

Wanna see your OSS project succeed?

Nurture your community

Jordi Cabot – ICREA Research Professor at UOC

@softmodeling

modeling-languages.com

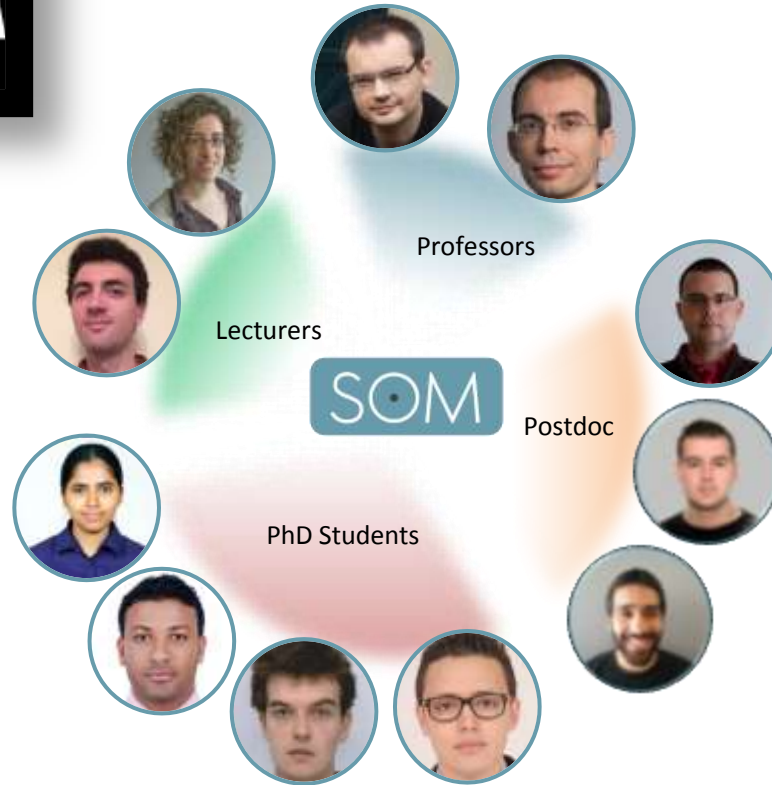
A nighttime aerial view of a city, likely San Francisco, with the SOM Building (Salesforce Tower) as the central focus. The building is illuminated and stands out against the dark sky. Other city lights and buildings are visible in the background.

# SOM Research Lab

Software runs the world. Models run the software



# The Team



Professors

Lecturers

SOM

Postdoc

PhD Students



# Our mission

We are interested in the broad area of systems and **software engineering**, especially promoting the rigorous use of software **models and engineering principles** in all software engineering tasks while keeping an eye on the most unpredictable element in any project: the **people** involved in it.



SOM



# Been there done that since 2003

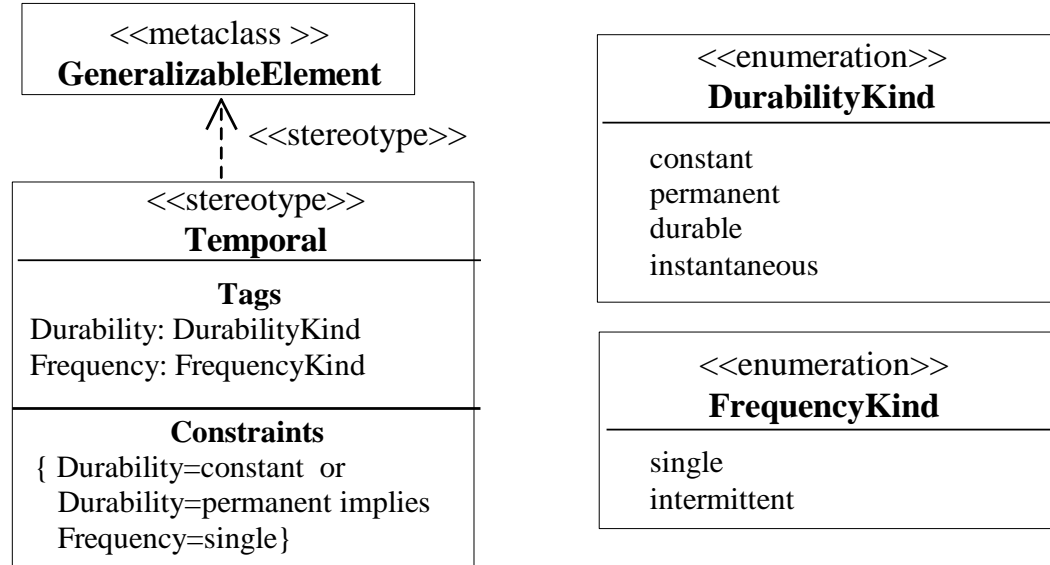
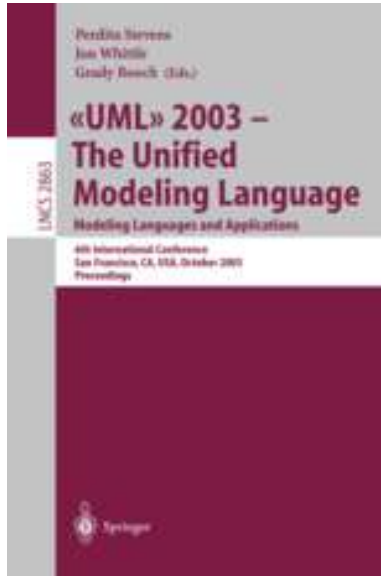


Fig. 4.1 –The `<<temporal>>` stereotype



## EMF-REST

Model → RESTful API + Validation + Security



## JSON discoverer

Visualize the schema lurking behind your JSON documents



SOM-Research / **EMFtoCSP**

Unwatch 13 Star 7

Code Issues (10) Pull requests (0) Wiki Pulse Graphs Settings

Bounded verification of UML/OCL (or EMF/OCL) models — Edit



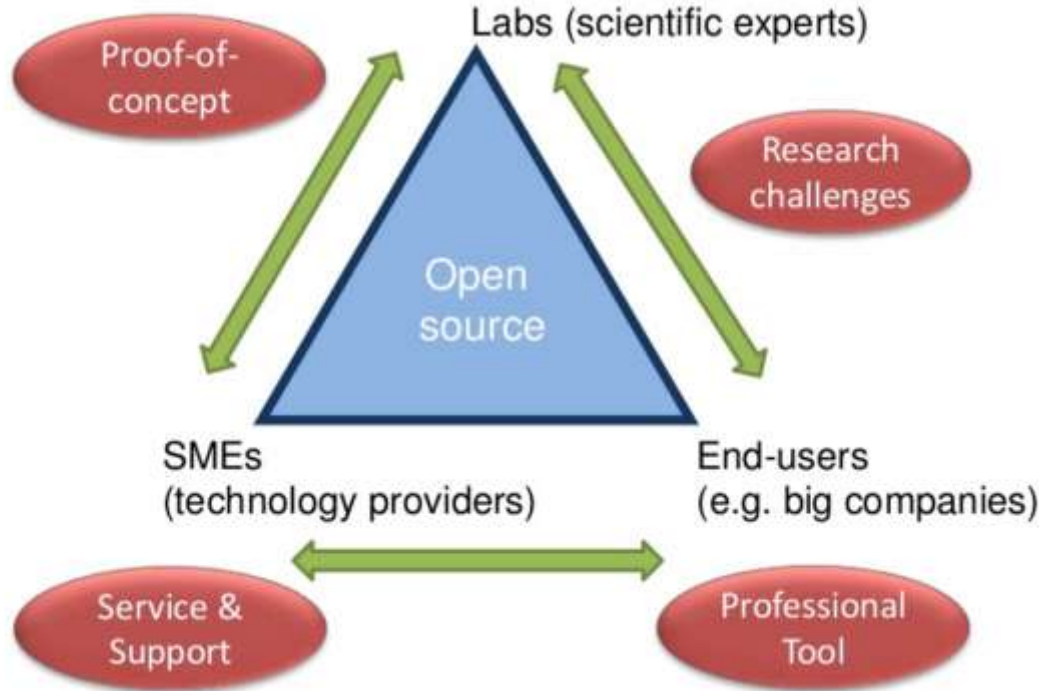






Why the f\*\*\* are  
people not using  
our tools?

# Industrialization of research tools



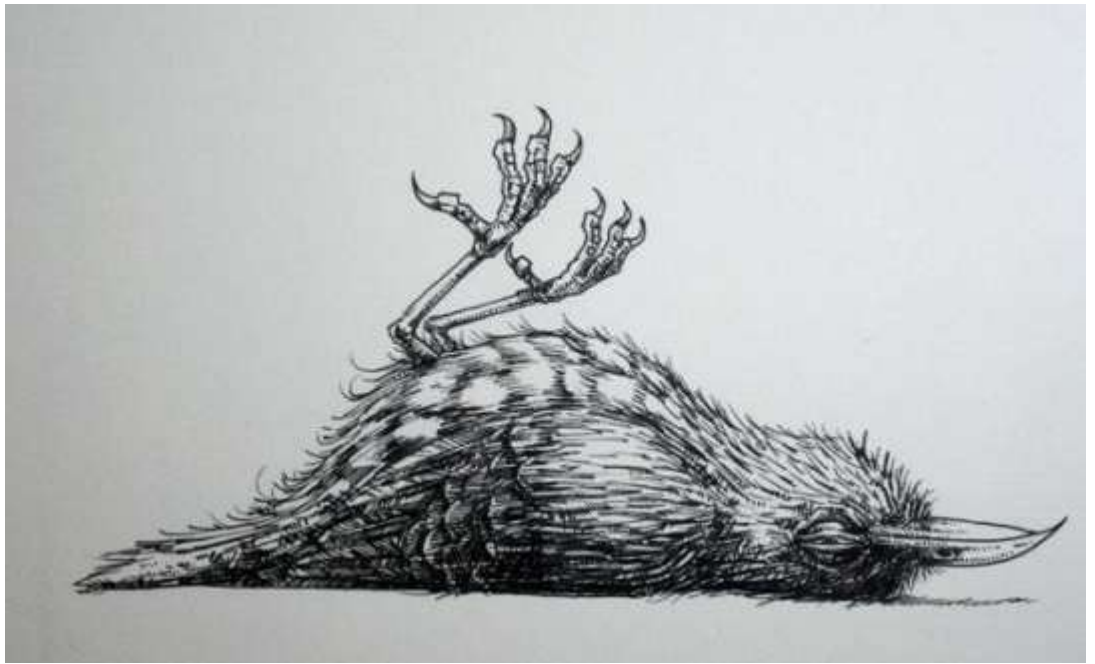
BUT:

- Relies too much on SMEs that may change their focus
- Naïve view of open source (people will magically show up and help)

# Remember when...



**Many projects fail and get abandoned in the very early stages unable to get any traction (or because they lose it!)**



**Goal: Discuss strategies to ensure the long-term sustainability of Papyrus**



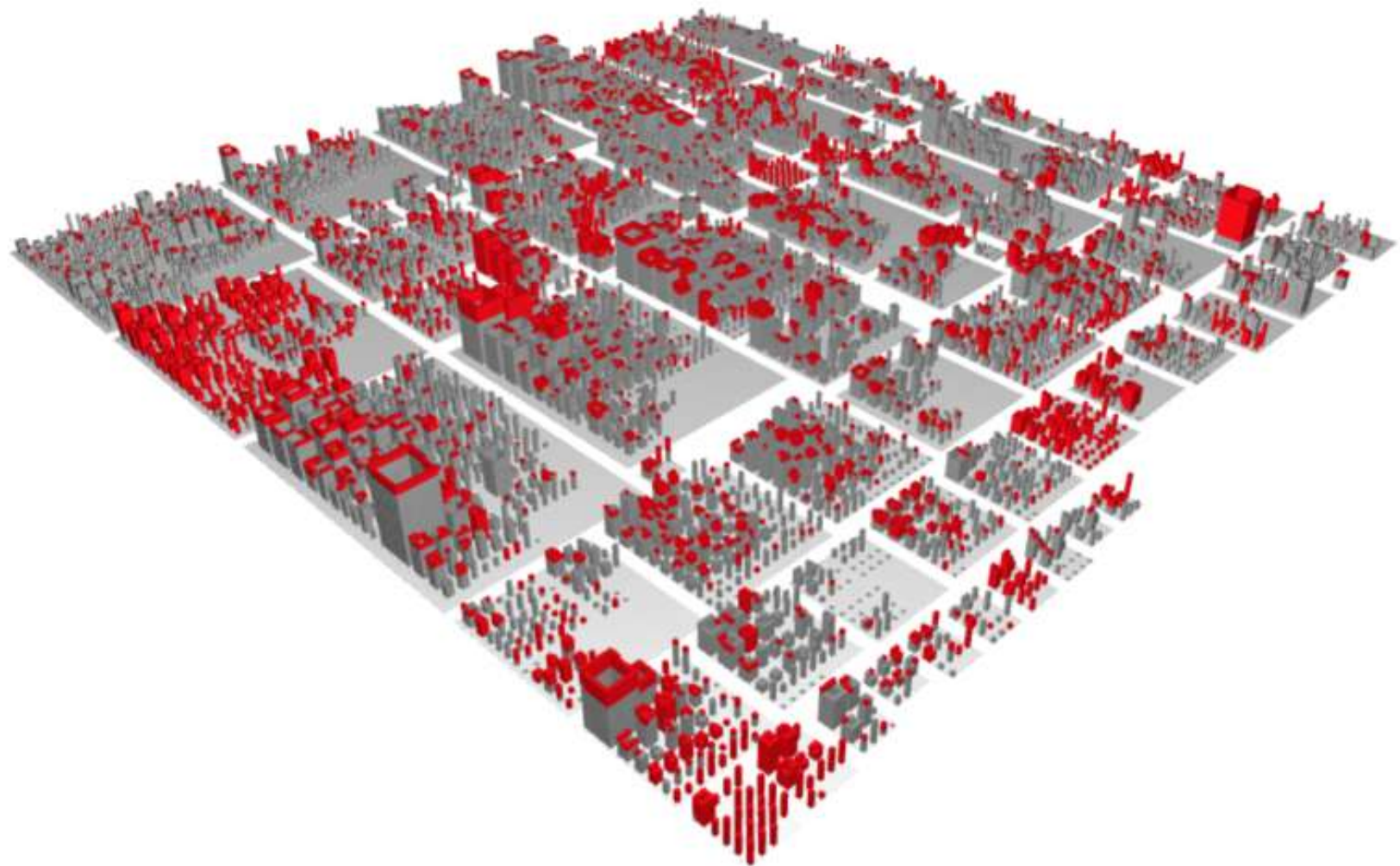
# Software Analysis

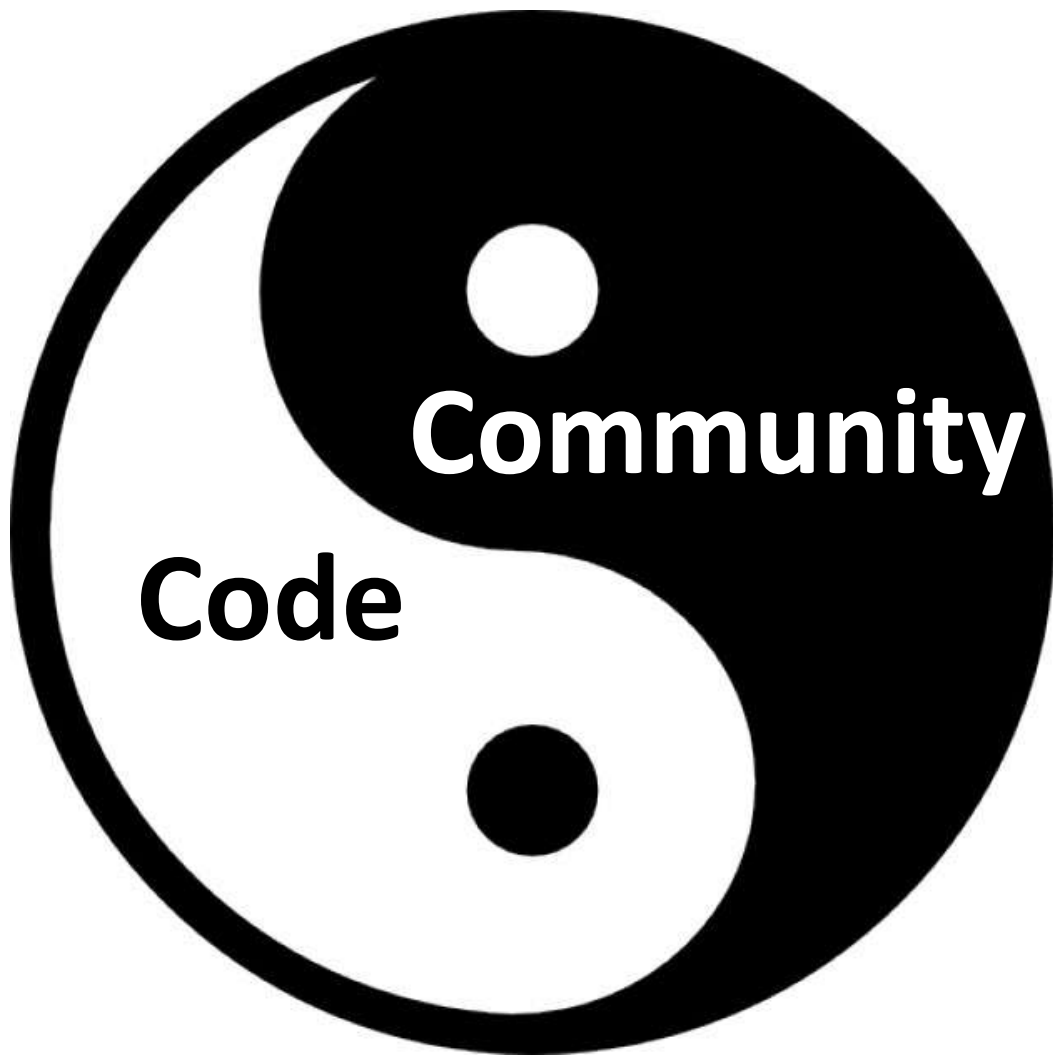


- wordpress (66 932 items)
  - Assignment issues (1 item)
  - Code Smell (102 items)
  - Code Style (16 items)
  - Code style issues (185 items)
  - Control Flow (4 items)
    - Unreachable statement (4 items)
      - wp-includes (2 items)
        - Unreachable statement
        - Unreachable statement
      - wp-admin (2 items)

Most works  
focus on  
code  
analysis

```
\getid3_lib\CopyFileParts
public static function CopyFileParts($filename_source, $filename_dest, $offset, $length) {
    if (!self::intValueSupported($offset + $length)) {
        throw new Exception('cannot copy file portion, it extends beyond the '.round(PHP_INT_MAX / 1073741824).'GB limit');
    }
    if (is_readable($filename_source) && is_file($filename_source) && ($fp_src = fopen($filename_source, 'rb'))) {
        if (($fp_dest = fopen($filename_dest, 'wb'))) {
            if (fseek($fp_src, $offset, SEEK_SET) == 0) {
                $byteslefttowrite = $length;
                while (($byteslefttowrite > 0) && ($buffer = fread($fp_src, min($byteslefttowrite, getID3::FREAD_BUFFER_SIZE)))) {...}
                return true;
            } else {
                throw new Exception('failed to seek to offset '.$offset.' in '.$filename_source);
            }
        }
        fclose($fp_dest);
    } else {
        throw new Exception('failed to create file for writing '.$filename_dest);
    }
    fclose($fp_src);
} else {
```





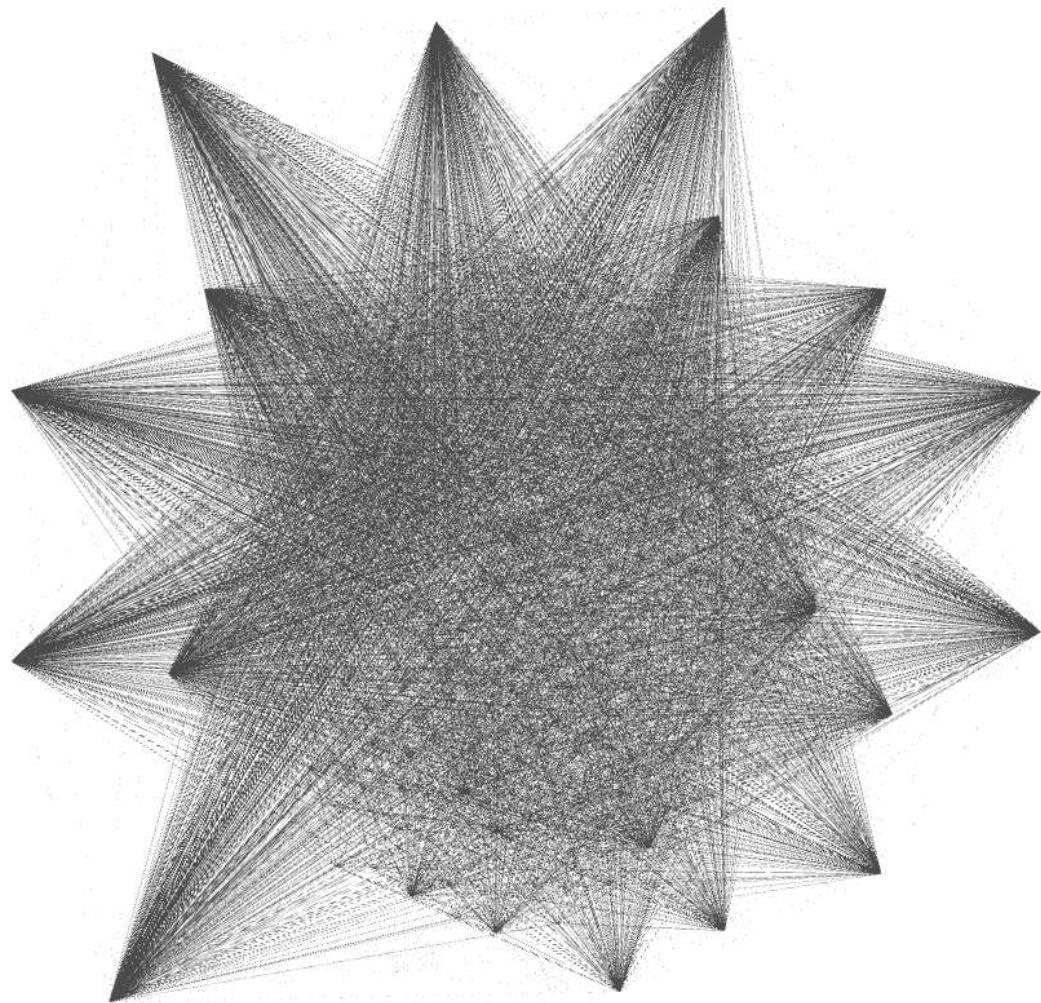
**Code**

**Community**





**Your community  
is the KEY**





Governing

How to  
help your  
OSS  
succeed

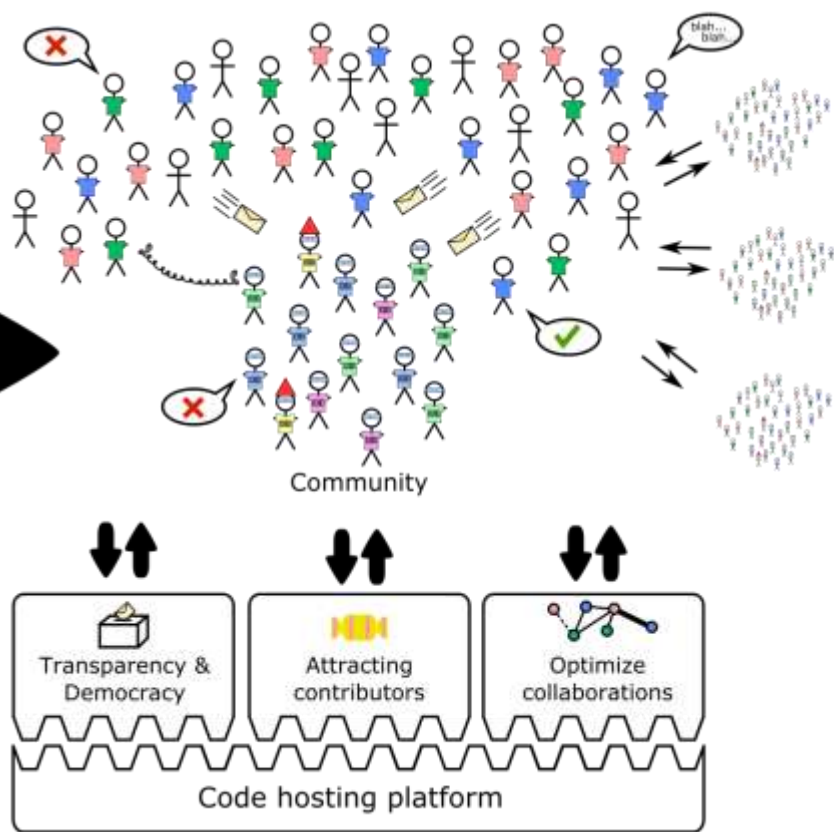
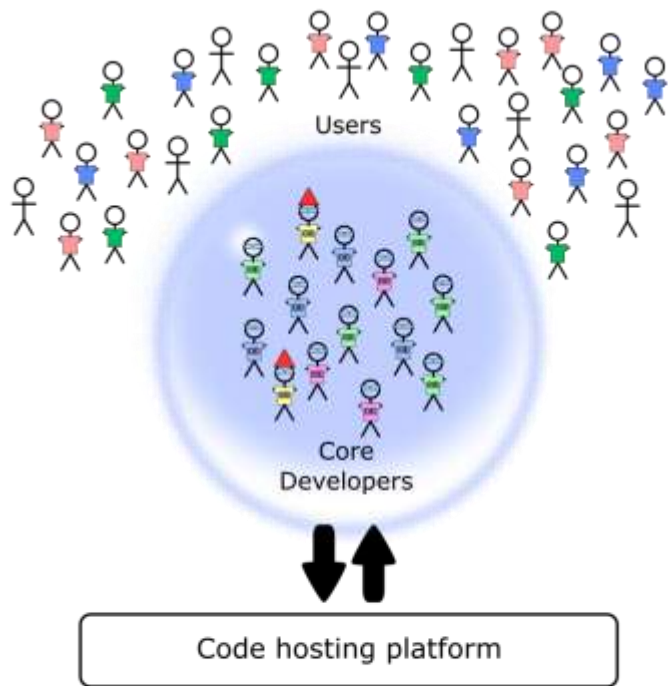
Onboarding

Optimizing



**SUPER  
SOCIOLOGIST**

DEVELOPER  
CENTRIC



COMMUNITY  
BASED



# *Community Health*





**Size doesn't  
matter**

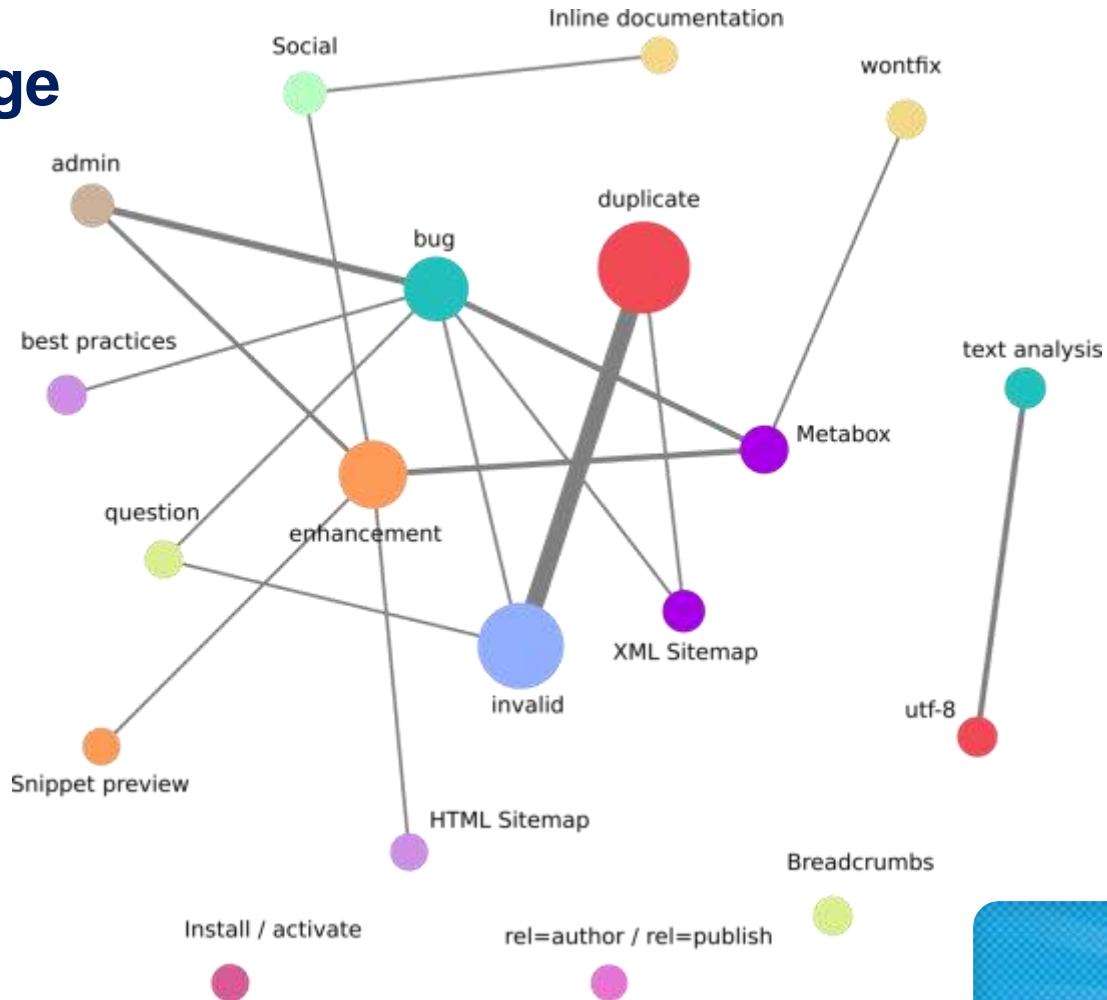
# Understanding Community = Graph Analysis

- Many types of graphs (e.g. Bipartite graphs)
- Many types of properties
  - Micro-view (local properties)
  - Macro-view (global properties)
  - Meso-level (emerging properties)
- Analysis at different levels

**Build the  
right graph  
for your  
purpose**

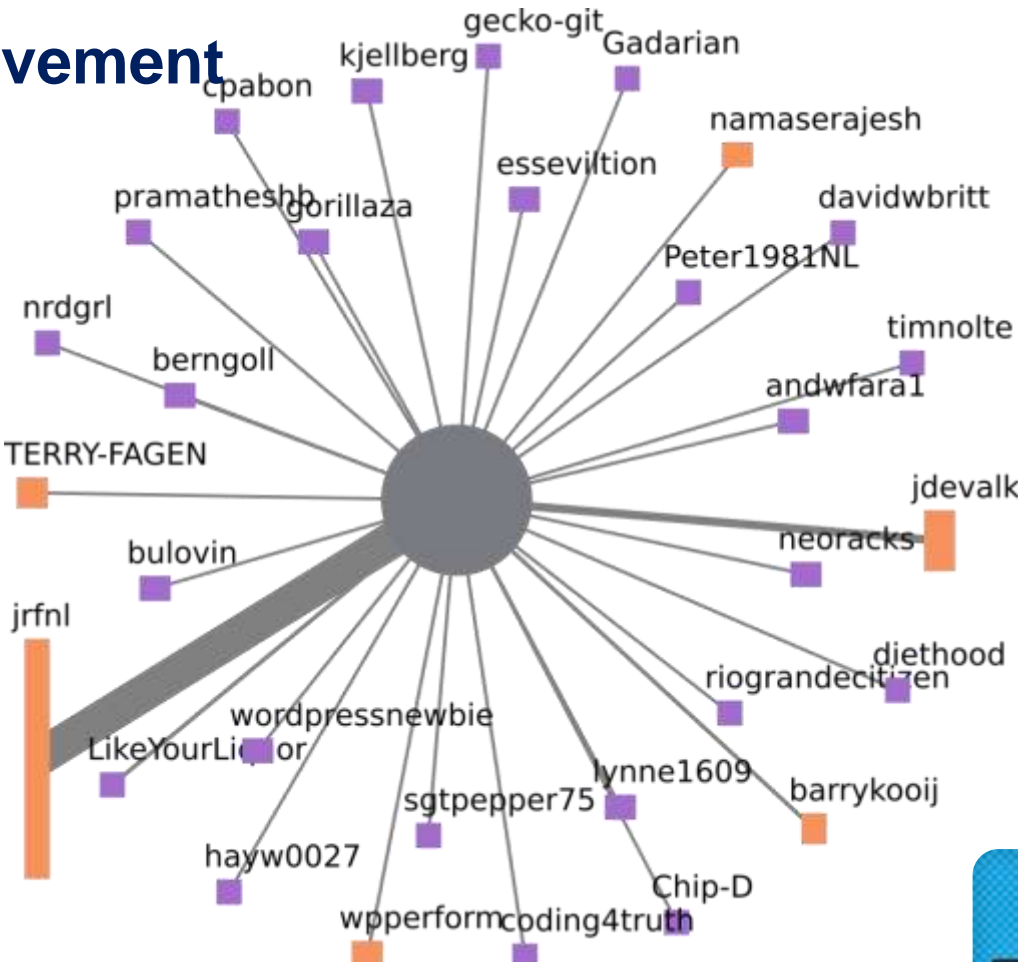


# Label Usage





# User Involvement



# Bus Factor

*“Number of key developers who would need to be incapacitated (hit by a bus), to send the project into disarray that it would not be able to proceed”*



# The 2\_0\_0\_papyrus project

## Summary

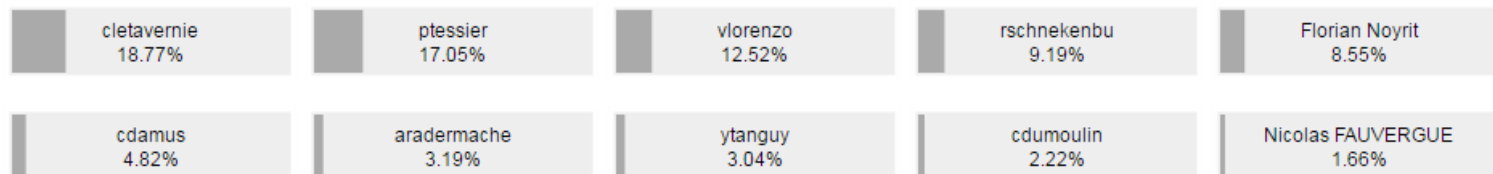
In your project **82** developers contributed actively in **146079** files (the most important file extensions are **java (61.8%)**, **gif (7.19%)** and **xwt (4.01%)**). The project will have a hard time if **cletavernie** is hit by a bus. The project also relies on **ptessier**, **vlorenzo**, **rschnekenbu**, **Florian Noyrit** and **cdamus**. In any case, the project can manage without **aradermache**, **ytanguy**, **cdumoulin**, **Nicolas FAUVERGUE**, **tlandre**, **eperico**, **francois.le-fevre**, **acuccuru**, **mauricio alferex**, **Gabriel Pascual**, **mvelten**, **vhemery**, **jeremie.tatibouet**, **bmaggi**, **Laurent Wouters**, **Ed Seidewitz**, **cmraidha**, **Mickael ADAM**, **tfaure**, **Maged Elaasar**, **jscadavid**, **sdhouib**, **dservat**, **adaussy**, **atischenko**, **sgerard**, **aelkouhen**, **Quentin Le Menez**, **ashatilov**, **tfesenko**, **jbenois**, **Céline Janssens**, **Philippe Roland**, **skovalsky**, **Thomas Daniellou**, **fcano**, **Shuai Li**, **gmerincube**, **Fanch BONNABESSE**, **fadwa tmar**, **Onder Gurcan**, **mgolubev**, **Eike Stepper**, **sboyko**, **pnandorf**, **truc.nguyen**, **Sébastien Gabel**, **rfaudou**, **Bruno Marques**, **Géry Deloge**, **Dirk Fauth**, **omlois**, **Jonathan GEOFFROY**, **Thibault Le Ouay**, **Marc-Andre Laperle**, **Ed Willink**, **David Akehurst**, **Andrew Eidsness**, **Antonio Campesino**, **Boutheina Bannour**, **Bran Selic**, **atichenko**, **Sebastien Poissonnet**, **Calin GLITIA**, **Axel Richard**, **Alain Le Guennec**, **Fred Eckertson**, **Sebastien Revol**, **PT202707**, **Klaas Gadeyne**, **Alexis Fouché**, **Anatoliy Tischenko**, **Yuri Strot**, **lapitre**, **Gerrit Code Review @ Eclipse.org** and **Alexey Shatilov**.

The Bus Factor is:

6

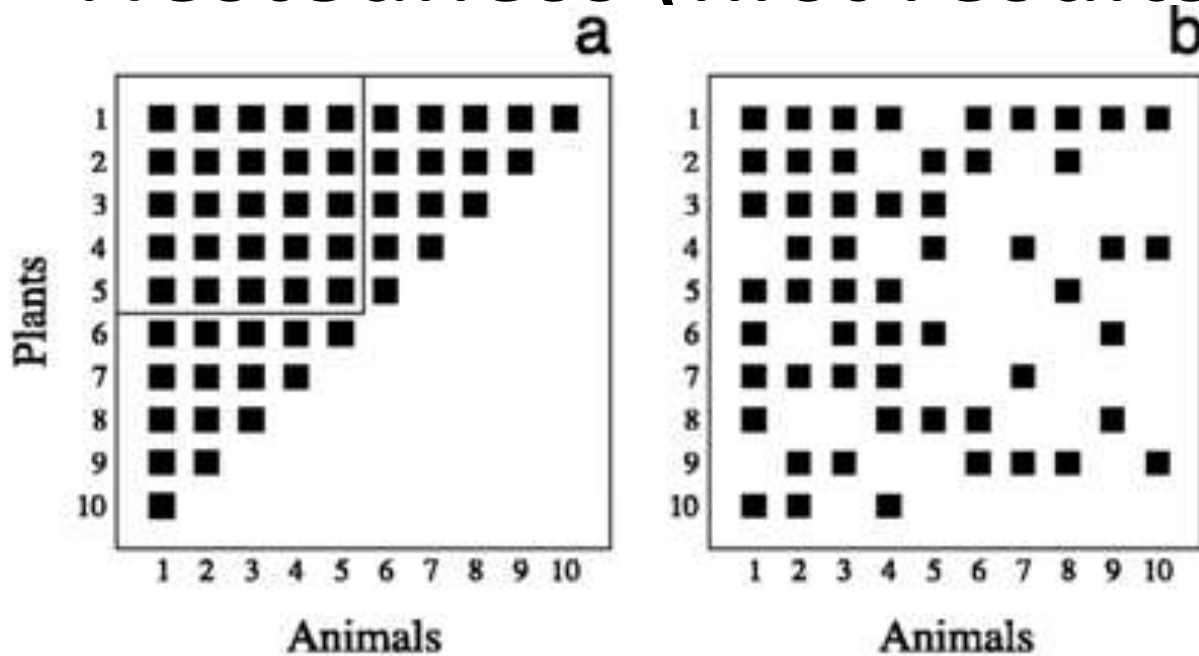
Start Bus Hitting

## User Relevance





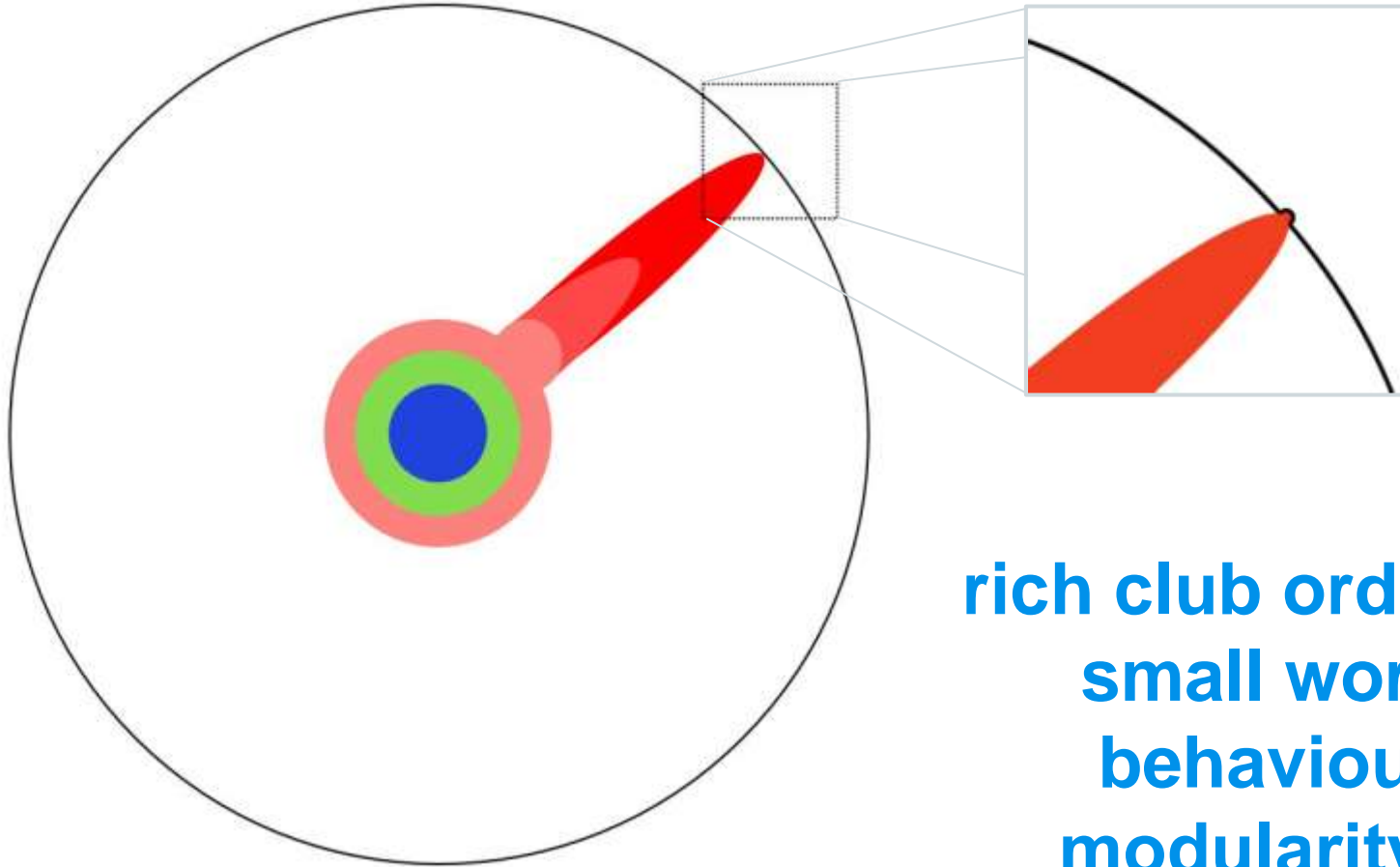
# Nestedness (first results)



**Occasional contributors focus on the most frequently modified files**



And there's much more...



**rich club ordering,  
small world  
behaviour,  
modularity...**

# Gitana: Integrated analysis

## Coding platform



## Code review tools



## Issue trackers

facebook



## Commun. channels

# ***Attracting contributors*** ***(and keeping them)***

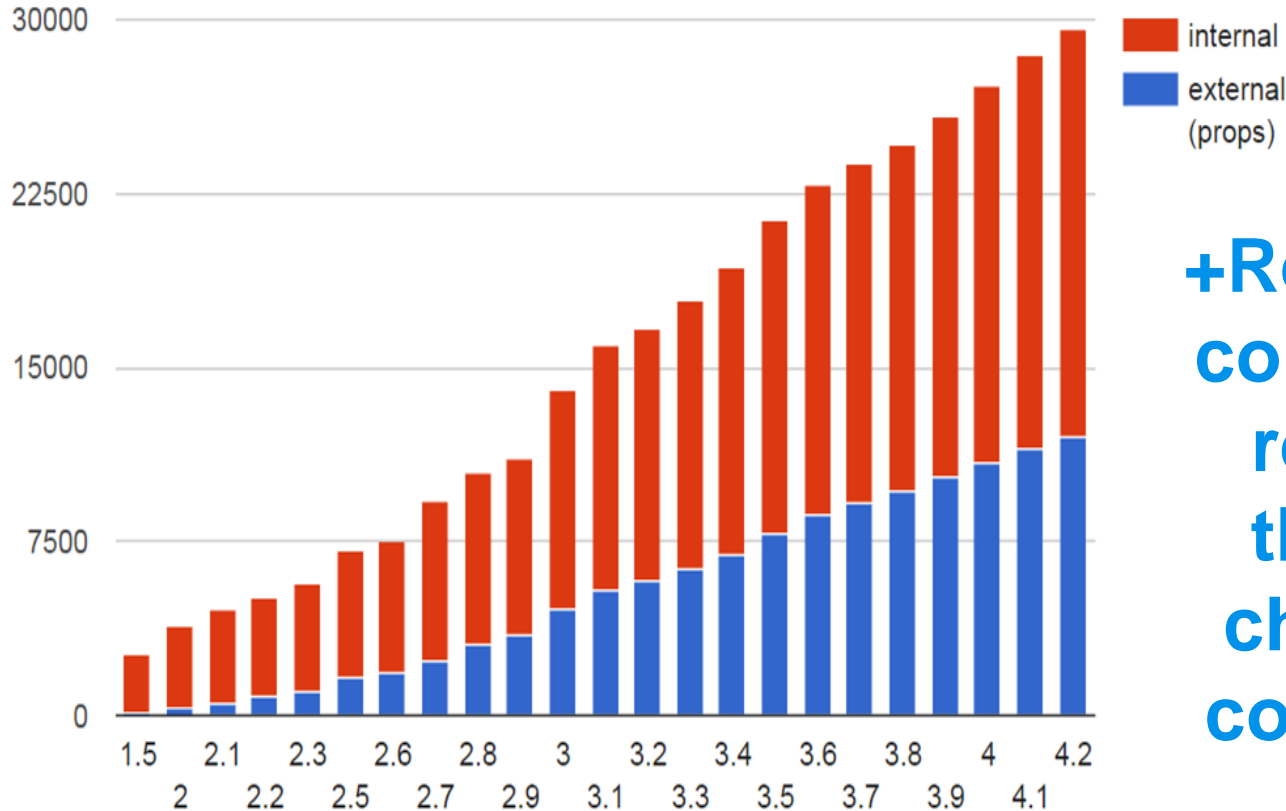


# THE 90-9-1 RULE

On Participation in  
Online Communities



Proportion of core team vs external contributions



**+Retention: If you contribute to one release in WP, there is a 46% chance you will contribute to the next**



# Facilitate on boarding: Importance



WORDPRESS.ORG

Search WordPress.org



Showcase Themes Plugins Mobile Support [Get Involved](#) About Blog Hosting

Download WordPress

Make WordPress Core

Blog

Handbook

Tickets

Components



Login

Notifications

Search

Custom Query

{44} Good First Bugs (80 matches)

Update

Max items per page

100

These tickets have been marked as being a "good first bug" for new contributors.

First bugs aren't necessarily "easy," though some are. These bugs are meant to be well-contained. They are designed to help get you familiar with WordPress core code, processes, and contributing, not send you down a rabbit hole for days on end. Whoever marked the ticket likely explained in the ticket why they did so, giving you a good starting point from which to work.

Create a new ticket

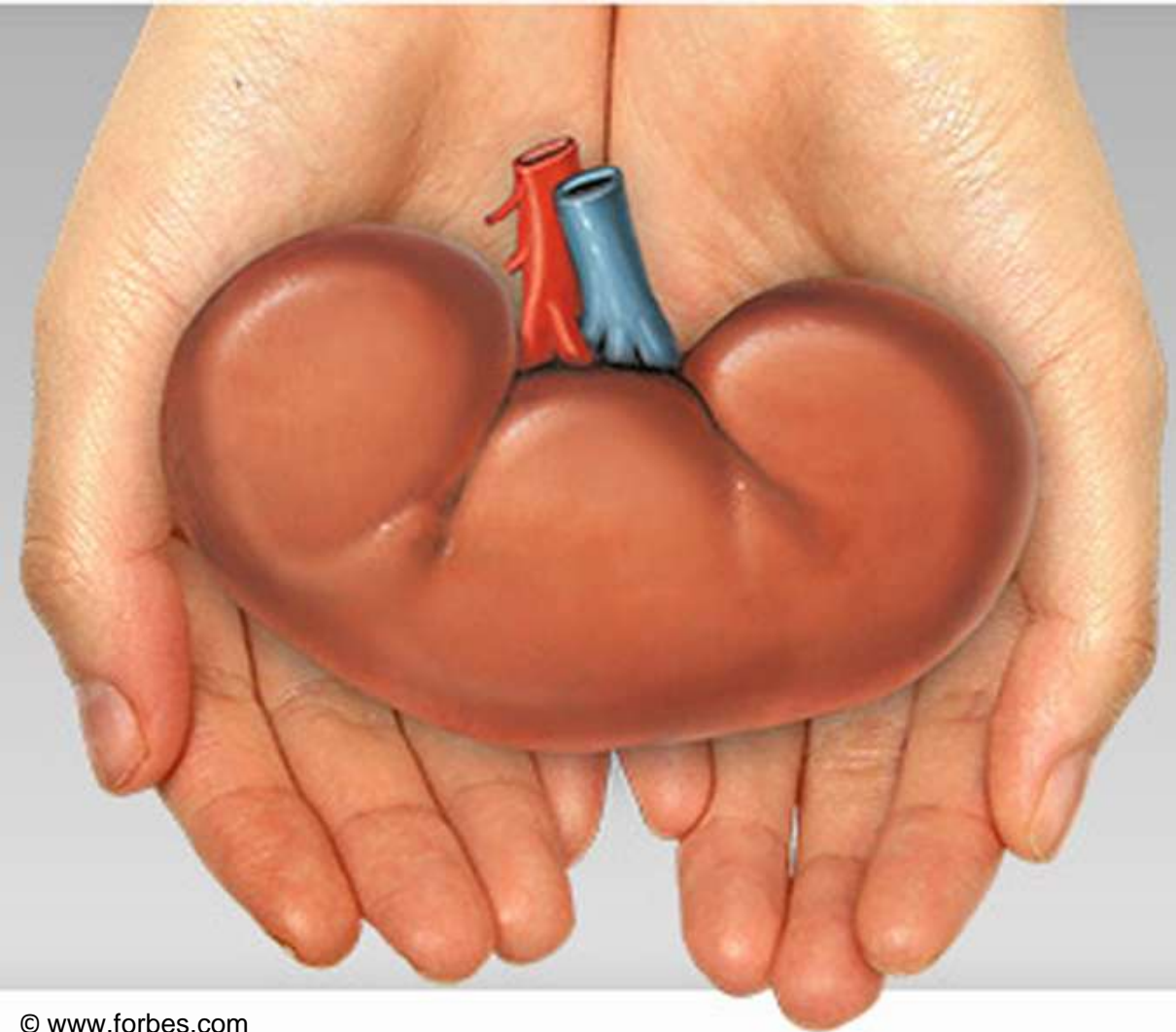
project and skills

start with

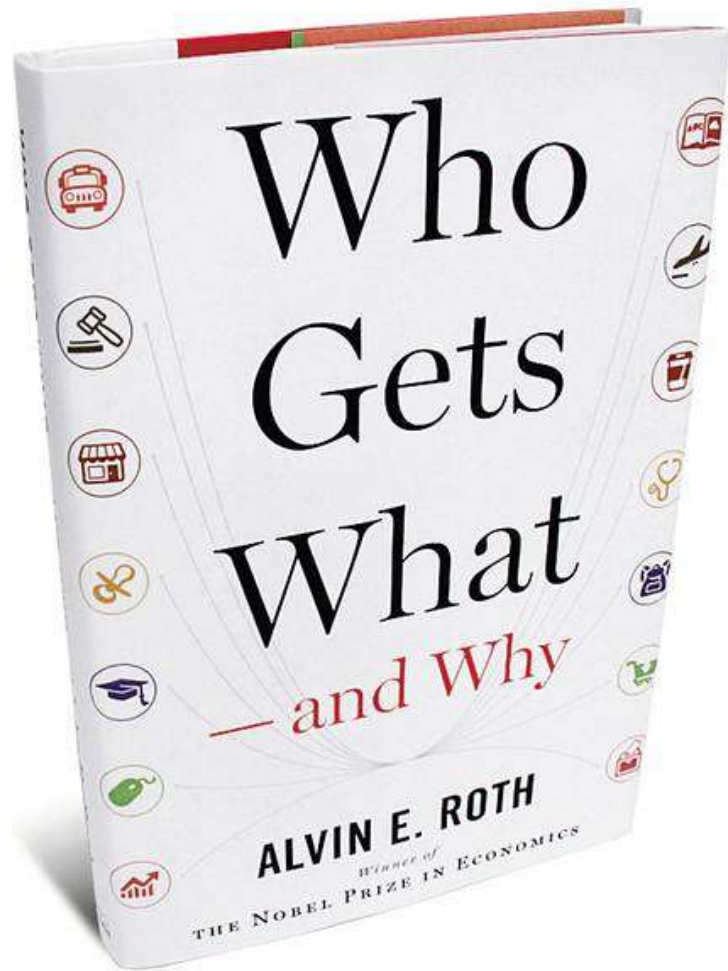
contribution

Setup your local workspace

Study and change the code

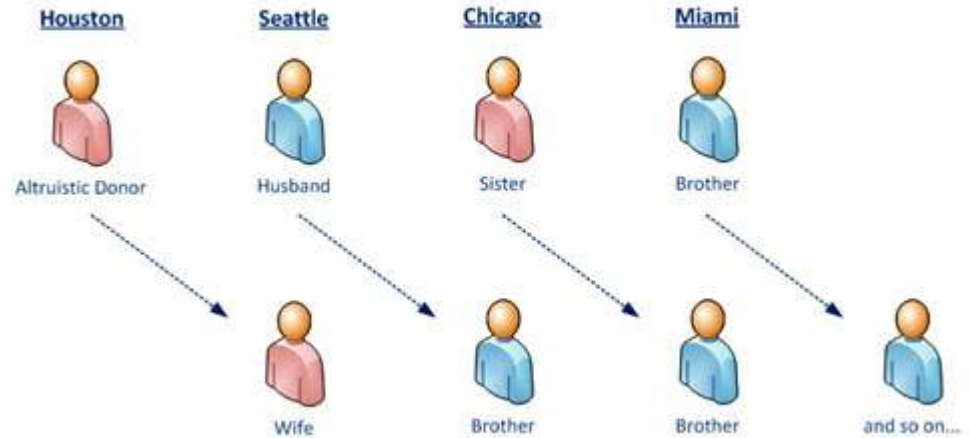


**What  
kidney  
exchange  
programs  
can teach  
us about  
OSS?**



# Retribution=OSS as a matching market (markets where

National Kidney Registry Non-Directed Donor Chain



NATIONAL EQUITABLE LABOUR EXCHANGE

BIRMINGHAM BRANCH  
TRUTH.

ESTABLISHED 1835  
To the STOREKEEPER of the EXCHANGE

N<sup>o</sup>

July 22<sup>nd</sup> 1833

July 22<sup>nd</sup> 1833

N<sup>o</sup>

Deliver to the Bearer Exchange  
Stores to the Value of **TWO HOURS** by Order of

**TWO**

Robert Owen GOVERNOR  
Benj. Woolfield DIRECTOR  
SECRETARY

CHARLOTTE STREET, RATHBONE PLACE, LONDON.



# Gamification on top of GitHub





*Power to  
the people*



# Benevolent Dictator for Life



## CVE-2014-6412 - WordPress (all versions) lacks CSPRNG

*From:* Scott Arciszewski <scott () arciszewski me>

*Date:* Tue, 10 Feb 2015 11:50:16 -0500

Ticket opened: 2014-06-25

Affected Versions: ALL

Problem: No CSPRNG

Patch available, collecting dust because of negligent (and questionably competent) WP maintainers

On June 25, 2014 I opened a ticket on WordPress's issue tracker to expose a cryptographically secure pseudorandom number generator, since none was present (although it looks like others have tried to hack together a band-aid solution to mitigate php\_mt\_seed until WordPress gets their "let's support PHP < 5.3" heads out of their asses).

For the past 8 months, I have tried repeatedly to raise awareness of this bug, even going as far as to attend WordCamp Orlando to troll^H advocate for its examination in person. And they blew me off every time.

If anyone with RNG breaking experience (cough solar designer cough) can PoC it, without the patch I've provided you should be able to trivially predict the password reset token for admin users and take over any WordPress site completely.

Eight f\*\*\*\*\*months.

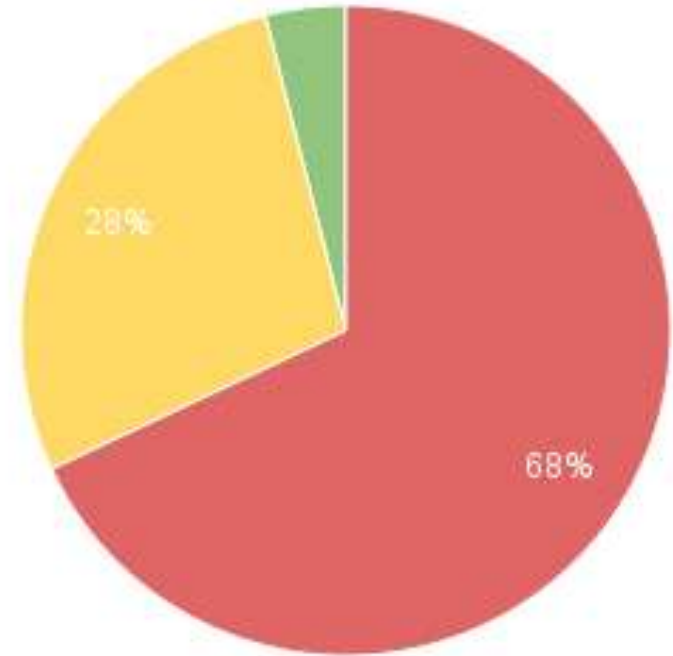
Patch available with unit tests and PHP 5.2 on Windows support at <https://core.trac.wordpress.org/attachment/ticket/28633/28633.3.patch>

Scott

<https://scott.arciszewski.me>

@voodooKobra

## Specification of the governance



● Not existing    ● Limited    ● Existing

**Governance in every project MUST be explicit (TRANSPARENCY)**

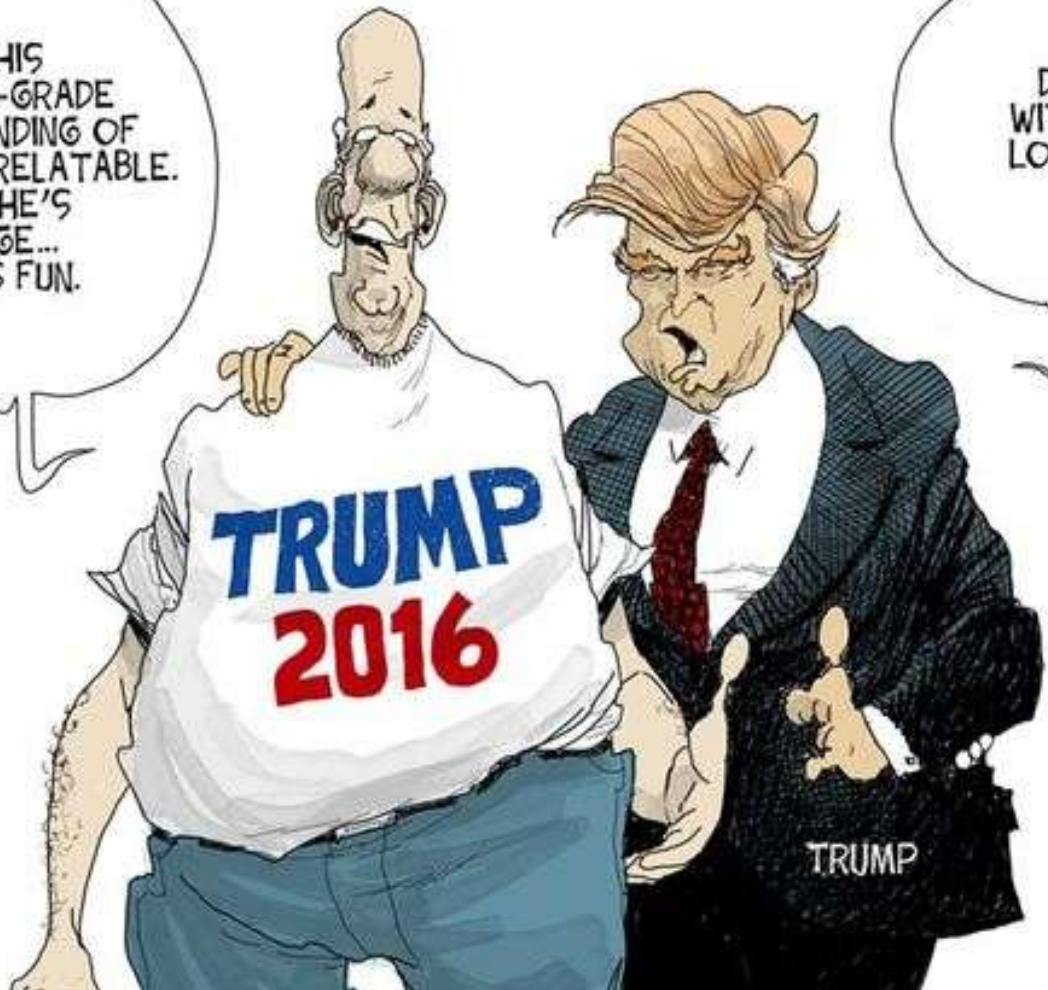


**Governance  
should also  
be more  
democratic**





I FIND HIS SEVENTH-GRADE UNDERSTANDING OF U.S. POLICY RELATABLE. PLUS, HE'S ORANGE... THAT'S FUN.



DEAL WITH IT, LOSERS.

*The open source definition does not mention democracy*

**True**

*If you don't like it, just fork it*

**Option only available for technical users**

*End-users are not technical experts, can't give valid opinions*

**No need to ALL vote on EVERYTHING. Or not with the same weight (dangerous road)**

*Proprietary software is much worse*

**Agreed**

*It would be impossible to make  
decisions*

**Many types of democracy (liquid, direct,  
representative,...)**

*I am a volunteer, I want to work on what  
interests me*

**Sure. You can always do that (but less impact)**

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Problem: No CSPRNG

Patch available, competent) WP ma

On June 25, 2014, cryptographically present (although band-aid solution support PHP < 5.3

For the past 8 months, bug, even going for its examination

If anyone with R it, without the the password res completely.

Eight fucking months

Patch available v <https://core.trac>

Scott <https://scott.ar> @voodooKobra



SOM-Research / collaboro

Unwatch 10

Star 2

Fork 0

Code

Issues 5

Pull requests 0

Pulse

Graphs

Settings

Collaborative DSL development <http://som-research.github.io/collaboro/#/> — Edit

235 commits

6 branches

3 releases

2 contributors

Branch: master

New pull request

Create new file

Upload files

Find file

Clone or download



jlcánovas updating readme

Latest commit ac0a4dd on 9 Jul 2015

examples

Preparing to marge with master

2 years ago

features

preparing for tag 0.2

4 years ago

plugins

Creating dev branch

2 years ago

.gitignore

Fixed #14

2 years ago

README.md

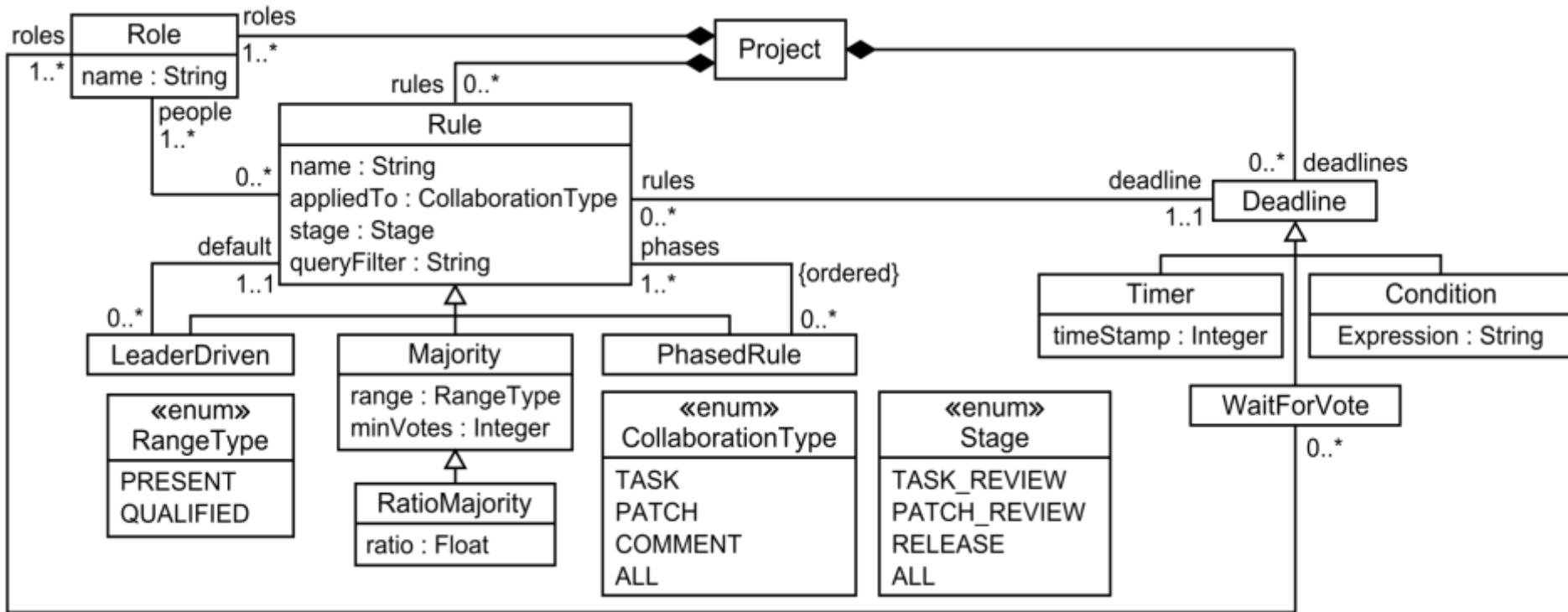
updating readme

a year ago

governance.md

Adding governance description

2 years ago



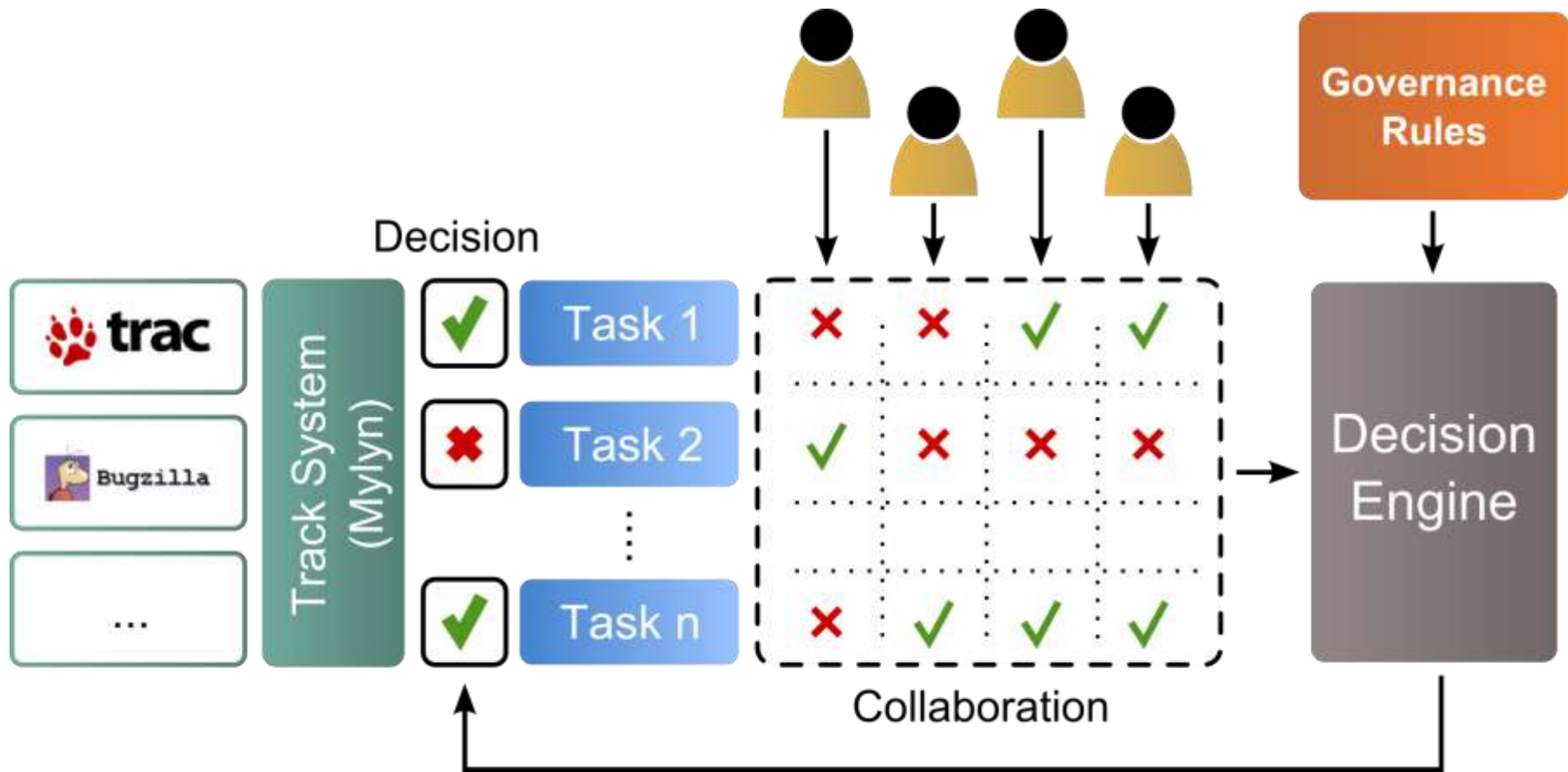




```
Project myProject {  
  Roles: Committers  
  Deadlines:  
    myDeadline : 7 days  
  Rules:  
    myMajorityRule :  
      Majority {  
        applied to Task  
        when TaskReview  
        people Committers  
        range Present  
        minVotes 3  
        deadline myDeadline  
      }  
}
```

## Verbalization

*All the proposals for new development tasks will be accepted or rejected in 7 days by the committers of the project.*



# The many names of Democracy

## Democratic Theories Database

### Five Hundred and Seven Theories of Democracy

Jean-Paul Gagnon (Australian Catholic University), Mark Chen (Australian Catholic University), Selin Ercan (University of Canberra), and Gorkana Navarra (University of Sydney)

2014 Database for Working Paper #1, Australian Catholic University Research Node in the Sydney Democracy Network.

#### I. A

1. Aboriginal democracy (Broth and Stabansky, 1996; LaSelva, 1990)
2. Absent democracy (Deth et al. 1999; Merle, 2013)
3. Absurd democracy (Nylan, 2003; Mauerhoff, 2008)
4. Accelerated (accelerating) democracy (McGrain, 2012; Nymanjoki, 2005)
5. Accidental democracy (Nedboose, 2011)
6. Advanced democracy (Schadler, 1998; Dogan, 1997)
7. Advancing democracy (Shabazz, 2004; McFaul, 2010)
8. Adversarial (adversary) democracy (Friedman and Hochstetler, 2002; Lighter, 1989)
9. Aesthetic democracy (Docherty, 2006; Fink, 2007)
10. Affluent democracy (Park, 1990; Persson, 2002)
11. Aggregated (aggregative) democracy (Bovase, 2009; Bäcklund and Miettinen, 2010)
12. Agnostic democracy (Bell, 2008; Wiegant, 2011)
13. Agrarian democracy (Griswold, 1946; Rappaport, 1987)
14. Alternative democracy (Zweig, 2002; Aronowicz and Gantner, 2003)
15. Anarchic democracy (DePalma, Rager, and Weber, 2008; Springer, 2010)
16. Anarist democracy (Miller and Turel, 2006; Sutherland, 2014)
17. Anaximand democracy (Lutzon, 1992; Moyal, 2008)
18. Anthropocentric democracy (Gagnon, 2013; Gagnon, 2014)
19. Anthropogenic democracy (Dyrek, 2014a [forthcoming])
20. Anthropocentric (human-only) democracy (Dyrek, 1993; Heninger, 2001)
21. Apolitical (un-political, non-political, anti-political) democracy (Gagnon-Hecht, 1999; Urbanski, 2010)
22. Argumentative democracy (Warkus, 1987; Sperke, 2007)
23. Aristocratic democracy (Kassa, 2009a; Ober, 2007)
24. Assembly democracy (Hansen, 1999; Dahl, 1994)
25. Associational democracy (Baccaro, 2006; Elitoh, 2008)
26. Atomic democracy (Martin, 1946; Woods, 2007)
27. Attention deficit democracy (Berger, 2011)
28. Autonomous democracy (Fayard, 2010)
29. Automatic democracy (Hauke, 2007)
30. Autocratic democracy (Manser, 1997; Lloyd, 2002)
31. Aversive democracy (Norval, 2007; Dyrek, 2010)

#### II. B

32. Bad democracy (Ranciere, 1994; Mochan, 2004)
33. Banking democracy (Santio, 2013)
34. Basic democracy (Sayeed, 1961; Navarra, 1962)
35. Basic income democracy (Potenza, 2004)



# The many names of Democracy

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  15. Anarchic democracy (DePalma, Ragan, and Weber, 2008; Springer, 2010)
  16. Anaristic democracy (Miller and Tavel, 2006; Sutherland, 2014)
  17. Anarist democracy (Lutzon, 1992; Mowd, 2004)
  18. Anthropocentric democracy (Lugan, 2013; Gagnon, 2014)
  19. Anthropocentric democracy (Dyrek, 2014a [forthcoming])
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  21. Apolitical (un-political, non-political, anti-political) democracy (Gagnon-Hecht, 1999; Urbani, 2010)
  22. Argumentative democracy (Walton, 1987; Sperke, 2007)
  23. Aristocratic democracy (Kassa, 2009a; Ober, 2007)
  24. Assembly democracy (Hansen, 1999; Dahl, 1994)
  25. Associational democracy (Baccaro, 2006; Elst, 2008)
  26. Atomic democracy (Martin, 1946; Wood, 2007)
  27. Attention deficit democracy (Bergir, 2011)
  28. Autonomous democracy (Farré, 2010)
  29. Automatic democracy (Hauke, 2007)
  30. Autocratic democracy (Manser, 1997; Lloyd, 2002)
  31. Aversive democracy (Norval, 2007; Dyrek, 2010)
- ## II B
32. Bad democracy (Rancière, 1994; Mochan, 2004)
  33. Banking democracy (Santio, 2013)
  34. Basic democracy (Sayeed, 1961; Nayana, 1962)
  35. Basic income democracy (Potenza, 2004)





- Problem is getting worse
  - Complexity of SW
  - New channels (e.g. Slack)
  - Team distribution
- Need of studies targeting MDE projects
- Multi-disciplinary solution



**We Can Do It!**





**Let's work  
together**

**jordi.cabot@  
icrea.cat**

 **@softmodeling**

**modeling-  
languages.com**