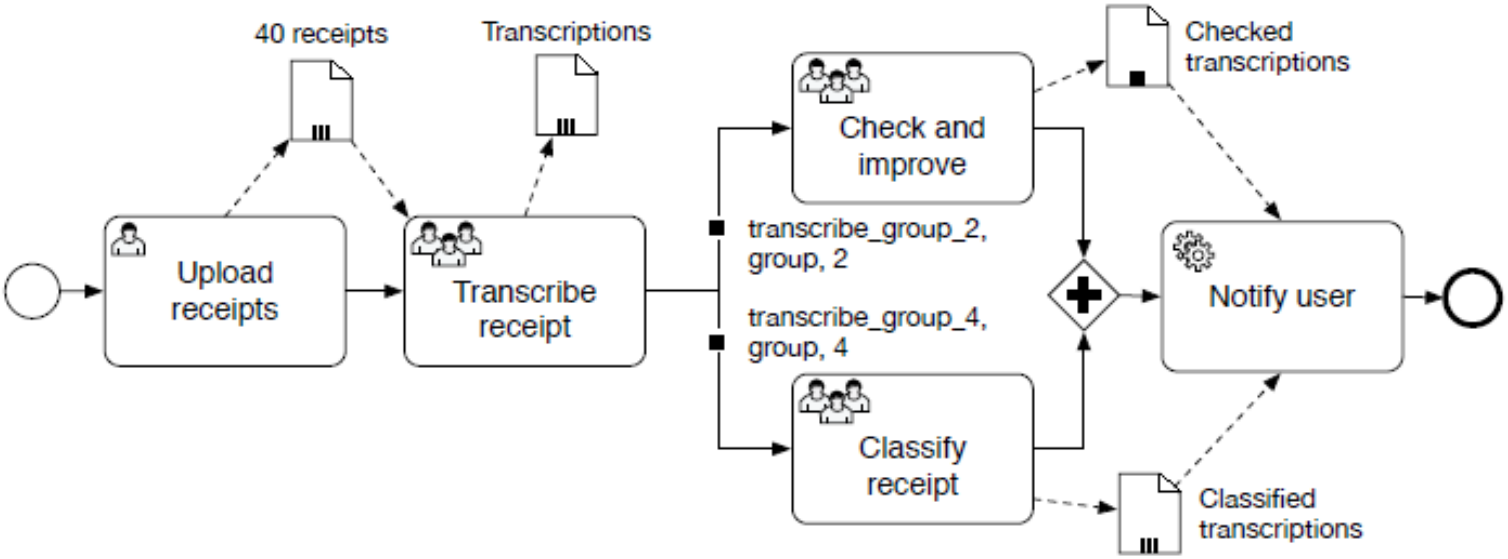
Spending type

- Transportation
- Accommodation
- Meal
- Other

BPMN Task Instance Streaming for Efficient Micro-Task Crowdsourcing Processes

Stefano Tranquillini[1], Florian Daniel[1,2], Pavel Kucherbaev[1], and Fabio Casati[1]

BPM for crowdsourcing



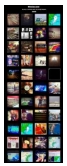
Large scale real time coordination

Unsollicited individual data

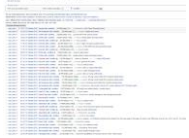
Twitter– 35000 geolocalised tweet/day

Flickr – 3000 geolocalised photos/day

10 photos/s on instagram during sandy

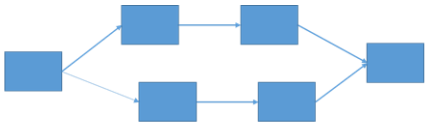


Collaborative data

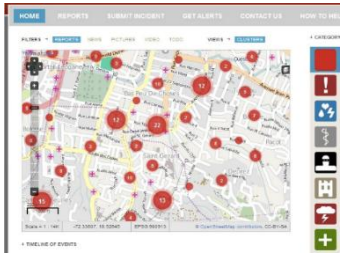


Wikipedia 1500 edit to the main page between the 28 and the 30th of october, not mentionning the talk or the area related pages

INPUTS



Process

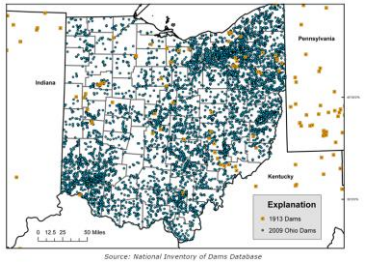


Citizen Sourcing Data

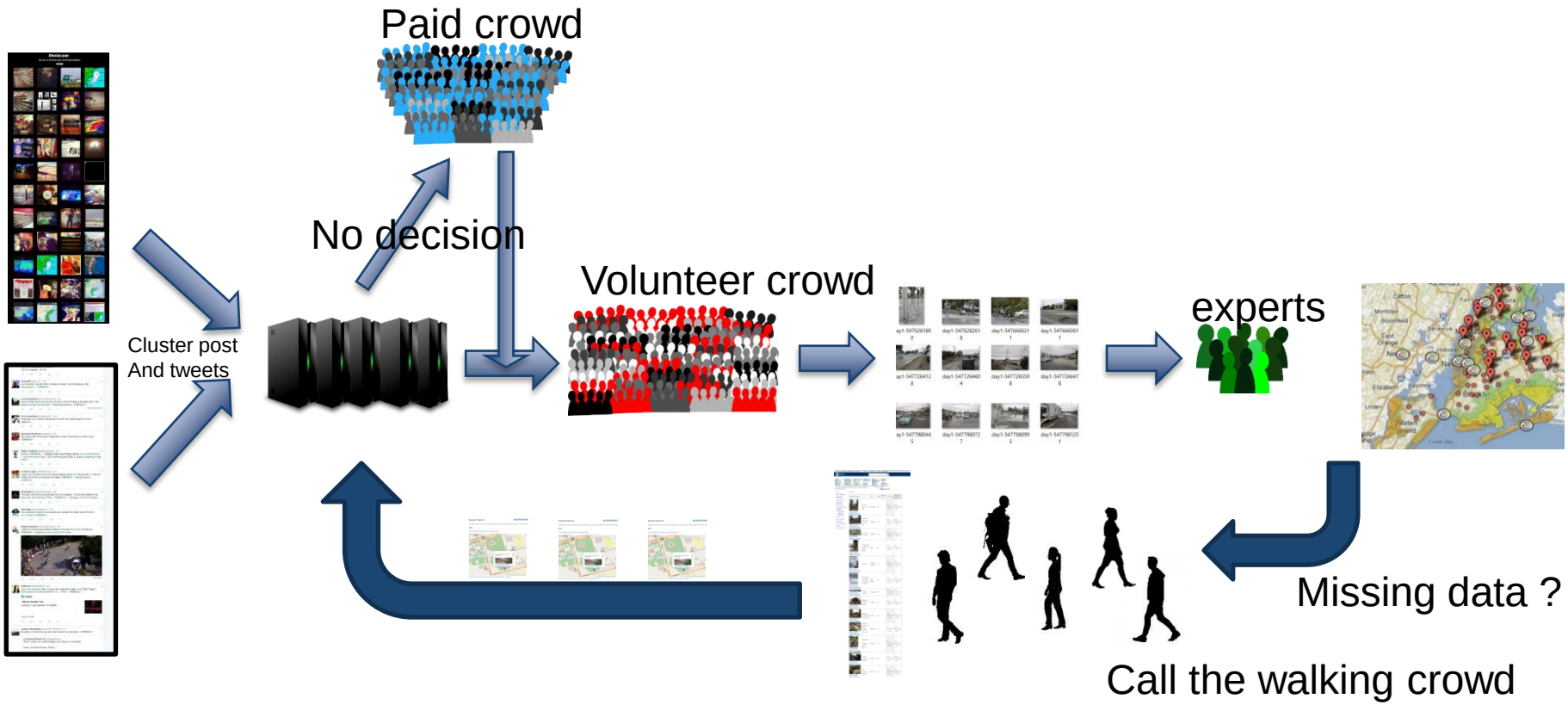
FEMA dedicated app

Dedicated app can receive notification and but used to ask for data

Computers Crowd Experts



Human/Machine composition example

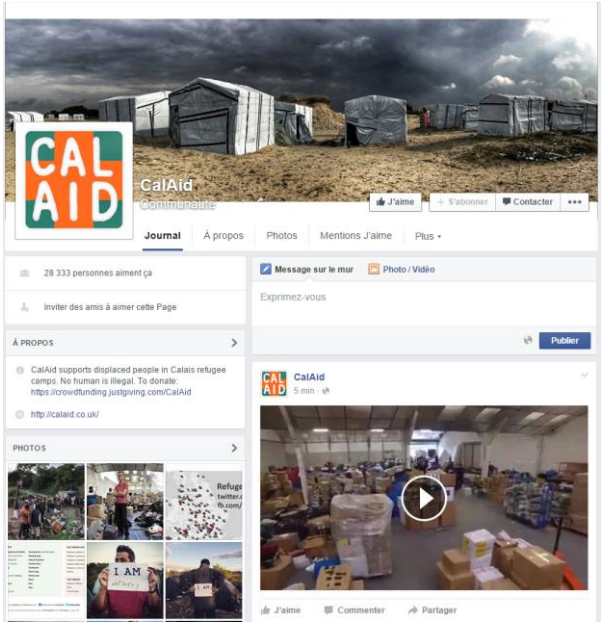


The Refugee crisis

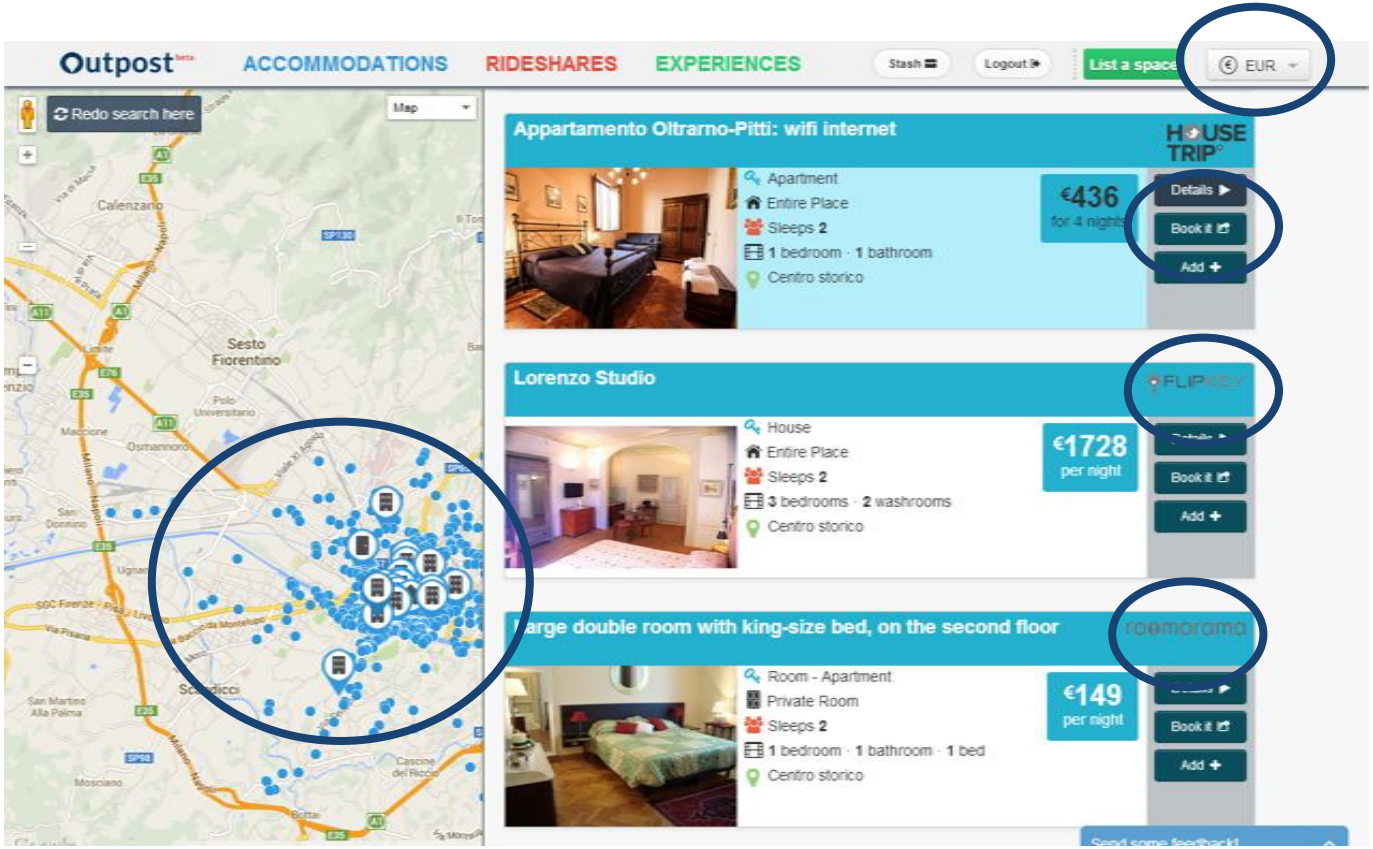
- A very tricky kind of crisis
- Affect international relationships
- Difficult agreement on the response

Citizen coordination

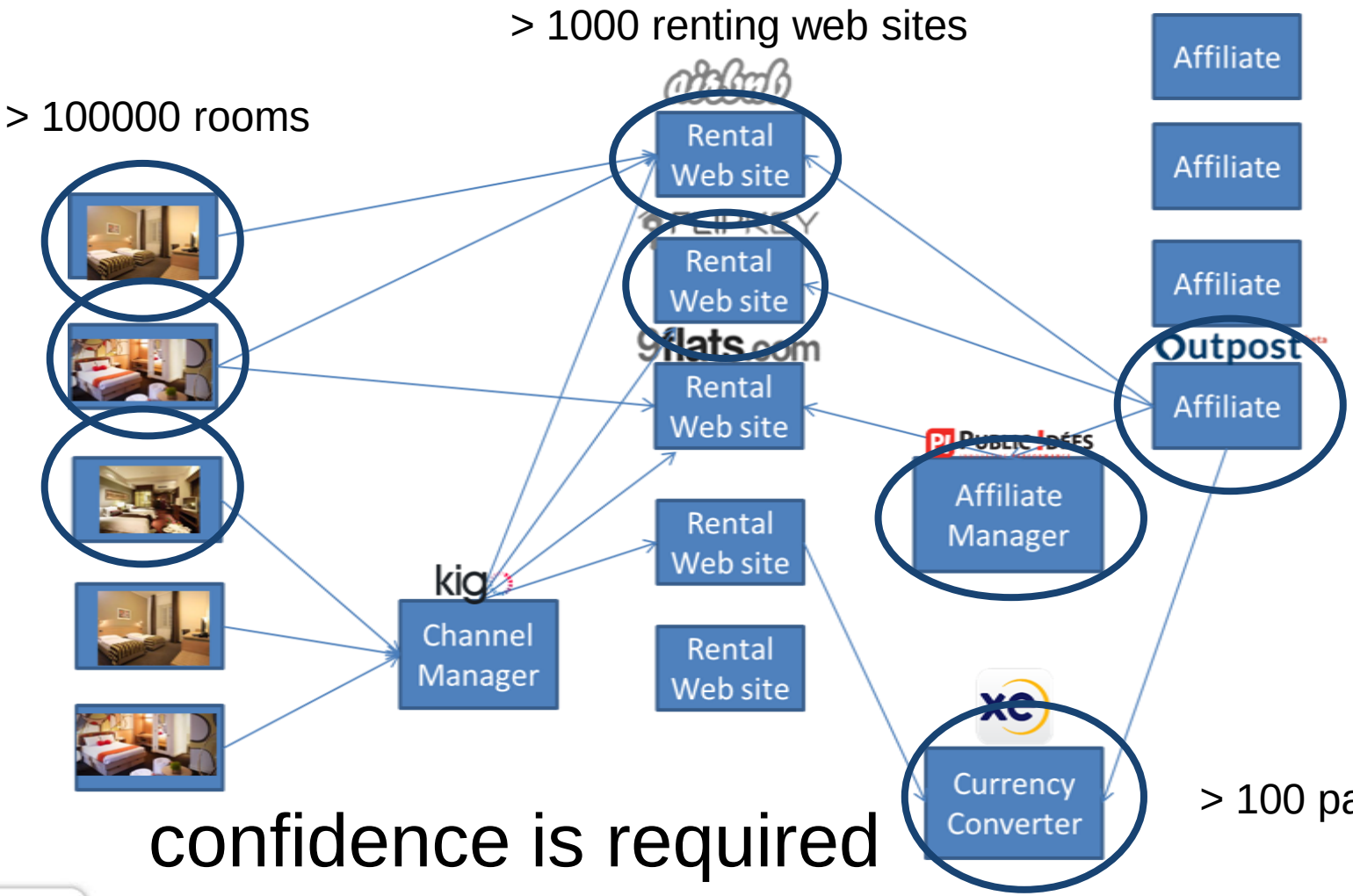
- International scale
- Citizen create Facebook pages, maps, dedicated tools to coordinate
- But privacy, security, reliability, trust issues



Internet wide service composition



Behind the scene



Conclusion

- Large scale collaboration exists
- Large scale collaboration helps to solve large scale problems
- Only very solution based ad-hoc support

Large scale collaboration issues

- A programming language that can be used by a **Clerical worker**
- Software engineering – **modeling** and **validation**
- Operating Systems and database – **distribution of data, consistency and security**
- Measurement and Evaluation - **prediction**
- Security, **privacy and trust**
- WYSIWweS or What ou see is what we see
- **Community** Processes
- Concurrency Control
- Other area – psychology, social implications

QUESTIONS ?

Credits

- Some slides have been prepared by
  - Jorn Franke (Activity management)
  - Gérald Oster (P2P sharing)

  Most of the work presented here are contribution made by members of the Coast team and the preceeding ones

  https://team.inria.fr/coast/

  Original photos are from Christian Morel (DR)