

A photograph of a sailboat's deck at sunset. The sun is low on the horizon, casting a warm glow over the water and the surrounding forested hills. Laundry is hanging from a line on the left side of the frame. The boat's mast and rigging are visible in the foreground.

Margaret-Anne Storey  
@margaretstorey

# The Elusive Nature of Software Documentation

And Why Understanding How  
***Knowledge*** Flows Matters



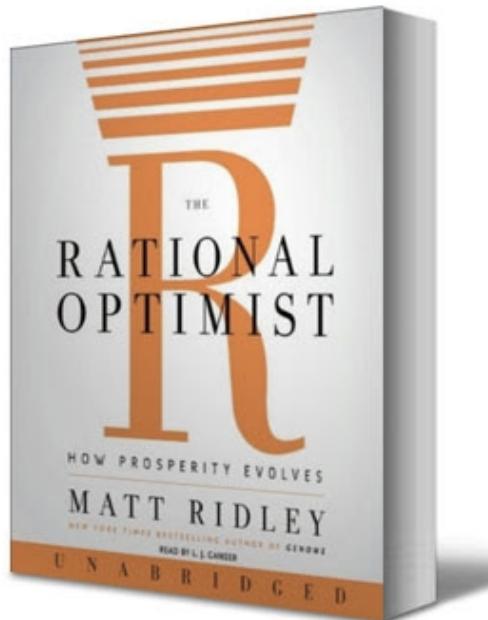
What happens when  
documentation is elusive!

*“Simple?*

**Yet, not a single person on the face of this earth knows how to make me”**



“I, Pencil”, An essay by Leonard Read, 1958



*“At some point, human intelligence became collective and cumulative in a way that happened to no other animal”*

— [Matt Ridley, The Rational Optimist](#)



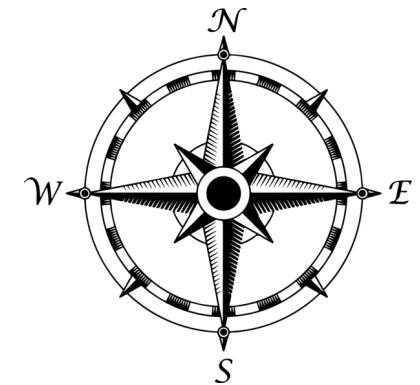
# *The role of knowledge in software development*

- **Insights** are more important assets than program text
- Designers need to share **theories** of the problem and solution domain, not the design of the code
- Much of these insights are “**tacit**” knowledge
- No one person or team can understand everything about a technology

*"Programming as theory building", Peter Naur, 1985.*

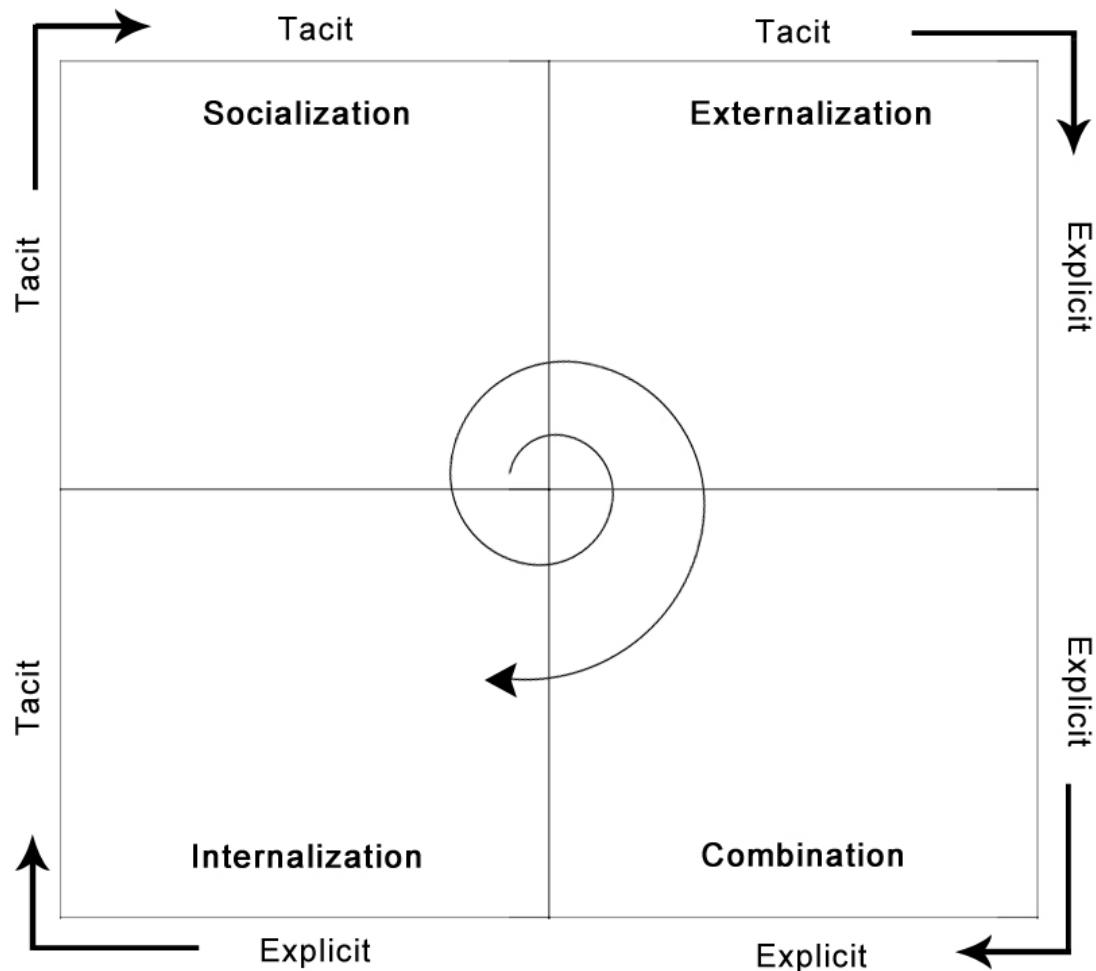
# *Itinerary...*

- **How development knowledge** flows and how it is created
- **Challenges** faced in knowledge flow  
(*externalization, communication, onboarding*)
- **Goals** for improving knowledge flow  
(*documentation, creativity, learning*)
- **Enablers**  
(*automation, culture, rewards, knowledge routes, specialization*)
- **An idea!**



*"We can know more  
than we can tell"*  
Polanyi, 1966

## *Knowledge creation model:*



[Nonaka, Ikujiro; Takeuchi, Hirotaka](#) (1995), [The knowledge creating company: how Japanese companies create the dynamics of innovation](#),  
New York: Oxford University Press, p. 284, [ISBN 978-0-19-509269-1](#)

# *Communities of practice [Wenger]*

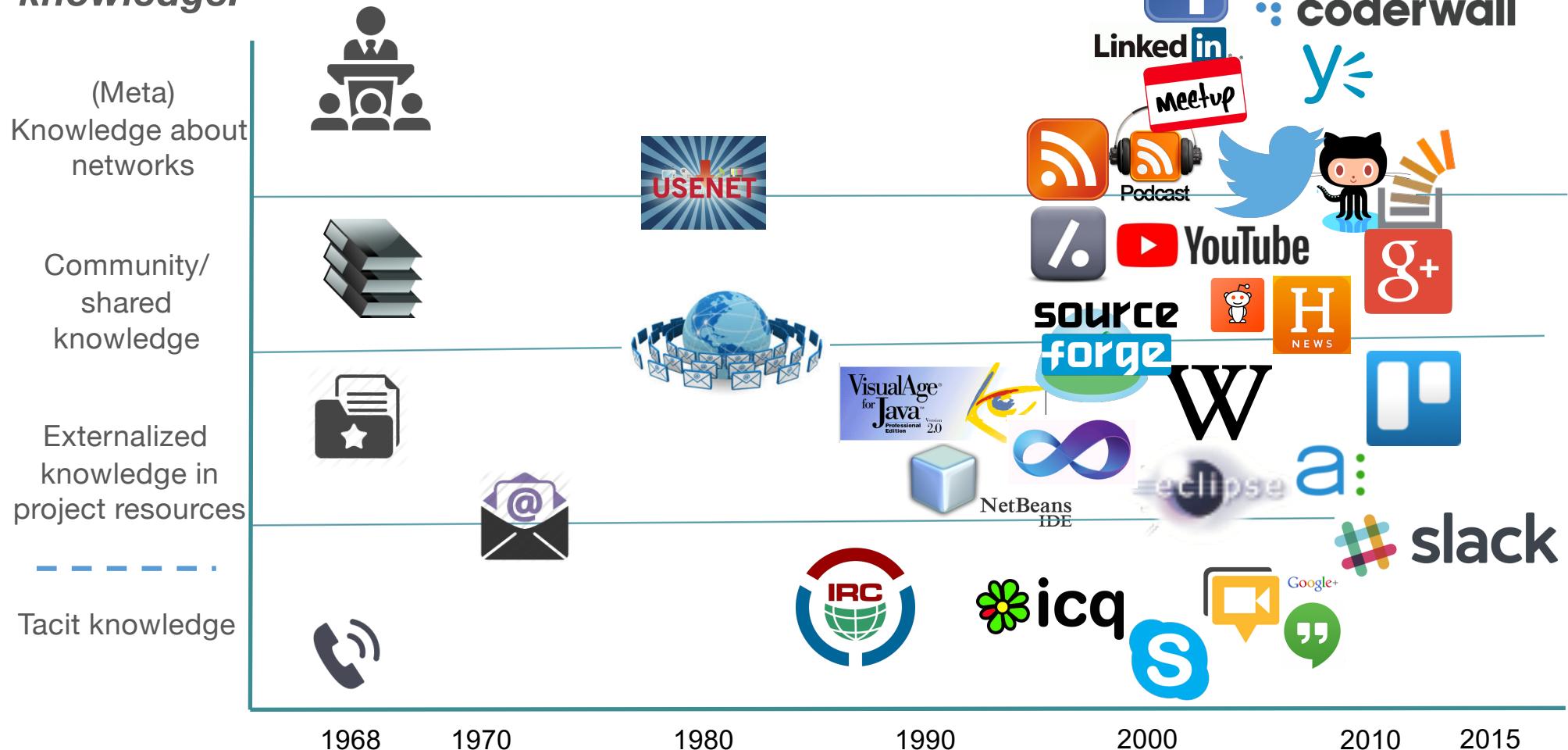
## ***Three modes of social learning:***

- **Engagement** (talking to others, producing artifacts)
- **Imagination/reflection** (of what is, what could be)
- **Alignment** (of local activities with other processes)

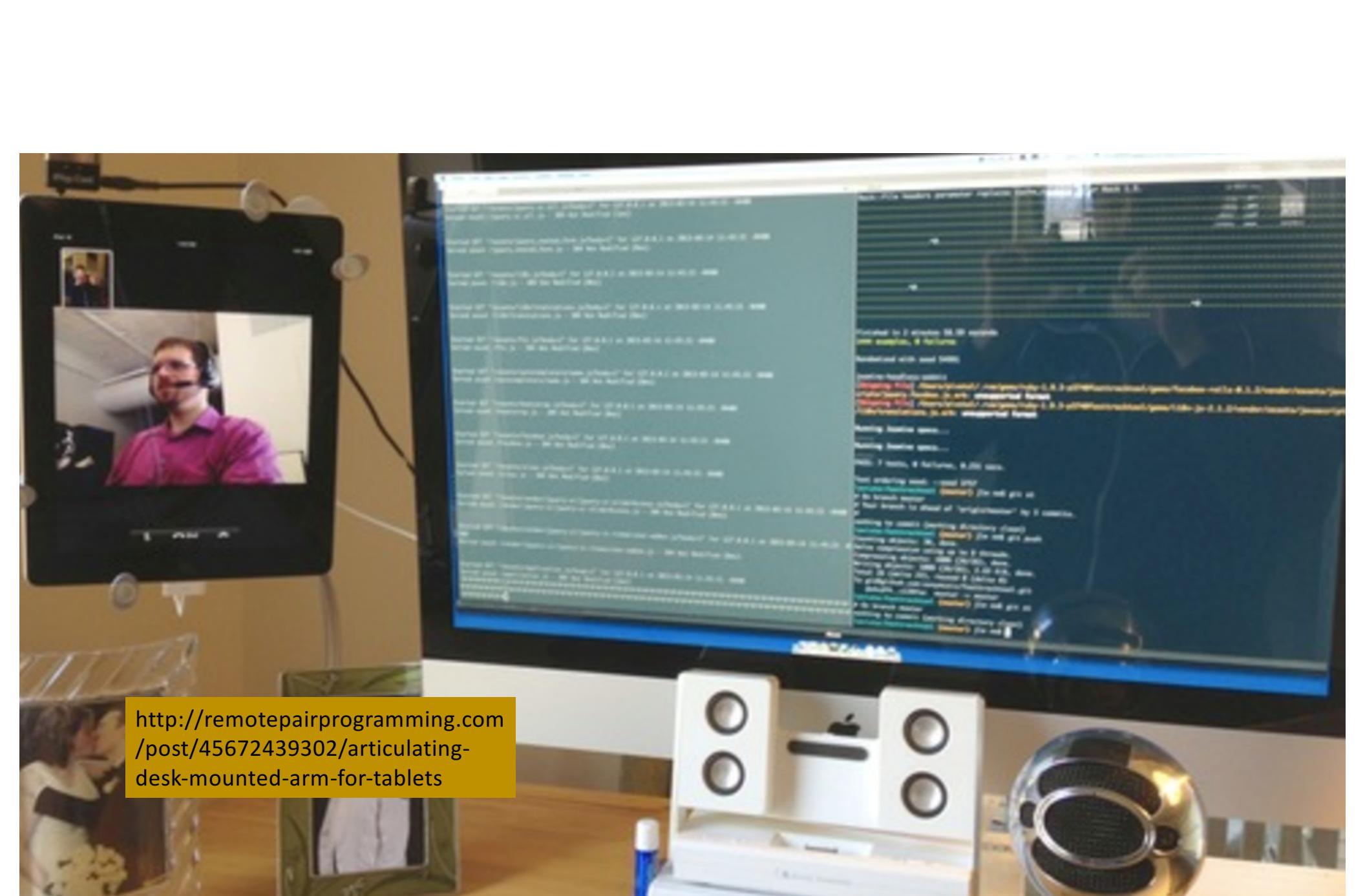
*How effectively organizations engage in social learning depends on how develop social capital and their repertoire of tools and resources*

Wenger, Etienne. *Communities of practice: Learning, meaning, and identity.* Cambridge university press, 1998.

## *Types of developer knowledge:*



M. Storey et al., The (R)evolution of Social Media in Software Engineering, ICSE Future of Software Engineering Track 2014.



<http://remoteairprogramming.com/post/45672439302/articulating-desk-mounted-arm-for-tablets>

"Commenting code is like explaining a bad joke."



```
1  <?php bloginfo( 'charset' );
2  <meta name="viewport" content="width=device-width, initial-scale=1">
3  <?php wp_title( '|', true, 'right' );
4  <link rel="profile" href="http://gmpg.org/xfn/11" type="text/html">
5  <link rel="pingback" href="<?php bloginfo('pingback_url' );
6  <?php get_header(); ?>
7  <?php get_header(); ?>
8  <?php wp_head(); ?>
9  <?php wp_body_class(); ?>
10 <?php wp_footer(); ?>
11 <?php get_footer(); ?>
12 <?php wp_footer(); ?>
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31 <?php wp_footer(); ?>
```

## Explore GitHub

# Projects with great wikis

These projects all use GitHub Wikis to share documentation and helpful resources.

9 repositories 5 languages Last updated on Jan 31

Stars Language



d3 / d3

The D3 wiki is one of the most popular wikis on GitHub.

JavaScript 68,179 17,732 Updated a day ago



Netflix / Hystrix

The Hystrix wiki is incredibly thorough, with a clear overview, diagrams to explain the complexities of the problem it solves, navigation in the sidebar, and more.

Java 11,007 2,187 Updated 3 days ago



The guard wiki uses footers to link to all the resources a user might need.

Ruby 5,422 475 Updated on Jun 17



The Titan wiki uses images to call out important links.

Java 4,517 954 Updated on Feb 18



## Netflix / Hystrix

Code Issues 103 Pull requests 14 Projects 0 Wiki Insights

Watch 1,198 Star 11,007 Fork 2,187

### Home

Matt Jacobs edited this page on Jul 3 · 24 revisions



# HYSTRIX

DEFEND YOUR APP

1. What Is Hystrix?
2. What Is Hystrix For?
3. What Problem Does Hystrix Solve?
4. What Design Principles Underlie Hystrix?
5. How Does Hystrix Accomplish Its Goals?

### What Is Hystrix?

In a distributed environment, inevitably some of the many service dependencies will fail. Hystrix is a library that helps you control the interactions between these distributed services by adding latency tolerance and fault tolerance logic. Hystrix does this by isolating points of access between the services, stopping cascading failures across them, and providing fallback options, all of which improve your system's overall resiliency.

### History of Hystrix

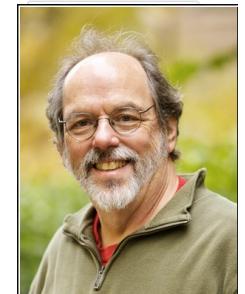
Hystrix evolved out of resilience engineering work that the Netflix API team began in 2011. In 2012, Hystrix continued to evolve and mature, and many teams within Netflix adopted it. Today tens of billions of thread-isolated, and hundreds of billions of semaphore-isolated calls are executed via Hystrix every day at Netflix. This has resulted in a dramatic improvement in uptime and resilience.

Pages 14

- Home
- Getting Started
- How it Works
- How To Use
- Operations
- Configuration
- Metrics
- Plugins
- Dashboard
- End-to-End Examples
- Migration Guide
- FAQ : General
- FAQ : Operational

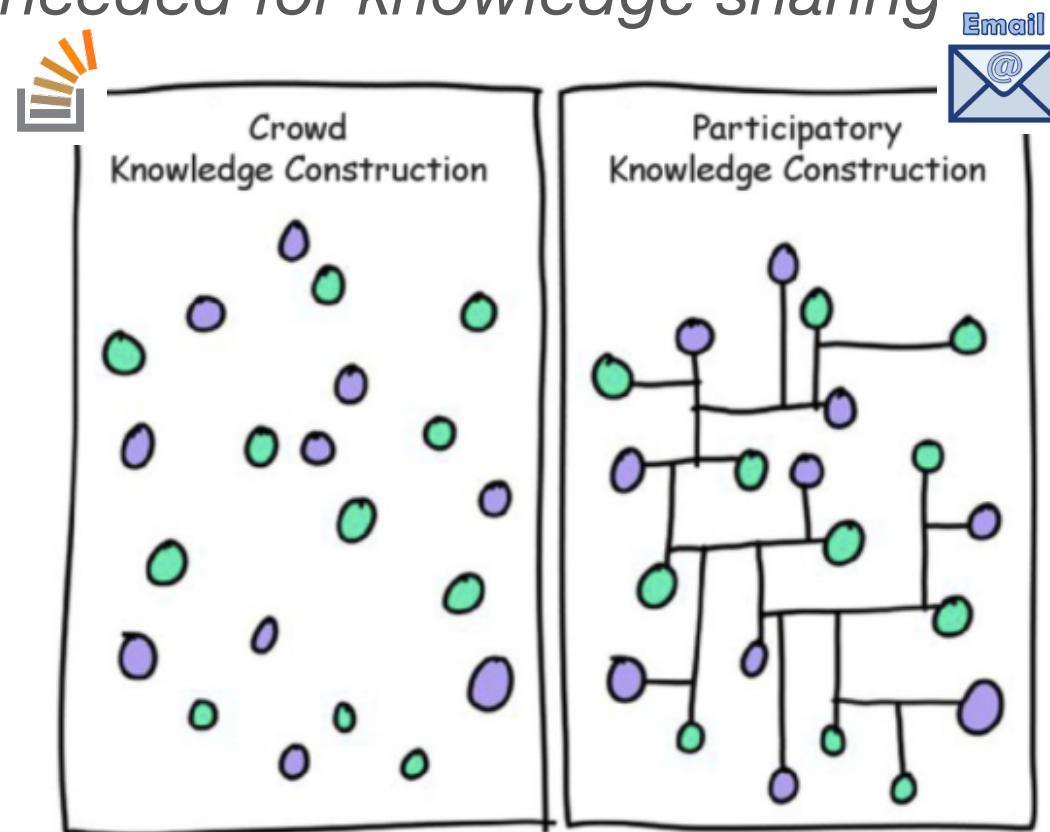
Clone this wiki locally

[https://github.com/Netflix/Hystrix/](https://github.com/Netflix/Hystrix)



## *Studying the R community – why email and Stack Overflow are both needed for knowledge sharing*

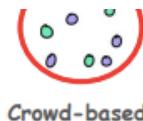
*"The best way to get the right answer on the Internet is not to ask a question, it's to post the wrong answer",  
Ward Cunningham*



[How the R community creates and curates knowledge: an extended study of stack overflow and mailing lists](#)

A Zagalsky, DM German, MA Storey, CG Teshima, G Poo-Caamaño, Empirical Software Engineering 2017, 1-34

# Example: Crowd knowledge construction on SO



▲ The Little SAS Book is the only SAS book I have seen. I liked it as an introduction but you may still find it useful. There's a preview on Google Books at the link.  
6 share edit

answered Feb 2 '09 at 0:42  
 Utrecht

▲ The problem with 'SAS for Dummies' is that it's written for people getting data out of SAS; it's a limited book. I strongly, strongly urge you to get 'The Little SAS Book'. It's sweet. When I was a graduate student learning SAS, I'd have gladly paid twice the cover price for it.  
1 share edit

answered Dec 22 '09 at 2:02  
 [REDACTED]

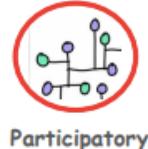
▲ SAS for Dummies is supposed to be pretty good. I haven't read it, but people here at work seem to like it.  
0 share edit

answered Feb 2 '09 at 19:48  
 [REDACTED]

- (1) there is **no obvious collaboration**; or (2) an answer is a variation of one of the other answers in the thread

<https://speakerdeck.com/alexeyza/msr16-how-the-r-community-creates-and-curates-knowledge>

# Example: Participatory knowledge construction on the R-help mailing list



Bert Nov 22, 2013; 9:36am Re: Principal Components in a Linear Model

1. Probably not, depending on what you expect to gain from this. R's numerical procedures can **almost** certainly handle the correlations.

▶ Nov 22, 2013; 11:39am FW: Principal Components in a Linear Model

Bert is correct.

In addition, you **are** using prcomp() for your **principal**

John Jul 03, 2014; 12:13pm Re: Help with tables in R

In reply to [this post](#) by ruminater

I see that others have answered the question much better than I could. However assuming you are getting the data **in** the layout you want you might consider using **tables in** some flavour of LaTeX.

Odfweave seems to produce good **tables in** OpenOffice/LibreOffice.

(1) **previous answers are included** in the current answer with clear links between them; or (2) a reply contains a **direct reference** to other answers or authors

Documenting and sharing software knowledge using screencasts,  
L MacLeod, A Bergen, MA Storey  
Empirical Software Engineering 2017,  
22 (3), 1478-1507

DevTube 

Keywords: software engineering, social media, discovery, video

Upload  Laura 

# Code, Camera, Action!

## How Developers Create and Use Code Walkthrough Videos

Laura MacLeod, Andreas Bergen, Margaret Anne Storey - University of Victoria



```
6 function Tween( elem, options, prop, end, easing ) {
7   return new Tween.prototype.init( elem, options, prop, end, easing );
8 }
9 jQuery.Tween = Tween;
10
11 Tween.prototype = {
12   constructor: Tween,
13   init: function( elem, options, prop, end, easing, unit ) {
14     this.elem = elem;
15     this.prop = prop;
16     this.easing = easing || "swing";
17     this.options = options;
18     this.start = this.now = this.cur();
19     this.end = end;
20     this.unit = unit || (jQuery.cssNumber[ prop ] ? "" : "px" );
21   },
22   cur: function() {
23     var hooks = Tween.propHooks[ this.prop ];
24
25     return hooks || hooks.get ?
26       hooks.get( this ) :
27       Tween.propHooks._default.get( this );
28   },
29   run: function( percent ) {
30     var eased,
31       hooks = Tween.propHooks[ this.prop ];
32
33     if ( this.options.duration ) {
34       this.pos = eased = jQuery.easing[ this.easing ](
35         percent, this.options.duration * percent, 0, 1, this.options.duration
36       );
37     } else {
38       this.pos = eased = percent;
39     }
40     this.now = ( this.end - this.start ) * eased + this.start;
41
42     if ( this.options.step ) {

```

L.Macleod; A.Bergen; M.Storey - 21 videos  12,061,713  2,644,156  104,902  4,077

### Research Questions

 How developers produce code walkthrough videos?

 How do developers describe code in these videos?

 Why do developers make these videos?

### Methodology

 Grounded Theory: Using Video Analysis and Interviews.

# 10 Social Networks for Developers

ARTICLE BY AWWWARDS TEAM IN RESOURCES & TOOLS - FEBRUARY 21



**T**hough the stereotypical developer might be a socially awkward geek, **developers are among the most active users of social networks**. They usually prefer sites that are community-driven and focus on quality content. **Social networks are a great place for developers to learn from colleagues, contact clients, find solution to problems and resources, and improve their own skills.** In this post we compiled 10 of the most used and useful social networks for developers. There are other lots of other great ones out there, so feel free to share your favorites in the comment section.

## GitHub

The Company  
Originally founded by Chris Wanstrath, PJ Hyett and Tom Preston-Werner as a project to simplify sharing code, GitHub has grown into an application used by over a million individuals and two million code repositories, making GitHub the largest code host in the world.  
Code is about the people writing it. We focus on lowering the barriers of collaboration by building powerful features into our products that make it easier to contribute. The tools we create help individuals and companies, public and private, to write better code, faster, and together.  
GitHub is headquartered in San Francisco with more members working remotely. Here at GitHub, we work hard to create a culture based on personal responsibility, rather than management, by hiring great people and treating them accordingly. You can meet the team before or around the team at a [meetup!](#)

The Team

**GitHub** is a web-based hosting service for software development projects. Originally born as a project to simplify sharing code, GitHub has grown into the largest code host in the world. GitHub offers both commercial plans and free accounts for open source projects. [GitHub](#)

## Geeklist

Get your Geeklist name!  
Get early access to our private beta by incurring an alpha and entering your Geeklist Name:  
[Sign up with Geeklist](#)  
We won't ban you for without your explicit permission.

Some of our geeks...

**geeklist** private beta

**geeklist** is an achievement-based social portfolio builder for developers where they can communicate with colleagues and employers and build credibility in the workplace. [Geeklist](#)

## Masterbranch

Show off your coding chops  
We bring all your projects together in one neat profile and let you show off your coding skills to developers and employers.  
[Sign up and claim your profile](#)

**Projects**  
All your projects (private and open source), in one single place.

**Skills**  
Your profile, automatically updated. Always.

**DevScore**  
Your reputation in the developer community.

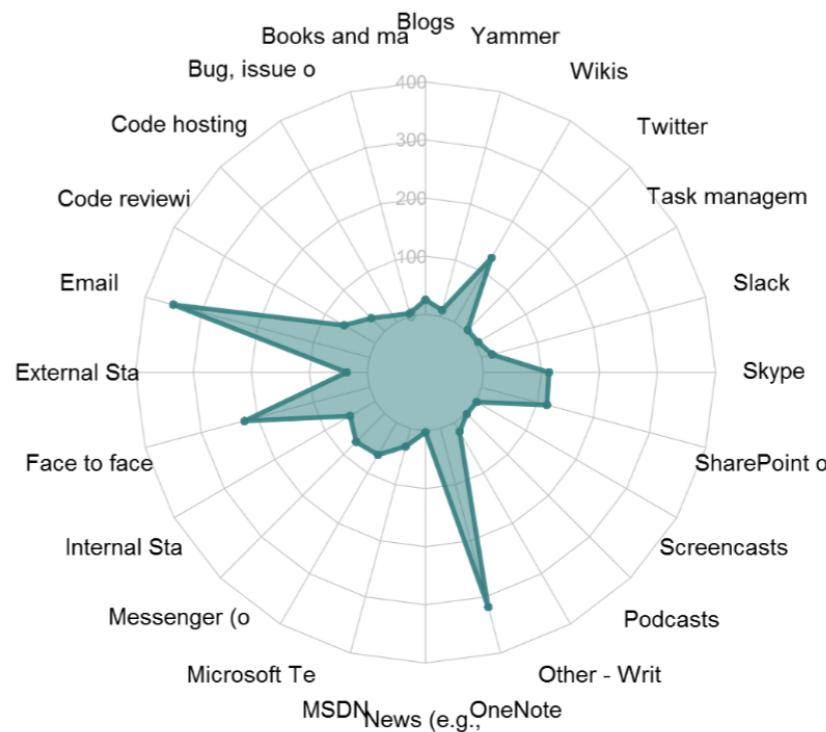
**Achievements**  
Get recognized with awards for your mad skills.

Sources we track  
  
Jesus Leganés Combarro  
"Masterbranch and GitHub have become my preferred

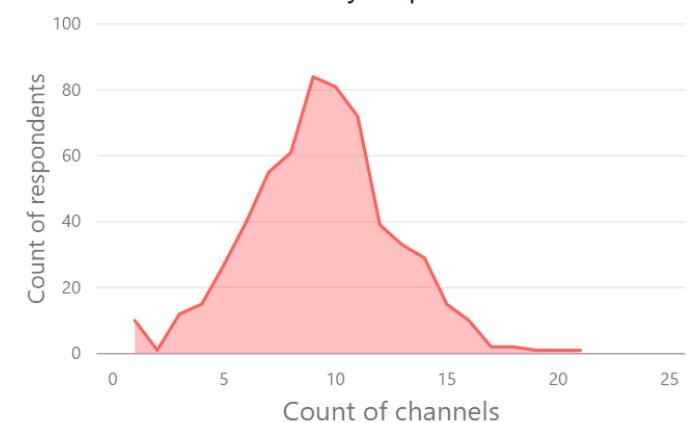
**Masterbranch** is a site for developers and employers. Developers can create their coding profile, and employers who are looking for great developers can find candidates for available positions. [Masterbranch](#)

# *Understanding **knowledge flow** at a large software company... (a work in progress)*

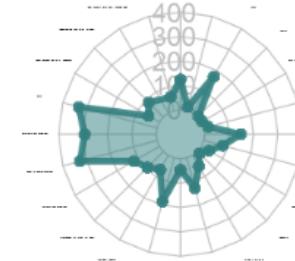
Channels used for documentation



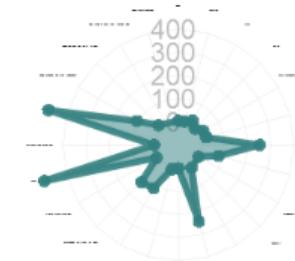
Count of channels used by respondents:



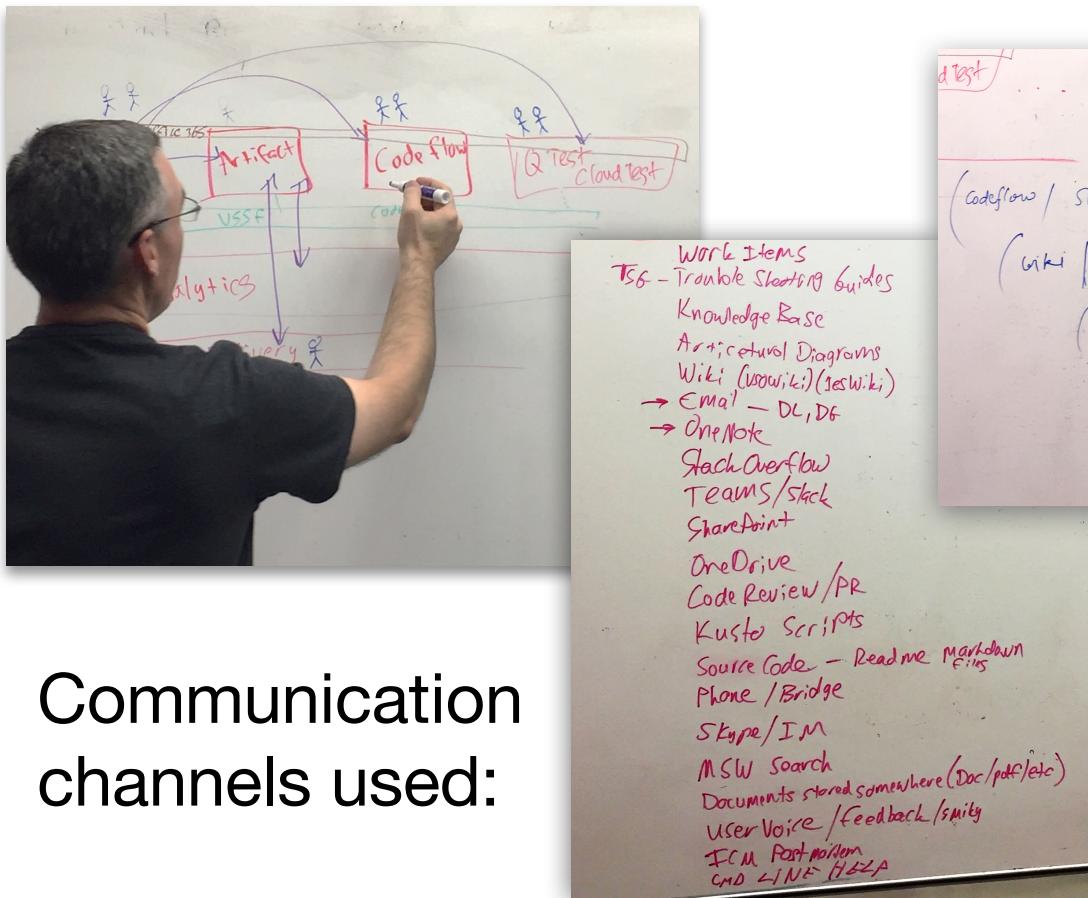
Channels used for finding answers



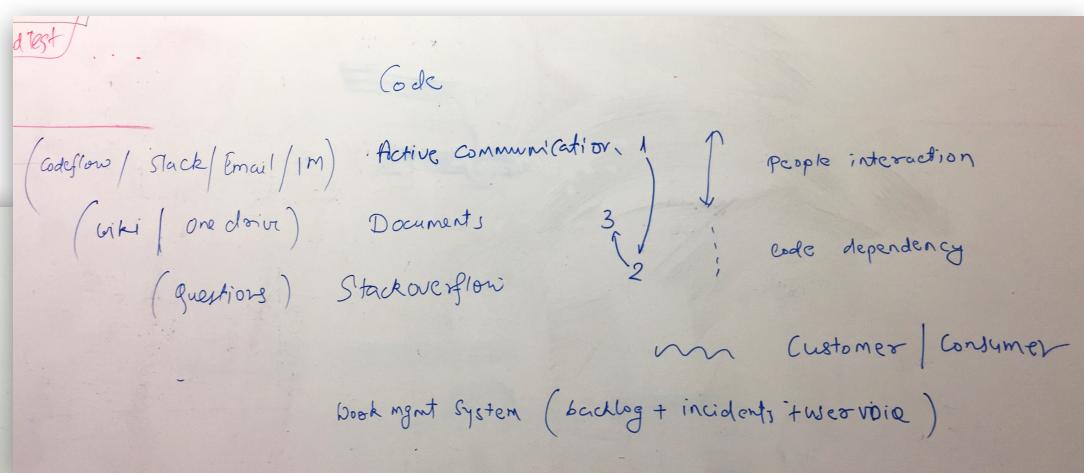
Channels for discussing goals



# Focus group... to understand **knowledge flow**



Communication  
channels used:



**Knowledge fragmentation!**  
Fewer (integrated) channels?

Work in progress...

*“Documentation: castor oil  
of programming”*

Weinberg 1975



*“Incomplete or confusing documentation is the top pain point of  
programmers”, GitHub Open Source Developer Survey 2017*

## ***Knowledge flow improvement goals:***

- Improve efficiency of ***externalizing knowledge***
- Ensure externalized knowledge is ***accurate***, up to date and concise
- Ensure externalized knowledge is ***easier to find***
  
- Design effective communication channels to support ***collaboration, tacit knowledge sharing, knowledge creation*** and ***innovation***
  
- Support ***social learning***

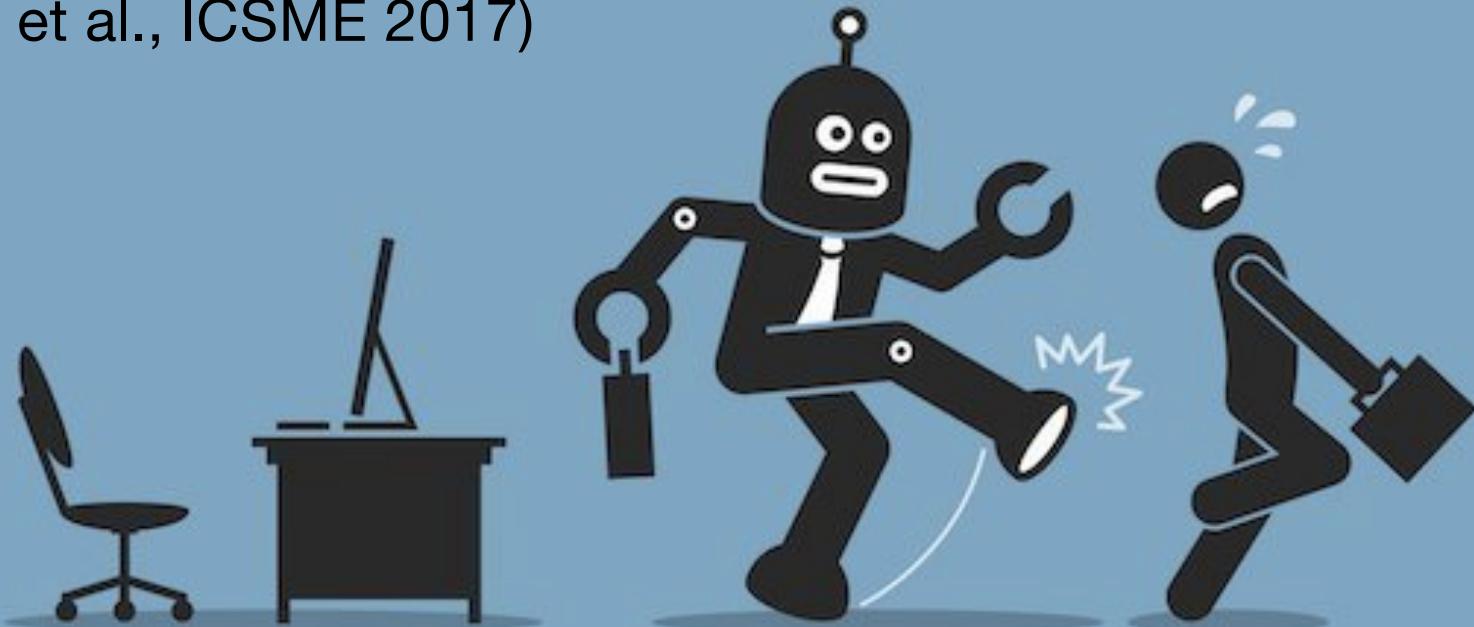
# ***Enablers for improving knowledge flow:***

**Documentation** is just another software engineering challenge, we should **automate** it

Amplify cognition during knowledge creation, curation and acquisition

On Demand Developer Documentation

(Robillard et al., ICSME 2017)



Learn from *failures*:

- Stack Overflow's documentation effort



Watch for *risks*:

- Beware the “idiot savant” (The Master Algorithm, Domingos)
- “Too big to know” but be aware of algorithm and data bias

<https://meta.stackoverflow.com/questions/303865/warlords-of-documentation-a-proposed-expansion-of-stack-overflow>

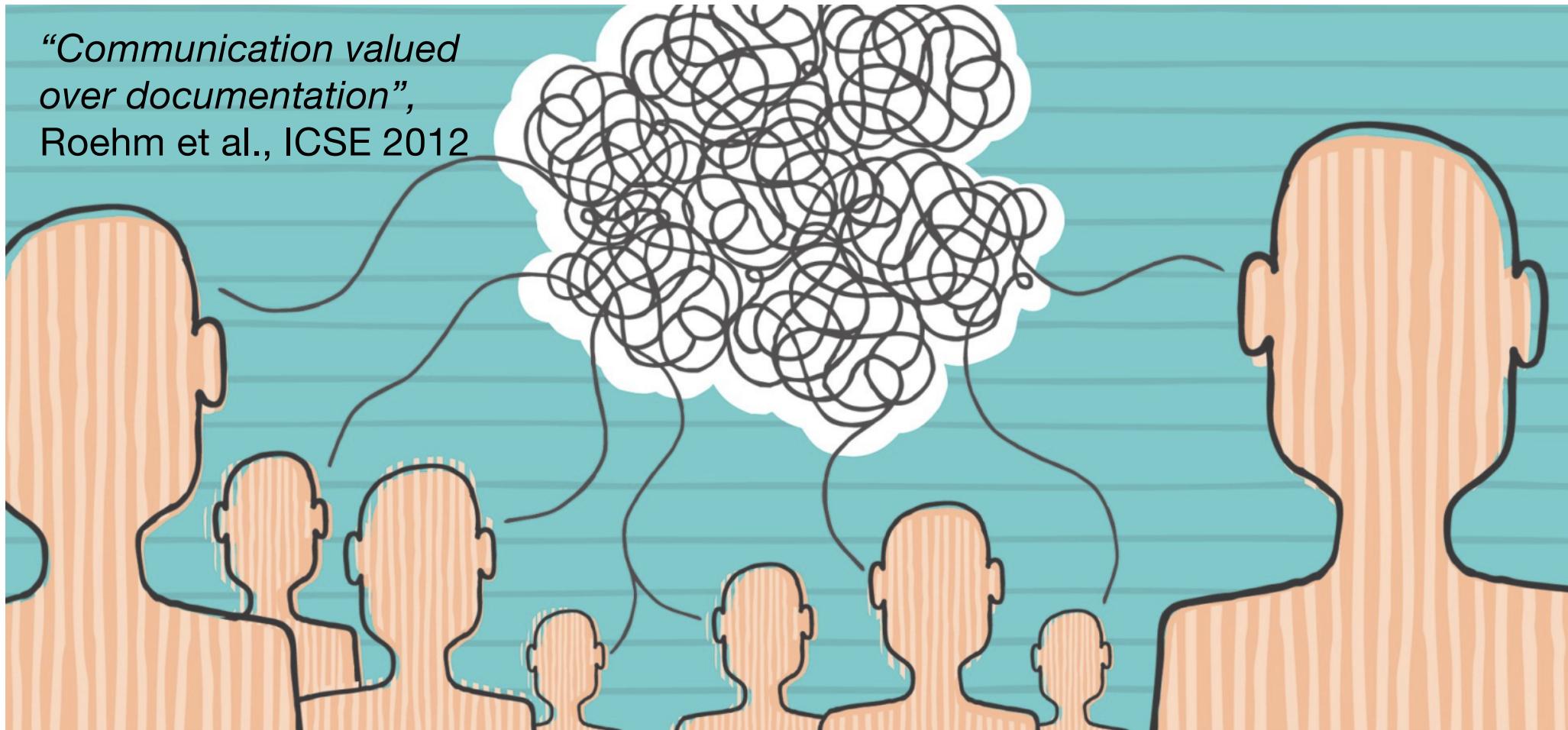
“ You can't build a wall to keep the robots out. That doesn't mean we're doomed. Scott Hartley does a masterful job going beyond the headlines to explain why the future needs engineers as much as it does philosophers. The two need each other. ”

— Ian Bremmer,  
President of Eurasia Group and  
author of *Superpower*

# the fuzzy and the techie

## ***Value communication***, not just documentation

*“Communication valued over documentation”,  
Roehm et al., ICSE 2012*





**Programming Wisdom**

@CodeWisdom

 Follow



"There is nothing more unproductive than to build something efficiently that should not have been built at all." - Milt Bryce

RETWEETS

**174**

LIKES

**276**



12:39 PM - 24 Apr 2017

 6

  174

 276

*"Big to know, but bigger to know who to ask"*, Piet Hein



*Stor er den som ved,  
men større  
den som ved  
hvør han skal spørre.*

Piet Hein

## *Need for media literacy skills* (<http://rheingold.com/>):

- Infotention
- “Crap” detection
- Participation
- Collaboration
- Network cultivation



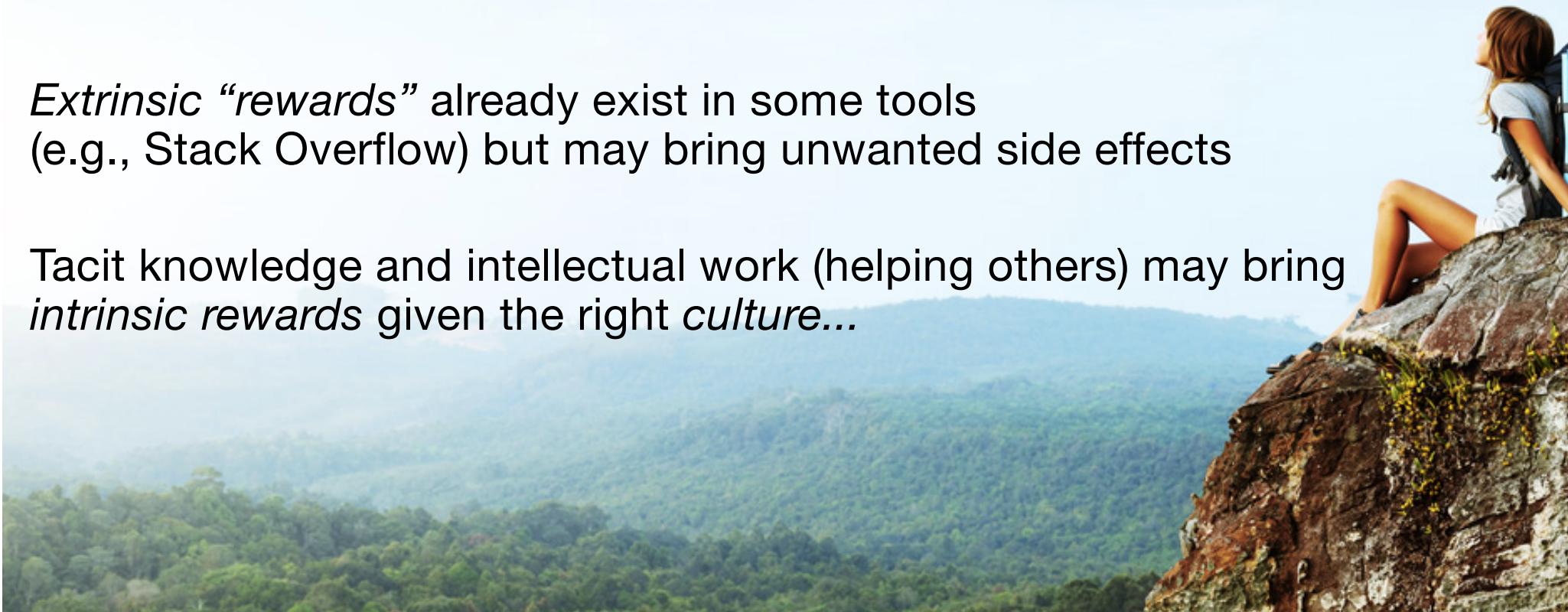
*“Information is cumulative and additive,  
whereas truth is exclusive and selective”,  
Byung-Chul Han*

## **Reward knowledge sharing**

Documentation that is used should be counted and *rewarded*  
Unnecessary documentation efforts should be discouraged

*Extrinsic “rewards” already exist in some tools  
(e.g., Stack Overflow) but may bring unwanted side effects*

Tacit knowledge and intellectual work (helping others) may bring  
*intrinsic rewards given the right culture...*



Let's raise the visibility of code documentation in Ruby!

Inch CI is here! Make your own badge with the new CI service: <http://inch-ci.org>

Early adopters:



docs

haml

HTML Abstraction  
Markup Language - A  
Markup Haiku



docs

PRY

An IRB alternative and  
runtime developer  
console

## Documentation badges for Ruby projects

docs

### Advantages for maintainers

If you are a gem developer or maintain a library you probably already use badges in your README to show that your tests are passing and your code isn't a horrible mess in need of refactoring.

Now you can also show that you documented your project properly.

[Click here to request a badge for your project](#)

### Advantages for developers

If you are a Ruby developer, you know the pain of cloning a project you want to improve just to find out that it is completely undocumented.

Then you have to form the mental equivalent of an AST to comprehend how it all fits together. Wouldn't it be great to see the present level of

<http://inch-pages.github.io/>

# Culture matters...



**Gregory Brown**  
@practicingdev

Follow

Be a developer of more than just code.  
Develop ideas. Develop relationships.  
Develop solutions to human problems.  
Develop with kindness.

8:47 AM - 14 Sep 2017

314 Retweets 501 Likes



6 314 501

Tweet your reply



**Gary** @blimey85 · 2h

Replying to @practicingdev

What if I'm asocial and just want to develop code?

1 1



**Gregory Brown** @practicingdev · 1h

Find a different career. Seriously.

1 1

# ***Map and understand how knowledge flows***

- Know how knowledge is *created*
- Understand how knowledge *flows*
- Identify *blockages*
- Understand who the *influencers* are

TABLE I. COGNITIVE FACTORS DERIVED FROM THE KNOWLEDGE CREATION MODEL

Cognitive factor	From	To
Acquisition	Explicit	Tacit
Validation	Explicit	Explicit
Synchronization	Tacit	Tacit
Realization	Tacit	Explicit (code)
Crystallization	Tacit	Explicit (artifact)

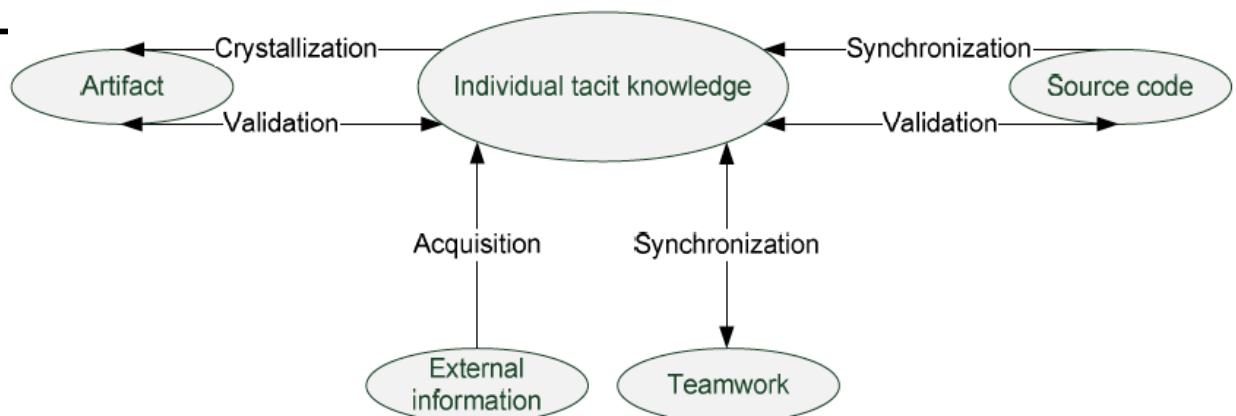


Figure 1. Knowledge flow model

Gendreau, Olivier, and Pierre N. Robillard. "Knowledge acquisition activity in software development." *Advances in Information Systems and Technologies*. Springer, Berlin, Heidelberg, 2013. 1-10.

"Could removal of project-level knowledge flow obstacles contribute to software process improvement? A study of software engineer perceptions." S. Mitchell and C. Seaman, *Information and Software Technology* 72 (2016): 151-170.

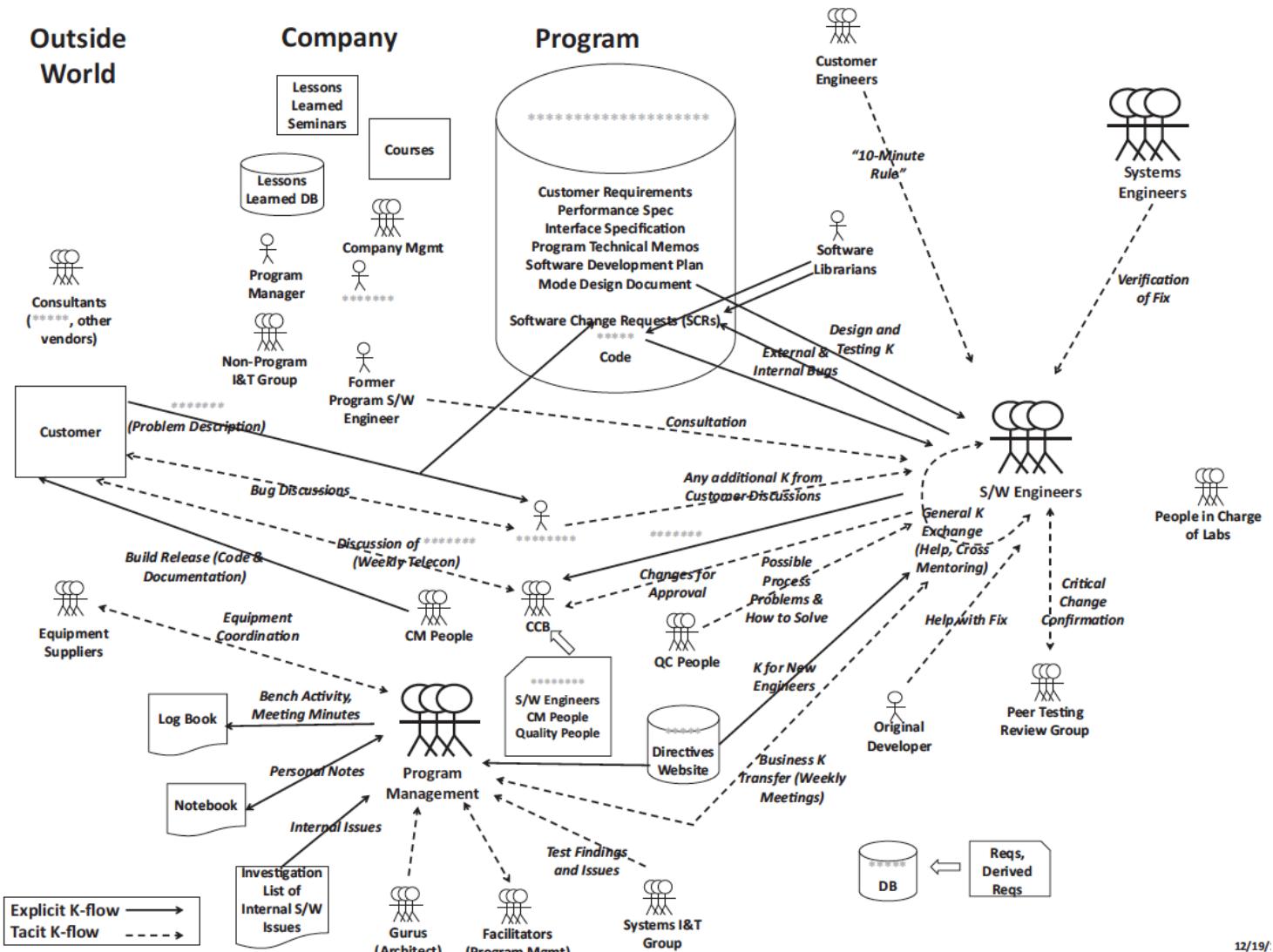
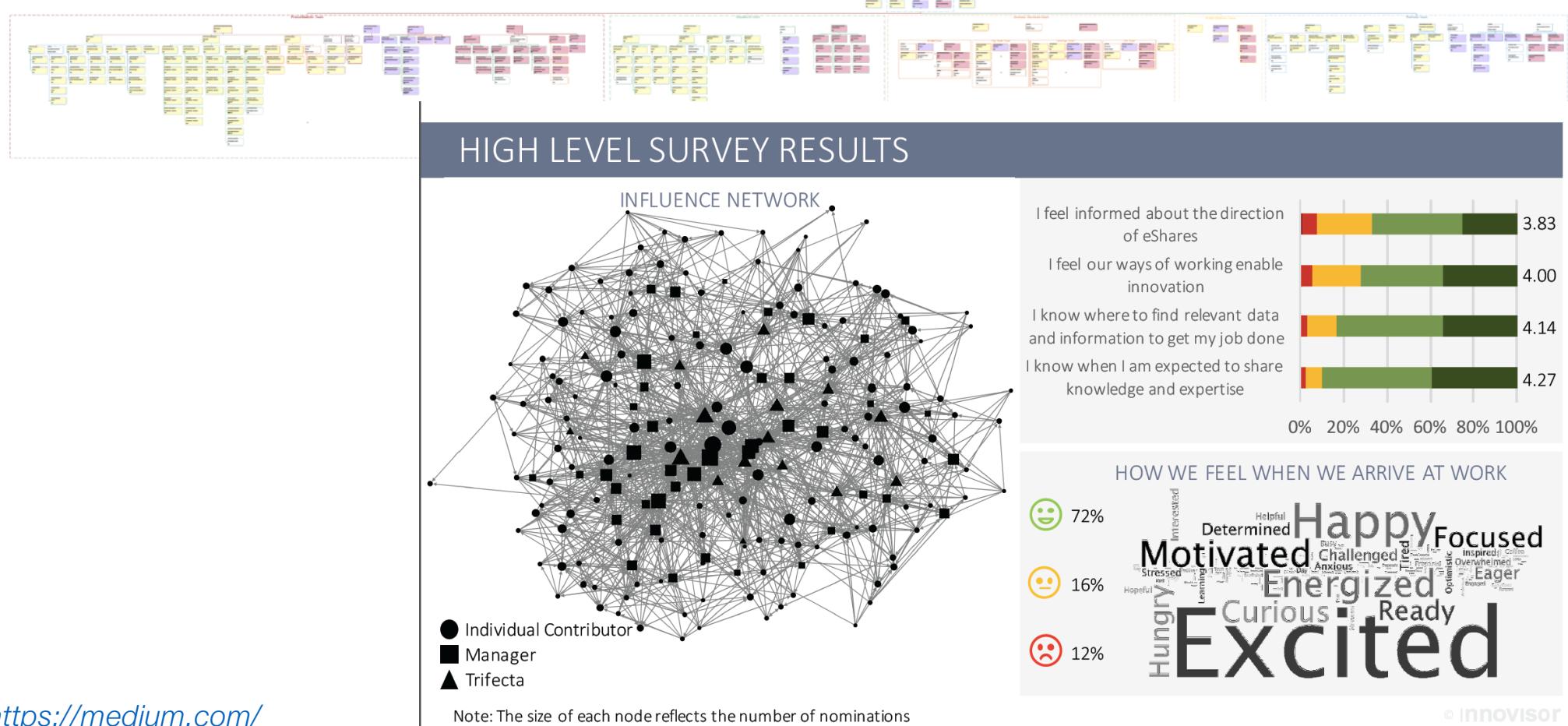


Fig. 5. Manager Radar Project Knowledge Map (Sanitized).

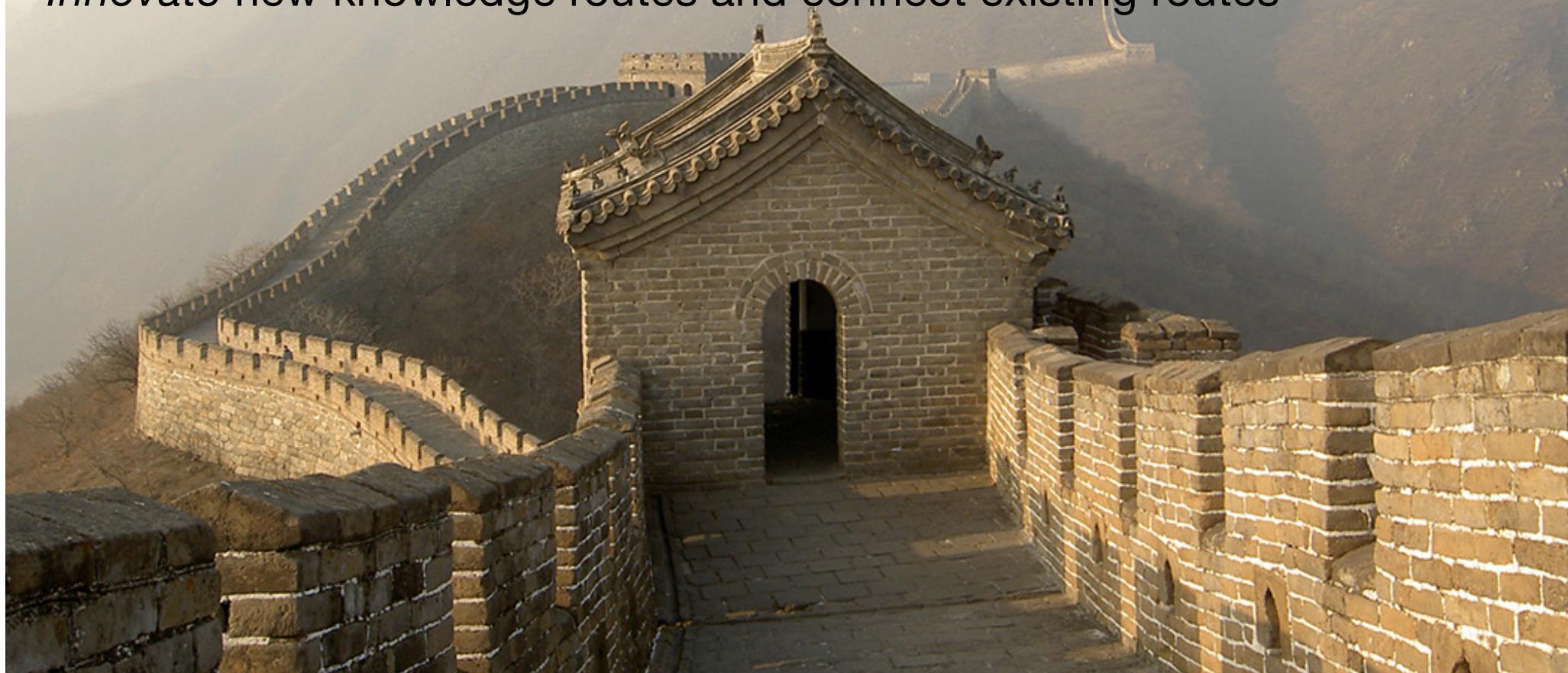
# From the organization chart to the shadow chart...



<https://medium.com/@henrysward/the-shadow-org-chart-cfcdd644575f>

## *Nurture developer knowledge trade routes*

- When designing communication covenants, consider channel *affordances*
- *Innovate* new knowledge routes and connect existing routes





PRODUCTS SOLUTIONS PARTNERS CUSTOMERS LEARN DEVELOPERS

Search

Need a helping hand?  
Reach out to our online community.



Stackoverflow

For technical questions please search-then-post.



Google Group

Share ideas, experiences and banter with fellow graphistas.



Github

Peruse Neo4j's open source, or report bugs on Github.

Tweets liked by @neo4j



Adriano @longoanalytics

@wadael @neo4j Know it, love it, and will read any book on it. #neo4j changed the way I look at data in the wild.



1h



Hanneli Tavante @hannelita

@neo4j "graphashion" :) thanks @hellojewfro!



1h



Breki Tomasson @BrekiT

@neo4j @Dethtron5000 Not yet, I'll be publishing the dataset once I finish it up, however. :)



Embed

View on Twitter

*Example of a  
communication  
channel covenant...*



#### Stay Connected

Sign up to find out more about Neo4j's upcoming events & meetups.

\* Your Email Address

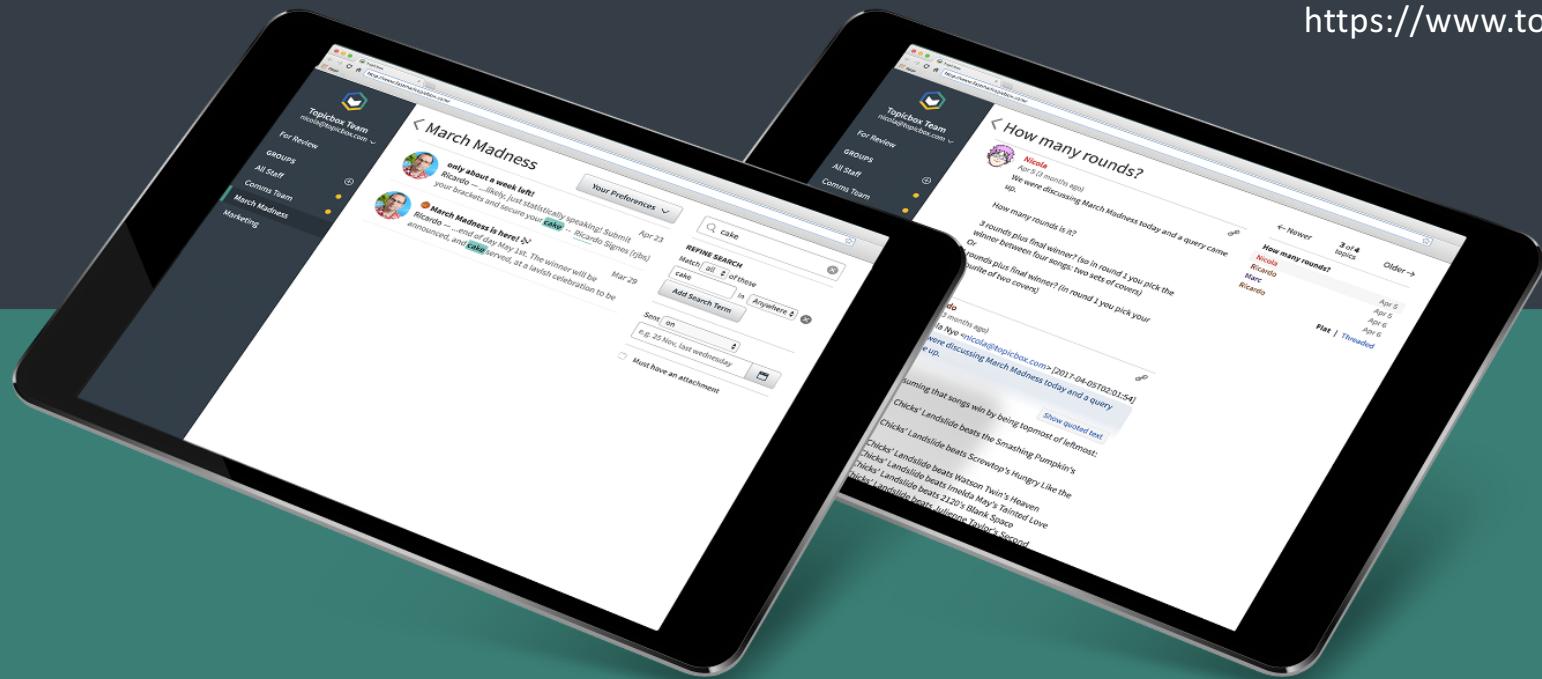
KEEP ME CONNECTED >

# *Communication channel affordances*

content  
audience  
trigger  
collaboration  
review  
feedback  
fanfare  
time  
sensitivity



<https://www.topicbox.com/>



## Turn team email into group knowledge

Don't lose your best information emailing it person to person.  
Build a central, shared history for every project.



**Refine as you go**  
**search** lets you zero  
in on what you need.



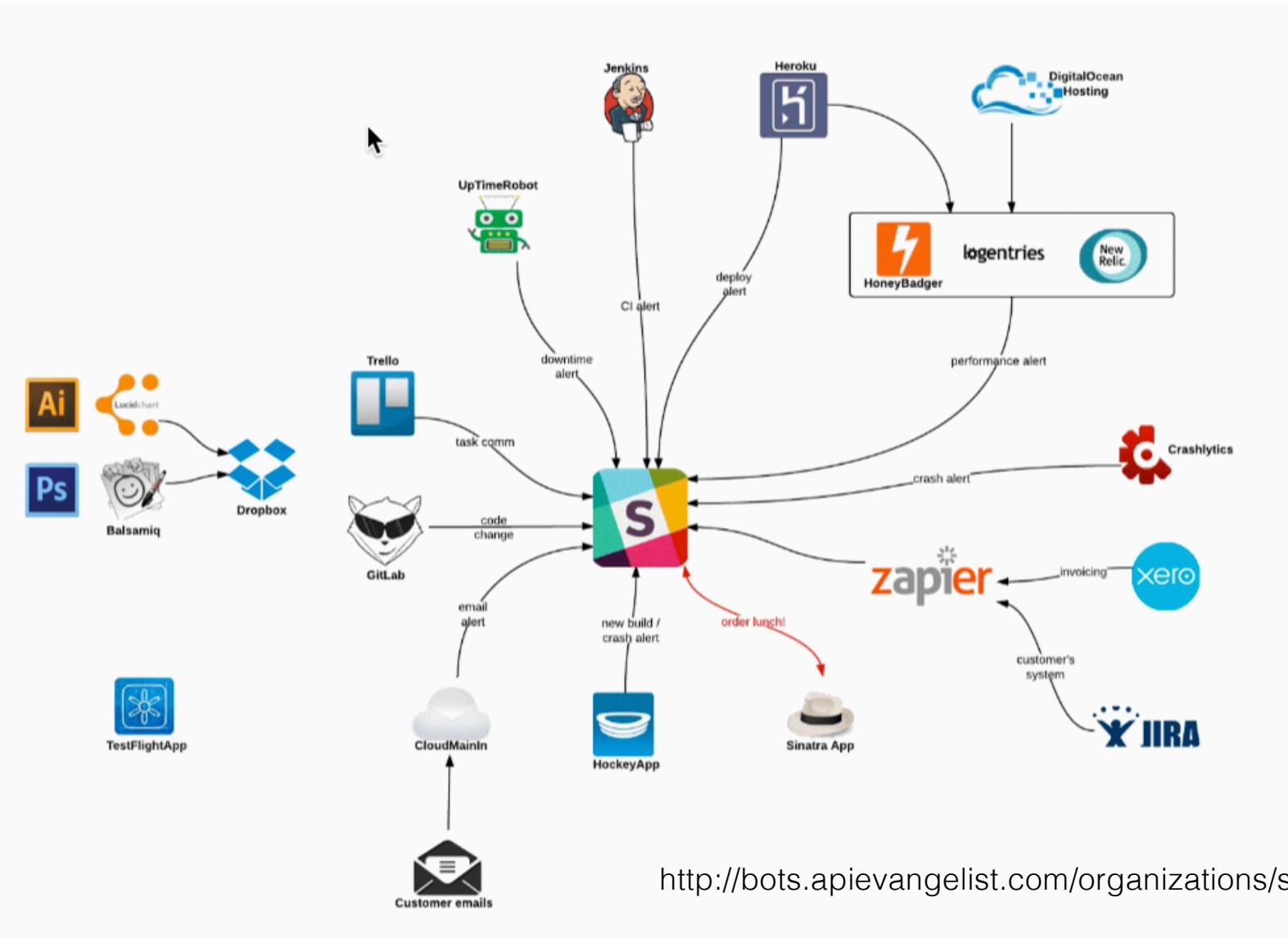
**Retired groups** are  
searchable, so history  
isn't lost as projects end.



**Onboarding** staffers  
and team members get  
a living knowledge base.



Topicbox is great for  
**email transparency** –  
make sharing standard.



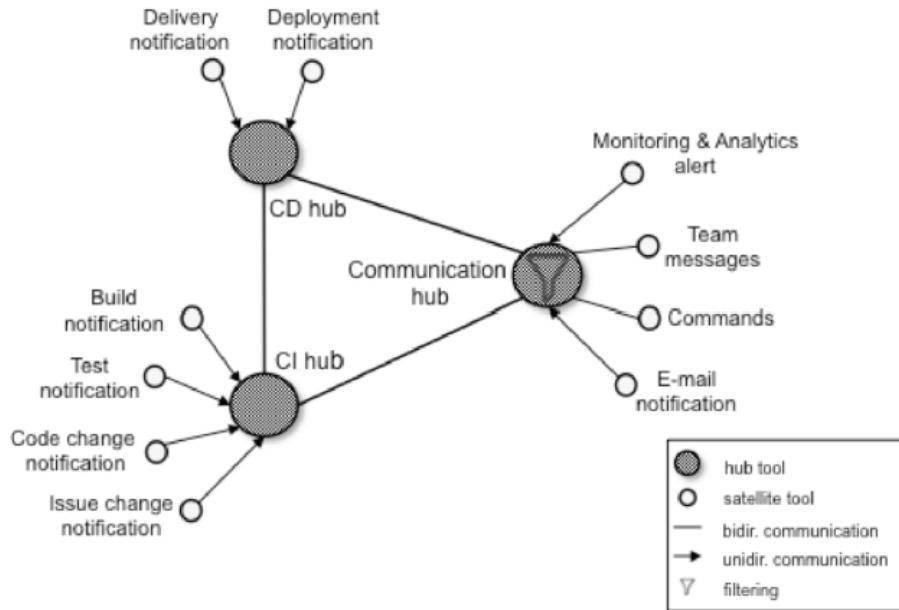


Fig. 1. The hub-and-spoke integration model

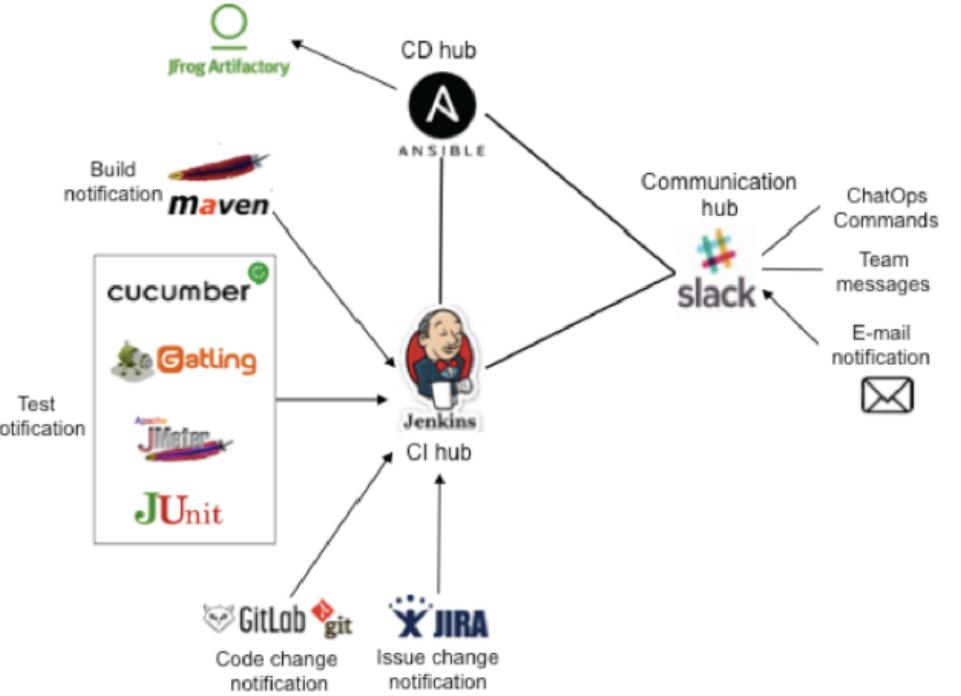


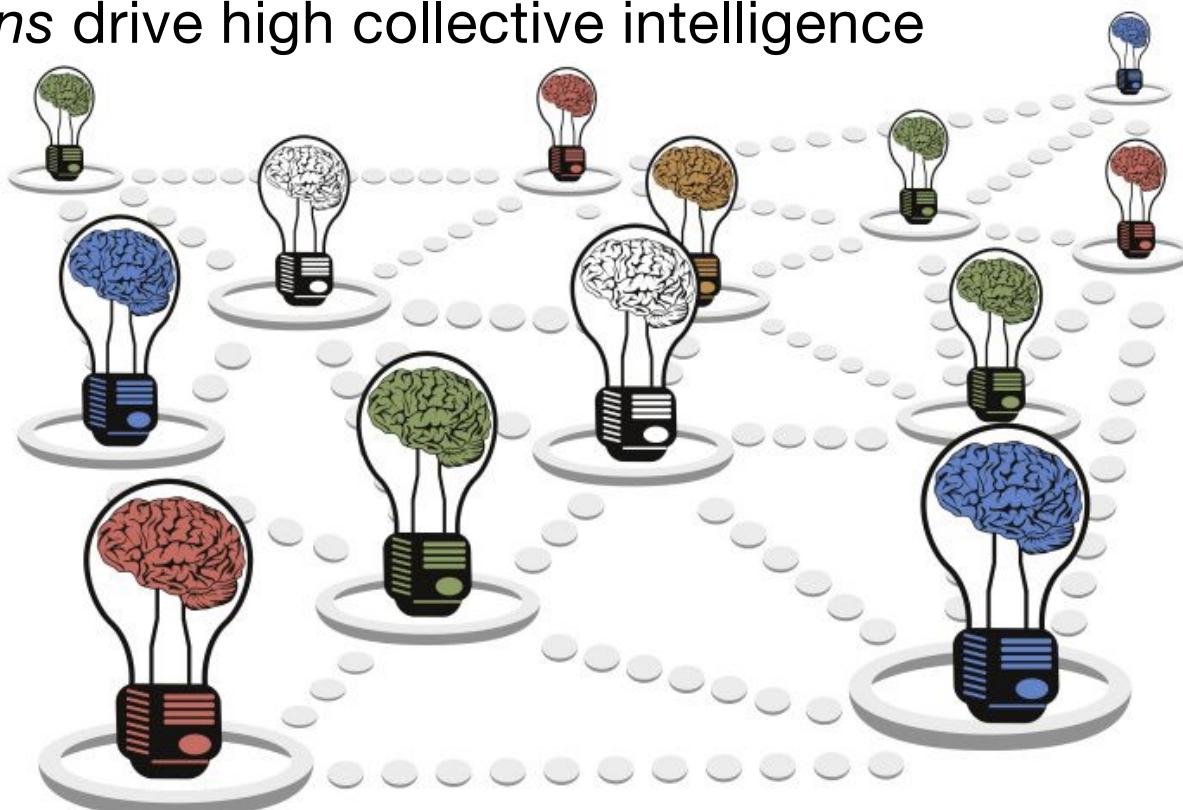
Fig. 2. The instantiated hub-and-spoke model

*Hub and Spoke Model, by Calefato and Lanubile*

<http://collab.di.uniba.it/fabio/wp-content/uploads/sites/5/2014/05/icgse16-camera-ready.pdf>

# **Aim for high *collective intelligence***

- *Specialization* drives high collective intelligence
- *Contributions* drive high collective intelligence

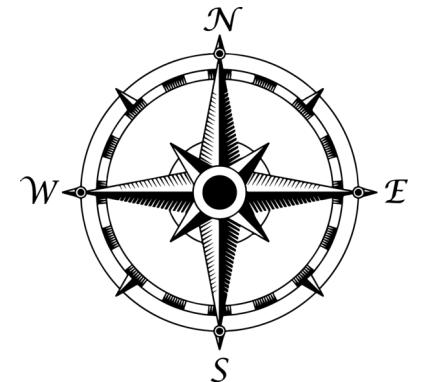




*High collective intelligence enhances **creativity***

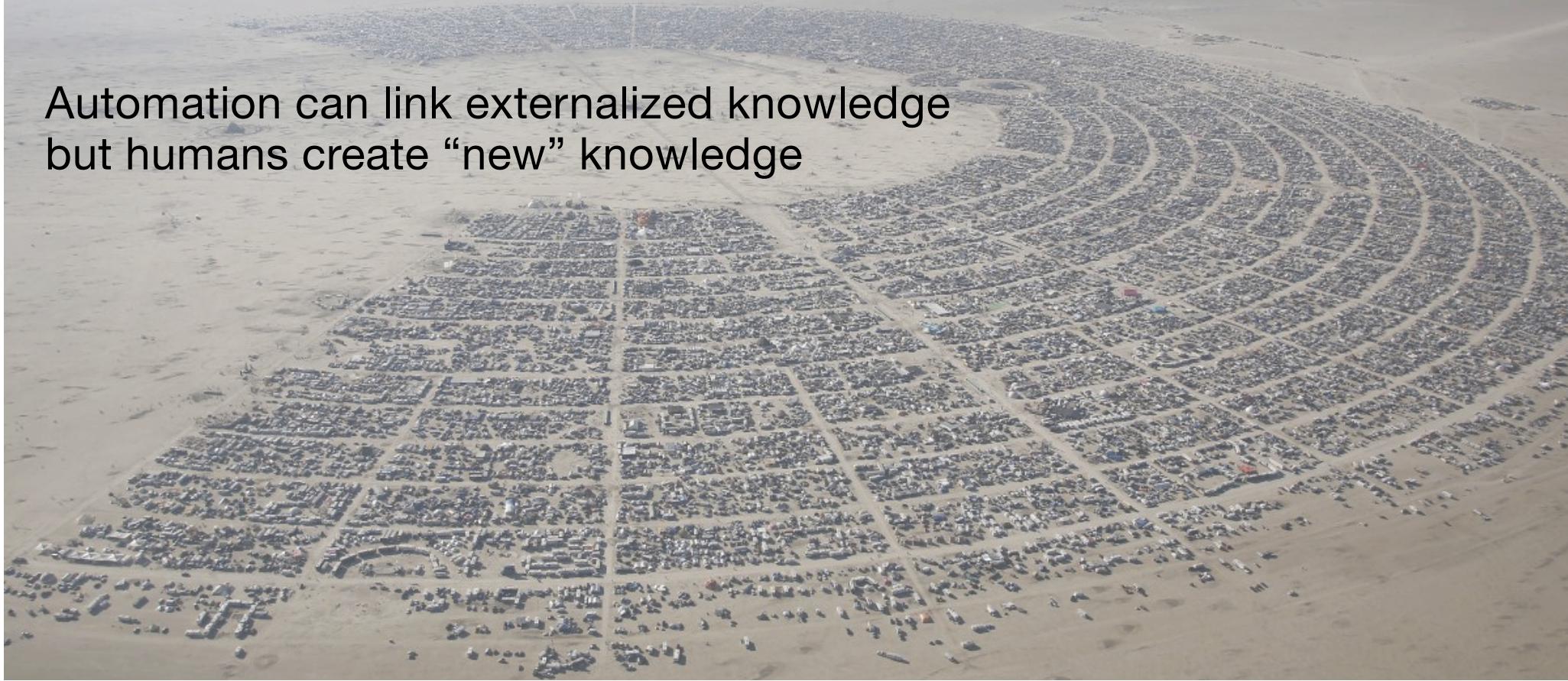
# *Our itinerary... we are almost there*

- **How knowledge flows** and how knowledge is **created** in software development and why it matters
- **Challenges** faced in knowledge creation (externalization, communication)
- **Goals** for improving knowledge flow (documentation, creativity)
- **Enablers**  
(automation, culture, rewards, knowledge routes, specialization)
- **An idea!**



# ***The idea: Use automation to amplify social communication and team cognition***

Automation can link externalized knowledge  
but humans create “new” knowledge





## *What is a bot?*

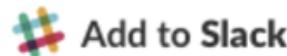
A bot is an application that performs automated, repetitive, pre-defined tasks

From setting an alarm, to telling you today's weather forecast, to gathering information

Conduit between users and services through a conversational UI

# Get your Slack organized with Pingpad

The Best of Trello, Google Docs and Wikis in one App built on Slack



# Bot-assisted collaboration

FOR TEAMS THAT LIVE IN SLACK

scott 9:26 PM  
One of the most interesting comments in the meeting was, "we think Kapil is ready to move the entire enterprise, based on the latest numbers". We should follow up and make this happen!

pingpad APP 9:27 PM  
Alrighty, I saved the [above message](#) as a New Note in Pingpad's #betacorp-onboarding

Reply to this message to add a Title.  
Anything else I can help with?

Change Channel Select List Dismiss

Filter options

- Open Items
- In Progress
- Done
- Meeting Notes
- Betacorp Documents
- Who's Who at Betacorp

SAVE, ORGANIZE AND ASSIGN IMPORTANT SLACK THREADS AND MESSAGES, SO YOU DON'T HAVE TO SEARCH

Just react to a message and @pingbot will save and organize for you.

## slack-overflow

This is the very beginning of the **slack-overflow** group, which you created today.

[Set a purpose](#) [+ Add a service integration](#) [Invite others to this private group](#)

---

Today

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**karan** 9:53 PM

joined #slack-overflow



Other data driven bots for amplifying team knowledge and collaboration: Obie, Guru, Niles....

# *Can we do even better?*

Given more insights on how developers collaborate and communicate...

Given more insights on impact of knowledge routes, blockages, influencers...

Given more insights from startups and successful open/closed source projects...





*Expert human(s) + (simple) computer + good process  
will beat many expert machines (today)*

- Can bots steer developers towards the *right channels* (e.g., Tbot)
- Can a bot connect the *right people* (e.g., WhoBot)
- Could we use a bot to *detect* when colleagues go astray?
- Can bots help at the *community* level (not just for teams)?
- Can bots help us *balance* documentation and communication?

Delivery of “on demand documentation” into the middle of a conversation with *feedback loops* to improve and evaluate the documentation and communication

***If we do all of this, would documentation becomes less elusive?***

# *Some souvenirs...*



@margaretstorey  
mstorey@uvic.ca

No one developer or team can understand everything

How knowledge flows impacts developer productivity and innovation

Knowledge externalization and communication are intertwined

Nurture knowledge flow, understand how it is rewarded or blocked

Automate to amplify cognition and social communication, keep the human in the loop and understand impact of automation

Borrow theories from other domains (e.g., reciprocity motivation theory), and apply our data analysis tools to this data!

*Together tool builders and empirical researchers can make significant impact on this topic*

# Thank you!

Talk title generator and collaborator – Per Runeson, Lund

Developer knowledge expert – Alexey Zagalsky

“Crazy bot lady” – Carly Lebeuf

Gamification and visualization expert – Matthieu Foucault

Crap detector – Cassie Petrachenko



My husband (Brian) and the motorbike mechanic in Powell River for fixing the leak in our boat!

## *Related work*

- M. Storey, L. Singer, F. Figueira Filho, A. Zagalsky, and D. German,  
**How Social and Communication Channels Shape and Challenge a Participatory Culture in Software Development**, Transactions on Software Engineering 2017.

Greetings,

The 2017 IEEE Computer Society (CS) Annual Election is open until Sep 25, 2017. I was nominated for IEEE CS 2018 President-Elect and 2019 President. I kindly ask for your vote in this election.

If you are an IEEE CS member, you should have received a couple of messages from IEEE CS inviting you to vote. Note that there is also an IEEE election in progress. To be eligible to vote, one must be an IEEE CS member as of June 30, 2016. *Please encourage your colleagues and graduate students to vote.*

IEEE CS voting: [goo.gl/TQDu21](http://goo.gl/TQDu21)

My election website: [goo.gl/fqMPYE](http://goo.gl/fqMPYE)

My town hall slides: [goo.gl/UEWUSj](http://goo.gl/UEWUSj)

Over 80 recommendations: [goo.gl/w71JPM](http://goo.gl/w71JPM)

**Please vote now.**

**If you already voted, thank you very much.**

Thank you very much for your support.

Best wishes,

Hausi Müller



#### 2017 IEEE Computer Society Annual Election

Hausi Müller

University of Victoria, Canada

Nominated by CS Elections Committee for

IEEE Computer Society President-Elect, 2018

IEEE Computer Society President, 2019

