

The first miles towards software-fueled cars

April 18, 2018 |

Johannes Nicolai

Enterprise Solutions Engineering, GitHub

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The First Miles Toward Software-Fueled Cars

Driving lessons from OEMs, tiers
and large IT companies

Johannes Nicolai

 @jonico -  jonico@github.com



German GitHub Giants (GGG)





- **Introduction to GitHub and why we joined GENIVI**
- Driving lessons learned from GitHub largest customers in Germany
 - How to achieve management buy in for large transformations
 - The biggest misperception of inner sourcing
 - The cabin in the woods
 - Don't treat your new platform like your old VCS
 - Helicopter vs cargo ship
- Why the journey is worth it



I have a confession to make ...





How much does it cost to update maps of an IVI...



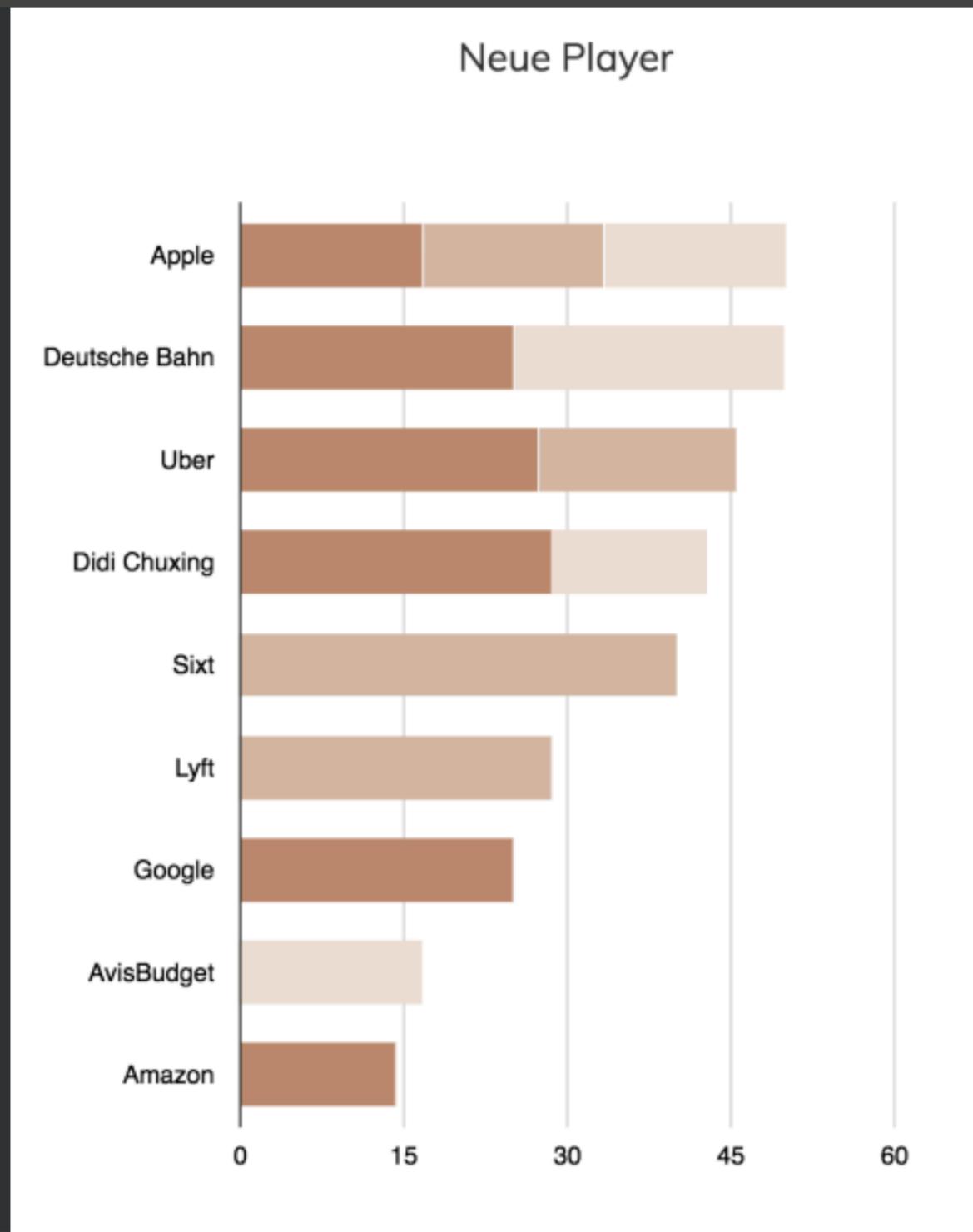


***JUST USE YOUR CELL PHONE
FOR NAVIGATION,
IT'S CHEAPER AND MORE
CONVENIENT***





Connected Car Innovation Study 2017

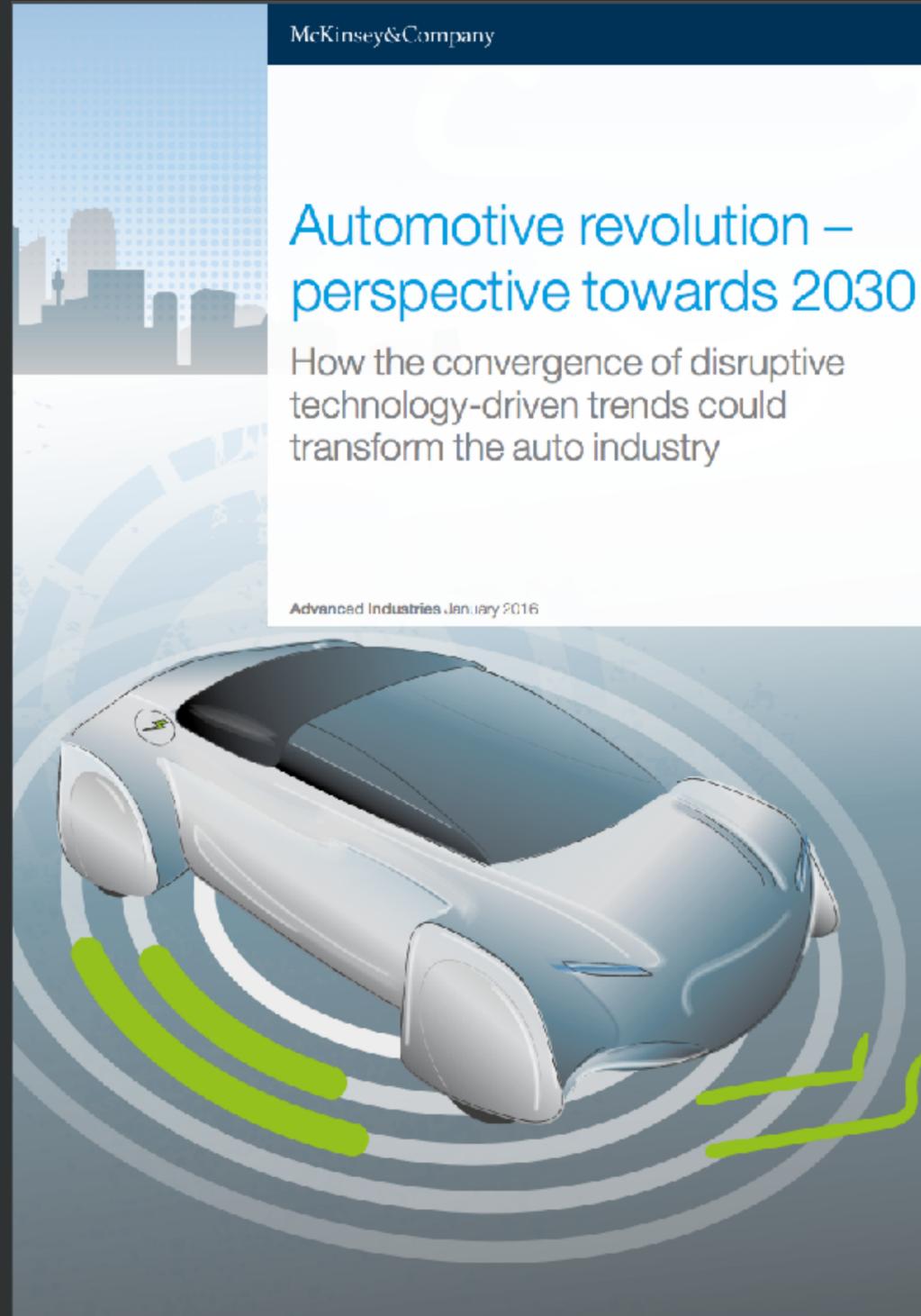


Anteil Kooperationen (Prozent) – Quelle: CAM



Ohne Partner wird es schwierig

Eines ist in Zeiten des alles durchdringenden digitalen Wandels deutlich: Neue Geschäftsmodelle oder Produkte lassen sich nicht mehr im Alleingang entwickeln oder betreiben. Das wird auch langsam der Automobilindustrie klar. Sie hat lange versucht, sich gegen die neuen Player zu wehren, ist aber zu der Erkenntnis gelangt, dass man aus Feinden besser „Frenemies“ macht – also sie akzeptiert und mit ihnen am besten kooperiert, um neue Technologien voranzutreiben. Die Hersteller rund um den Globus müssen vor allem im Bereich neuer Mobilitätsdienstleistungen und -services verstärkt auf das Know-how aus der digitalen Welt bauen, um mit der rasanten Entwicklung überhaupt Schritt halten zu können. Ebenso können die jungen Big-Data-Player



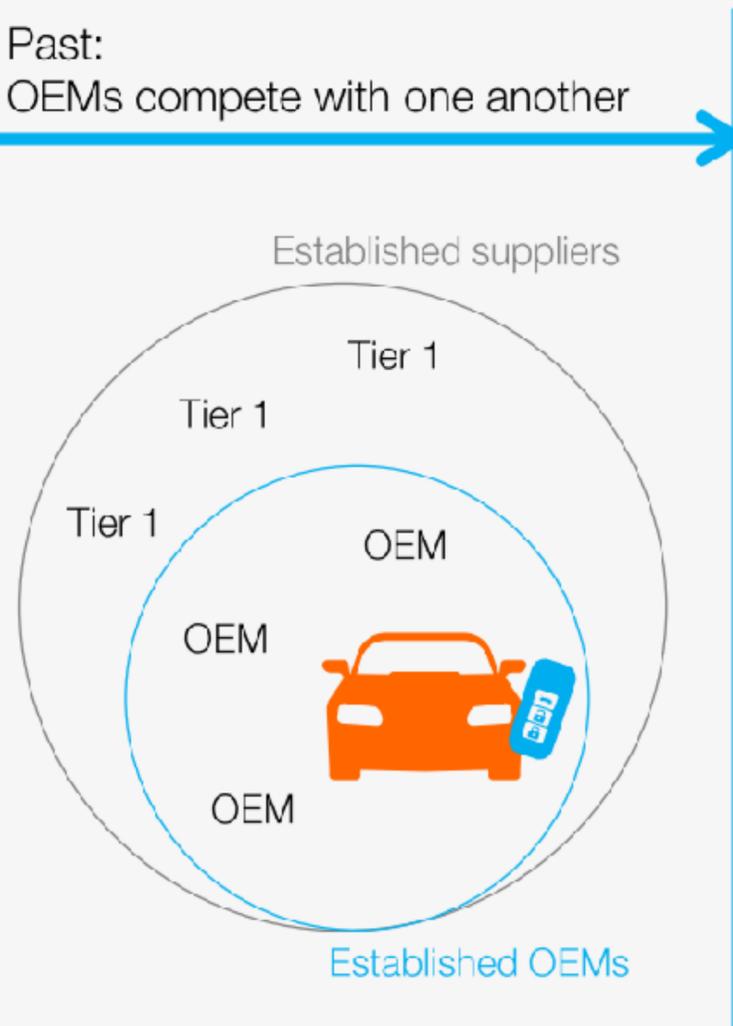
Form partnerships across and beyond the industry



Exhibit 7

Increasing complexity of the competitive landscape for individual mobility will force OEMs to compete on multiple fronts

Past:
OEMs compete with one another



2030:
OEMs compete in a complex market landscape



SOURCE: McKinsey

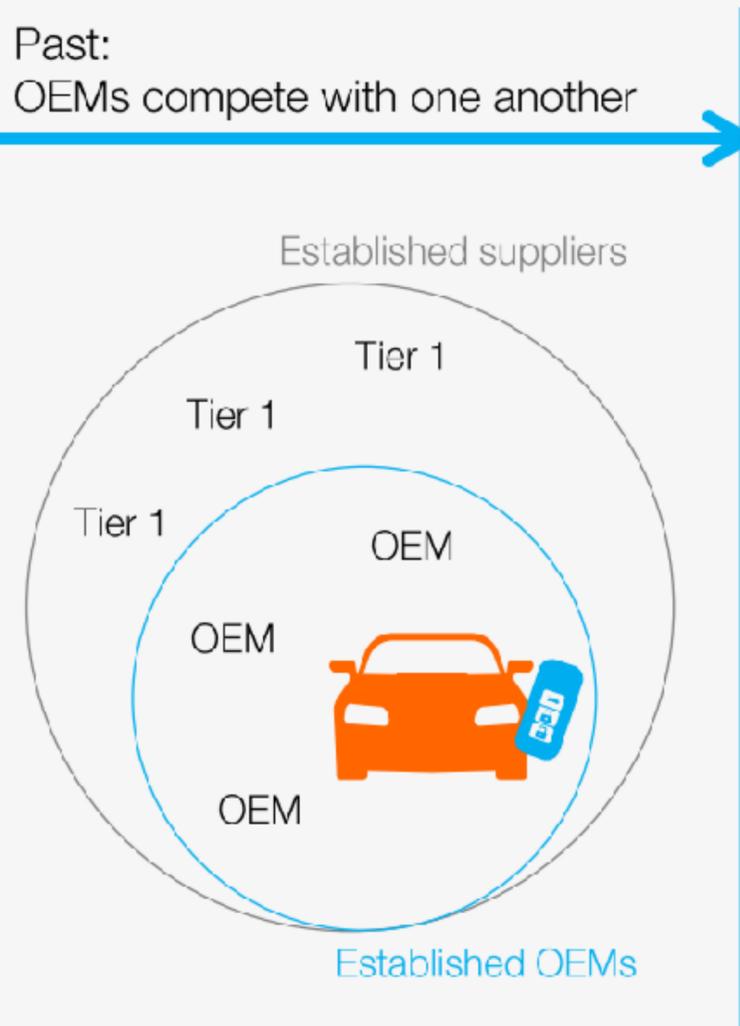
Form partnerships across and beyond the industry



Exhibit 7

Increasing complexity of the competitive landscape for individual mobility will force OEMs to compete on multiple fronts

Past:
OEMs compete with one another



2030:
OEMs compete in a complex market landscape



SOURCE: McKinsey

<https://github.com/apple>



This organization Search Pull requests Issues Gist

 **Apple** 
Cupertino, CA <https://developer.apple.com/opensource/>

Repositories People 56

Filters Find a repository...

swift C++ ★ 32,551 🍴 4,535
The Swift Programming Language
Updated 3 minutes ago

swift-package-manager Swift ★ 4,408 🍴 395
The Package Manager for the Swift Programming Language
Updated 30 minutes ago

People 56 >



<https://github.com/google>



This organization Search Pull requests Issues Gist

 **Google** 
<https://developers.google.com/>

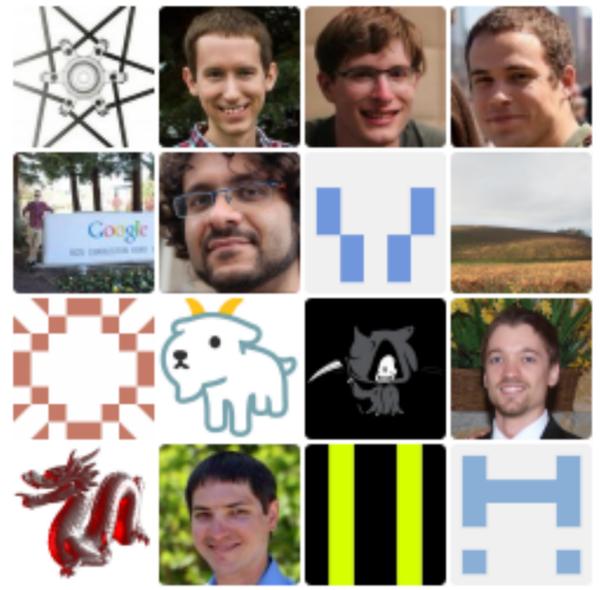
Repositories People 985

Filters Find a repository...

protobuf C++ ★ 10,357 📄 3,127
Protocol Buffers - Google's data interchange format
Updated 5 minutes ago

angle C++ ★ 306 📄 94
 mirrored from <https://chromium.googlesource.com/angle/angle>
A conformant OpenGL ES 2 implementation for Windows.
Updated 6 minutes ago

People 985 >



 Developer Program Member



This organization Search Pull requests Issues Gist

 **Tesla Motors** 
<http://www.teslamotors.com/>

Repositories People 1

Filters Find a repository...

pushr-core Ruby ★ 1 🍴 10
forked from 9to5/pushr-core
Redis backed push notification daemon
Updated on Feb 26

devise_ldap_authenticatable Ruby ★ 1 🍴 302
forked from cschiewek/devise_ldap_authenticatable
Devise Module for LDAP
Updated on Nov 24, 2015

People 1 >

 **noblige**
Aleksi Potov



This organization Search Pull requests Issues Gist

 **Zipcar** 
Boston, MA <http://www.zipcar.com>

Repositories People 2

Filters Find a repository...

omniauth-amazon Ruby ★ 0 13
forked from wingrunr21/omniauth-amazon
Login with Amazon OAuth2 strategy for OmniAuth 1.0
Updated 18 days ago

jquery.maskedinput JavaScript ★ 0 551
forked from digitalBush/jquery.maskedinput
jQuery Masked Input Plugin
Updated on May 5, 2014

People 2 >

-  **jbrunton**
John Brunton
-  **zipcarsystems**
DevOps Zipcar



This organization Search Pull requests Issues Gist

UBER **Uber** ⓘ
Open Source Software at Uber
<http://www.uber.com>

Repositories People 68

Filters Find a repository...

hyperbahn JavaScript ★ 258 🍴 27
Service discovery and routing for large scale microservice operations
Updated 20 seconds ago

airlock JavaScript ★ 19 🍴 2
A prober to probe HTTP based backends for health
Updated 2 minutes ago

People 68 >



This organization Search Pull requests Issues Gist

 **Lyft** 
San Francisco, CA <https://www.lyft.com>

Repositories People 16

Filters Find a repository...

SwiftLint Swift ★ 3 📄 306
🔗 forked from [realm/SwiftLint](#)
An experimental tool to enforce Swift style and conventions.
Updated 21 seconds ago

mgo Go ★ 0 📄 240
🔗 forked from [go-mgo/mgo](#)
The MongoDB driver for Go. See <http://labix.org/mgo> for details.
Updated 3 days ago

People 16 >



<https://github.com/car2go>



This organization Search Pull requests Issues Gist

 **car2go GmbH** 
<https://www.car2go.com>

Repositories People 0

Filters Find a repository...

openAPI ★ 8 📄 2
Documentation on the openAPI of the car2go system
Updated on Nov 18, 2015

People 0 >

This organization has no public members. You must be a member to see who's a part of this organization.



This organization Search Pull requests Issues Gist

 **BMW Car IT GmbH** 
Munich <http://www.bmw-carit.de>

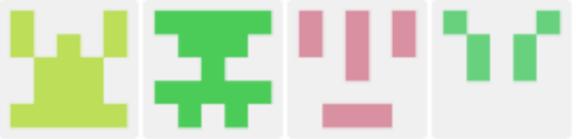
Repositories People 4

Filters Find a repository...

capu C++ ★ 13 🍴 11
Collections And Platform Utils (CAPU)
Updated 9 hours ago

silex-jira-oauth-provider PHP ★ 3 🍴 3
The Silex JIRA OAuth Provider provides a simple mechanism to enable your application to use the Atlassian JIRA REST API without the need of password transmission.
Updated a day ago

People 4 >



<https://github.com/bsinno>



This organization Search Pull requests Issues Gist

BOSCH **Bosch Software Innovations GmbH**
Germany http://www.bosch-si.com info-de@bosch-si.com

Repositories People 0

Filters Find a repository...

hawkbit Java ★ 3 7
forked from eclipse/hawkbit
Updated 4 hours ago

vorto Java ★ 2 32
forked from eclipse/vorto
Vorto Project
Updated 4 hours ago

People 0 >

This organization has no public members. You must be a member to see who's a part of this organization.



This organization Search Pull requests Issues Gist

 **GENIVI Alliance** ⓘ
Open Source InVehicle Infotainment Alliance
Global <http://genivi.org/> | <https://...> [✉ genivi-projects#@# lists...](mailto:genivi-projects#@#lists...)

Repositories People 7

Filters Find a repository...

meta-ivi Shell ★ 2 📄 8
Yocto layer for InVehicle Infotainment software
Updated 2 hours ago

genivi-dev-platform Shell ★ 7 📄 15
GENIVI Development Platform
Updated 2 hours ago

People 7 >



Why GitHub joined the GENIVI alliance



GitHub Special License Offer



- **Offer for GENIVI Members**

- 10 free users of GitHub Enterprise (on-premise) or GitHub Business Hosted
 - 10% discount on additional users (11+)
 - New GitHub Enterprise/Business Hosted customers only
 - Offer expires October 15 , 2018 (6 months)

For additional information, please contact :

Steve Crumb (GENIVI)
scrumb@inventures.com

or

Kim Sekulich (GitHub)
ksekulio@github.com



GitHub Facts



FOUNDED

2008

USERS

26M+

UNIVERSITIES

1200+

GLOBAL RANK

50

PROJECTS

67M+

MONTHLY VISITORS

50M+

OFFICES

San Francisco
Tokyo, Amsterdam, Boulder

FORTUNE50

53%

CORPORATE CUSTOMERS

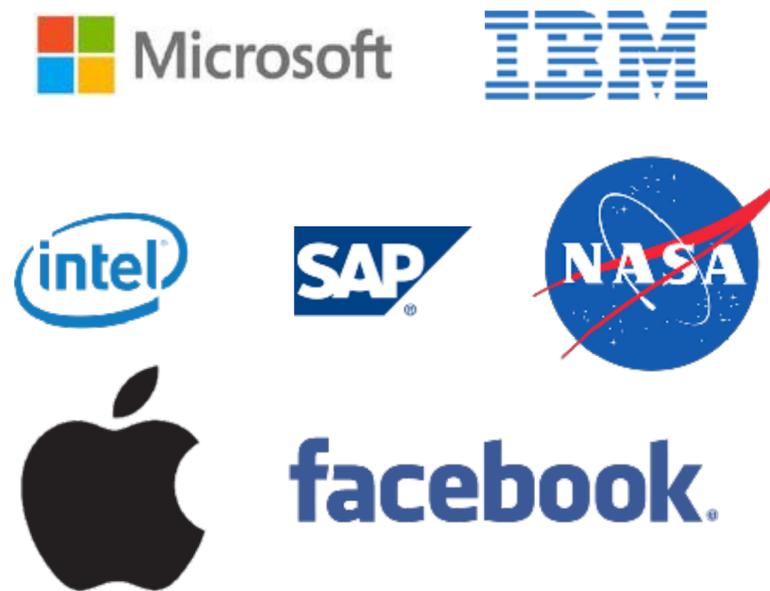
75k+

Run GitHub on your own servers

OPEN SOURCE



TECHNOLOGY



FORWARD THINKING ENTERPRISES



German GitHub Giants (GGG)



DEUTSCHE BÖRSE
GROUP





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- Why the journey is worth it





O'REILLY®

Getting Started with InnerSource

Keys to collaboration and productivity
inside your company



Andy Oram

What is Inner Source?



Applying the Philosophies and Practices of Open Source Development to the Enterprise

Why the journey is worth it



Benefits of Inner Sourcing ...



Cross-team collaboration



Increased shipping velocity



Improved code quality



Worldwide scalability



Developer happiness



Transparency

Legacy tools vs modern tools used in Open Source



VS



How does Inner Source work?



Visibility: all internal software projects are by default visible to all employees



Fork/Branch: anyone can create a copy of a project to make changes freely



Pull Requests: people outside a project team can suggest changes and contribute to the project



Testing/CI: every proposed change is automatically tested and the result is shown in the pull request



Issues: there is a public issue tracker in which everyone can submit a bug or ask a question



Documentation: all software projects include a Readme that describes what the software does, how to run it and how to contribute to it.

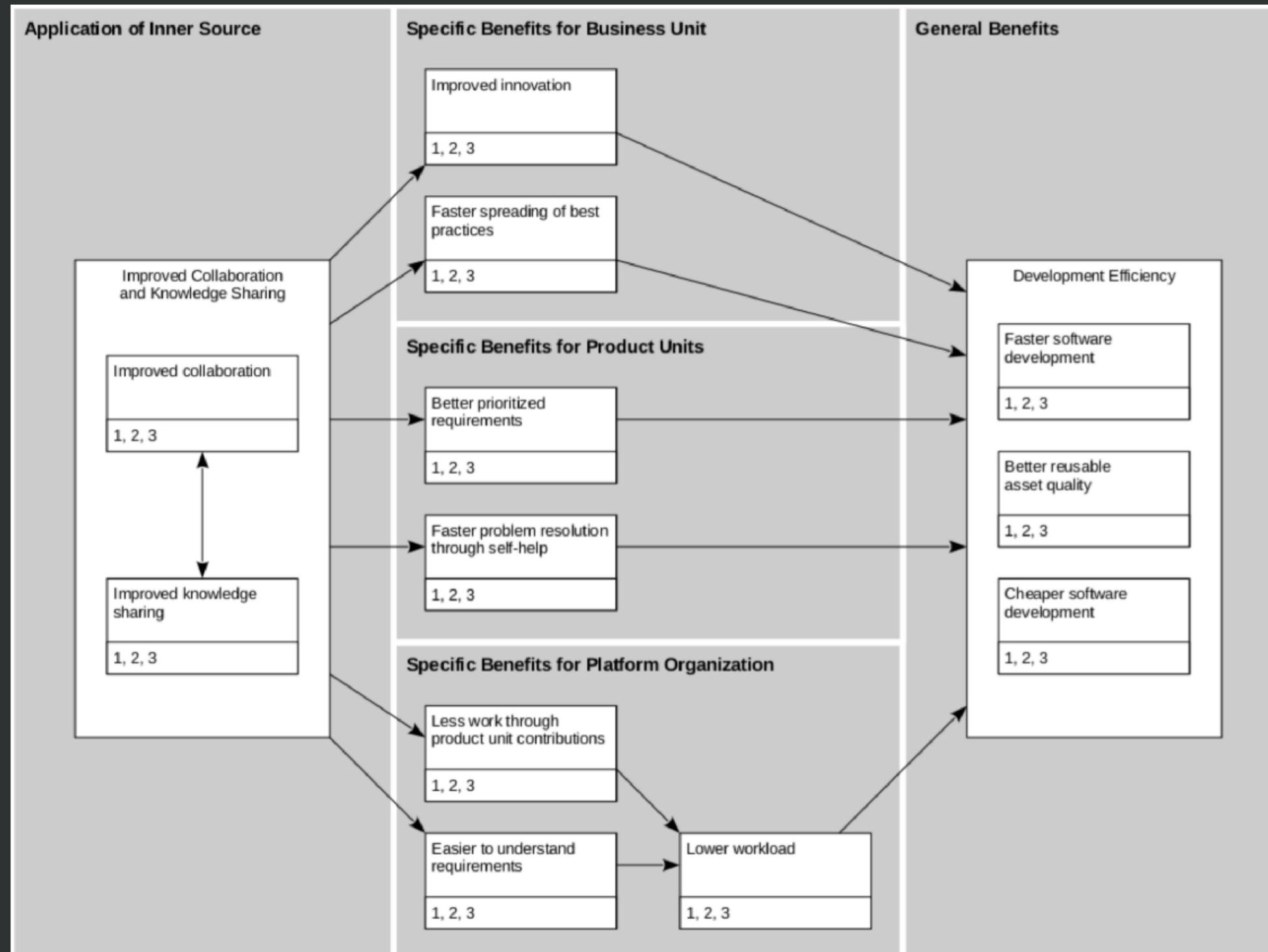
Companies doing Inner Source



@WalmartLabs



Scientific Validation



Common pitfalls and challenges for Inner Source



- Culture change- It won't happen overnight and needs buy in on all levels
- **Manager Fears**
 - **Fear of losing control (best developers contribute to other projects)**
 - **Fear of missing performance goals because of locally optimized metrics**
- Developer Fears
 - Fear of doing development with the entire company watching
 - Fear of follow up / maintenance work / reviewing all day
- Legal - Sharing information and contributing to other projects has to be ok
- Architecture - The more modular, less coupled the software, the better
- Test automation - Investments into fully automating have to be made - agile practices help

Inner source is not about arbitrary contributions



Inner source is **NOT** about contributing to all kind of internal projects **just because you can do so, but because your team is working on cross-functional features** that need to change components out of your core team's responsibility.

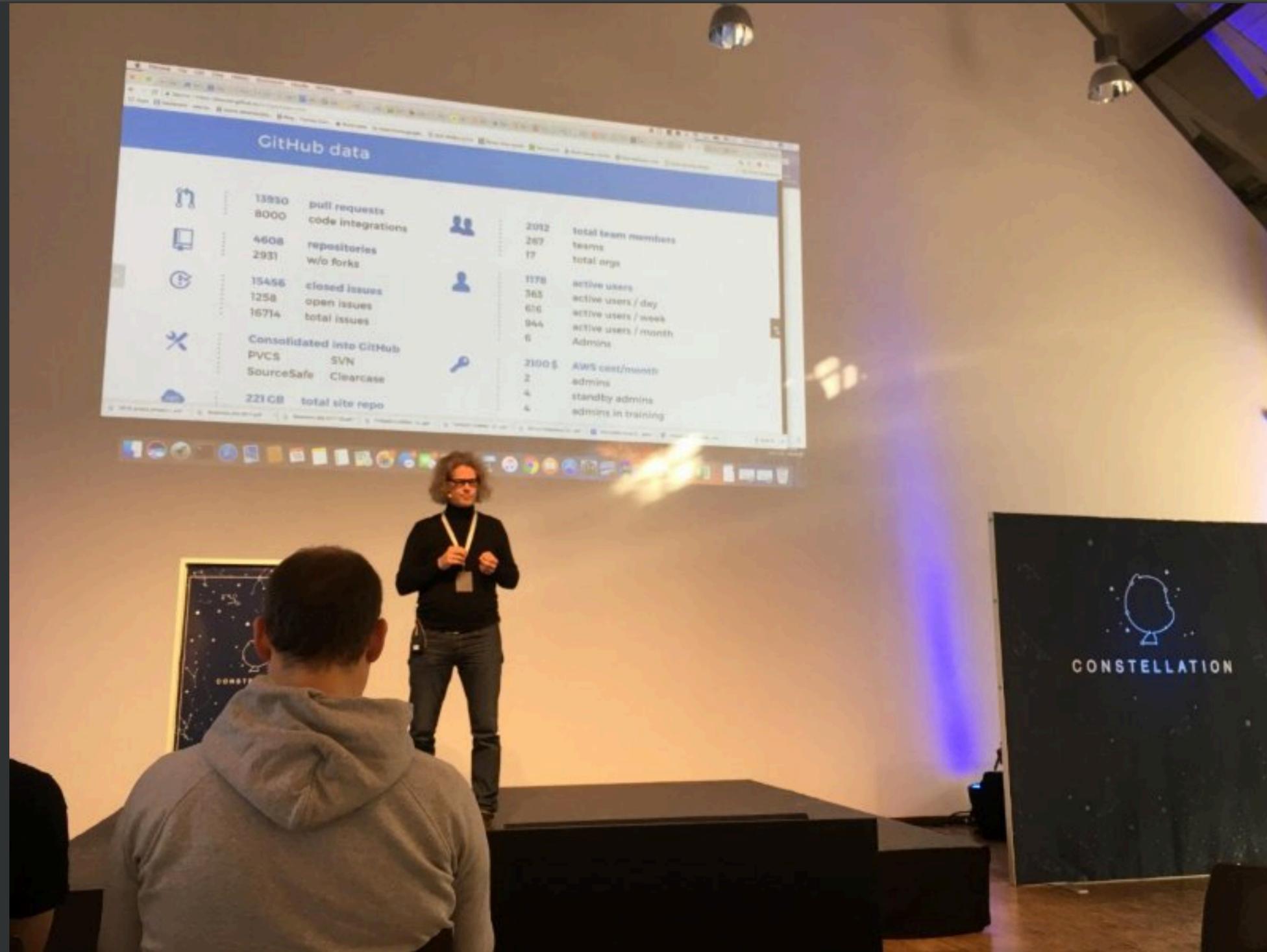
In a world **before Inner source**, you would have to **wait for many product owners** of other components to prioritise your request which may take **forever** or might never happen. **Now**, our teams can **propose the needed changes themselves** and most likely **get them merged** if they follow the contribution guidelines which are a mandatory part of every inner source project.

The **best argument for Inner source** is that **other teams** are motivated to **make your own software better** and less work stays on your plate.

Inner Source Evangelists at Zalando



Achieve top level management buy in



Achieve top level management buy in



Repositories Developers Trending: this week ▾

All languages
Unknown languages
Groovy
HTML
Java
JavaScript
Python
Ruby
Shell
Other: Swift ▾

PaoloCuscela / Cards ★ Star

Awesome iOS 11 appstore cards in swift 4.

Swift ★ 1,767 🍴 67 Built by ★ 602 stars this week

shadowsocks / ShadowsocksX-NG ★ Star

Next Generation of ShadowsocksX

Swift ★ 7,091 🍴 2,564 Built by ★ 312 stars this week

BalestraPatrick / WhatsNew ★ Star

Showcase new features after an app update similar to Pages, Numbers and Keynote.

Swift ★ 394 🍴 7 Built by ★ 305 stars this week

ProTip! Looking for most starred Swift repositories?
[Try this search](#)

Achieve top level management buy in



GitHub is at the center of our DevOps toolchain



GitHub is at the center of our DevOps toolchain
and a critical technology in our movement to
cloud computing.

– Andreas Preuss

Achieve top level management buy in



Timeline





- Introduction to GitHub and why we joined GENIVI
- Driving lessons learned from GitHub largest customers in Germany
 - How to achieve management buy in for large transformations
 - Fighting the biggest misconception of inner source
 - **Don't treat your new platform like your old VCS**
 - **Helicopter vs cargo ship**
- Why the journey is worth it



Legacy VCS - Cargo Ship



Git - Helicopter



Why are large binary files a problem in Git?

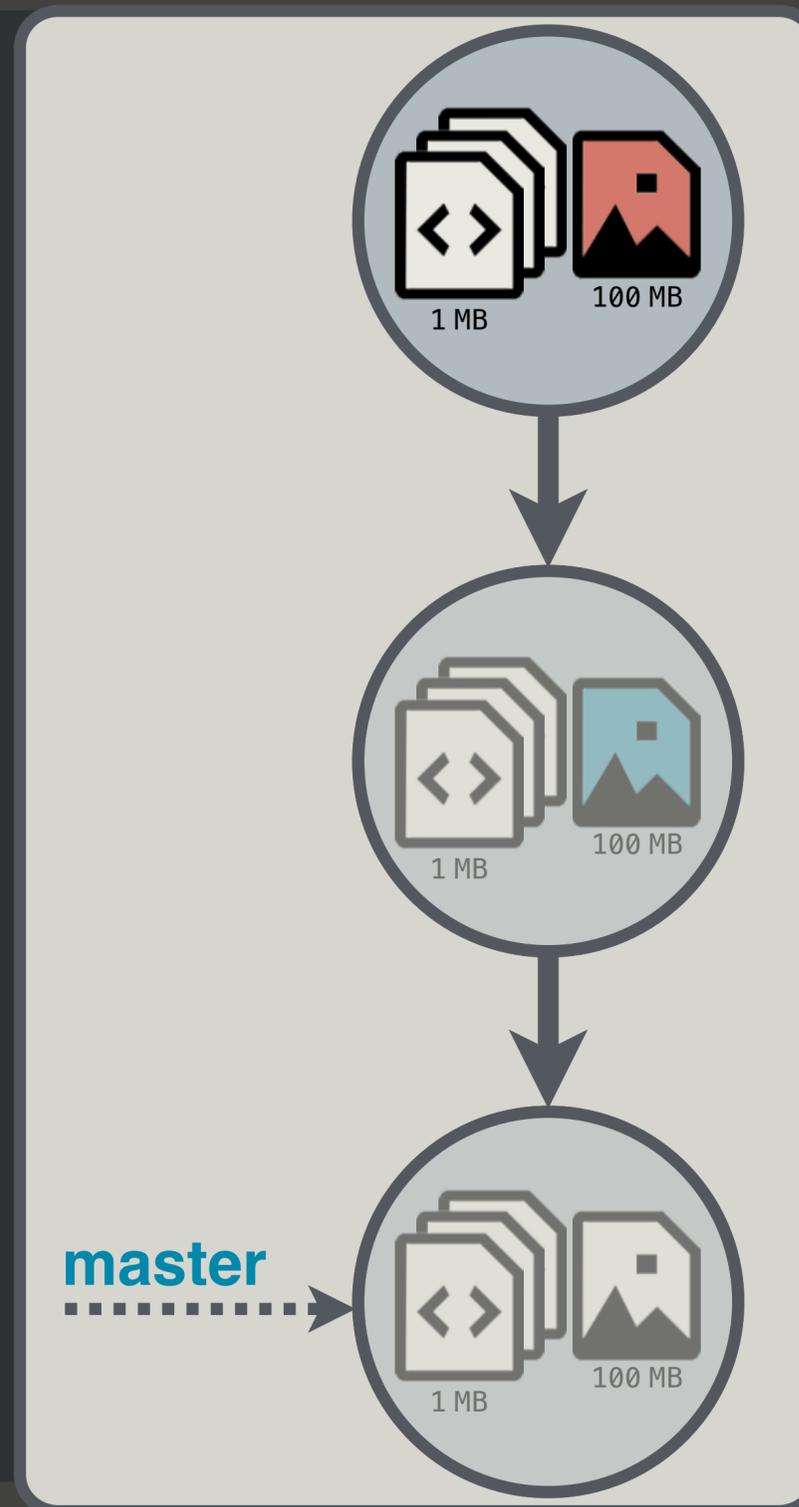


= 100 MB pre-compiled library

Why are large binary files a problem in Git?



Clone: 301 MB



+ 100 MB

+ 100 MB

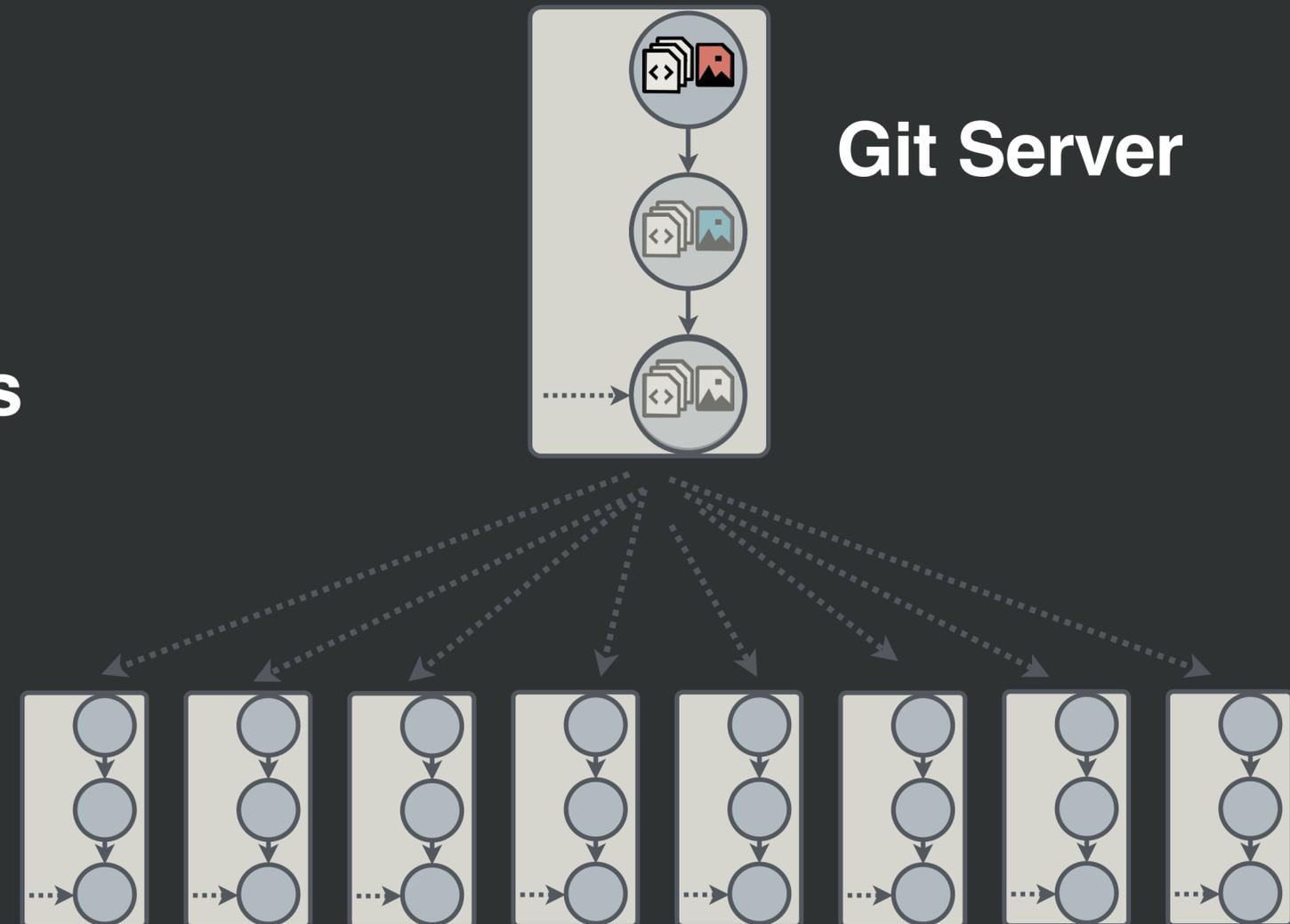
Why are large binary files a problem in Git?



Clone: 301 MB

X

Number of Engineers

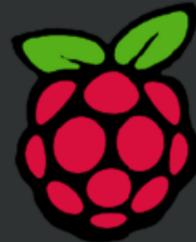


How? - Introduction to conan.io



- <https://conan.io>
- Open Source (MIT)
- Python based
- Cross platform

- Windows
- Linux
- Mac OS
- Solaris
- Free BSD



CONAN
THE FROGARIAN

Conan Package Manager Core Functionality



- retrieve all packages and their dependencies specified in a dependency file

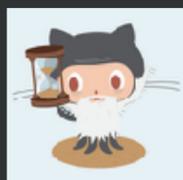
```
[requires]
```

```
ZenGitHub/[>0.9]@jonico/stable
```

```
libgit2/0.24.2@paulobrizolara/stable
```

```
bzip2/[~=1.0]@lasote/stable
```

- avoid long compile times

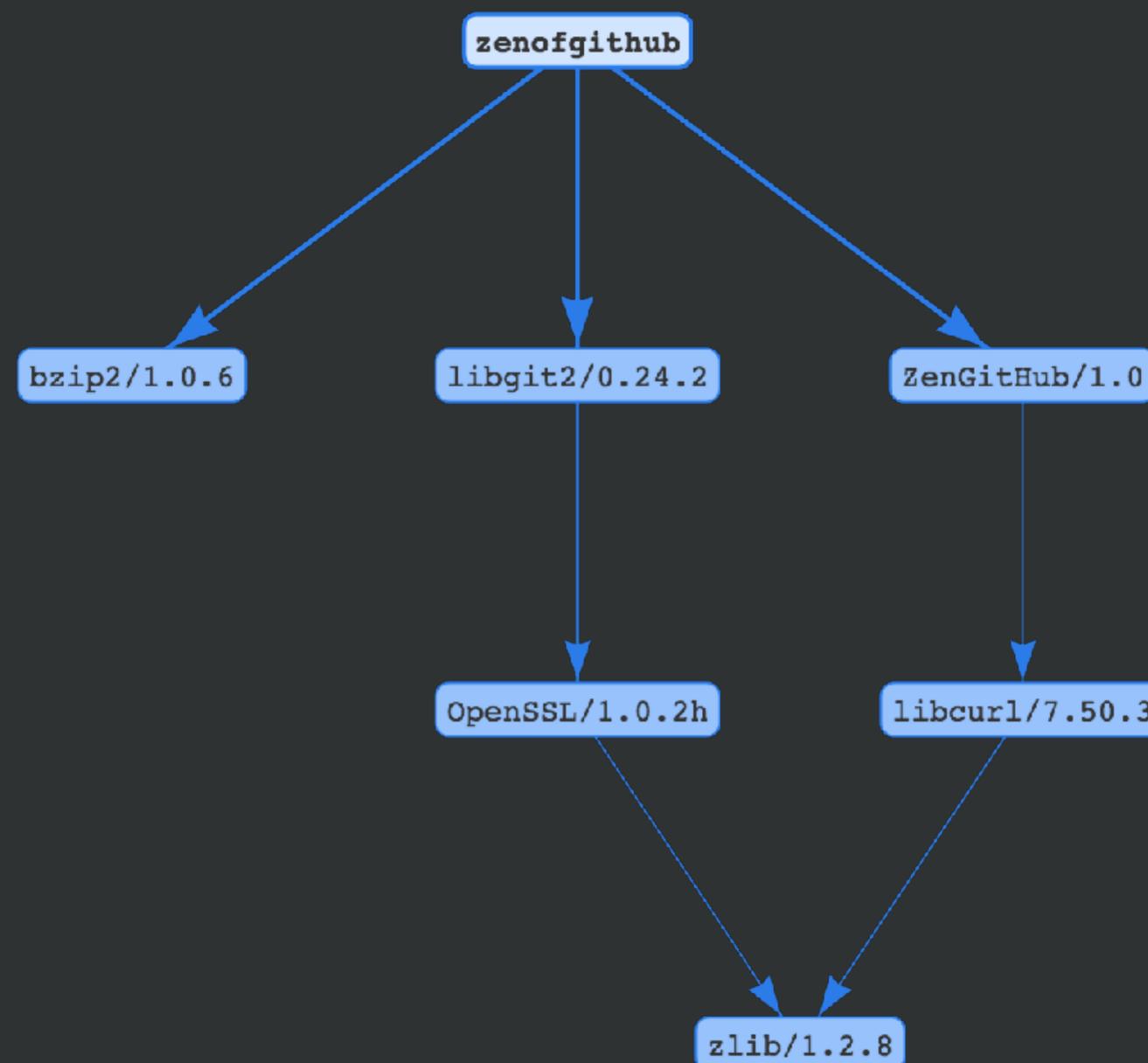


- avoid bloated Git repositories

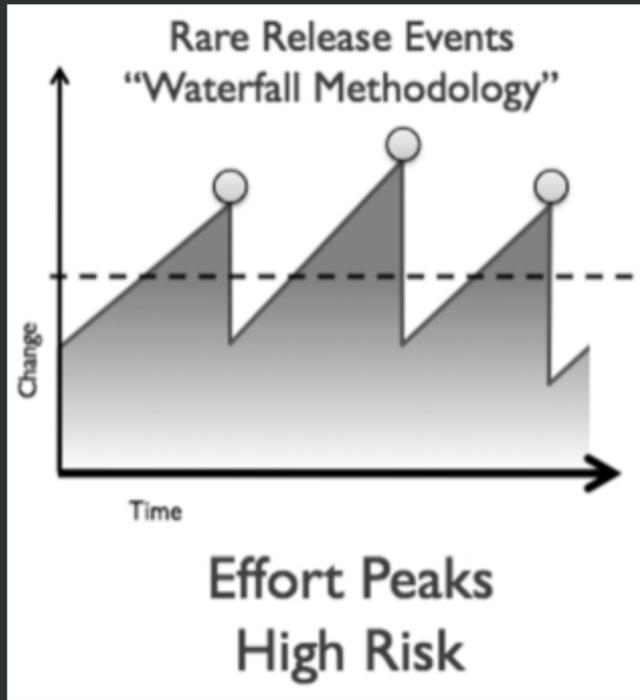


100 MB

- provide semantic versioning

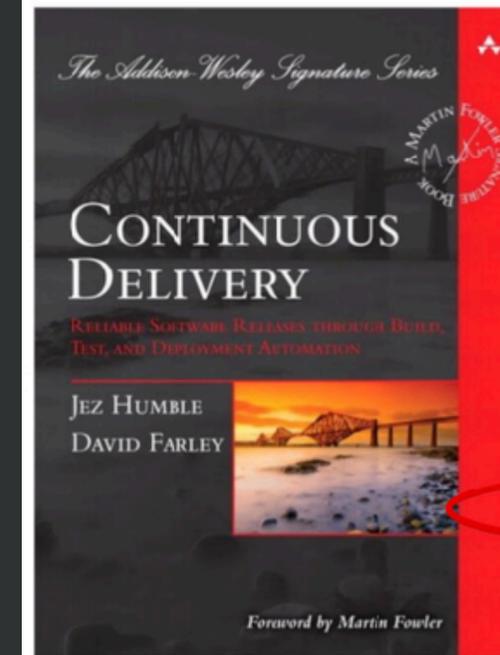
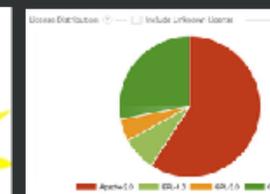
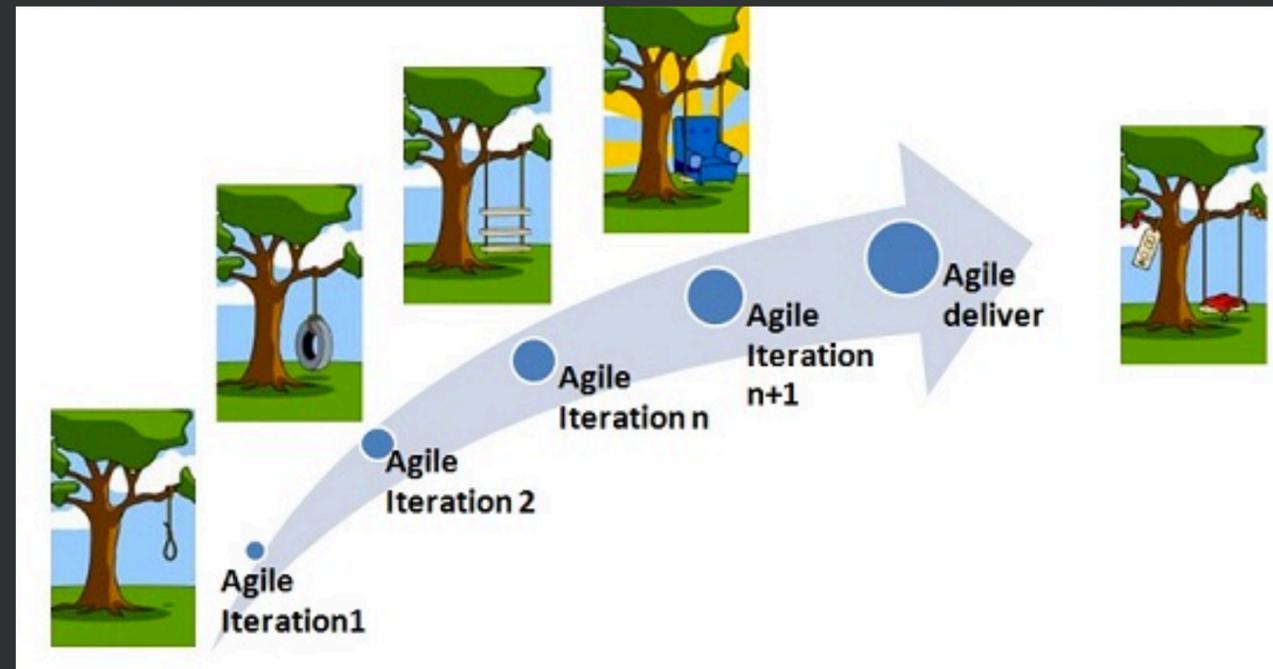
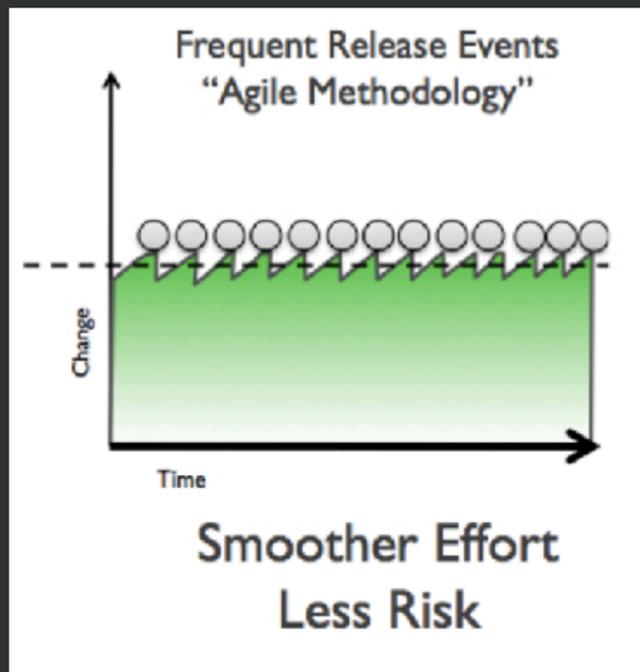


Cargo Ship vs Helicopter



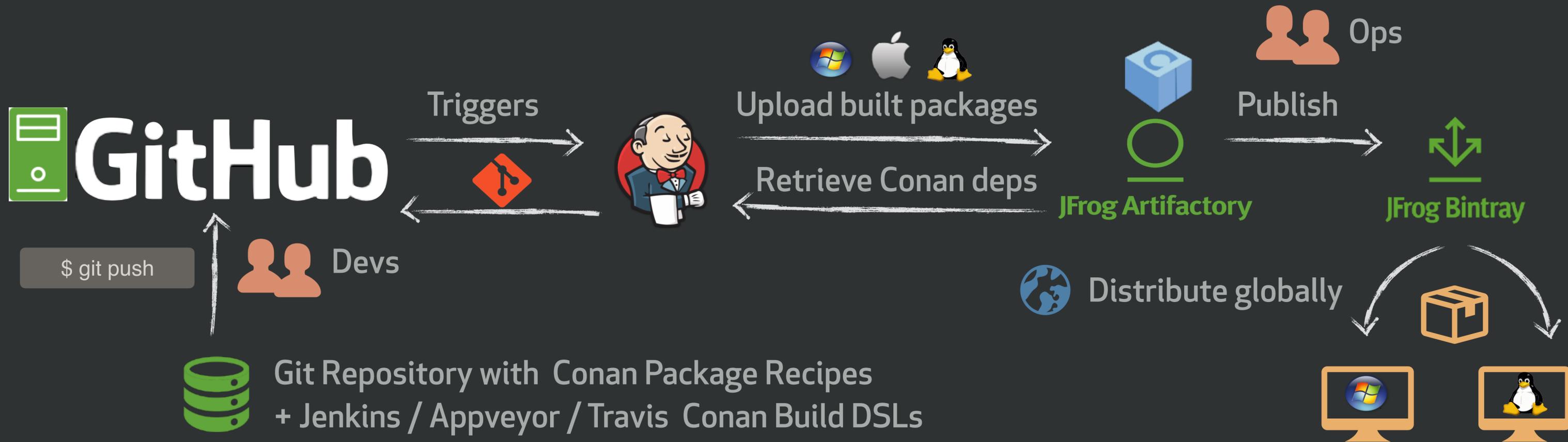
100 MB

VS



- Keep Everything in Version Control
- Done Means Released
- Don't Check In on a Broken Build
- Never Go Home on a Broken Build
- Fail the Build for Slow Tests
- Only Build Your Binaries Once
- Deploy the Same Way to Every Environment

Embedded C/C++ CD-Pipeline





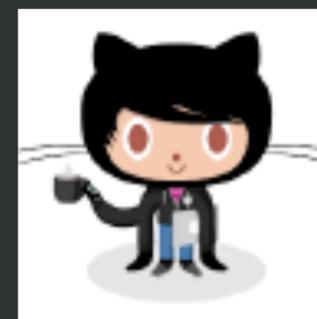
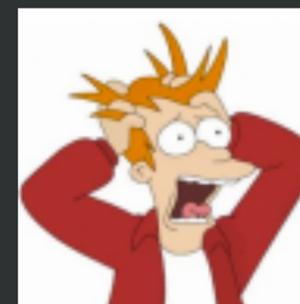
- Recap from last year's Euroforum talk "Software is the new fuel"
 - Why GitHub joined the GENIVI alliance
- Driving lessons learned from GitHub largest customers in Germany
 - Achieve top management buy in for large transformations
 - Fighting the biggest misconception of inner source
 - Don't treat your new platform like your old VCS
 - Helicopter vs cargo ship
- **Why the journey is worth it**



What do those people have in common?



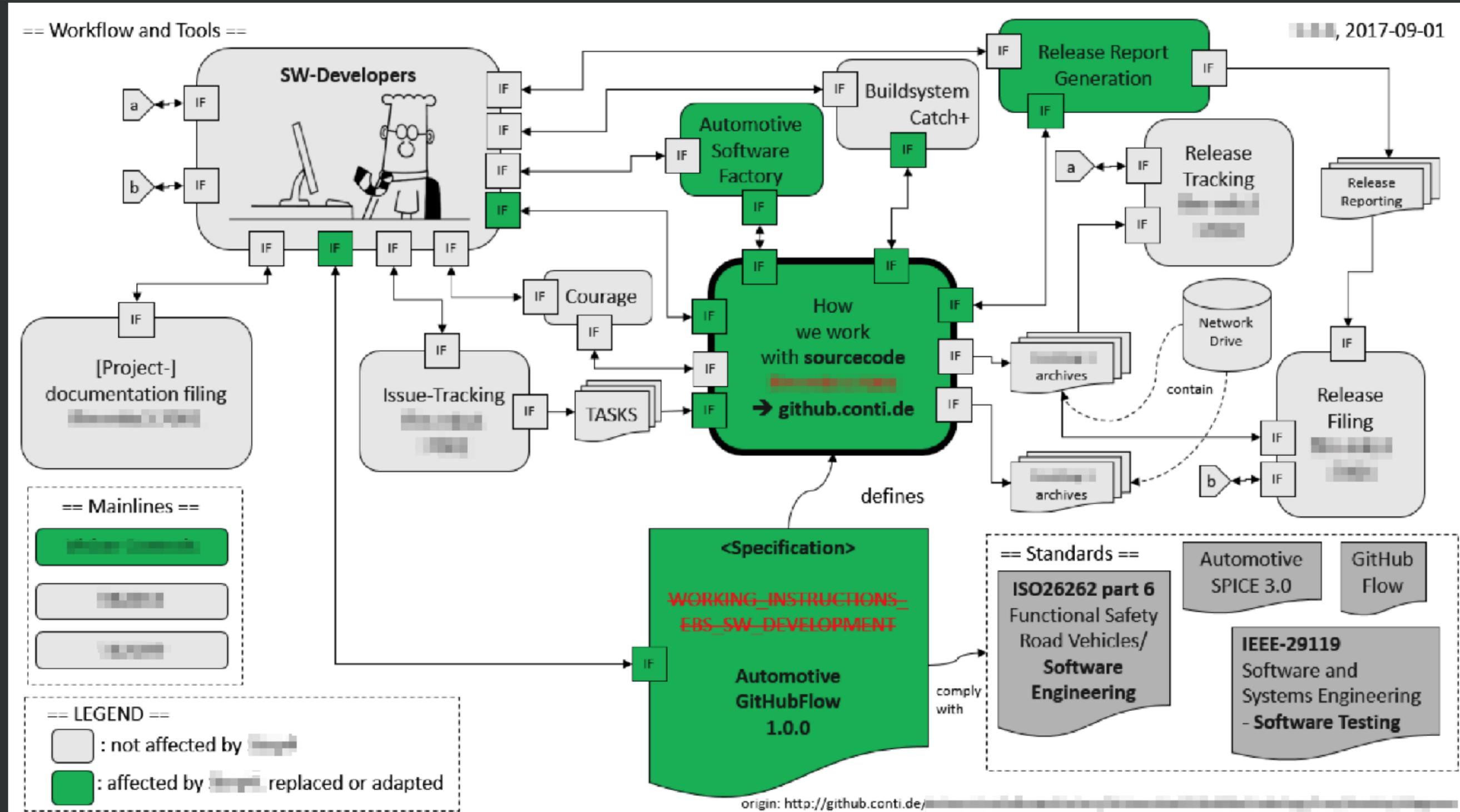
- **basejumpa**
- **besessener**
- **RandomByte**
- **marti4ka**
- **drivingThrillhouse**
- **SWCraftsMan**
- **moltob**
- **zemunk**
- **matz3**
- **sengaya**
- **dannola**
- **tacurran**



1. They all work for the German GitHub Giants



2. They work on complex problems

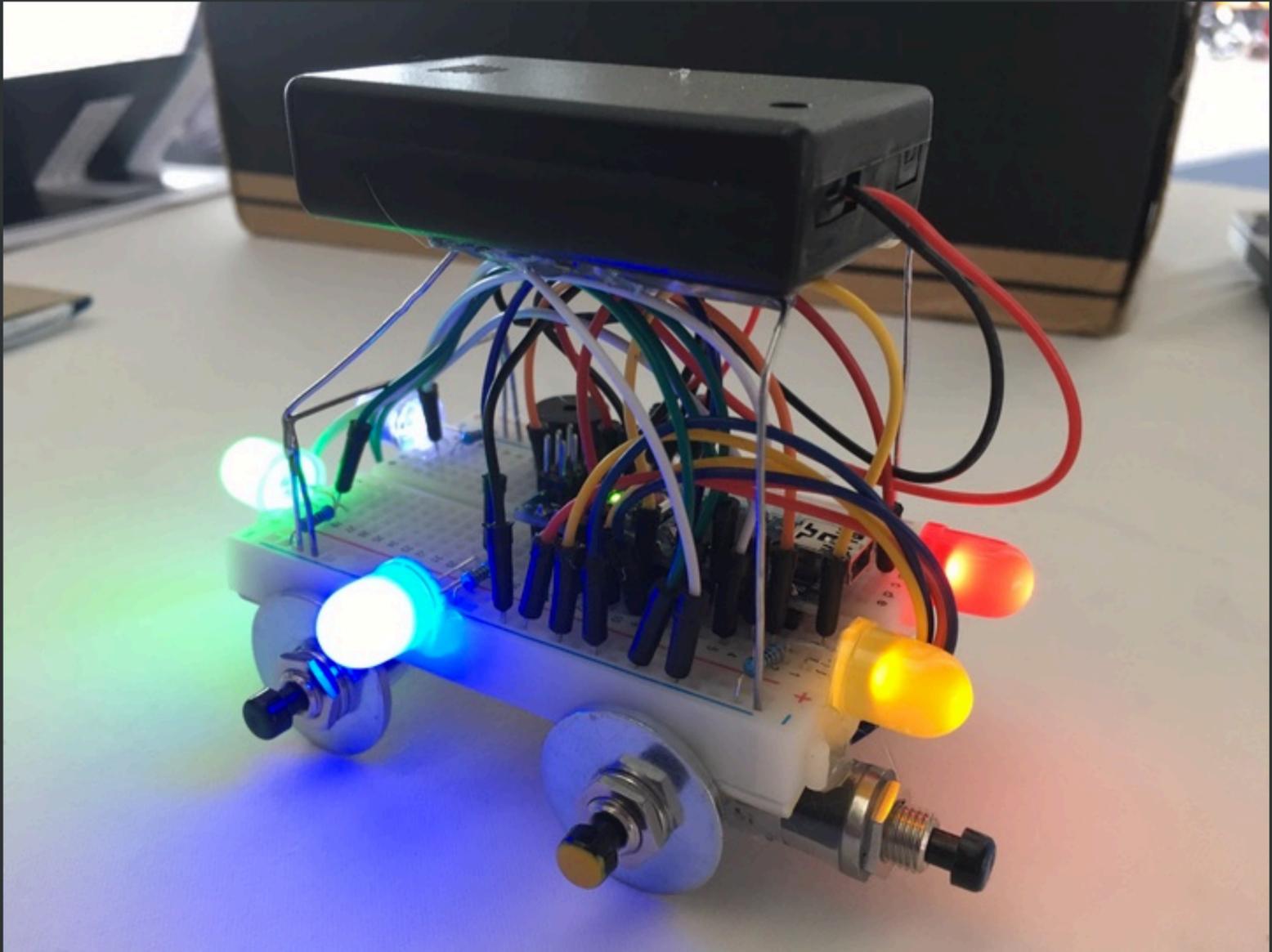


3. They are passionate to teach their passion

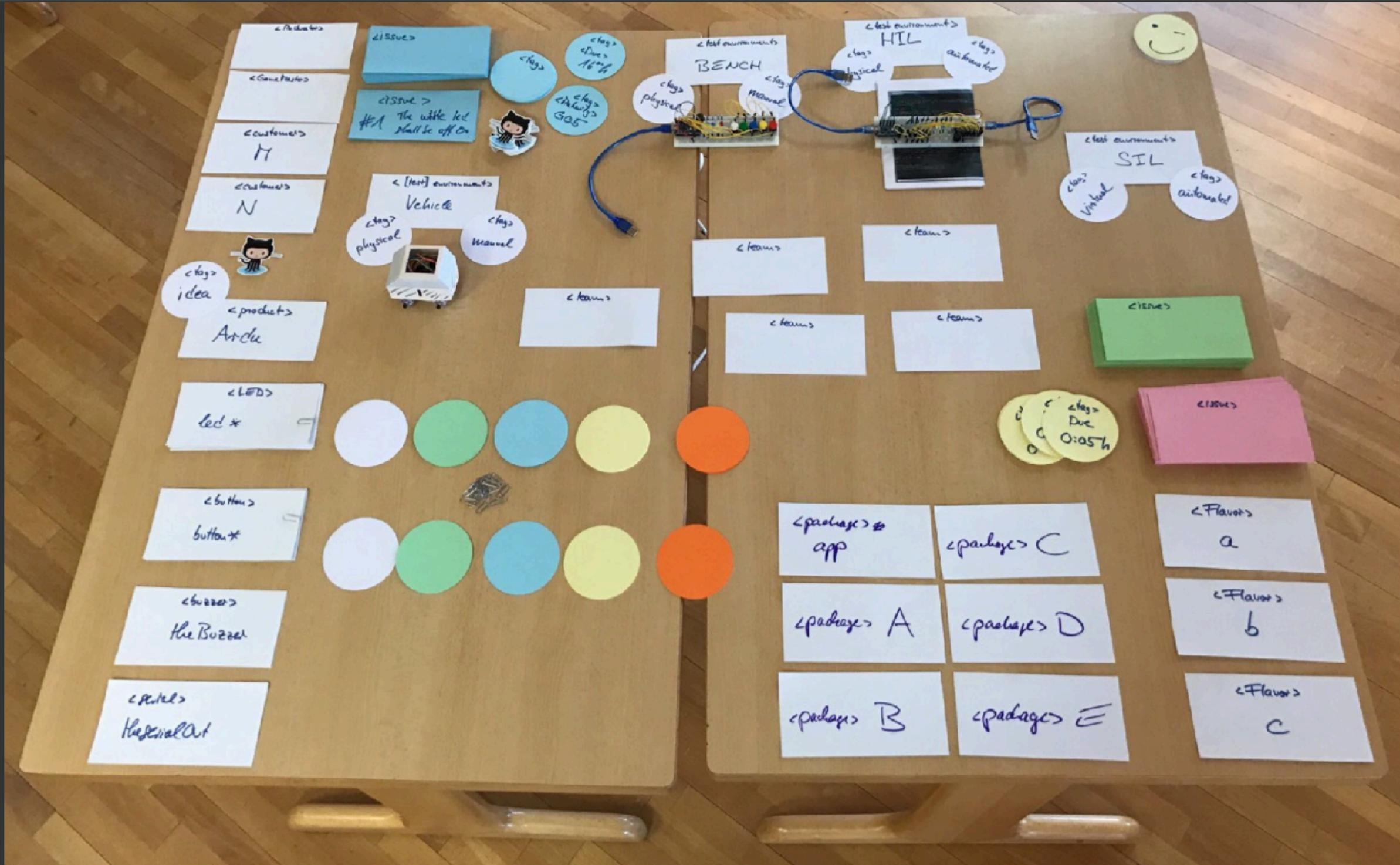


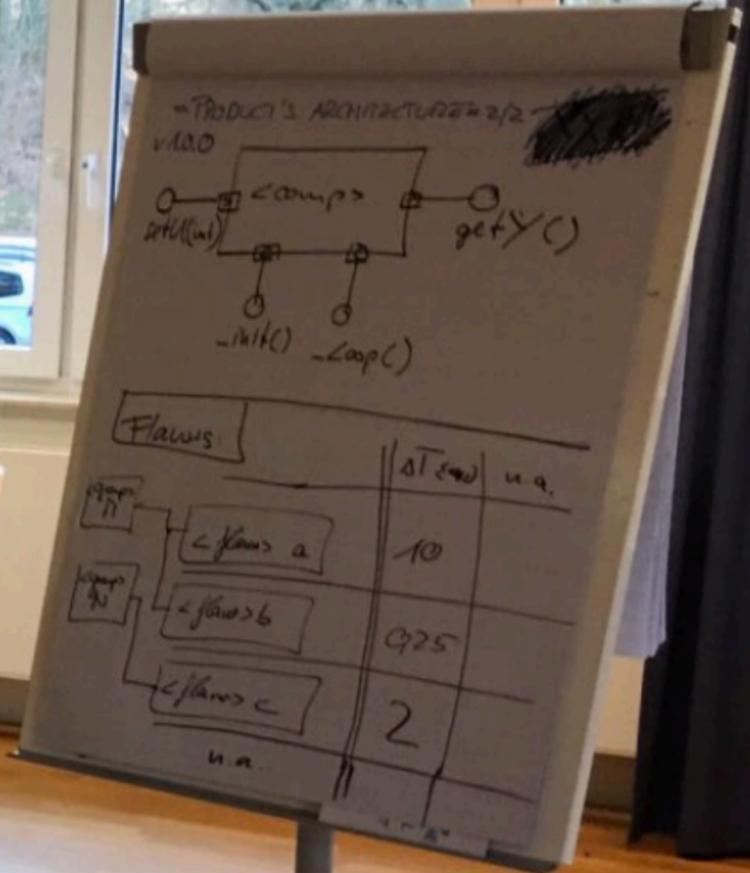
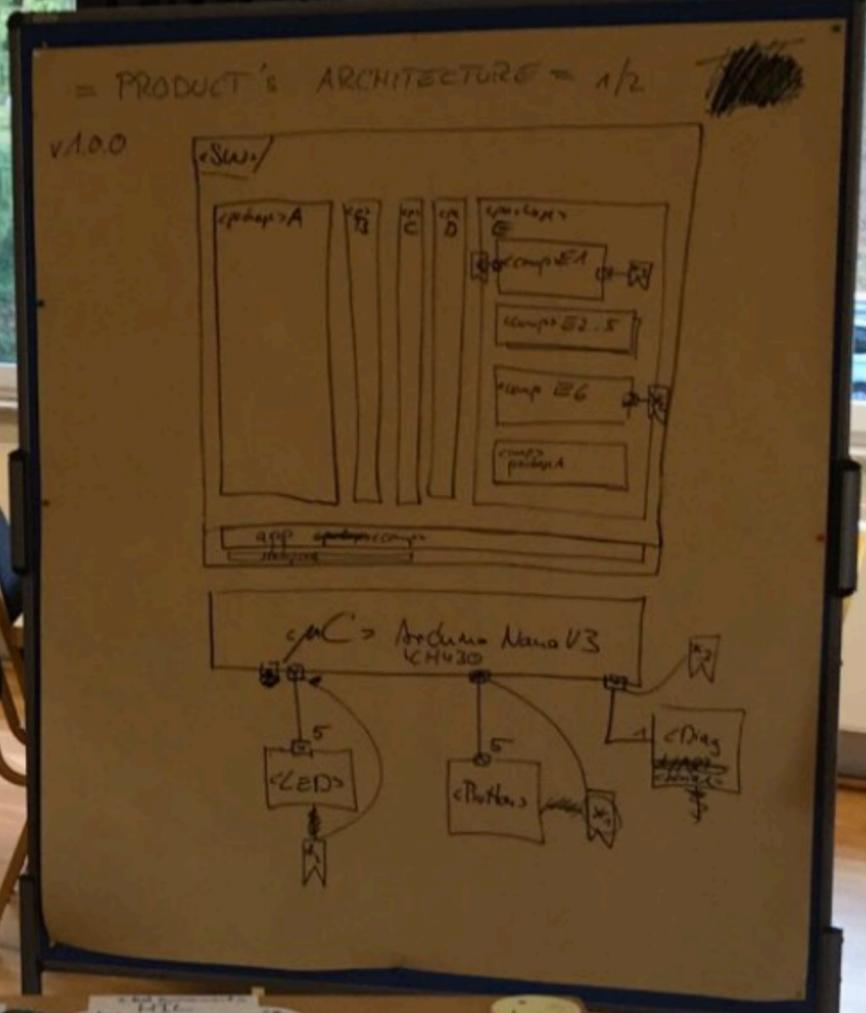
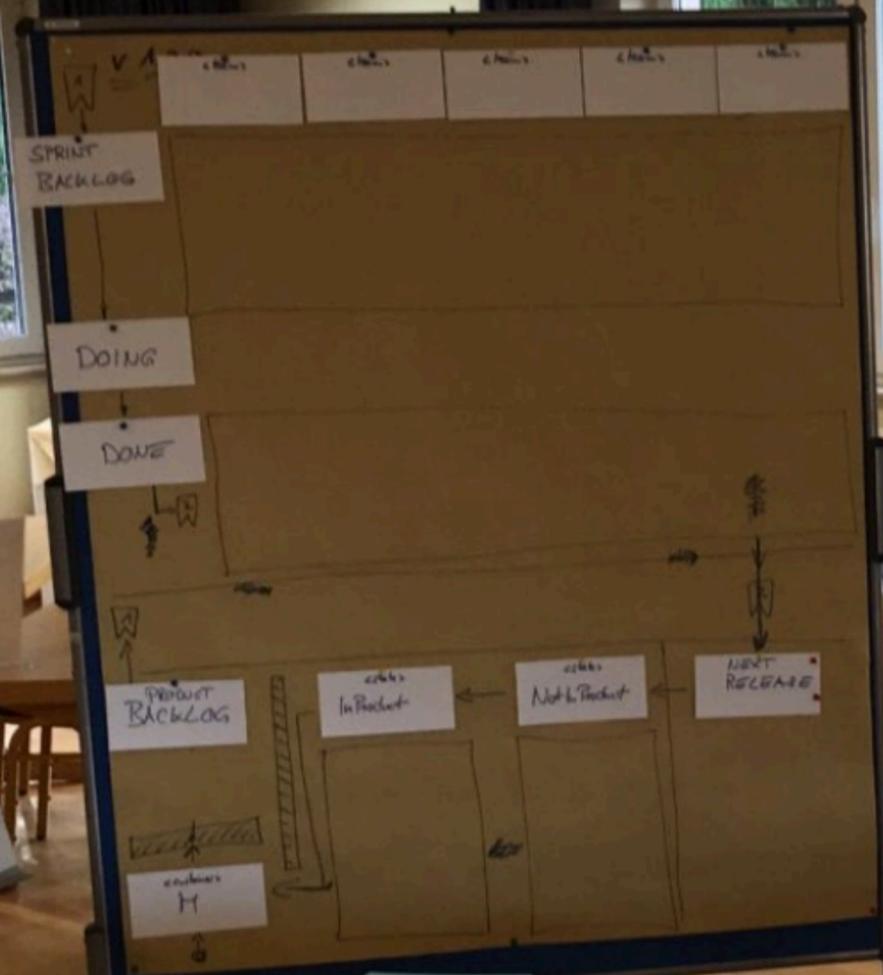


... tailored to their specific industry



... doing better workshops than any consultant





Physical workspace with sticky notes and components:

- Sticky notes: <code>package app</code>, <code>package A</code>, <code>package B</code>, <code>package C</code>, <code>package D</code>, <code>package E</code>, <code>Flaw a</code>, <code>Flaw b</code>, <code>Flaw c</code>
- Colored circles: white, green, blue, yellow, orange
- Components: Arduino Nano V3, LED, button, breadboard, jumper wires
- Other items: markers, a small jar of beads, a pink sticky note

4. They ignite other departments with their passion



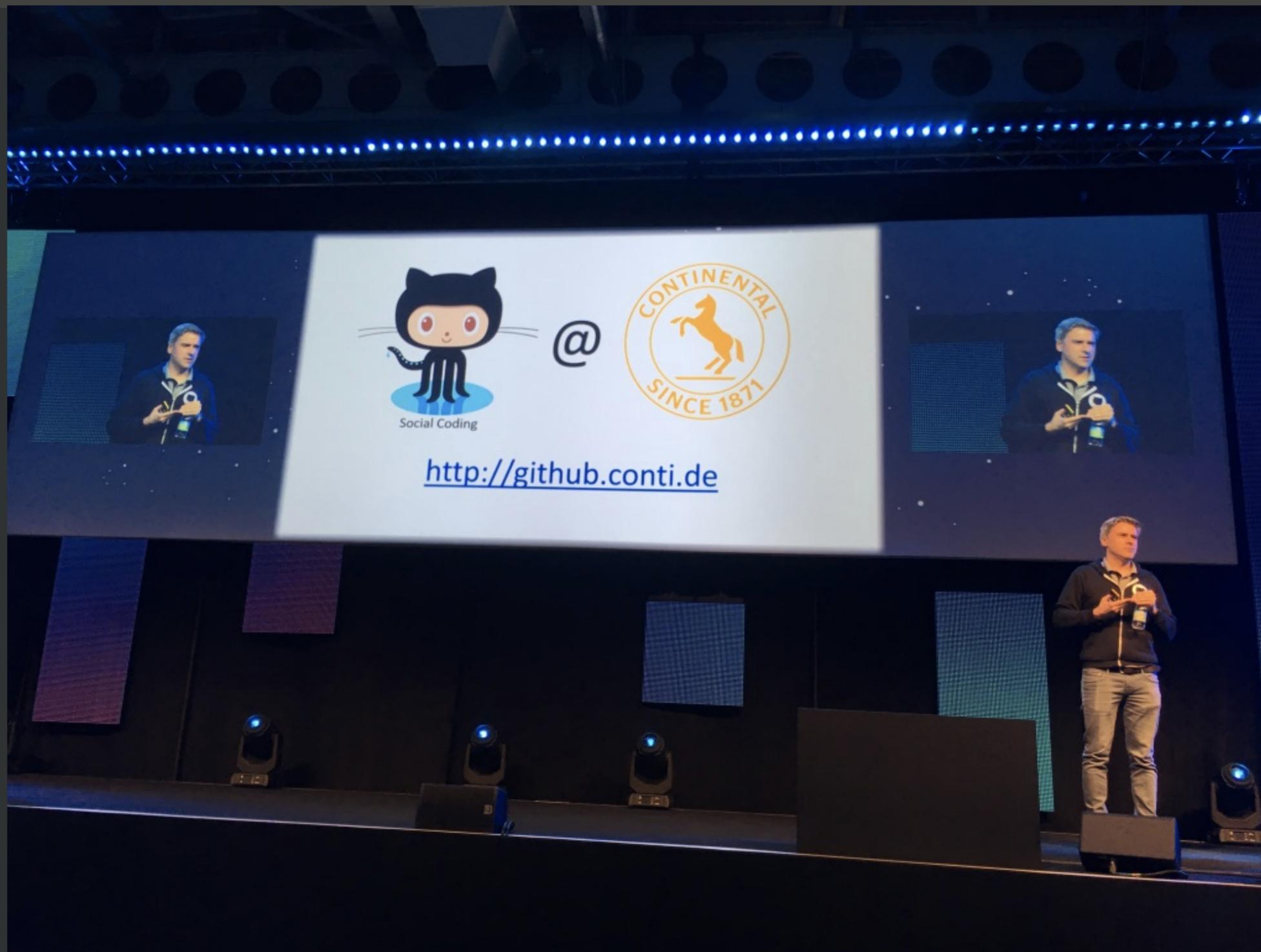
... and agile methodologies



Spreading the word internally ...



... and externally



Why the journey is worth it



Benefits of Inner Sourcing ...



Cross-team collaboration



Increased shipping velocity



Improved code quality



Worldwide scalability



Developer happiness



Transparency

QUESTIONS?



Thank you!

Visit GENIVI at <http://www.genivi.org> or <http://projects.genivi.org>

Contact us: help@genivi.org

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