

A photograph of a sailboat on a lake at sunset. The sun is low on the horizon, casting a warm glow over the water and the surrounding forested hills. The sailboat's mast and rigging are visible in the foreground, and a dark blue cover is draped over part of the deck. The water reflects the sunset and the surrounding landscape.

Margaret-Anne Storey  
@margaretstorey

# The Elusive Nature of Software Documentation

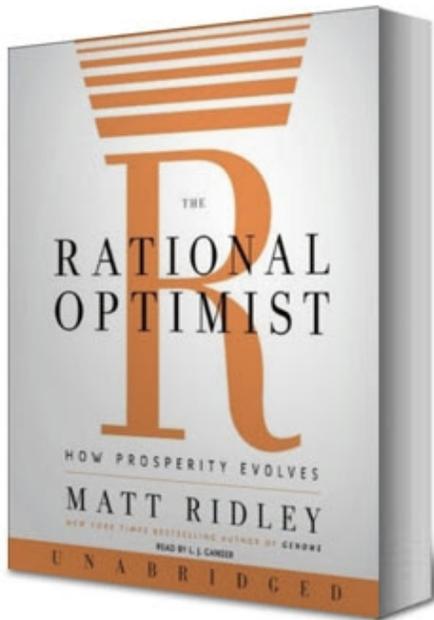
And Why Understanding How  
*Knowledge* Flows Matters

What happens when  
documentation is elusive!



*“Simple?”*

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



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

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



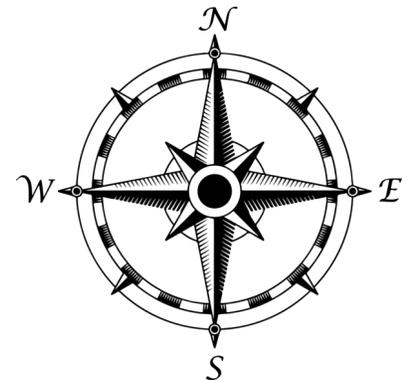
# *The role of knowledge in software development*

- **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.*

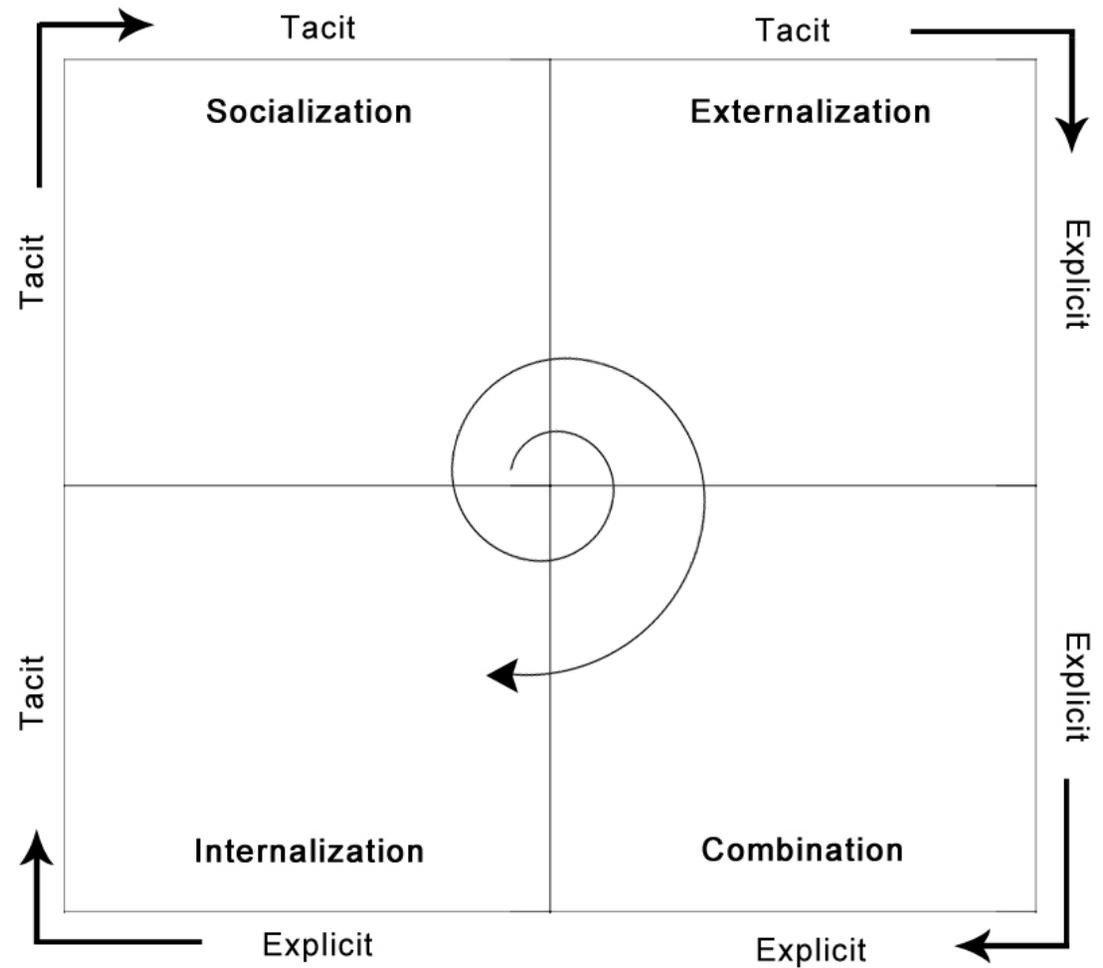
## *Itinerary...*

- **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:***

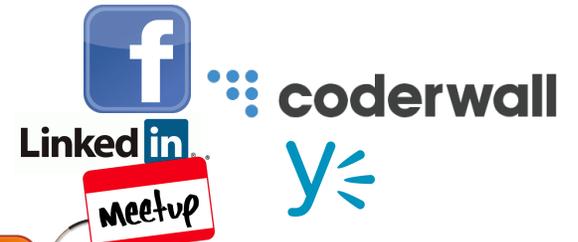
- **Engagement** (talking to others, producing artifacts)
- **Imagination/reflection** (of what is, what could be)
- **Alignment** (of local activities with other processes)

*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:

(Meta)  
Knowledge about networks



Community/  
shared knowledge



Externalized  
knowledge in  
project resources



Tacit knowledge



1968

1970

1980

1990

2000

2010

2015



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



“Commenting code is like explaining a bad joke.”

# 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

**guard / guard**  
The [guard wiki](#) uses footers to link to all the resources a user might need.  
Ruby ★ 5,422 🍴 475 Updated on Jun 17

**thinkarelius / titan**  
The [Titan wiki](#) uses images to call out important links.  
Java ★ 4,517 🍴 954 Updated on Feb 18

## Home

Matt Jacobs edited this page on Jul 3 · 24 revisions



# HYSTRIX

## DEFEND YOUR APP

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

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?

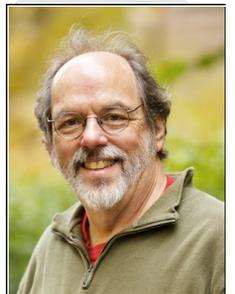
In a distributed environment, inevitably some of the many service dependencies will fail. Hystrix is a library that helps you control the interactions between these distributed services by adding latency tolerance and fault tolerance logic. Hystrix does this by isolating points of access between the 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.

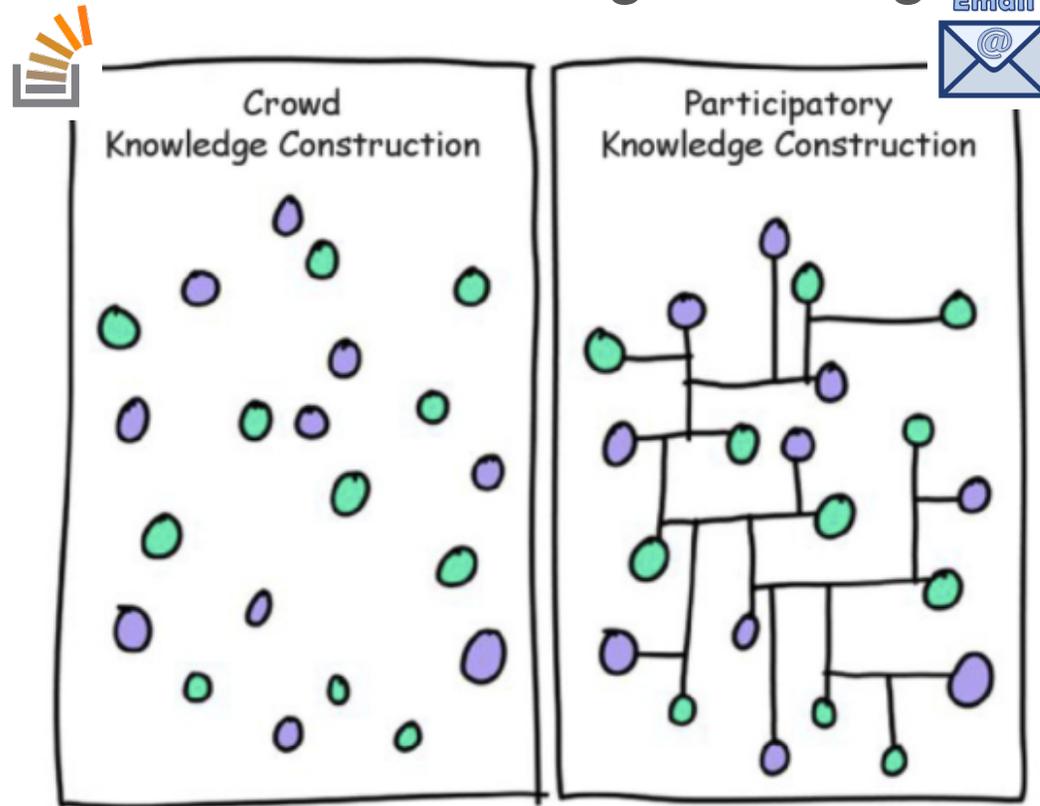
Clone this wiki locally

<https://github.com/Netflix/>



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

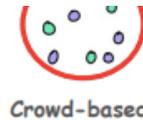
*"The best way to get the right answer on the Internet is not to ask a question, it's to post the wrong answer",*  
Ward Cunningham



[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



▲ 6 ▲  
▼ 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.  
share edit answered Feb 2 '09 at 0:42  
Utrecht

---

▲ 1 ▲  
▼ 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.  
share edit answered Dec 22 '09 at 2:02

---

▲ 0 ▲  
▼ SAS for Dummies is supposed to be pretty good. I haven't read it, but people here at work seem to like it.  
share edit answered Feb 2 '09 at 19:48

Three red rectangular boxes highlight specific phrases in the first and third answers. A red line connects the boxes containing "The Little SAS Book" and "SAS for Dummies" to the second answer, pointing to the phrases "The Little SAS Book" and "I'd have gladly paid twice the cover price for it".

(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



Participatory

**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.

**David** 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 may see some good-looking **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

The screenshot shows a YouTube video player interface. At the top, the DevTube logo is on the left, and a search bar contains the text "Keywords: software engineering, social media, discovery, video". To the right of the search bar are "Upload" and "Laura" (with a profile icon). The video title is "Code, Camera, Action! How Developers Create and Use Code Walkthrough Videos" by "Laura MacLeod, Andreas Bergen, Margaret Anne Storey - University of Victoria". The video content is a code walkthrough for a jQuery Tween plugin, with the code displayed in a dark-themed editor. A blue silhouette of a person is visible in the bottom right corner of the video frame. To the right of the video player, there are sections for "Research Questions" and "Methodology".

```
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 ) {
```

**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.

Channel: L.MacLeod: A.Bergen: M.Storey - 21 videos  
12,061,713 views  
Subscribe 2,644,156  
104,902 likes 4,077 dislikes

# 10 Social Networks for Developers

ARTICLE BY **AWWARDS 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

Box of Fools™	
Home Base	San Francisco
Company Founded	2008
Hubbennouts Employed	57
Delicious Beers On Tap	4
VC Funding	\$0.00

**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

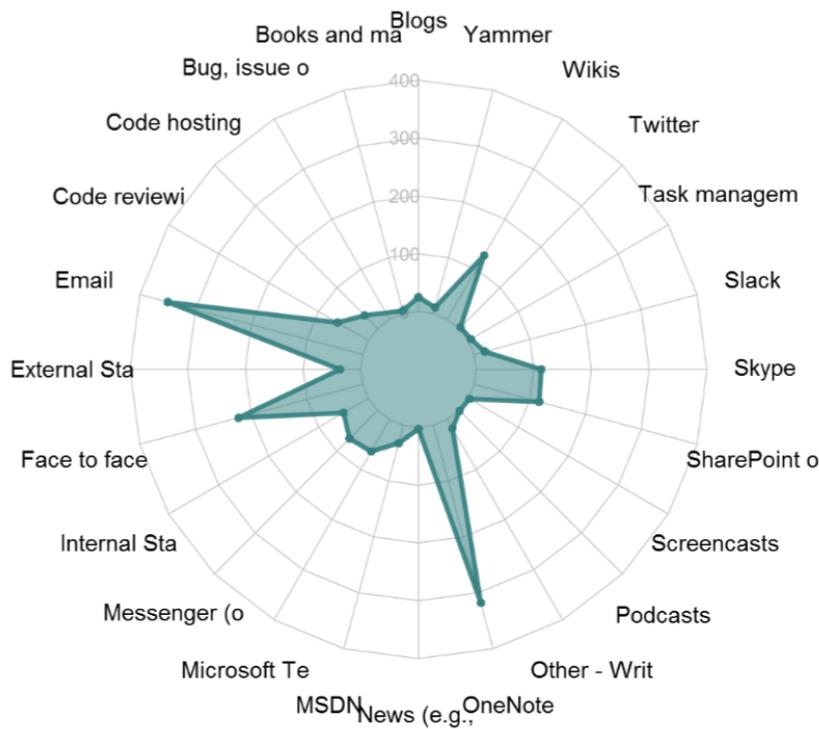
**Geekli.st is an achievement-based social portfolio builder for developers** where they can communicate with colleagues and employers and build credibility in the workplace. [Geeklist](#)  
[Geeklist](#)

## Masterbranch

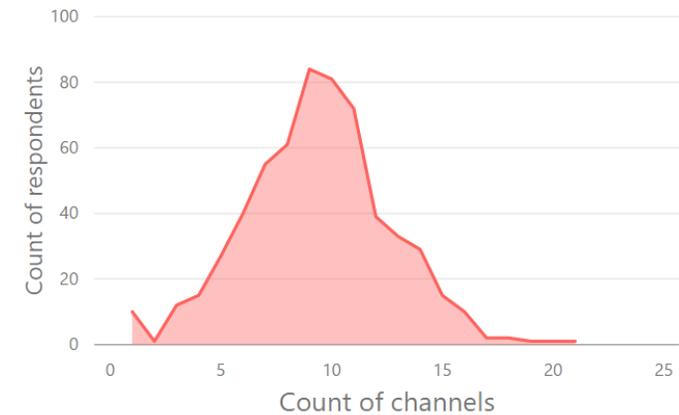
**Masterbranch is a site for developers and employers.** Developers can create their coding profile, and employers who are looking for great developers can find candidates for available positions. [Masterbranch](#)

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

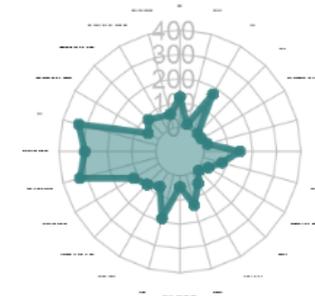
Channels used for documentation



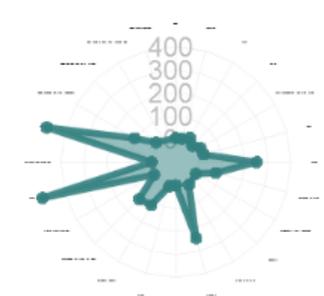
Count of channels used by respondents:



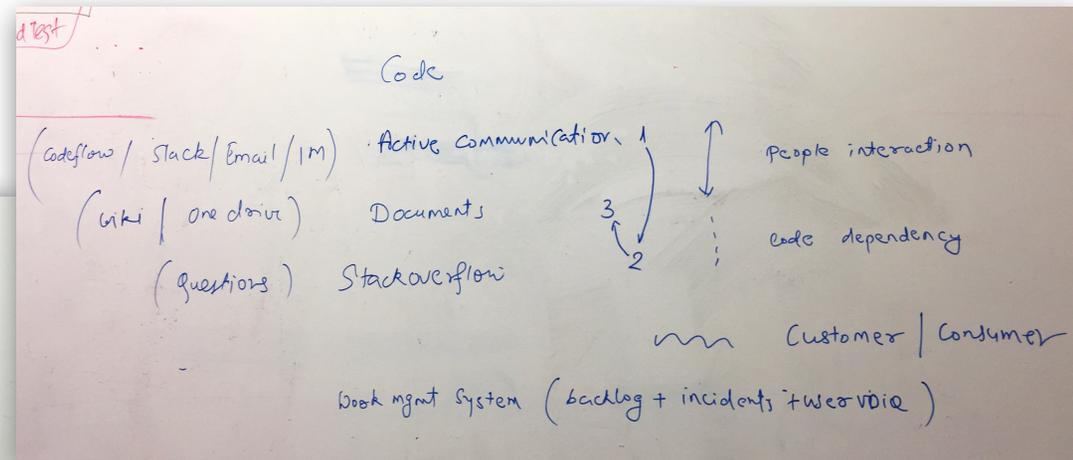
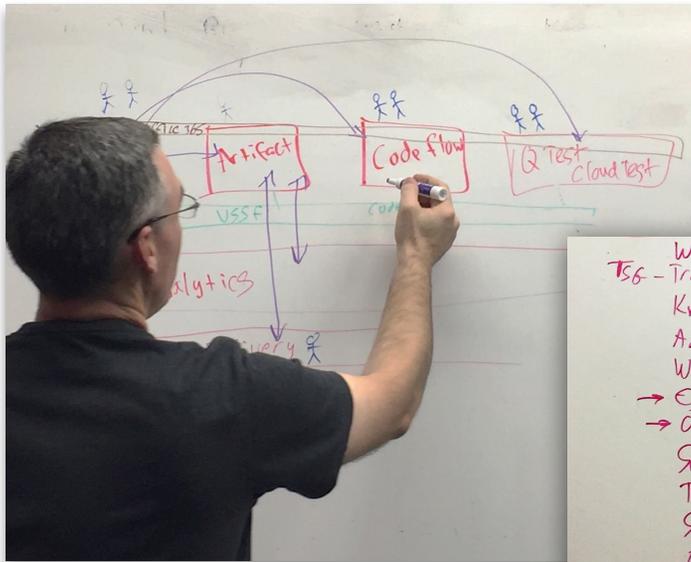
Channels used for finding answers



Channels for discussing goals



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



- Work Items
- TSG - Trouble Shooting Guides
- Knowledge Base
- Architectural Diagrams
- Wiki (user/wiki) (test/wiki)
- Email - DL, DF
- OneNote
- Stackoverflow
- TEAMS/Stack
- Sharepoint
- OneDrive
- Code Review/PR
- Kusto Scripts
- Source Code - Readme Markdown Files
- Phone / Bridge
- Skype/IM
- MSW Search
- Documents stored somewhere (Doc/pdf/etc)
- User Voice / feedback / survey
- FCM Post-mortem
- CMD - INet / GZA

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. ”

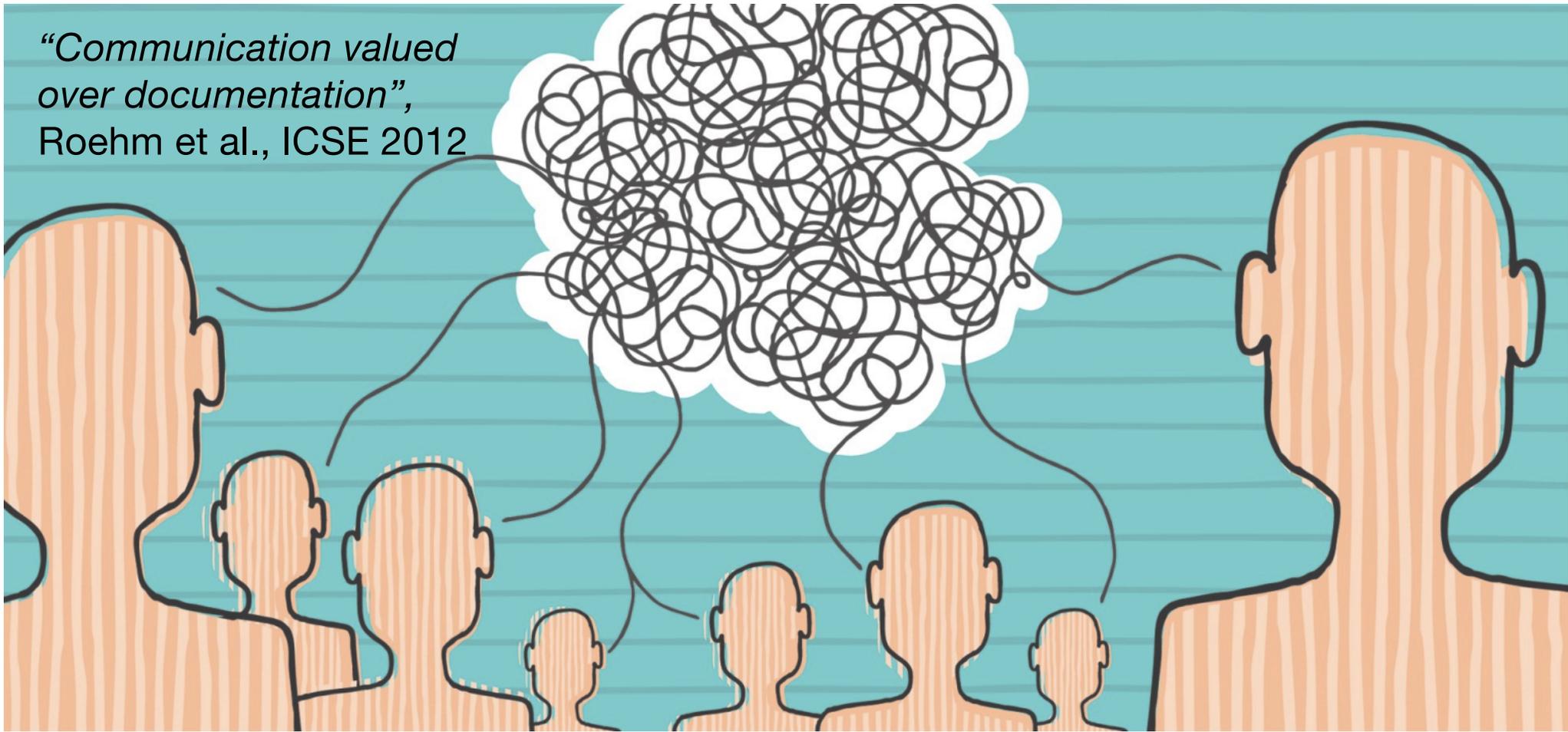
— Ian Bremmer,  
President of Eurasia Group and  
author of Superpower

the **fuzzy**  
and the  
techie

The logo features the word 'the' in a small, lowercase, blue sans-serif font. 'fuzzy' is written in a large, lowercase, rounded sans-serif font with a multi-colored gradient: 'f' is blue, 'u' is purple, 'z' is red, 'z' is orange, and 'y' is yellow. The 'y' has a glowing effect. Below 'fuzzy' is the phrase 'and the' in a smaller, white, lowercase sans-serif font. 'techie' is written in a large, lowercase, rounded sans-serif font where the letters are filled with a grey circuit board pattern.

# ***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

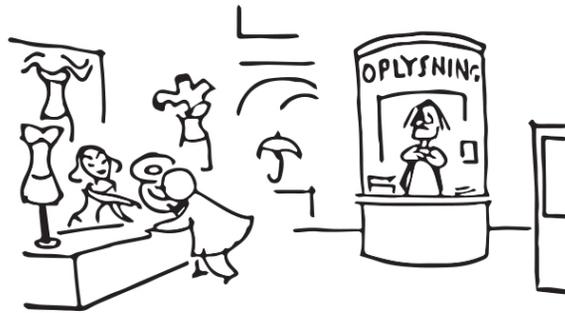


174



276

*“Big to know, but bigger to know who to ask”, Piet Hein*



*Stor er den som véd,  
men større  
den som véd  
hvor han skal spørre.*

*Piet Hein*

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

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



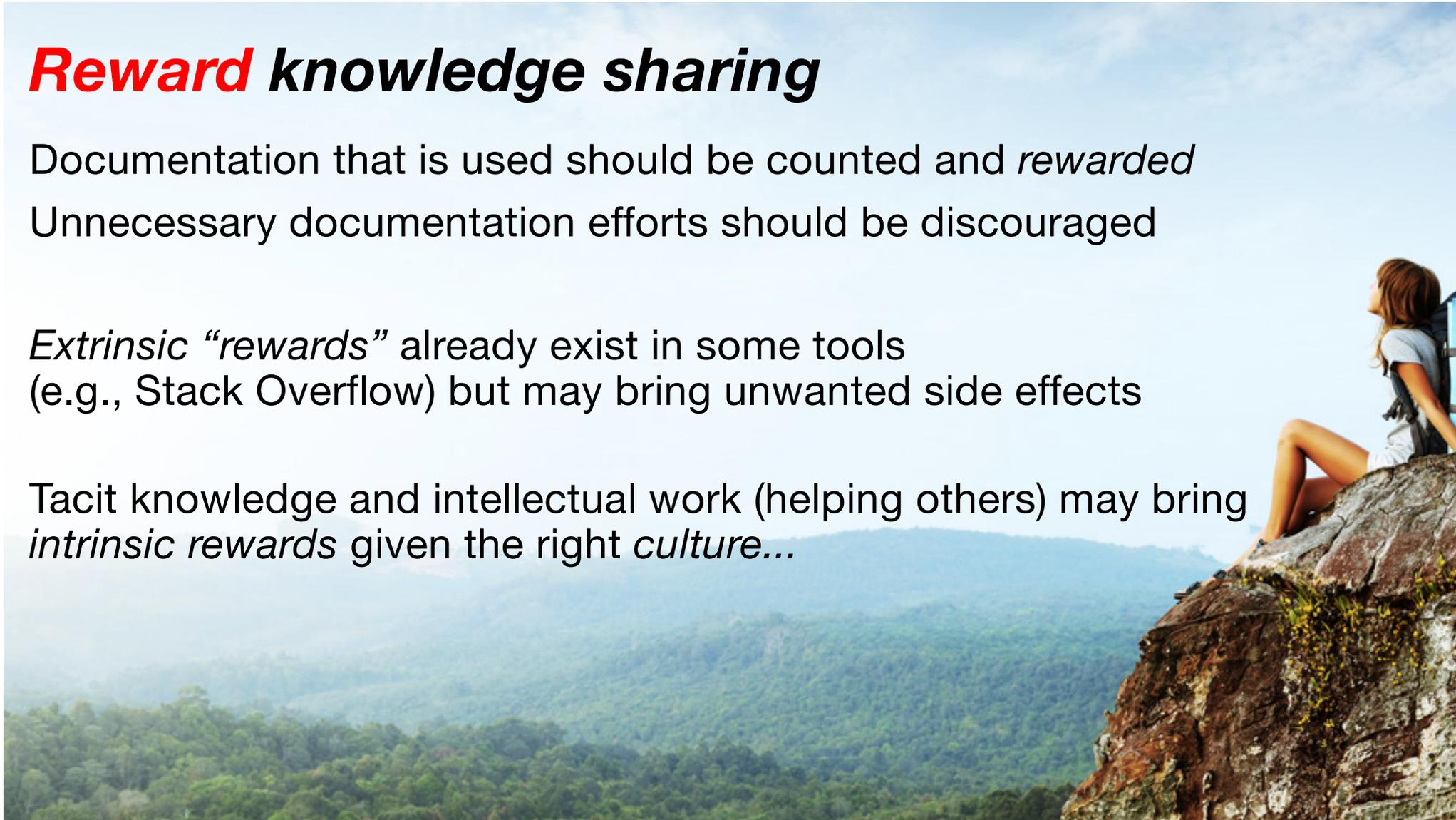
*“Information is cumulative and additive,  
whereas truth is exclusive and selective”,  
Byung-Chul Han*

## ***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

### 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





# **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)

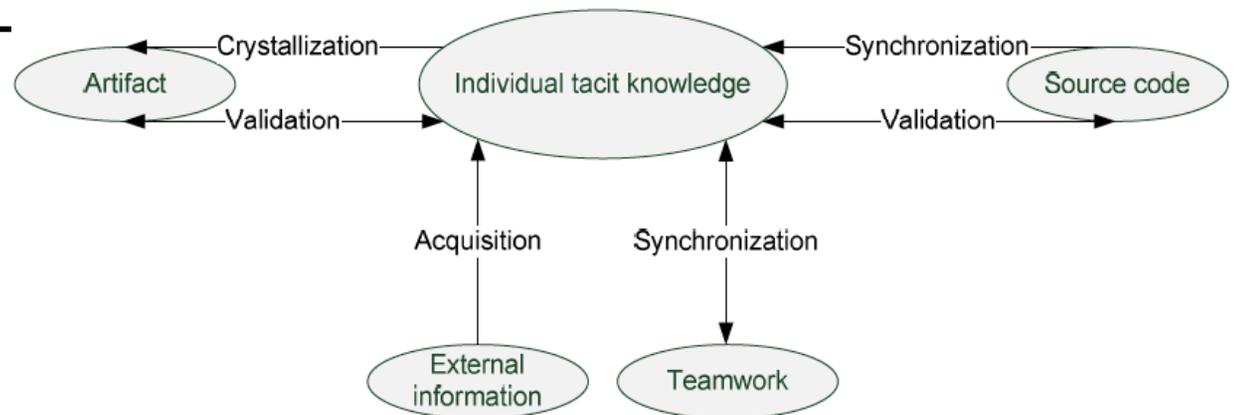


Figure 1. Knowledge flow model

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.

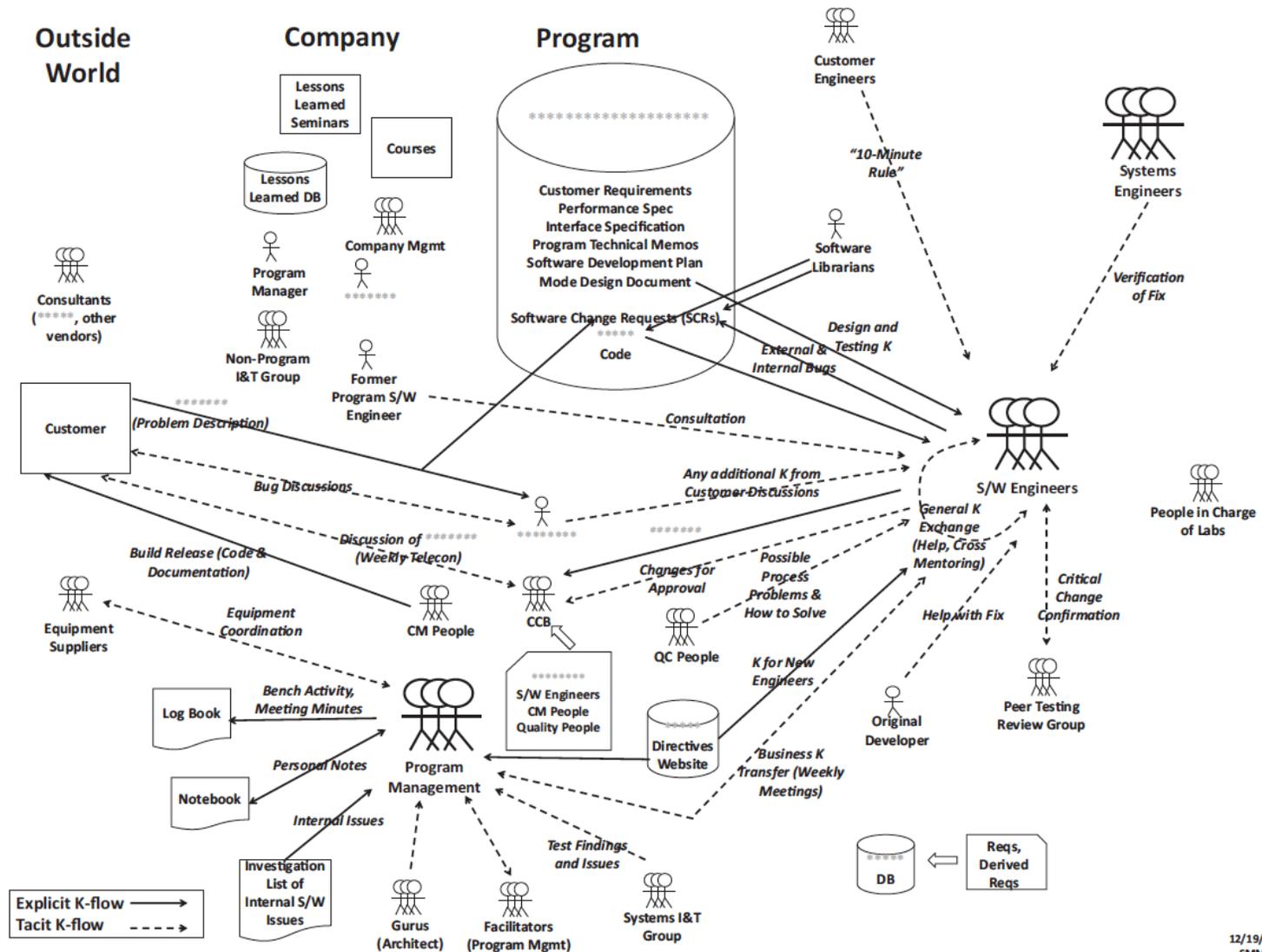
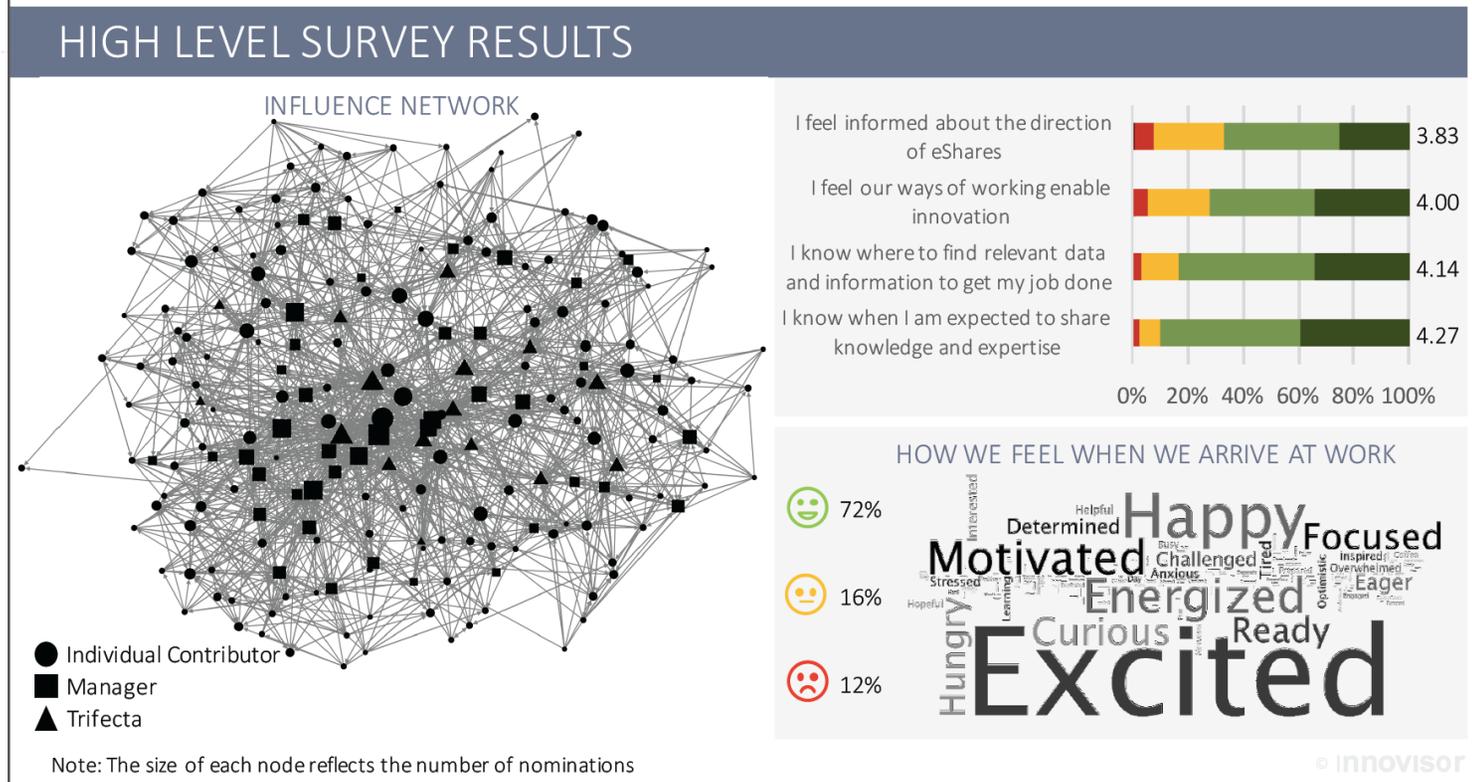


Fig. 5. Manager Radar Project Knowledge Map (Sanitized).

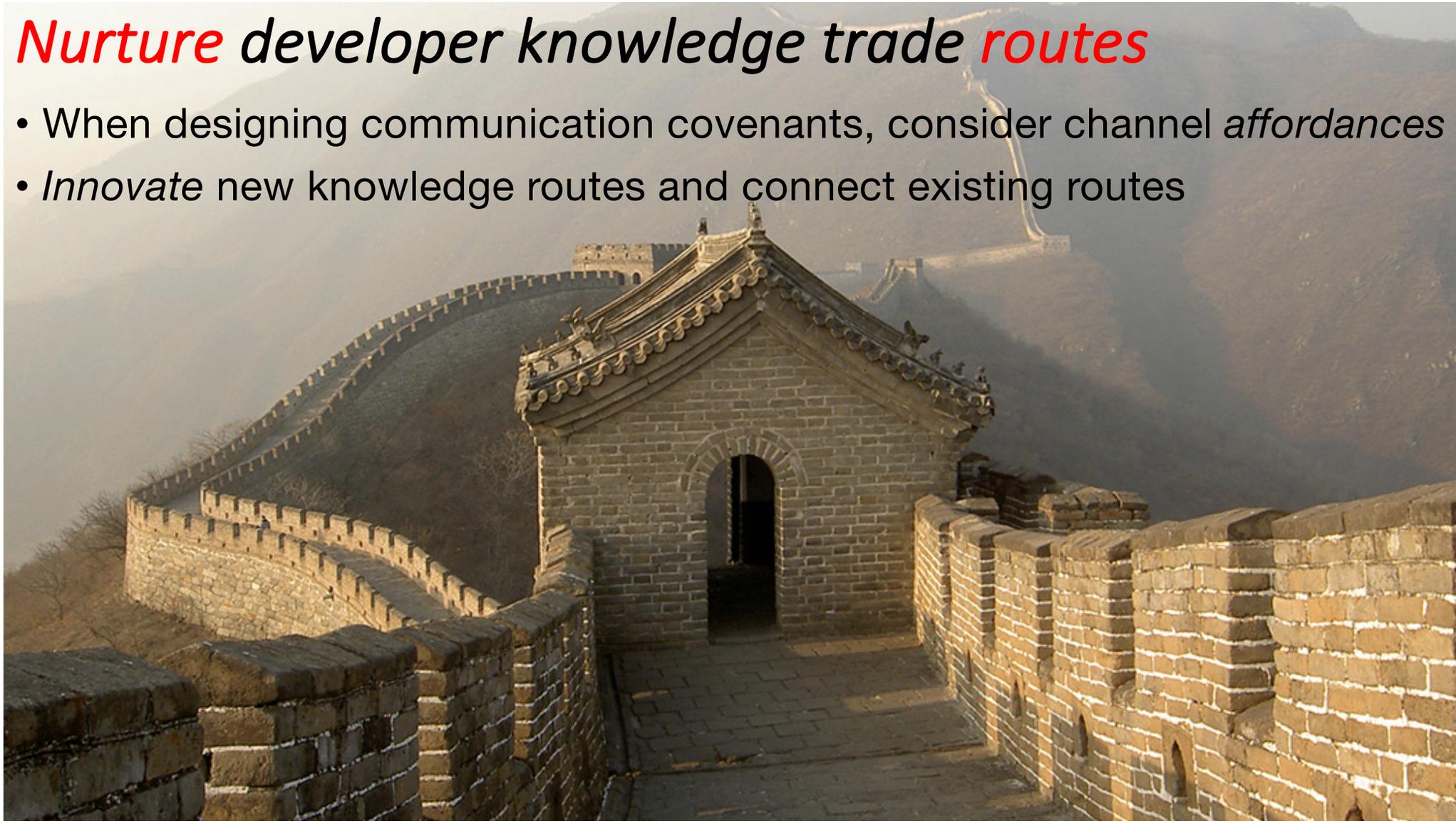
# From the organization chart to the shadow chart...



<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



## 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 @Delthron5000 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

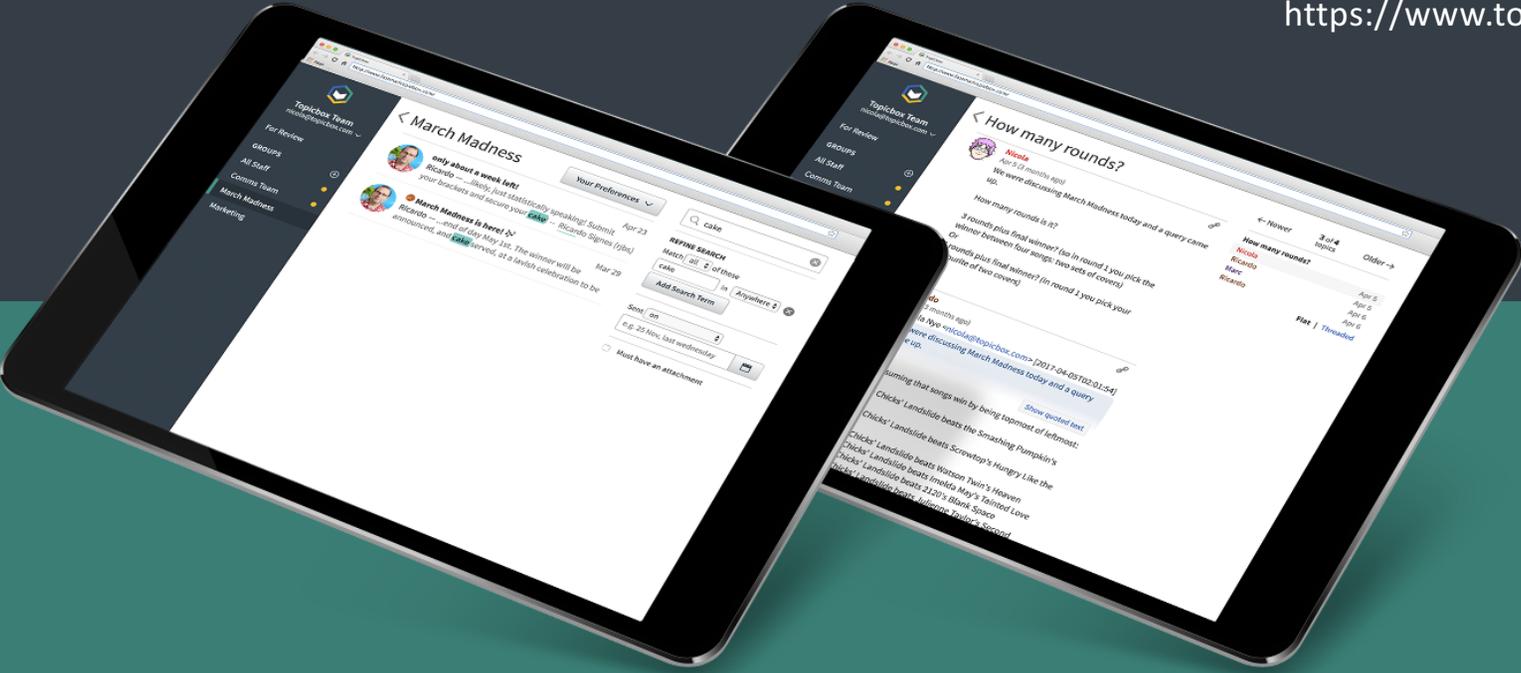
KEEP ME CONNECTED >

# *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.



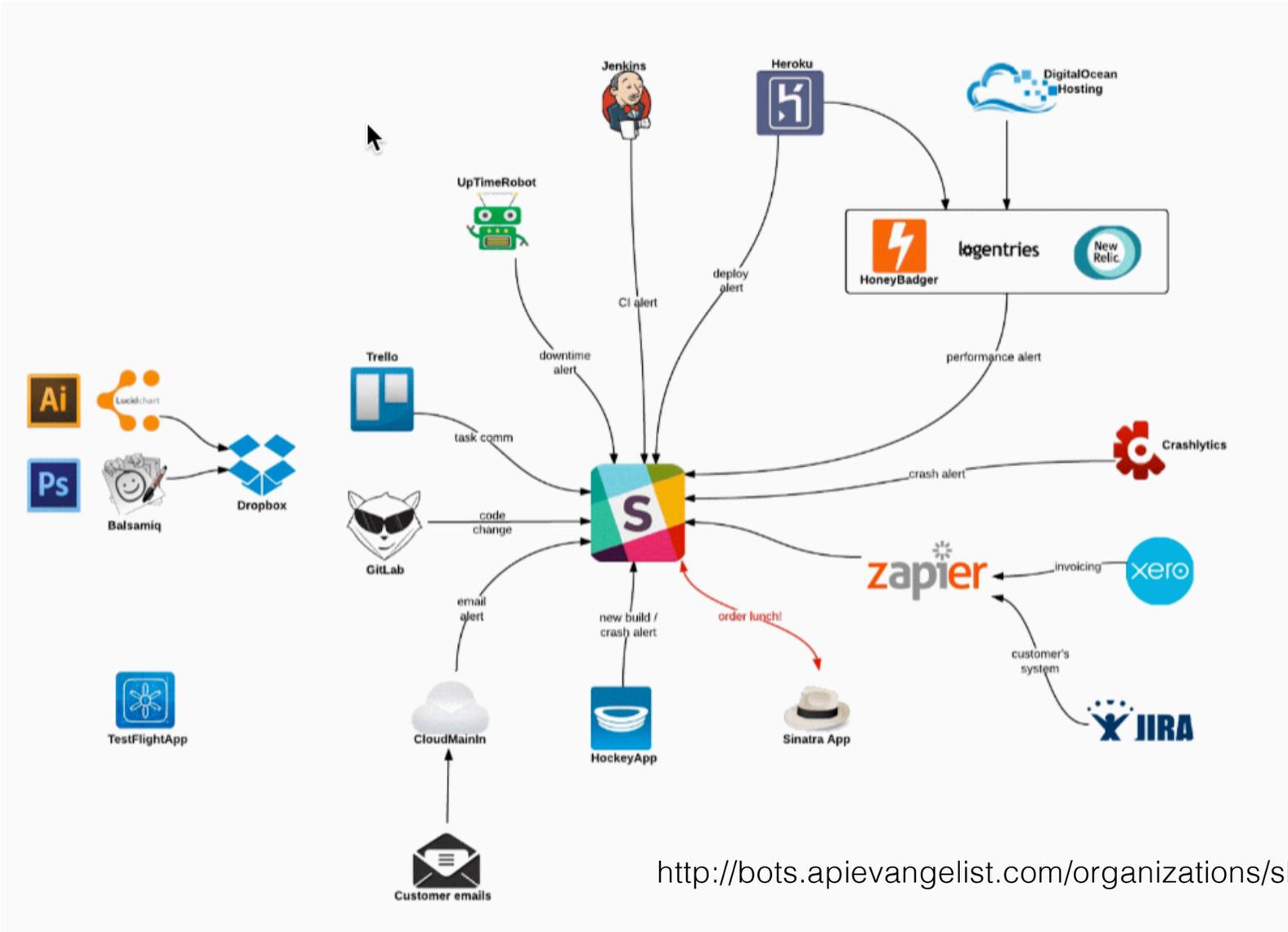
**Retired groups** are searchable, so history isn't lost as projects end.



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



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



<http://bots.apievangelist.com/organizations/slackbots/>

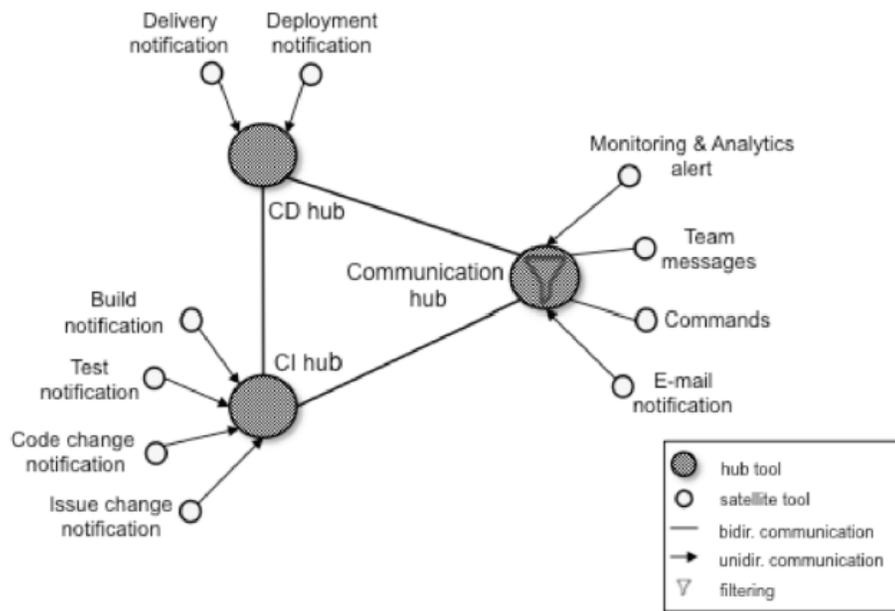


Fig. 1. The hub-and-spoke integration model

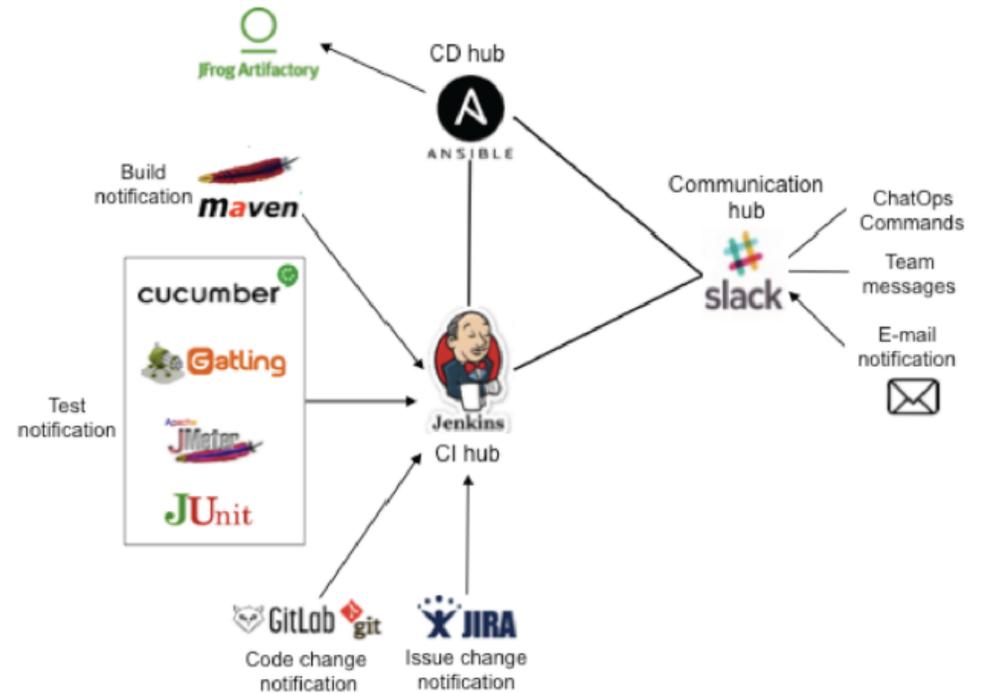


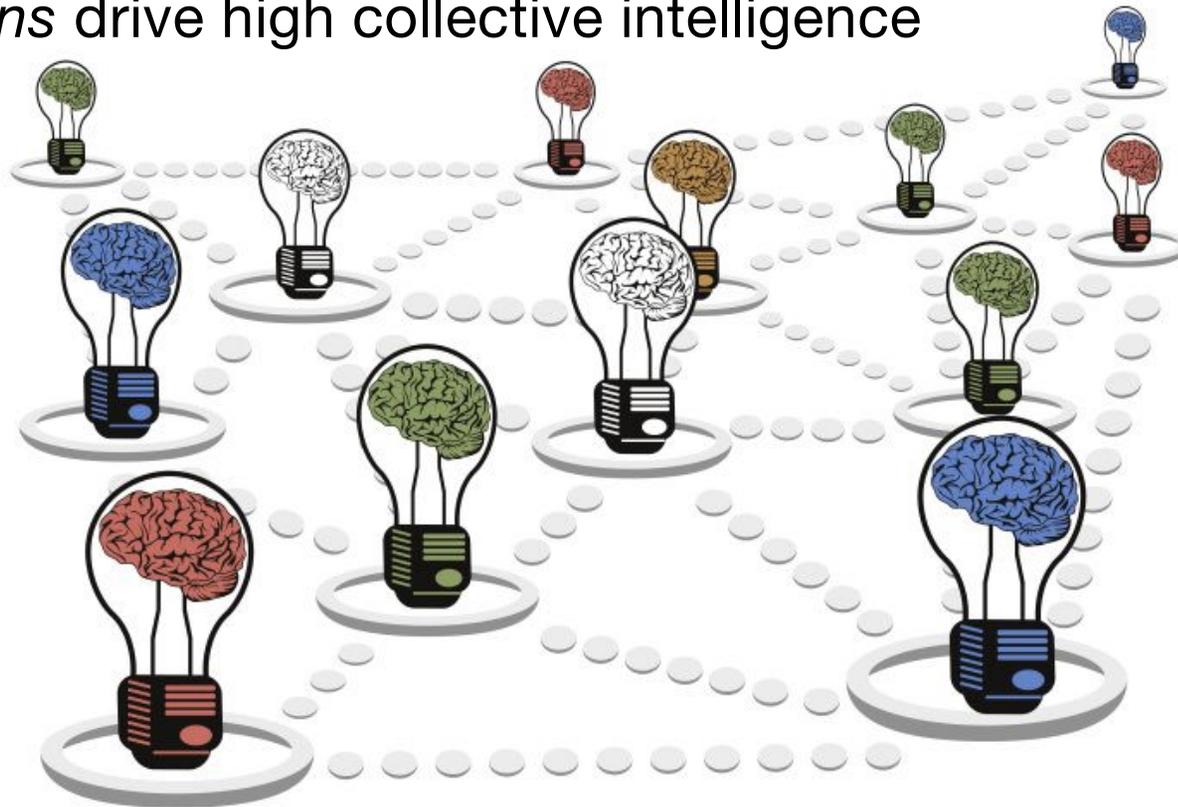
Fig. 2. The instantiated hub-and-spoke model

## *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

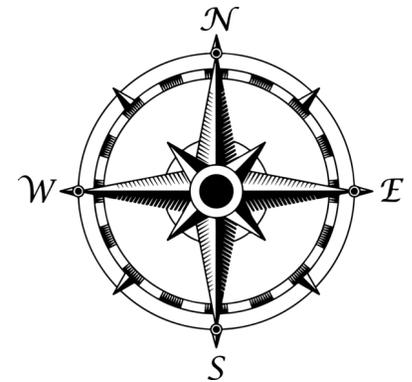




*High collective intelligence enhances **creativity***

# *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





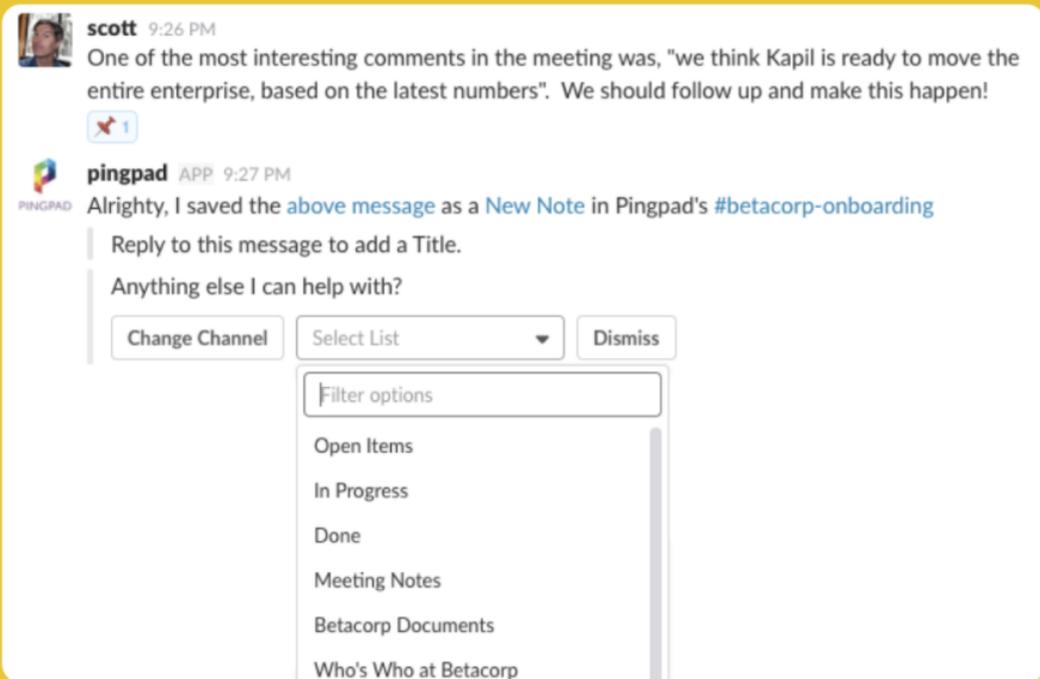
# Get your Slack organized with Pingpad

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

 Add to 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



**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!*

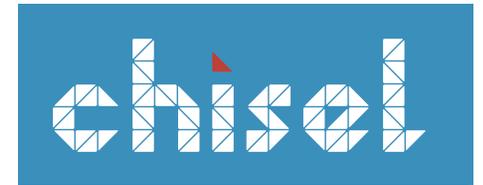
Talk title generator and collaborator – Per Runeson, Lund

Developer knowledge expert – Alexey Zagalsky

“Crazy bot lady” – Carly Lebeuf

Gamification and visualization expert – Matthieu Foucault

Crap detector – Cassie Petrachenko



**University  
of Victoria**



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**

