

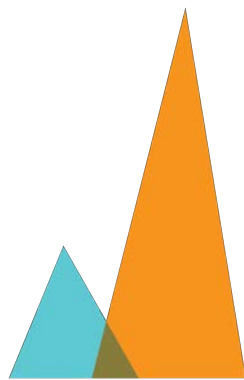
Transparency in open collaboration environments

Laura Dabbish

Associate Professor

Human-Computer Interaction Institute & Heinz College

Carnegie Mellon University



CONNECTED
EXPERIENCE
LAB



Carnegie Mellon University
HeinzCollege

“If there were such a thing as complete reciprocal transparency, the relationships of human beings to each other would be modified in a quite unimaginable fashion.”

Simmel, 1906

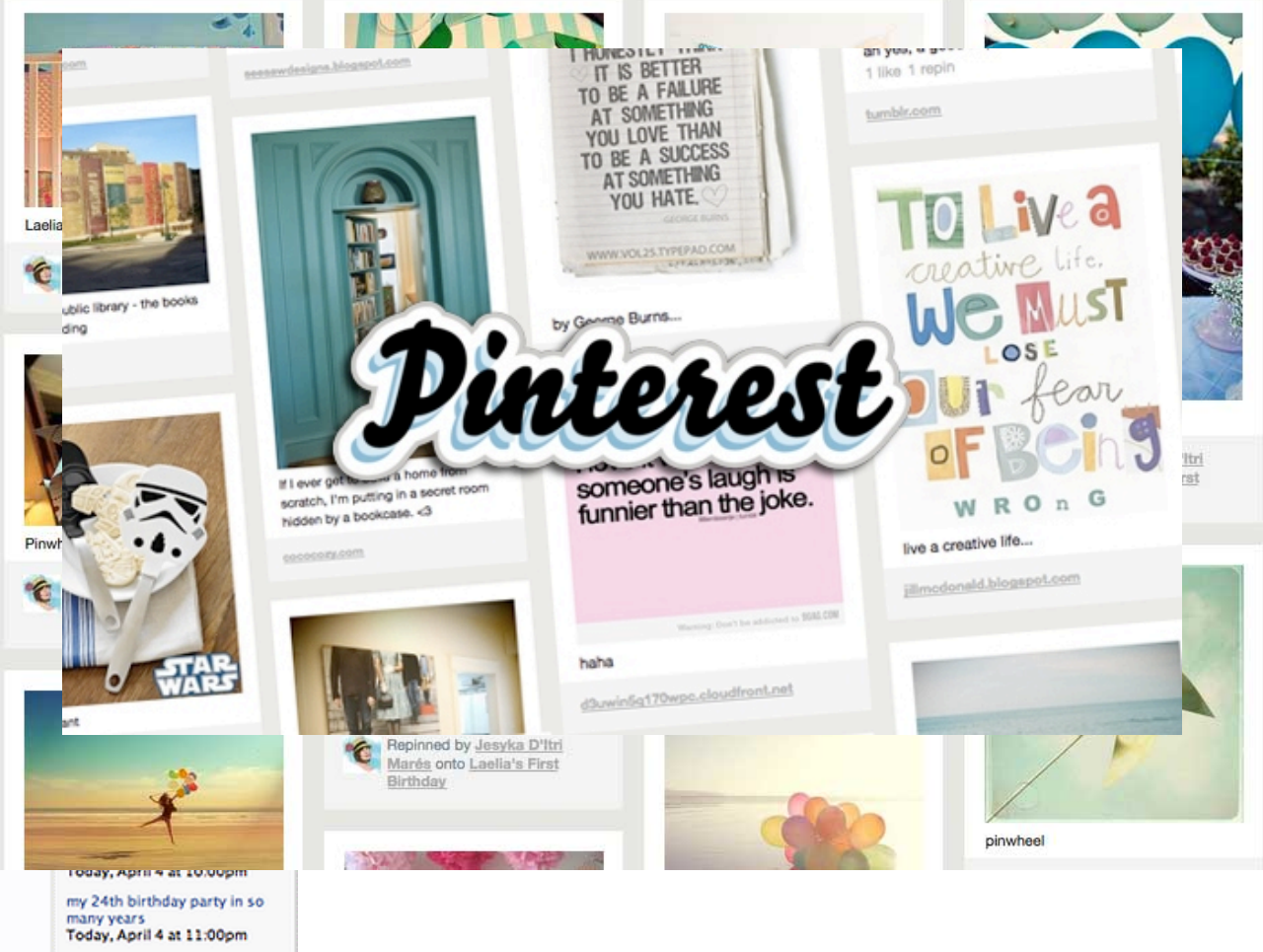
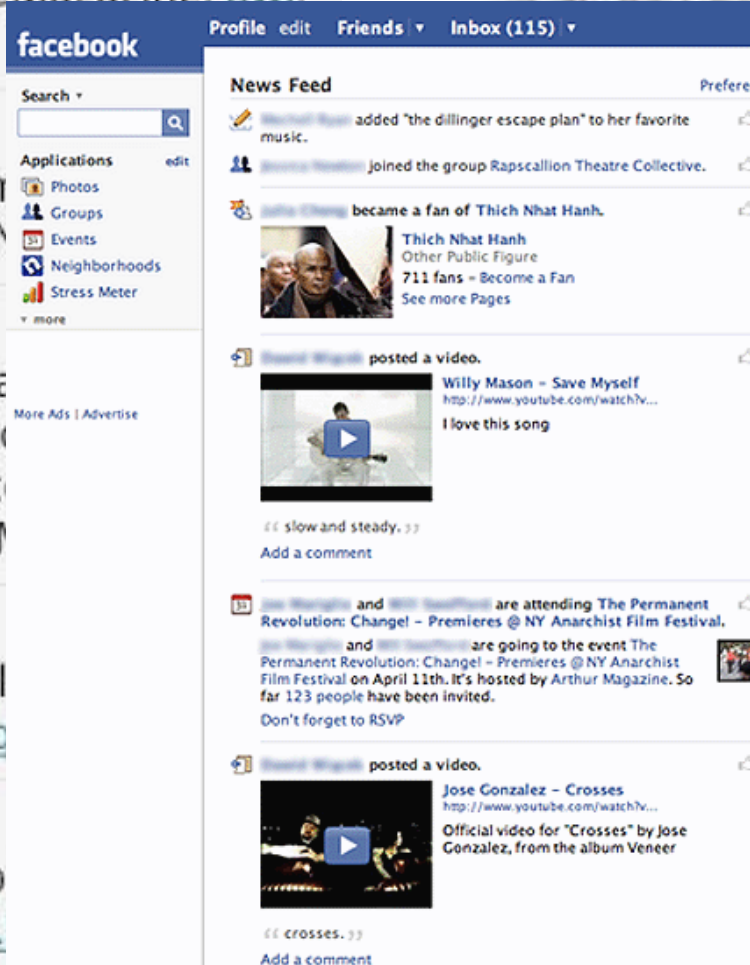
Simmel, 1906. The Sociology of Secrecy and of Secret Societies.



Pinterest

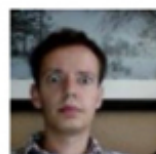
Pinboards You Follow | [Most Discussed](#) | [Everything](#) | [Gifts](#)

Pin-ter-view: n. [conversations](#) with members of the pinterest community.





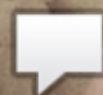
Frie



Dirk Stoop

11 seconds a

It's a great day for



Joseph

11 minut

Really, United' flight SAN-SFO figure that I wa Good call, guy

Like · Comm



Liz Law

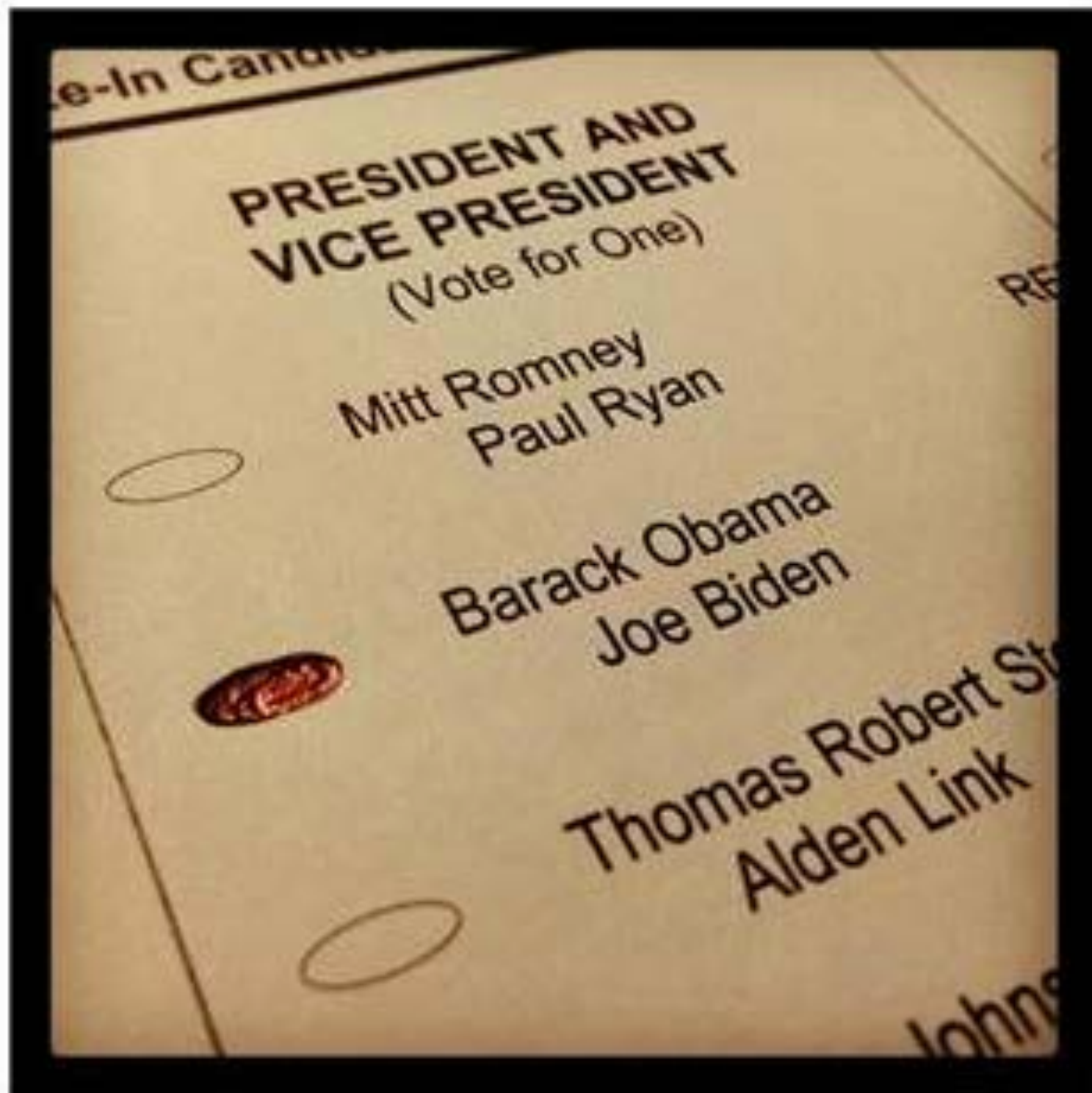
54 minut

What on earth 6:30am flight t that ended at order of busin Orleans tomor

Like · Comm



Tom Ca



#Obama #2012 #Election #Vote

Delete this now

Like

Comment



Transparency

Accurate observability of an organization's low-level activities, routines, behaviors, output, and performance (Bernstein, 2012)

Can be thought of as an attribute of a work environment



Digital transparency

Users can follow the activities of other people and their actions on artifacts



Article **Talk**

[Read](#)

[Edit](#)

[View history](#)

Revision history of The Hunger Games

[View logs for this page](#)

Browse history

From year (and earlier): From month (and earlier): Tag filter: ☐ Deleted only

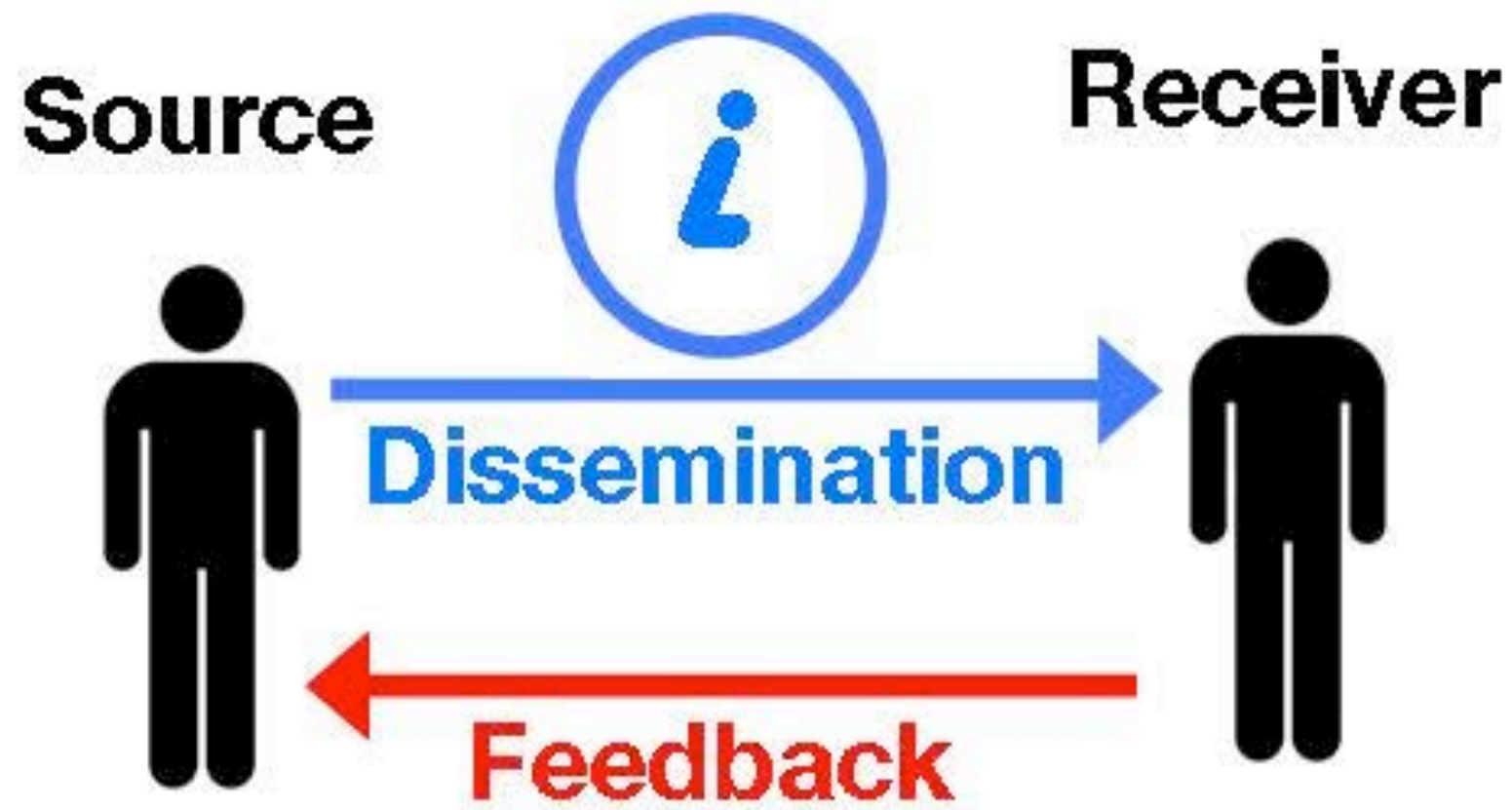
For any version listed below, click on its date to view it. For more help, see [Help:Page history](#) and [Help:Edit summary](#).

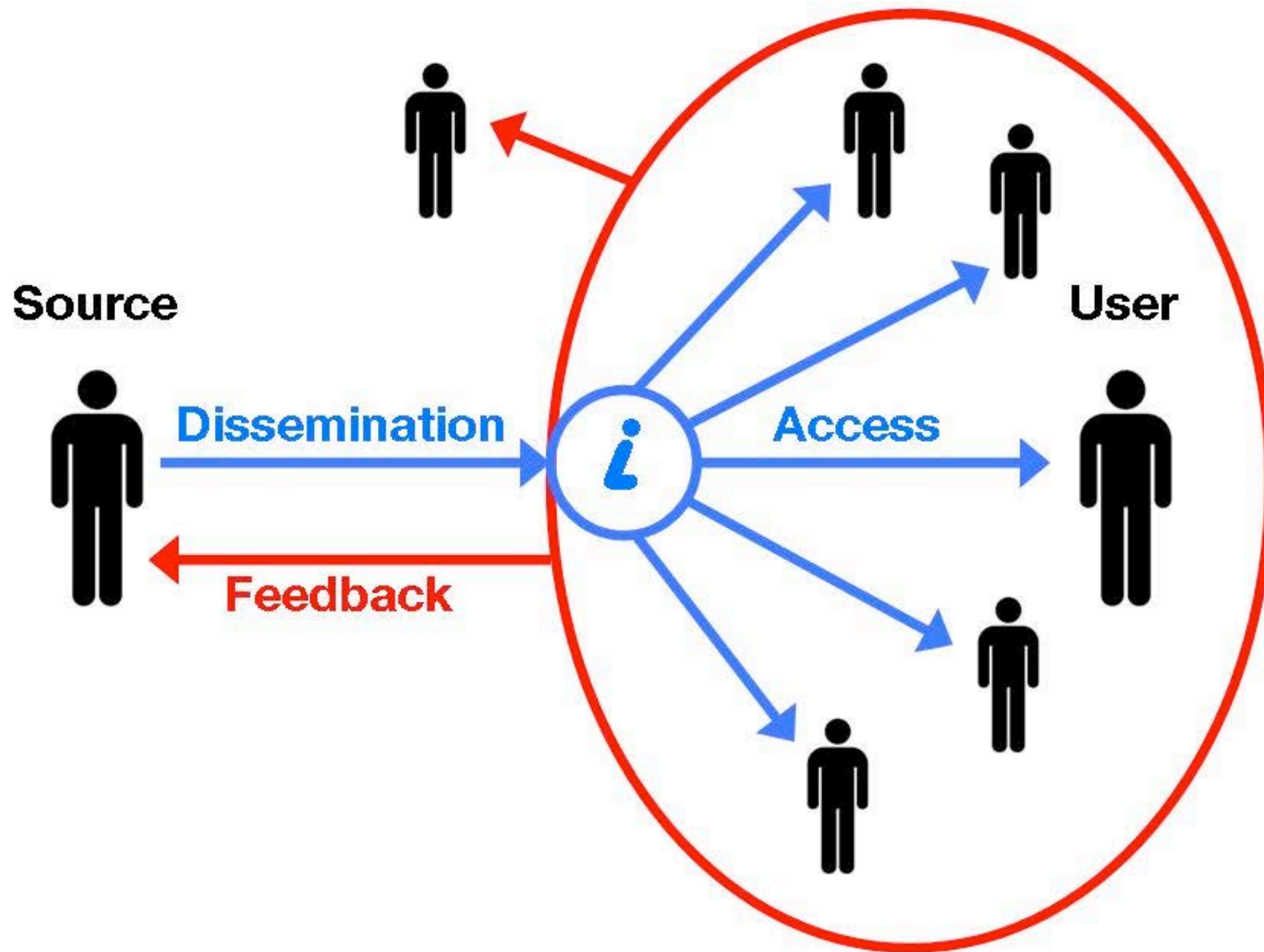
External tools: [Revision history statistics](#) · [Revision history search](#) · [Contributors](#) · [User edits](#) · [Number of watchers](#) · [Page view statistics](#)

(cur) = difference from current version, (prev) = difference from preceding version, **m** = minor edit, → = section edit, ← = automatic edit summary

(latest | [earliest](#)) View (newer 50 | older 50) (20 | 50 | 100 | 250 | 500)

- (cur | prev) ☐ 03:48, 8 February 2012 101.98.140.131 ([talk](#)) (33,577 bytes) ([→Main characters](#)) ([undo](#))
- (cur | prev) ☐ 03:07, 8 February 2012 Murmuration ([talk](#) | [contribs](#)) **m** (33,573 bytes) ([→Battle Royale comparisons: added {{sic}}](#)) ([undo](#))
- (cur | prev) ☐ 02:49, 8 February 2012 Sergay ([talk](#) | [contribs](#)) (33,566 bytes) ([Undid revision 475683930 by 24.229.111.100 \(\[talk\]\(#\)\) that's what it says](#)) ([undo](#))
- (cur | prev) ☐ 01:40, 8 February 2012 24.229.111.100 ([talk](#)) (33,566 bytes) ([→Battle Royale comparisons](#)) ([undo](#))
- (cur | prev) ☐ 20:32, 7 February 2012 ClueBot NG ([talk](#) | [contribs](#)) **m** (33,566 bytes) ([Reverting possible vandalism by 8.19.13.22 to version by Lawrax. False positive? Report](#))
[Thanks, ClueBot NG. \(868900\) \(Bot\)](#)) ([undo](#))





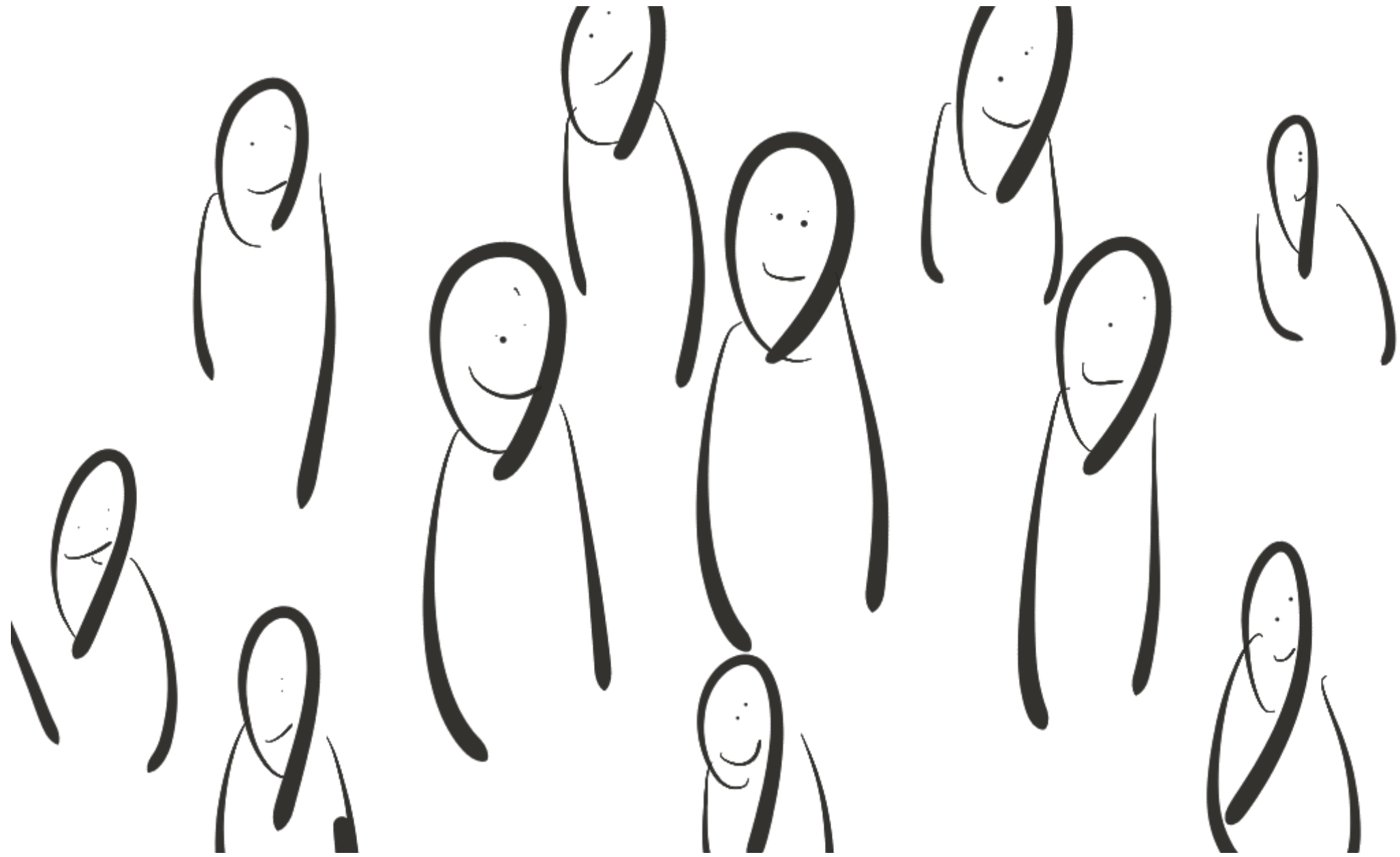
Stuart, Dabbish, Kinnaird, Kang, & Kiesler (2012)

Social Media as Transparency Tool

Users articulate an interest network of people and artifacts

Receive updates on actions by those people or on those artifacts

Affords unprecedented level of transparency in form of visibility of actions by others



Transparency affords broader information
access for both work process and product



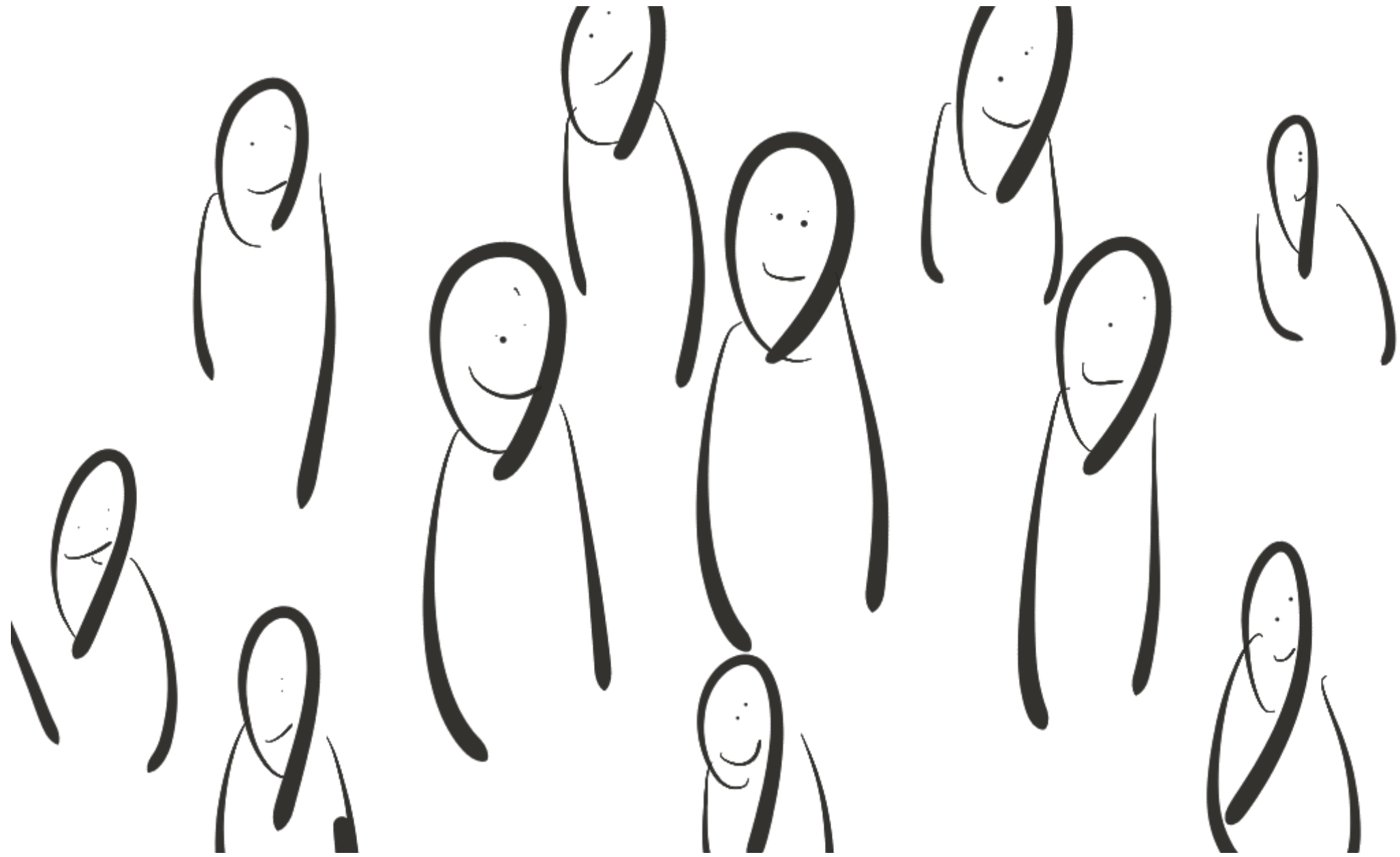
Social Challenges to Transparency

- Multiple stakeholders with with disparate interests and desires
- Social and political reasons to hide or share information in a conflict ridden environment
- Manipulate action to communicate certain information (signaling – Donath; impression management – Goffman)

Appropriating Transparency

How is the technology of transparency coopted to support the conflicting, emergent and dynamic needs of contributors in open collaboration settings?

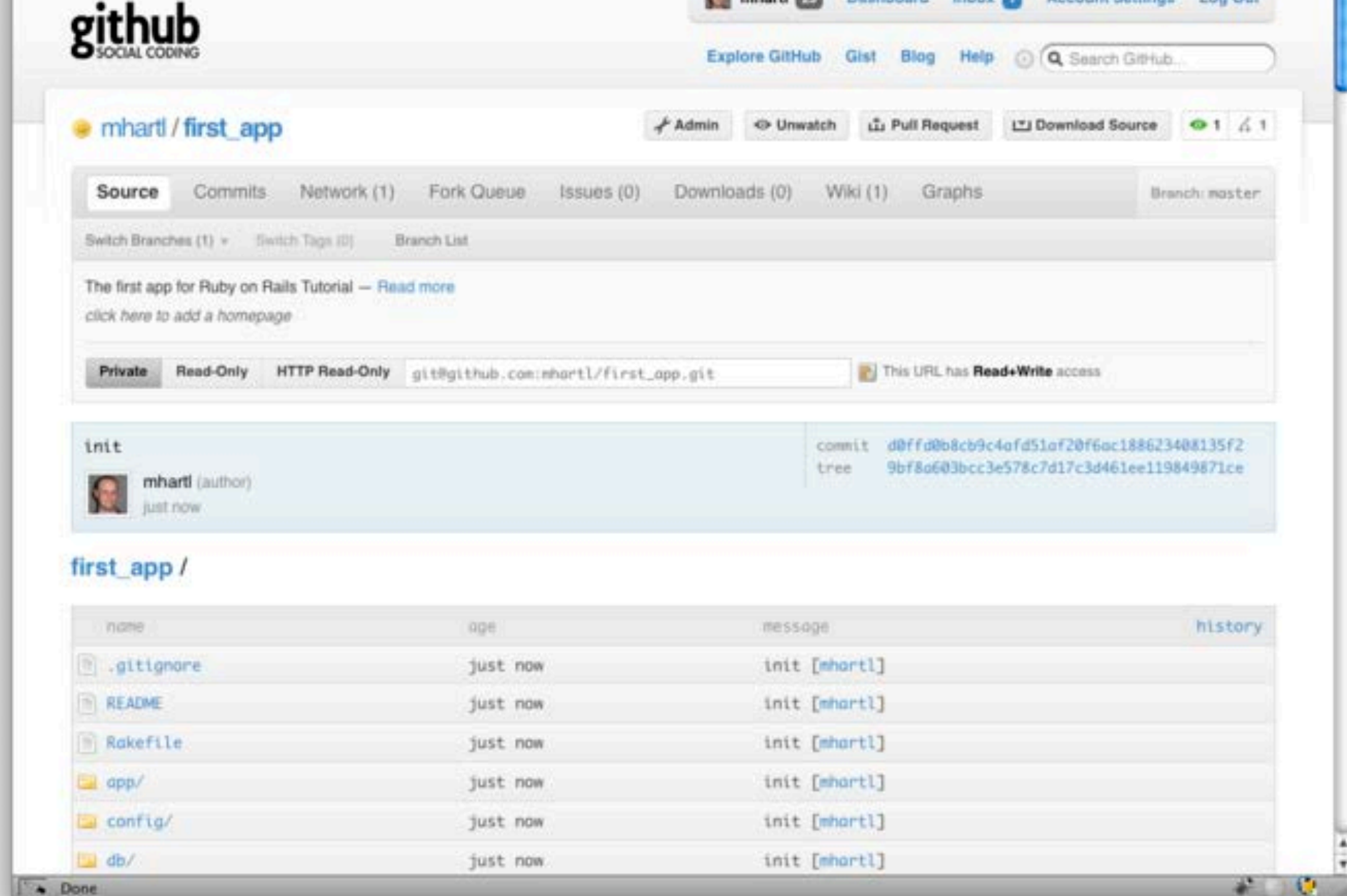
- What practices emerge to increase or limit openness?
- How does the technology of transparency interact with a culture of openness?
- What social, political and cultural factors support cross-project coordination and collaboration in a transparent open collaboration environment?



What does coordination look like in a transparent open collaboration environment?

github

SOCIAL CODING



- 5.9 million+ public code repositories
- 3.4 million registered users
- 10,000 new users and 20,000 new repos a day
- 80,000+ code commits per day



Sam Stephenson

sstephenson

 37signals

Chicago

✉ sstephenson@gmail.com

 <http://sstepphenson.us/>

🕒 Joined on Mar 08, 2008

1.6k followers **211** starred **24** following

211

24

followers

starred

following


Contributions

Repositories

Public Activity


 **Follow**

Popular repositories

 **rbenv** 3,109 ★
Groom your app's Ruby environment


 **prototype** 2,651 ★
Prototype JavaScript framework

 **sprockets** 1,824 ★
Rack-based asset packaging system

 **eco** 1,266 ★
Embedded CoffeeScript templates

 **ruby-build** 1,127 ★
Compile and install Ruby

Repositories contributed to

 **37signals/pow** 2,115 ★
Zero-configuration Rack server for Mac OS X

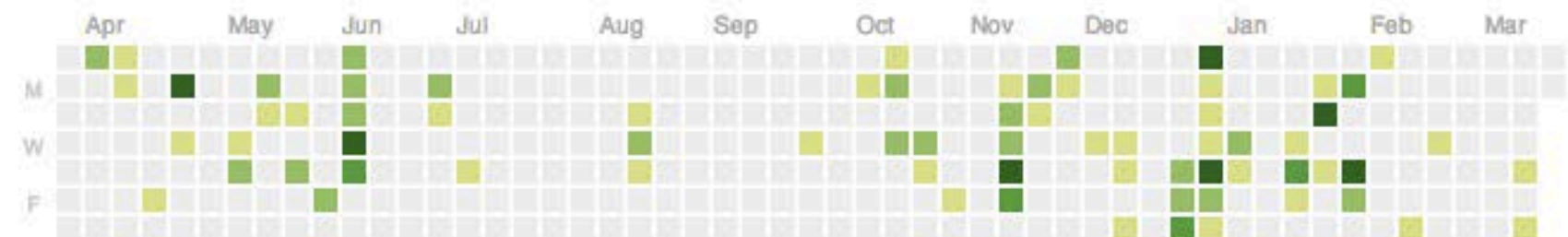
[prototypejs/prototypejs.github.com](https://github.com/prototypejs/prototypejs) 6 ★

 **documentcloud/underscore** 7,664 ★
JavaScript's utility _ belt

 rails/turbolinks 1,603 ★
Turbolinks makes following links in your we...

 [37signals/highrise-api](#) 44 ★
Official API documentation for Highrise

ssstephenson's Open Source Contributions





Sam Stephenson
sstephenson

37signals
Chicago
sstephenson@gmail.com
http://sstephenson.us/
Joined on Mar 08, 2008

1.4k followers
211 Starred
24 following

Organizations



Repositories

Public Activity

Unfollow



Filter sstephenson's repositories...

All Sources Forks Mirrors



rbenv

Simple Ruby version management

Last updated a day ago

Shell ★ 2,652 159



ruby-build

Compile and install Ruby

Last updated 2 days ago

Shell ★ 955 162



sprockets

Rack-based asset packaging system

Last updated 4 days ago

Ruby ★ 1,699 200



kinect

Kinect playground

Last updated 18 days ago

C ★ 85 9



bats

Bash Automated Testing System

Last updated a month ago

Shell ★ 129 8



ruby-build-download-mirror

Last updated a month ago

★ 1 0



prototype

Prototype JavaScript framework

Last updated a month ago

JavaScript ★ 2,541 327



stitch

Stitch your CommonJS modules together for the browser

Last updated a month ago

CoffeeScript ★ 607 66

Public Activity



sstephenson opened **issue 1** on **josh/nack** 2 days ago

Fire an event when an app fails to boot



sstephenson opened **pull request 2** on **skampl/ndns** 2 days ago

Add package.json

1 commit with 14 additions and 0 deletions



sstephenson pushed to master at **sstephenson/ndns** 2 days ago

[9be5368](#) Add package.json



sstephenson forked **skampl/ndns** 2 days ago

Forked repository is at [sstephenson/ndns](#)



sstephenson created **gist: 771090** 3 days ago

```
$ sudo su - # mkdir /etc/resolver # cat > /etc/resolver/test
```



sstephenson started watching **jamis/csmazes** 5 days ago

csmazes's description:

Maze algorithms implemented in CoffeeScript, with an eye toward demonstrating how the algorithms work by animating them.

Network view

👤 sstephenson / stitch

👁 Watch

🍴 Fork

👁 418

👍 41

Code

Network

Pull Requests 7

Issues 21

Stats & Graphs

Graph

Members

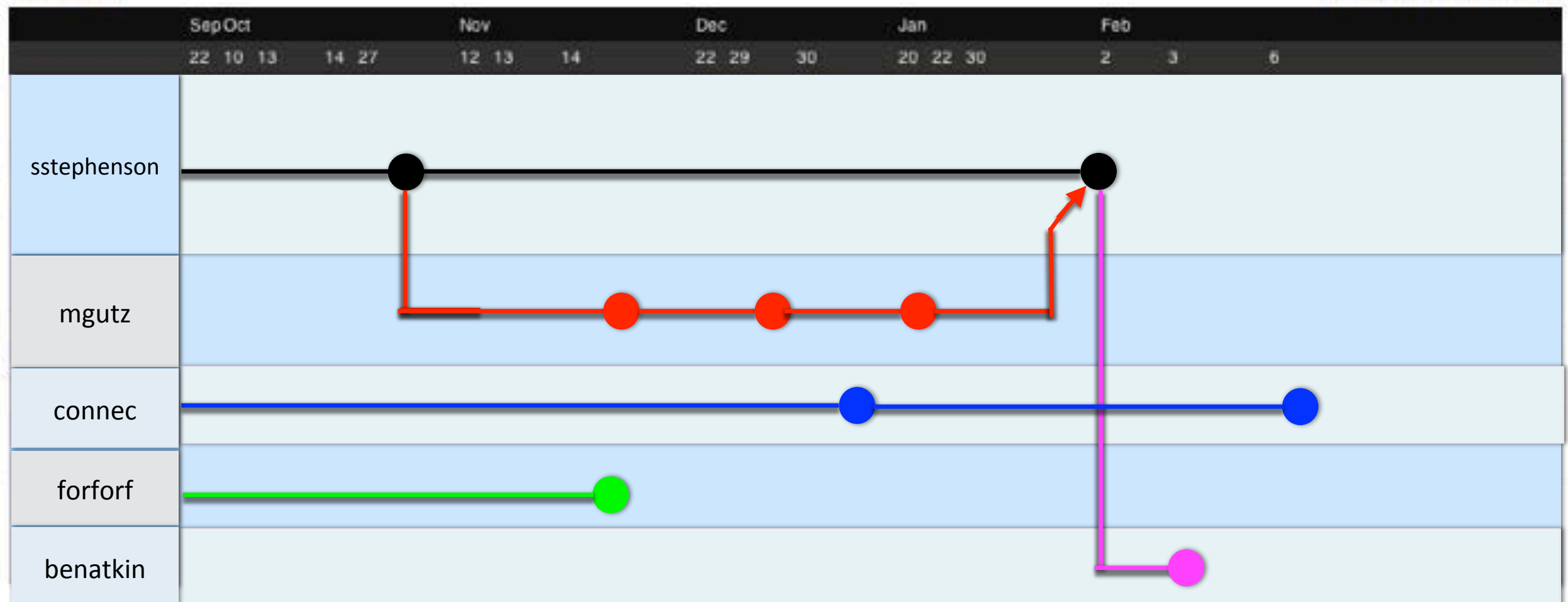
The stitch network graph

Keyboard shortcuts available 

All branches in the network using sstephenson/stitch as the reference point. [Read our blog post about how it works.](#)

[Show Help](#)

Last updated: 7 days ago



Qualitative Methodology

Semi-structured interviews w/ 50 GitHub members

- Peripheral and heavy users (project with > 80 watchers)
- OSS hobbyists and paid contributors

Focused on recent site usage, project management, and social activity

Open coded their responses to look at how transparent information influenced dependency management

Coordination in a Transparent Open Collaboration Environment

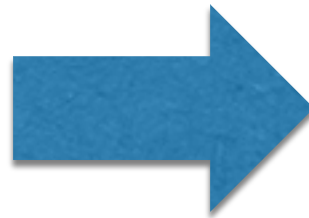
- Temporal process where projects are constantly in motion
- Information and accountability
 - Key decision points or major changes were immediately and broadly visible
 - Audience motivated expressive action
- Transparency allowed members to more readily view these changes and find right instance / moment to coordinate their work

Pre-coordination behaviors

- Lots of activity happens even before collaboration – and its precisely because of the potential for anyone to engage with you at any point
 - Anyone can join and leave at any time
 - Fluidity in open environment (Faraj & Majachzrak)
- Standardization & pre-coordination behaviors help manage fluidity

Pre-coordination

Technology
Public copies and edits
Feeds
Network view



Information seeking practices

Scouting

Monitoring

Scouting

Developers used aggregated traces of project activity to assess credibility and future potential

“Are there changes going in? How recent are changes? Like, weeks, months, years? Another kind of metric is what’s the mix of [contributors]. Is it all one person? Is it all people in a single organization? Is it a wide group of people? The wider the net there’s more likelihood any issue that I might run into has already been identified. ” (P22)

Monitoring

👤 sstephenson / stitch

👁 Watch

🍴 Fork

👁 418

🍴 41

Code

Network

Pull Requests 7

Issues 21

Stats & Graphs

Graph

Members

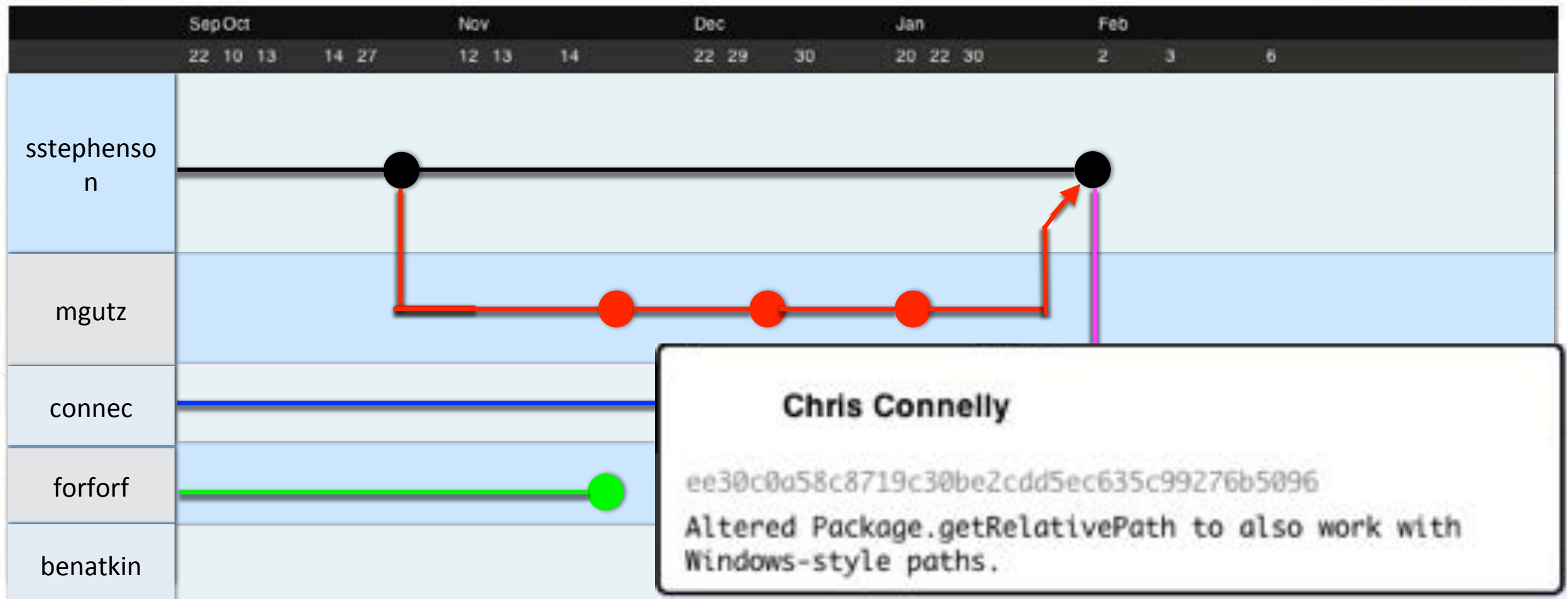
The stitch network graph

Keyboard shortcuts available 

All branches in the network using sstephenson/stitch as the reference point. [Read our blog post about how it works.](#)

[Show Help](#)

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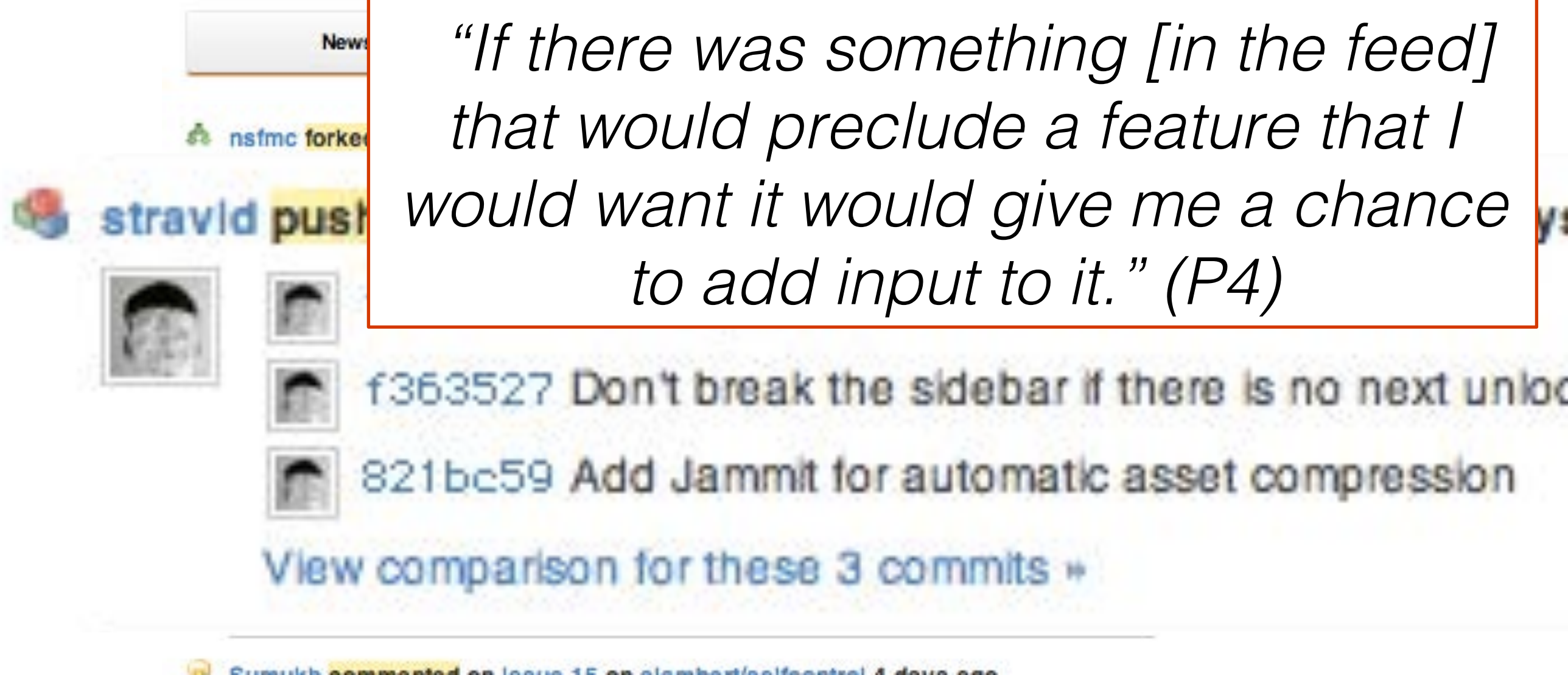
Assessing user needs

“I saw somebody trying to use [My Project] with the Rails master. I'm like well crap I don't know if it works with Rails master so let me check. So that type of stuff has been useful just to get a sense of the kinds of things people might like to see” (P9)

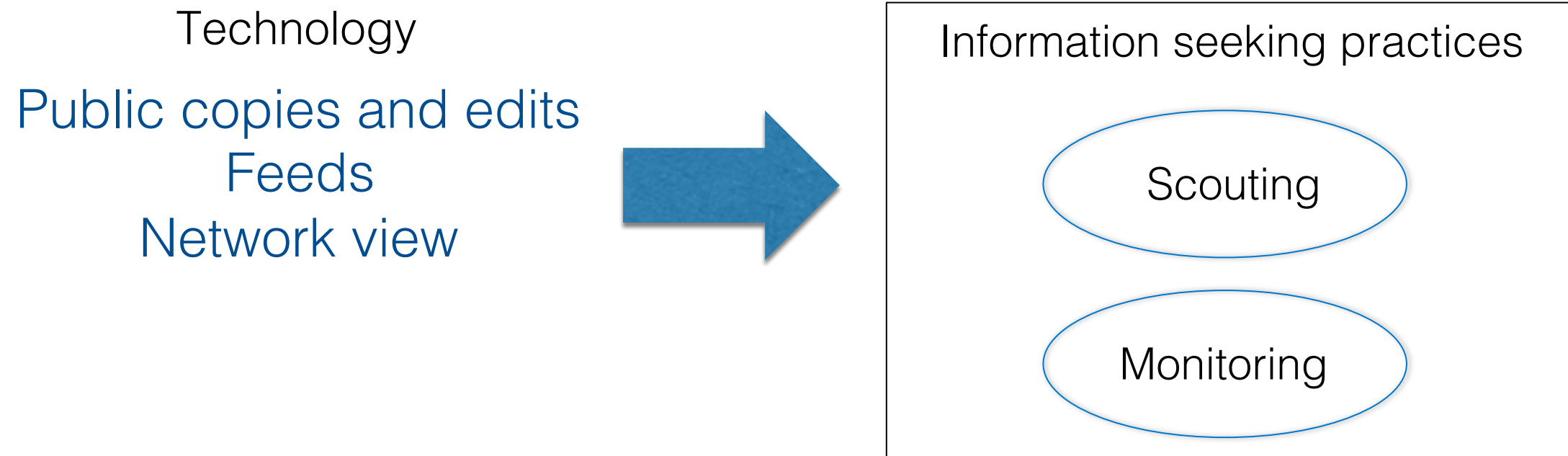
Watching dependencies

Developers watched dependent projects to notice potentially problematic changes in the feed

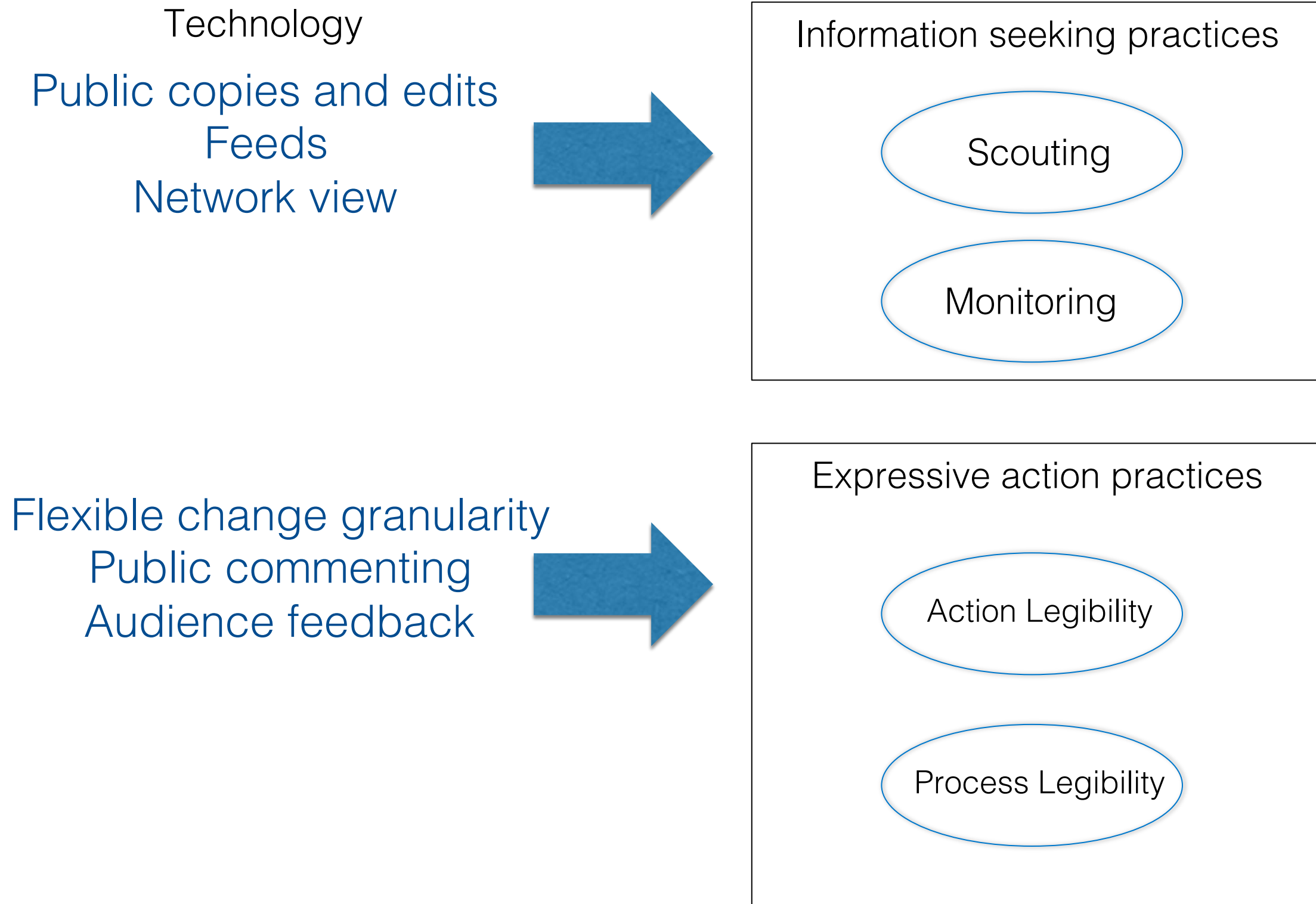
“If there was something [in the feed] that would preclude a feature that I would want it would give me a chance to add input to it.” (P4)



Pre-coordination



Pre-coordination



Expressive action and audience



'Being onstage'



Commit level broadcasts create detailed
process visibility

Code

Network

Pull Requests 3

Issues 107

Wiki 77

Stats & Graphs

Files

Commits

Branches 3

Tags 27

Downloads 31

Avoid test fa



ginatrapani

Showing 1 changed fil



tests/Test0f



tests/Test0f

```

... 1877
... 1878
... 1879
... 1880
... 1881

```

```

1880 +
1881 +
1882 +
1883 +
1884 +
1885 +
1882 1886
1883 1887
1884 1888

```

“I try and make sure my commit messages are snappy and my code is clean because I know that a lot of people are watching. ...It’s like being on stage, you don’t want to mess up, you’re giving it your best, you’ve got your Hollywood smile” (P4)

Browse code

75b00b975fe3fc0b

8

View file @ 94acccf

```

* The following two assertions evaluate differently depending on whether your MySQL server supports
* SET timezone statement in PDO::connect function
*/
//$this->assertTrue(strtotime($post->created_at) >= strtotime($_GET['from']));
//$this->assertTrue(strtotime($post->created_at) < strtotime($_GET['until']));

```

}

// test order_by

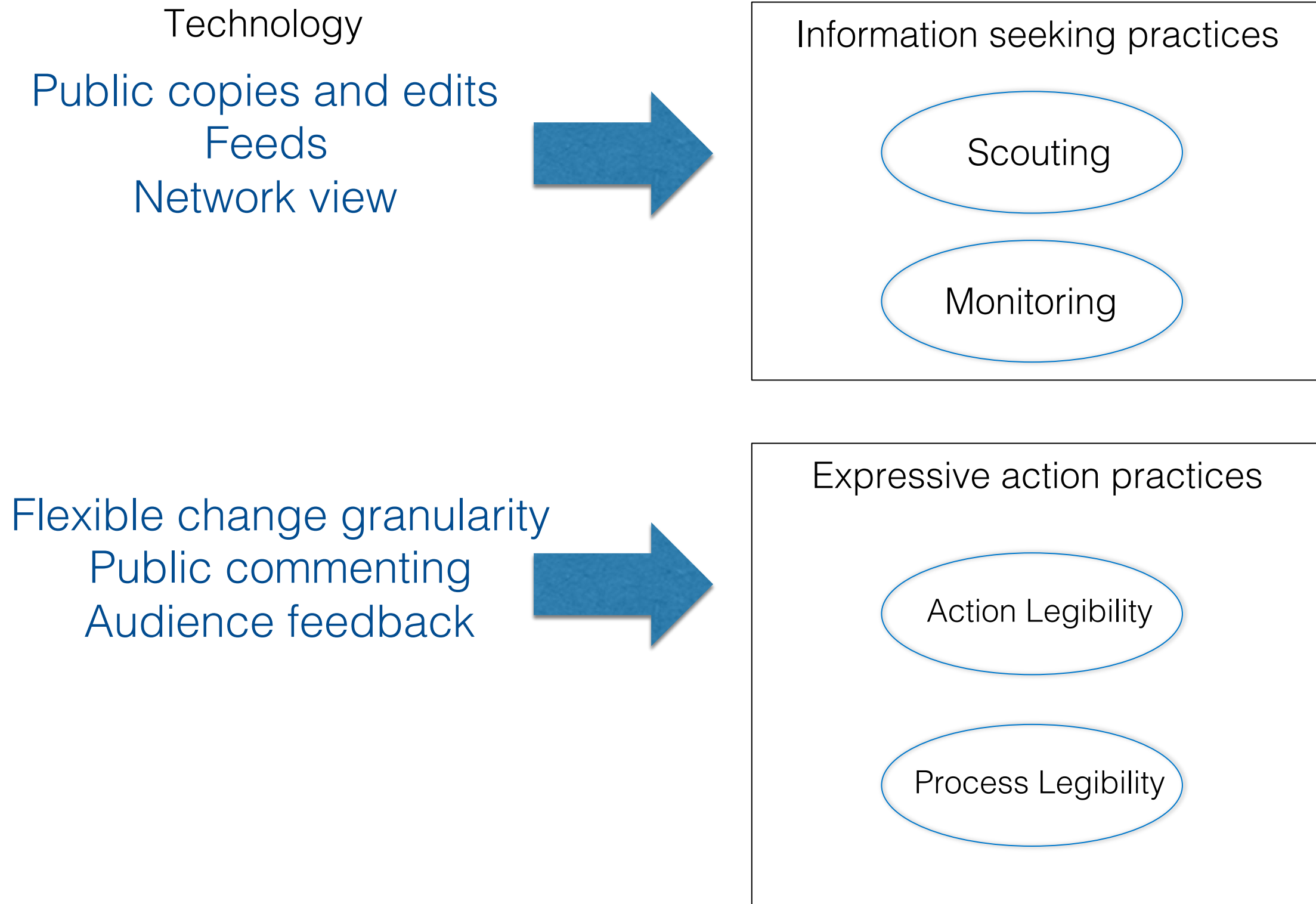
'Being onstage'



Norm that commits should be granular and
'tell a story'

Process visibility created desire to
communicate why you were doing what you
doing with the sequence of actions

Pre-coordination



Common language of contribution

Fixed structure supported by the infrastructure

- How one changes the code
- Talks about the code
- Thinks about changing the code

Within that people do their work to make things understandable

You can see the physical structure, and the way people use it is to use the language provided

Practices around

Project management and participation

(Dabbish, Stuart, Tsay, & Herbsleb, 2012)

Change management and acceptance

(Tsay, Dabbish, & Herbsleb, 2012; 2014)

Impression formation

(Marlow & Dabbish, 2013; Marlow, Dabbish, & Herbsleb, 2013)

Collaboration
platforms

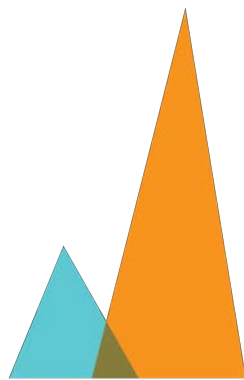
Transparency in open collaboration environments

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EXPERIENCE
LAB

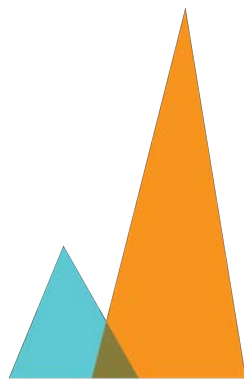


Carnegie Mellon University
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The Future of ~~Collaboration~~ ~~Work?~~ ~~platforms~~ Transparency in open collaboration environments

Laura Dabbish
Associate Professor
Human-Computer Interaction Institute & Heinz College
Carnegie Mellon University



CONNECTED
EXPERIENCE
LAB



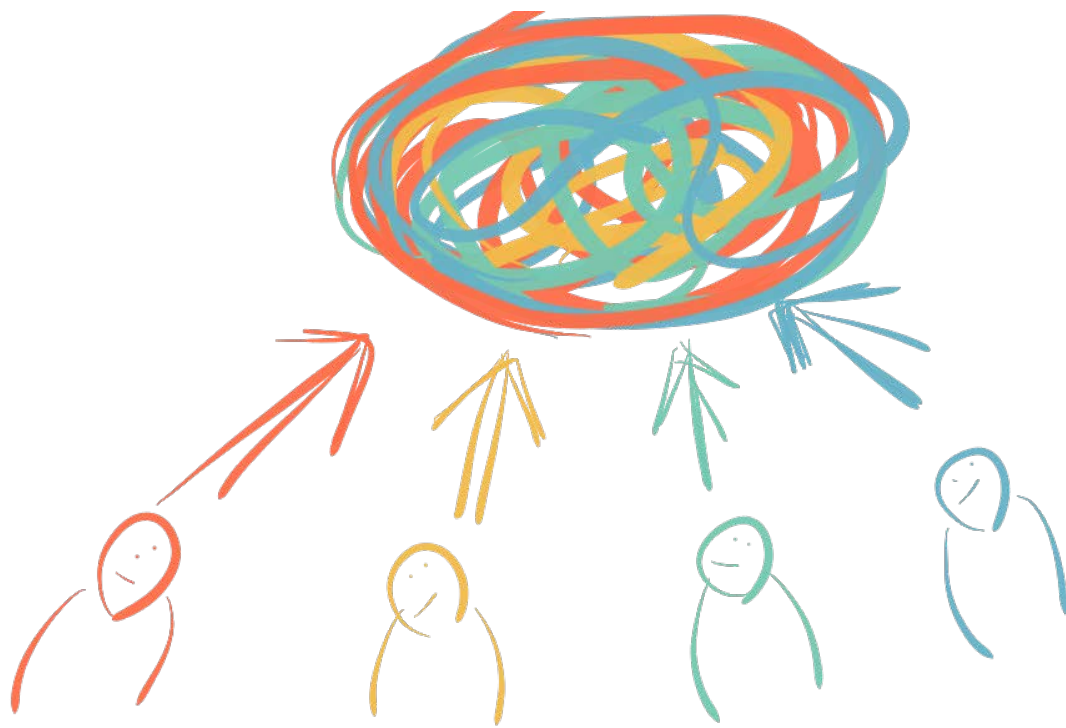
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Is peer production the future of work?

Collective

vs

Crowd



Alternative futures . . .

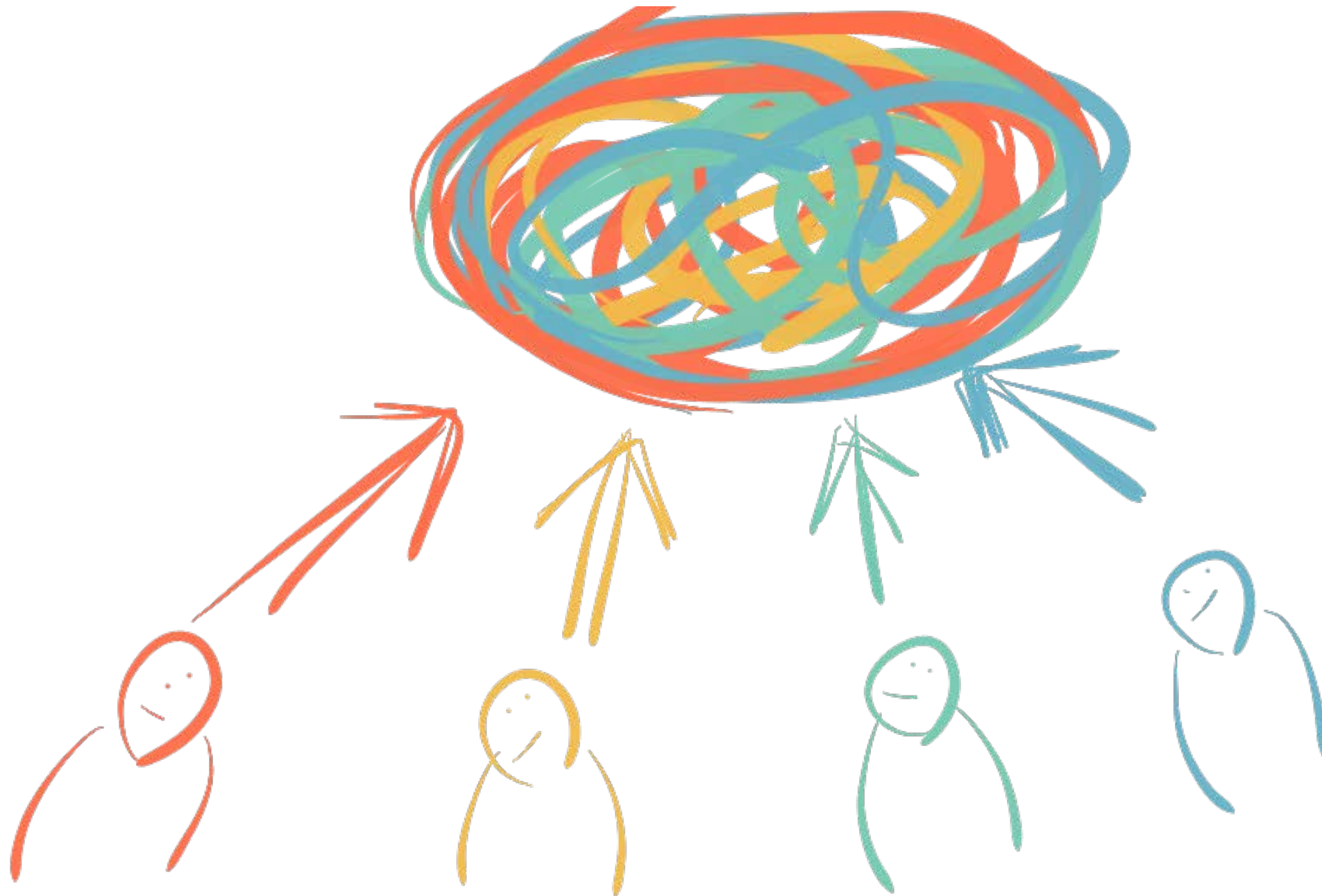
Post- currency collective



"Star Trek 08-poster" by Source. Licensed under Fair use via Wikipedia - https://en.wikipedia.org/wiki/File:Star_Trek_08-poster.png#/media/File:Star_Trek_08-poster.png

Open collaboration

Multiple individuals contributing effort towards a collective goal

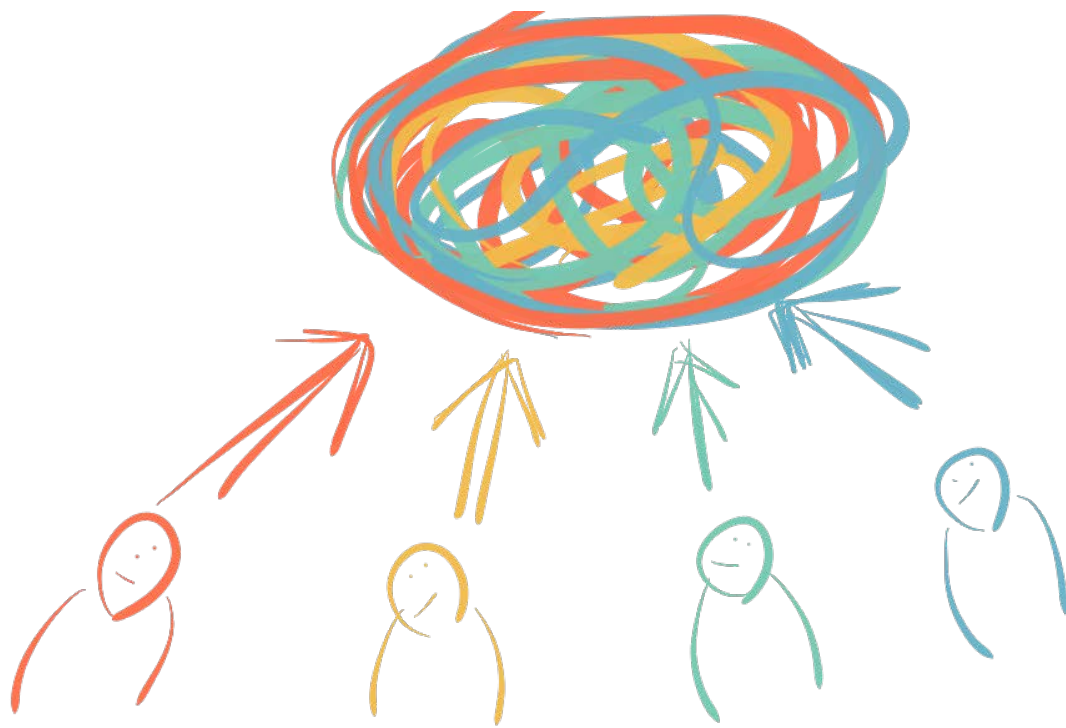


Is peer production the future of work?

Collective

vs

Crowd





Computational organizations



1984



Crowdsourcing: workers as
computation devices

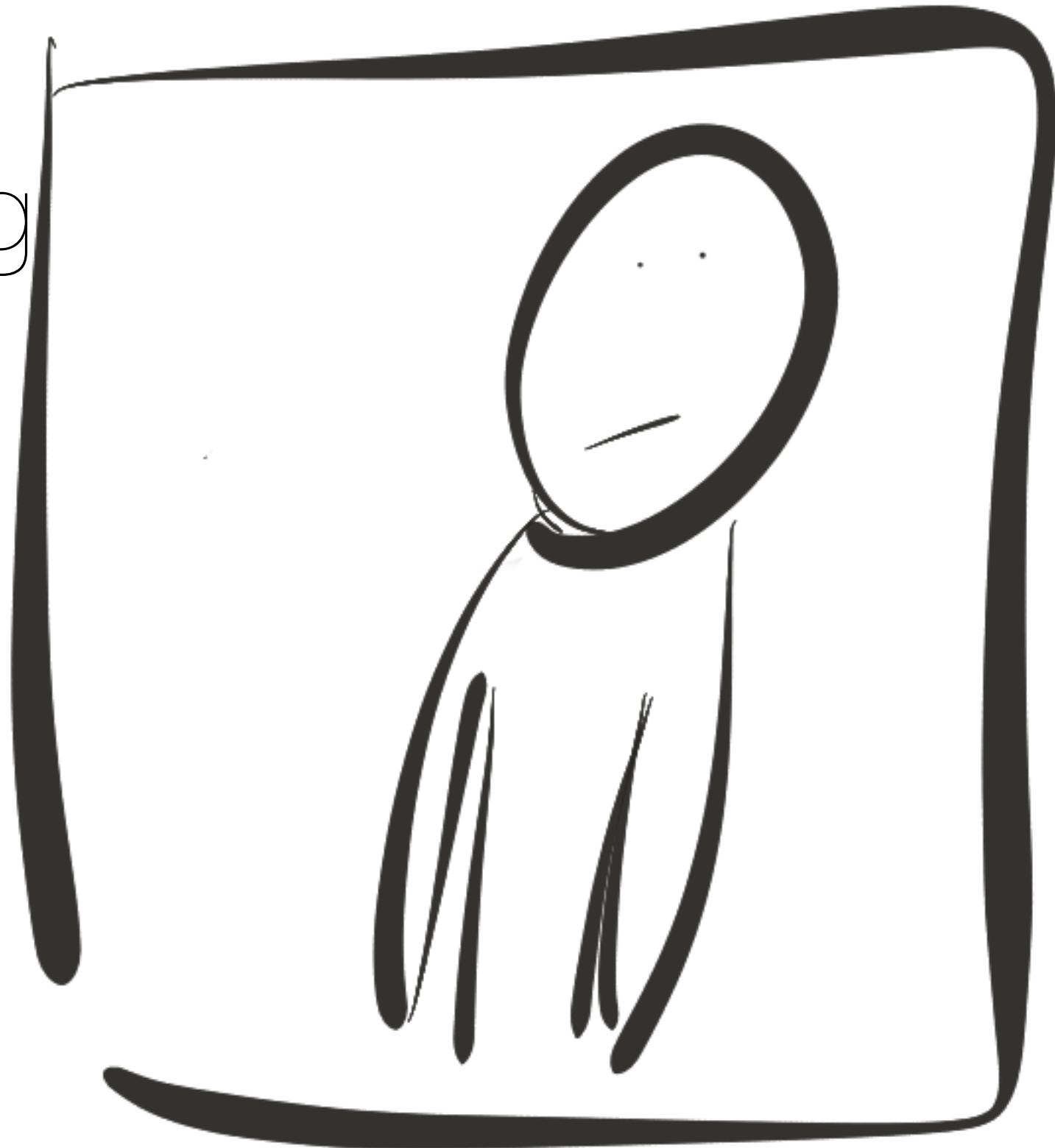
Crowdsourcing: workers as computation devices

- Humans training algorithms
- Contributors as computation devices carrying out tasks computers are learning to do
- Power centralized in platform that mediates connection between workers and requesters
- Little transparency of work assignment, evaluation, workflow
- Monitoring and surveillance

As soon as Winston had dealt with each of the messages, he clipped his speakwritten corrections to the appropriate copy of 'The Times' and pushed them into the pneumatic tube. Then, with a movement which was as nearly as possible unconscious, he crumpled up the original message and any notes that he himself had made, and dropped them into the memory hole to be devoured by the flames.



Crowdworkers get
few cues about who
else is around and
what they are doing



The crowdsourced workplace

Your Account

HITs

Qualifications

179,391 HITs
available now

All HITs | HITs Available To You | HITs Assigned To You

Find HITs

containing

that pay at least \$

0.00

☐ for which you are qualified

☐ require Master Qualification

GO

All HITs

1-10 of 1053 Results

Sort by: HITs Available (most first) GO!

Show all details | Hide all details

1 2 3 4 5 > Next >> Last

find email for given person via web search (~60sec) approved regularly			View a HIT in this group
Requester: Sebastian Darr	HIT Expiration Date: Aug 8, 2012 (4 weeks 1 day)	Reward: \$0.02	
	Time Allotted: 30 minutes	HITs Available: 46340	
3 questions about your city UNDER 230,000 population only = \$0.17 bonus!*** - qualification instantly granted (no wait)			View a HIT in this group
Requester: WSOVC.COM	HIT Expiration Date: Aug 8, 2012 (4 weeks 1 day)	Reward: \$0.00	
	Time Allotted: 2 hours	HITs Available: 23517	
Inv_B_2			View a HIT in this group
Requester: rohzi0d	HIT Expiration Date: Jul 30, 2012 (2 weeks 6 days)	Reward: \$0.00	
	Time Allotted: 48 minutes	HITs Available: 15517	
Give Your Opinion - Simple and Quick! (US)			View a HIT in this group
Requester: CrowdSource	HIT Expiration Date: Jul 9, 2013 (52 weeks)	Reward: \$0.16	
	Time Allotted: 32 minutes	HITs Available: 11947	
Determine the Photo Styles of 5 Images			View a HIT in this group
Requester: Tagasauris	HIT Expiration Date: Aug 8, 2012 (4 weeks 1 day)	Reward: \$0.02	
	Time Allotted: 60 minutes	HITs Available: 9846	
Tag 5 Images			View a HIT in this group

[All HITS](#) | [HITS Available To You](#) | [HITS Assigned To You](#)

Find containing

that pay at least \$

☐ for which you are qualified
☐ require Master Qualification

GO

Timer: 00:00:43 of 60 minutes

Finished with this HIT?

Let someone else do it?

Submit HIT

Return HIT

☐ Automatically accept the next HIT

Total Earned: \$
Total HITS Submitted: 1

Tag 5 Images

Requester: Tagasauris

Qualifications Required: HIT approval rate (%) is not less than 95, Location is US

Reward: \$0.04 per HIT

HITS Available: 7336

Duration: 60 minutes

1 OF 5

Tag 5 Images

Accurately Tag 5 Images with Main
Subjects

Add

DASHBOARD

FEEDBACK

INSTRUCTIONS

Caption

[Collapsed building.]





Zooniverse



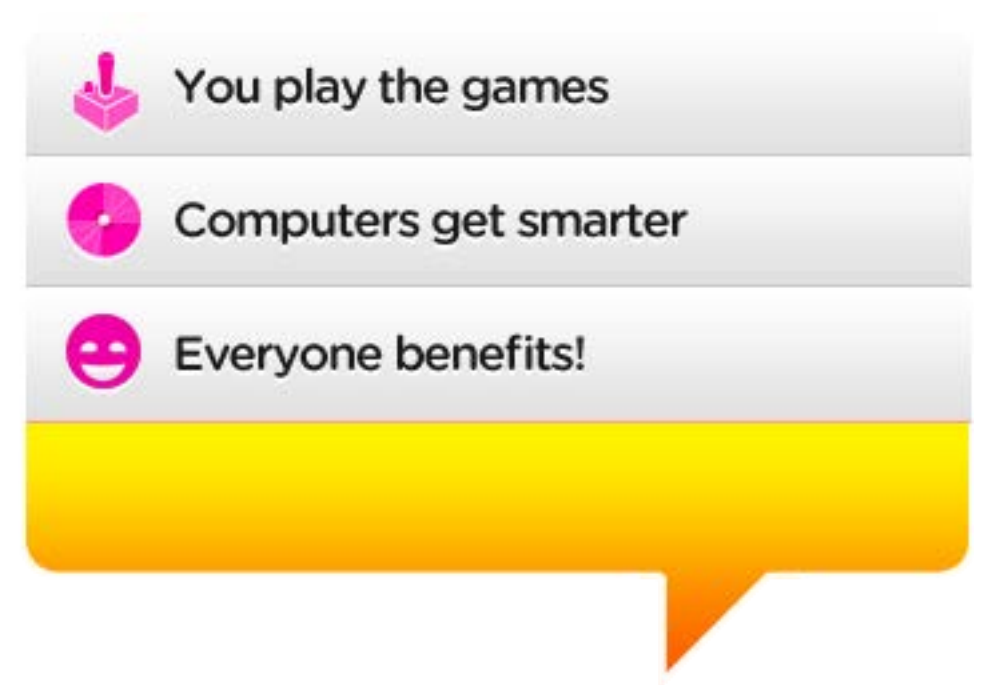
IceHunters

Research directions

- Scaling up the crowd [Kittur et al]
- Moving to more complex tasks
- Growing experts in the crowd
- Crowd innovation [Dow et al]
- Creating quick response teams within the crowd



von Ahn & Dabbish, 2004



von Ahn & Dabbish, 2008

-  Laura Dabbish
-  Edit Profile
- FAVORITES
-  News Feed
-  Messages 15
-  Events 31
-  Saved 6
- PAGES
-  CMU HCII 2
-  Pages Feed 20+
-  Like Pages
-  Create Ad
-  Create Page
- GROUPS
-  Researchers of the ... 8
-  CoEx Lab @ CMU 1
-  New Groups 3
-  Create Group
- DEVELOPER
-  Manage Apps
-  Insights
-  Tetris® for Researc... 3
- APPS
-  Games 1
-  On This Day
-  Steel Curtain

 Update Status

 Add Photos/Video

 Create Photo Album

 What's on your mind?

 Friends


Post


**Pernille Bjorn** added 2 new photos — with Micka Berkmann Ag and 2 others at City Hall Square, Copenhagen.
October 29 at 2:10pm · København, Denmark · 

Stop besparelserne på uddannelserne - demonstration fra rådhuspladsen til Christiansborg






[See Translation](#)


YOUR PAGES 2


 4 event invites


 Alex Arellano's birthday is today


TRENDING





 **The Wieners Circle:** Restaurant Staff Converts Store Into McDowell's Based on 'Coming to America' Film

 **Bucharest:** At Least 26 Concertgoers Killed in Explosion and Fire at Romanian Nightclub


 **US Budget Deal:** Senate Passes 2-Year Bipartisan Deal, Sends Bill to President Obama

 See More

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the revolutionary slipper
mahabis.com
available to buy now, get yours today!



 **Karla Pineiro** via We Like L.A. And another one...

 **Bo Begole** likes May Bakken's photo.

 **Sue Fussell** likes Tedeschi Trucks Band's link.

 Jenn Thom

 Yana Led

 Jeremy Birnholtz

 Irina Shklovski

 Duyen Mary Nguyen

 Luis von Ahn

 Gueorgi Kossinets

 George Loewenstein

 Mike Massimi

 Raquel Santiago

GROUP CONVERSATIONS

 Andrea, Yana, Laura

 CoEx Lab

 Turn on chat to see who's available.

Search  



Tracking and sensing capabilities

Optimizing workers – personal productivity

Optimizing teams & relationships

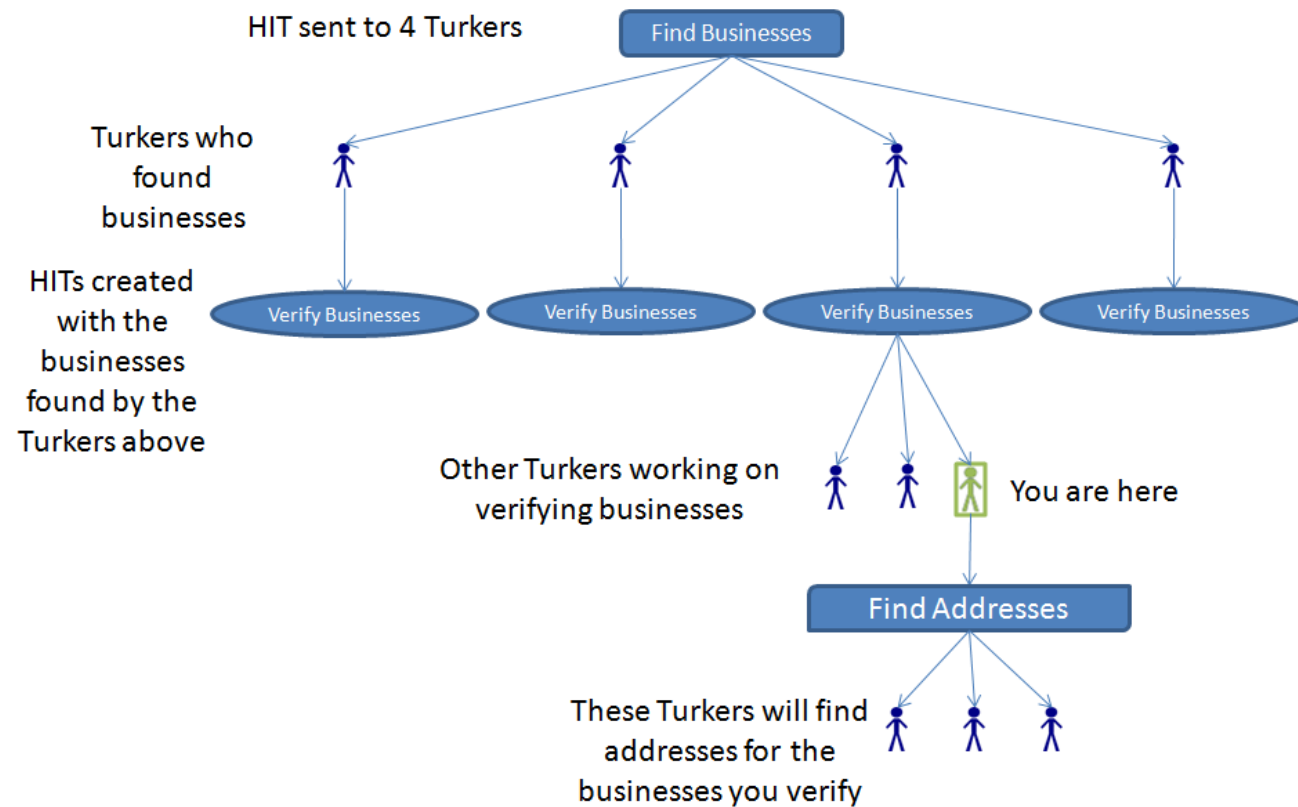
Presenting new privacy challenges

Leading to automated future: algorithmic design,
architecture, self driving cars

Algorithmic management

Lee, Metsky, Kusbit, & Dabbish (2015)



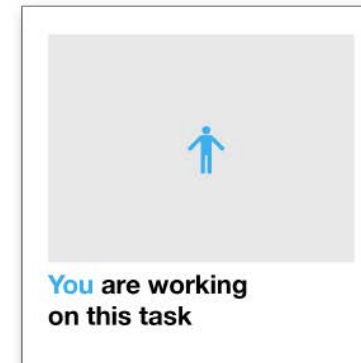


Workflow

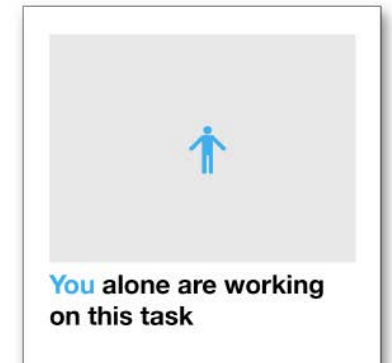
Kinnaird, Dabbish & Kiesler, 2013

Control Condition:

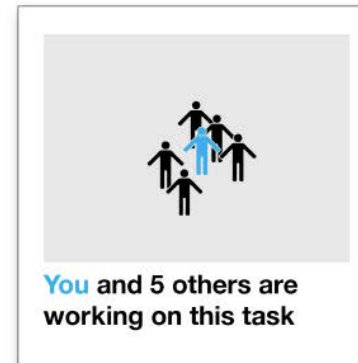
No co-worker information



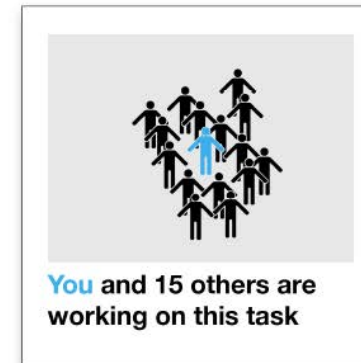
No co-workers



"Alone"



5 co-workers



15 co-workers

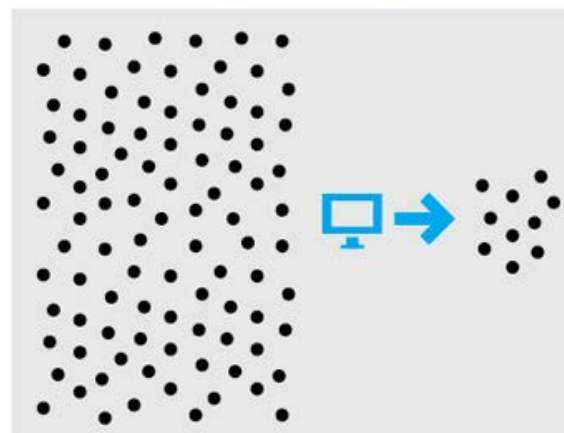


50 co-workers

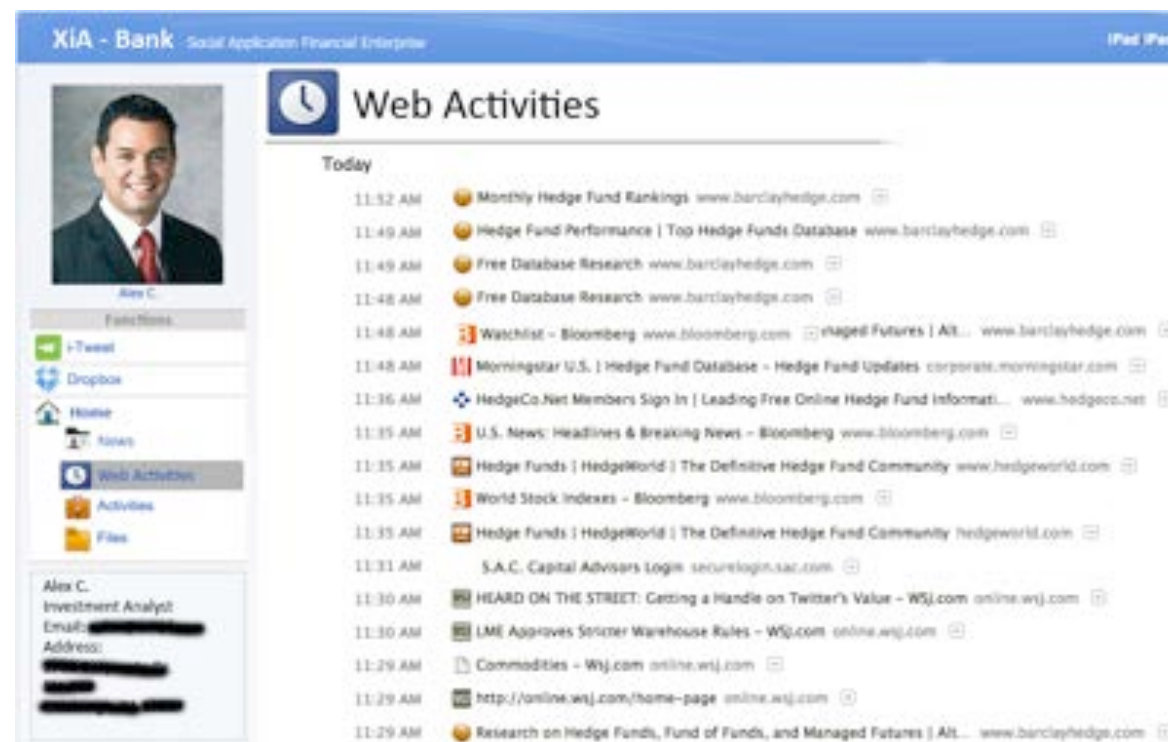
Work group size

Kinnaird, Dabbish, Faste, & Kiesler, 2013

Results will be reviewed by a computer:



Evaluator identity



Mere presence of activity history increases credibility

Nugyen, Dabbish, & Kiesler 2015

Work history for **User 650**

Image	Correct text	Work from User 650	Amount of text typed	Evaluation of work
5	SWEET BASIL & La FILIPINIANA	SWEET BASIL AND L. FILIPINIANA	100%	MINOR EDIT: Typos or incorrect letters
7	GMITER	GMITER	100%	ACCEPT
8	RESERVED PARKING THE RIGHT ONE UNAUTHORIZED VEHICLES TOWED AT OWNER'S EXPENSE	THE RIGHT ONE	16%	REJECT: More than 50% of text is missing
10	BENKOVITZ SEAFOODS	BENKOVITZ SEA FOODS	100%	ACCEPT
13	SUPER DOLLAR STORE WE ARE OPEN DURING DEMOLITION	SUPER DOLLAR STORE	39%	REJECT: More than 50% of text is missing
15	DON'T BE A LITTER BUG HELP KEEP EDGEWOOD CLEAN	DON'T BE A LITTERBUG	44%	REJECT: More than 50% of text is missing

Work history for **User 640**



Presentation affects perceived competence

Marlow & Dabbish, 2015; Marlow, Dabbish, & Forlizzi, 2015

What is the role of the network?

What networks are important?

- * Network of people and tasks

Who gets to know the network?

How does knowing the network help? When do you need network information?

Do networks facilitate performance in the same way in these different systems?

Implications

We can't design online work environments from hunches or guesswork. We need to test.

We need to consider the impacts of these systems. Whose interests should they serve? How do we decide?

What can open collaboration learn from crowdsourcing and vice versa?

Sociotechnical view of these systems: social effects of and interactions around platforms.

collaborators



**Colleen
Stuart**



**Jim
Herbsleb**



**Jason
Tsay**



**Jennifer
Marlow**



**Min Kyung
Lee**



**Mary
Nguyen**



**Peter
Kinnaird**



**Sara
Kiesler**



**Haakon
Faste**



**Luis
von Ahn**

Thank you!

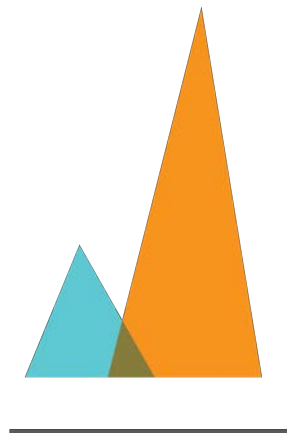
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