Making the most out of your OSS contributions

CERN Workshop February 2025
Dr. Dawn M. Foster
Director of Data Science for CHAOSS
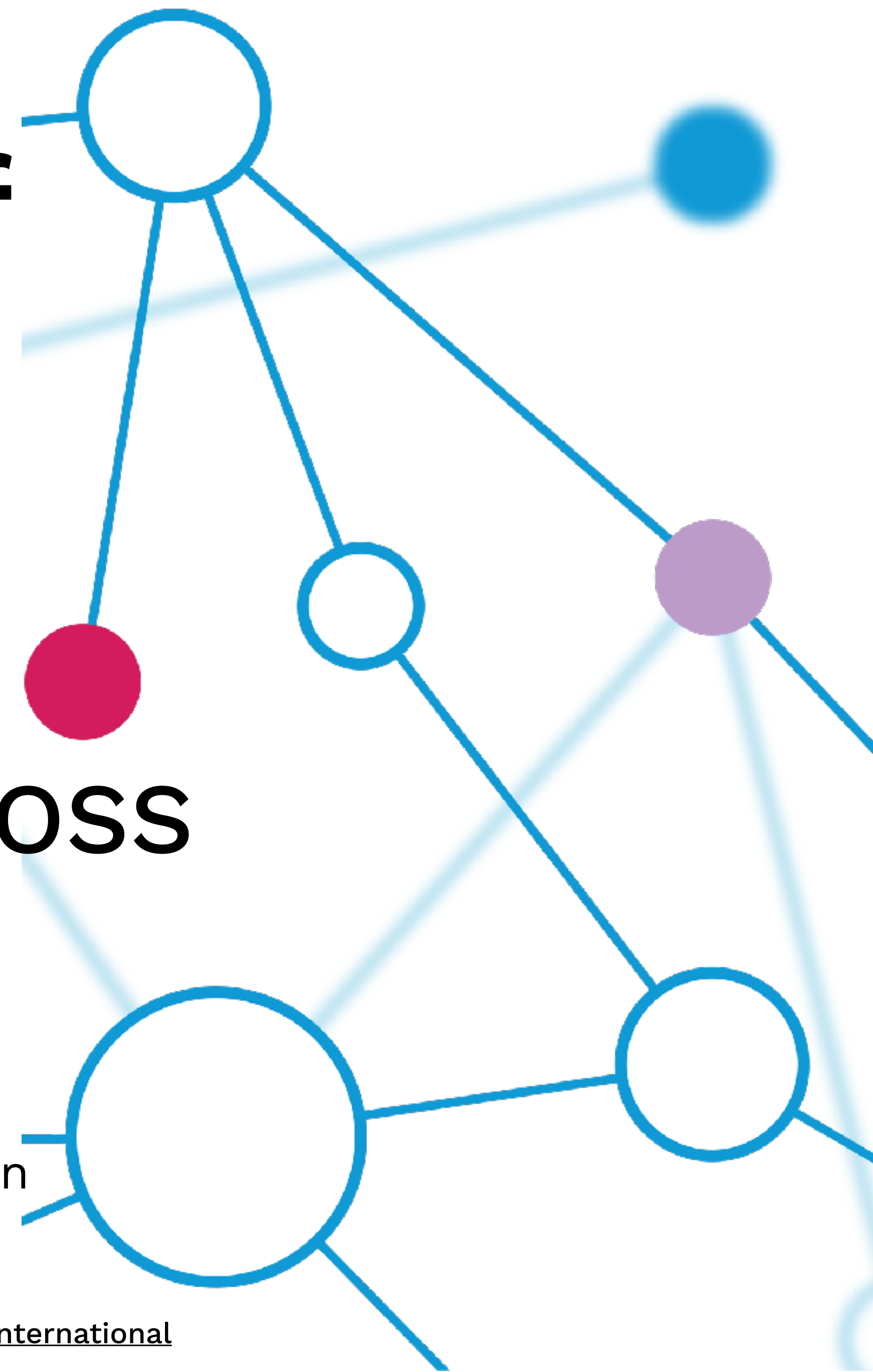
https://chaoss.community

https://chaoss.community/
https://github.com/chaoss
@chaoss@fosstodon.org

https://fastwonderblog.com/
https://github.com/geekygirldawn
@geekygirldawn@hachyderm.io

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Thank You!

Whoami

Photos by Mom, Josh Bancroft, Don Park

- Geek, traveler, reader
- 20+ yr tech career focused on community & open source (VMware, Intel, Puppet, …)
- OpenUK Board
- CHAOSS Board and Maintainer
- CNCF TAG Contrib Strategy co-chair
- PhD on Linux kernel collaboration

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Agenda

- What is CHAOSS?

- Getting started and contribution best practices

- Project health / risk in external OSS projects

- Improving projects from within

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CHAOSS: Community Health Analytics for Open Source Software

We are:

- An Open Source, Linux Foundation Project

- Globally distributed with 2000+ members in Slack

- A lovely place to spend your time

We are NOT:

- Not focused on medical health

- Not for-profit with any specific mandate
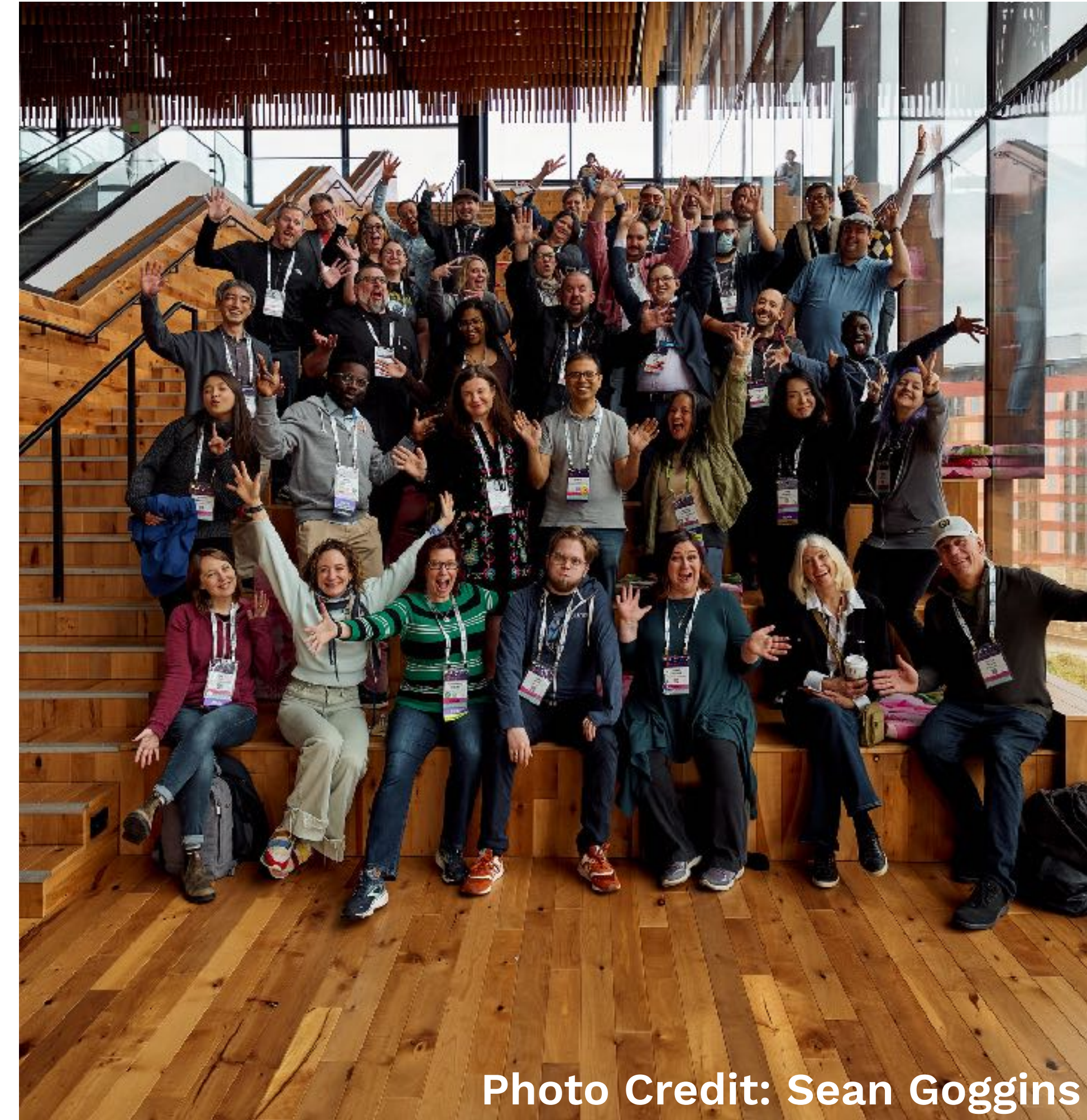
- Not only focused on code contributions

Photo Credit: Sean Goggins

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https://chaoss.community/kb-getting-started/

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Join Us!

Context WGs: OSPOs, Academic / Uni, Scientific, Data Science, UN SDGs, Funding Impact

Metrics WGs: Metrics Development, DEI

Chapters: CHAOSS Africa, CHAOSS Asia, CHAOSS Latam, CHAOSS Balkans

Programs: DEI Event Badging and Project Badging

Software: Augur and GrimoireLab

And More!

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Getting started and contribution best practices

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Collaboration in OSS Projects:
individuals, organizations, and communities

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Individuals

Make contributions
and earn
leadership positions

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Organizations

Employees contribute as individuals, but often on their organization's behalf

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Community = People

Community comes before organization or individual needs

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Balance

Your organization needs to balance your needs with individual and community needs

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Contribution Strategy and Plans

Align with your org's goals to highlight importance and impact for long-term participation

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Making Contributions as a Good Citizen in OSS

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Getting Started

Lurk and understand before starting with a small contribution

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Learn from Feedback

Avoid getting defensive

and prepare to iterate

on feedback

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Work with the Community

Discuss changes first and break them into smaller contributions

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Relationships

Attend events and

get to know people

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Upstream
Your Patches

Reduces your work
and benefits the
community

Maintenance Expectations

Don't expect someone else to maintain a large contribution

Contribution Best Practice Summary

Participation in OSS impacts

your organization's
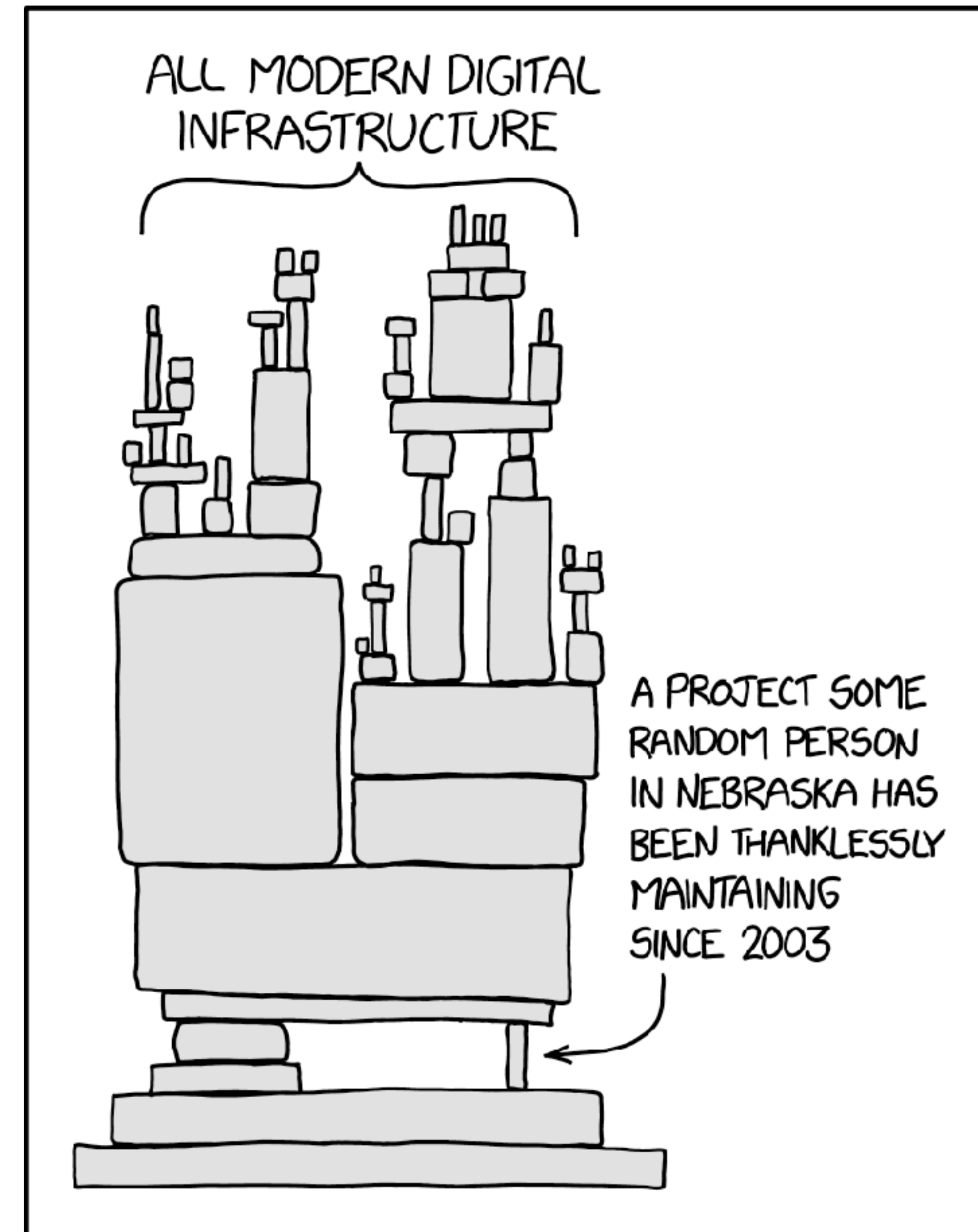
reputation. Strive to make

it a positive impact.

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Project health / risk

in external OSS projects

Why Does Viability Matter?

Your work

could be disrupted and

your valuable time wasted

ALL MODERN DIGITAL INFRASTRUCTURE

A PROJECT SOME RANDOM PERSON IN NEBRASKA HAS BEEN THANKLESSLY MAINTAINING SINCE 2003

https://xkcd.com/2347/

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Ownership:

Foundation vs. Company

Neutral Foundations

Participate as equals,

but make sure the

foundation is really neutral

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Company Originated

Higher risk:

single company in control

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Assessing and Measuring

Project Viability

https://chaoss.community/kb/metrics-model-project-viability-starter/

https://chaoss.community/chaoss-guide-oss-viability/

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Governance is about People

Processes for how people collaborate and make decisions

Metric Model: Governance Viability

Metrics:

- **Issues Inclusivity**

- **Documentation Usability**

- **Time To Close**

- **Change Request Closure Ratio**

- **Project Popularity**

- **Libyears**

- **Issue Age**

- **Release Frequency**

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https://chaoss.community/kb/metrics-model-oss-project-viability-governance/

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Community

Look for helpful, kind, respectful, and welcoming

Adopters

**Projects with
many adopters /
end users
are more viable**

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Responsiveness

Project that can keep up

with contributions will

be move viable

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Metrics Model: Community Viability

Metrics

- **Clones**

- **Forks**

- **Types of Contributions**

- **Change Requests**

- **Committers**

- **Change Request Closure Ratio**

- **Project Popularity**

- **Libyears**

https://chaoss.community/kb/metrics-model-oss-project-viability-community/
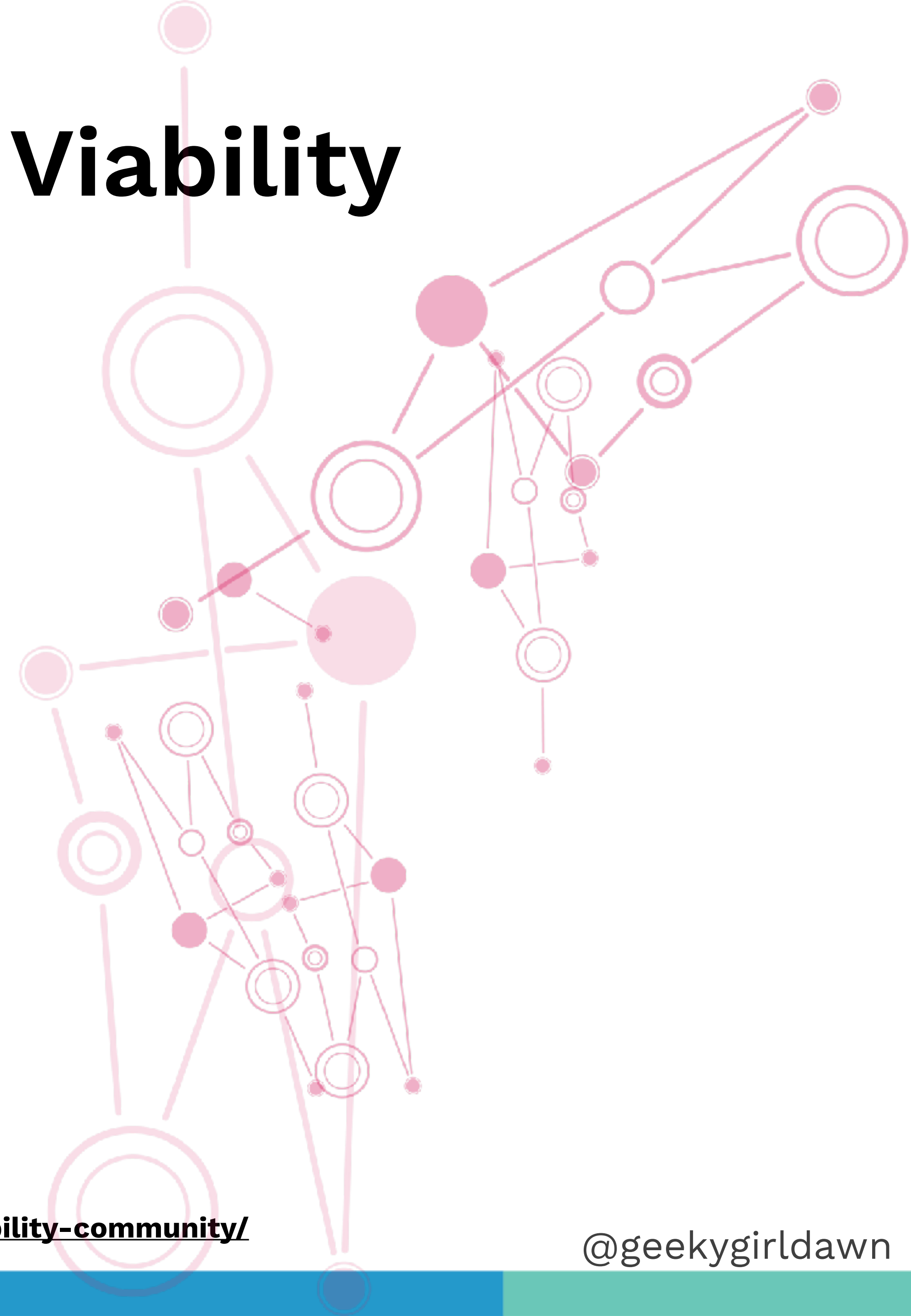
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Security

Look for proactive security response and policies

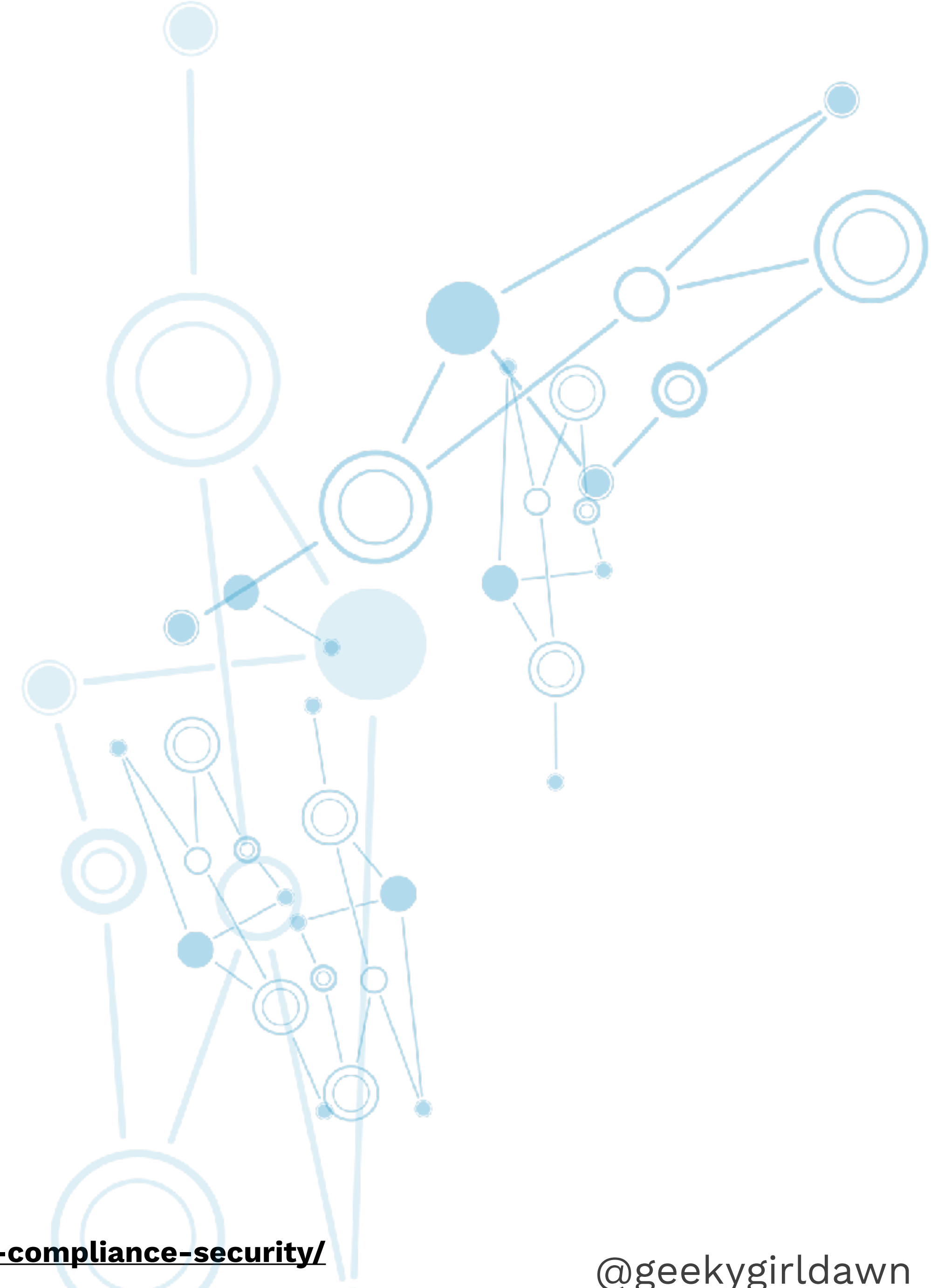Image by darwin Bell CC BY-NC 2.0

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Metrics Model: Compliance and Security Viability

Metrics

- **OpenSSF Best Practices**

- **Licensing**

  - **License Coverage**

  - **OSI Approved Licenses**

  - **Licenses Declared**

- **Defect Resolution Duration**

- **Libyears**

- **Upstream Code Dependencies**

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Contributor Sustainability

Active contributors and

a variety of

different organizations

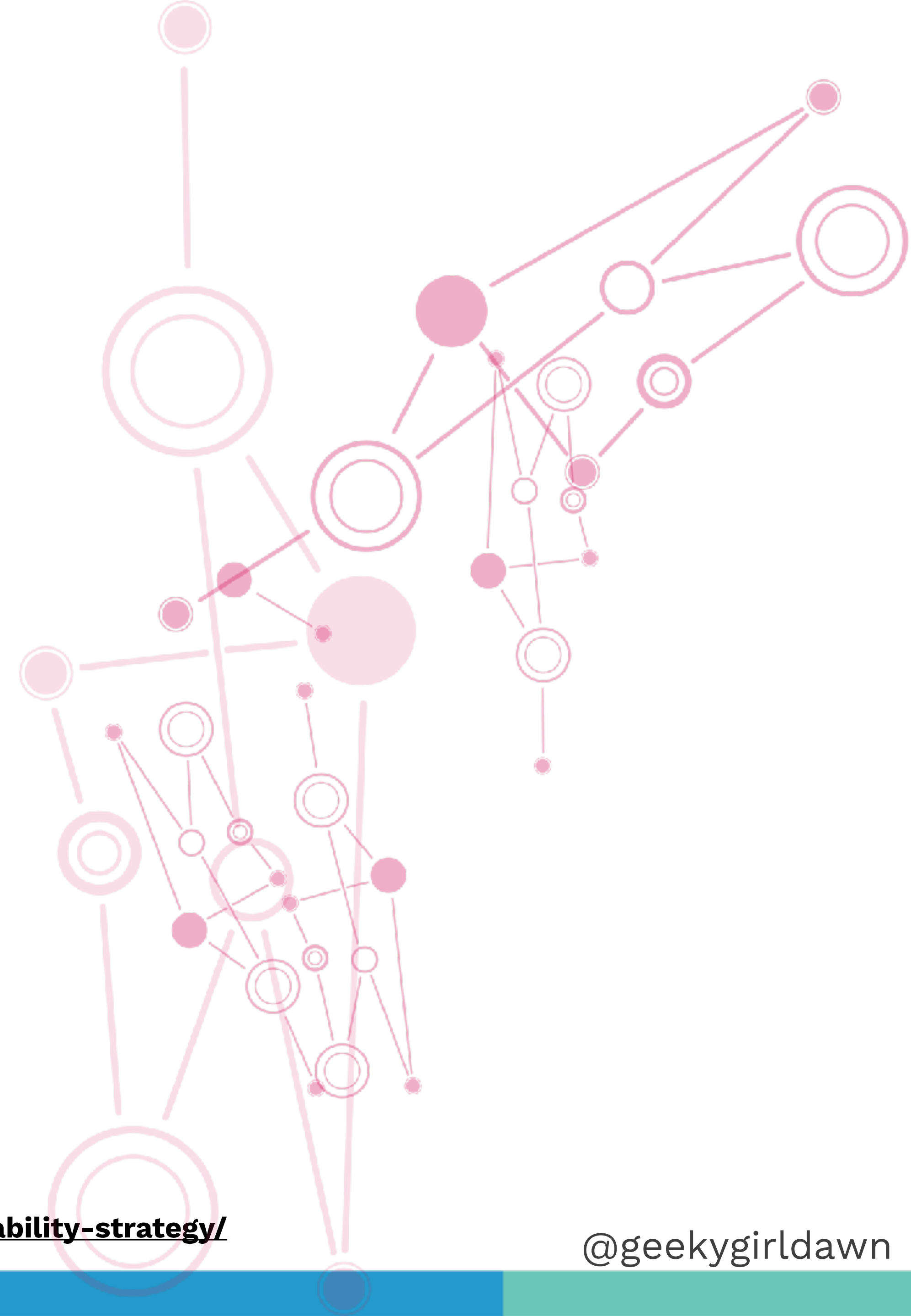CHAOSS

Metrics Model: Strategy

Metrics

- **Programming Language Distribution**

- **Contributor Absence Factor (aka Bus Factor)**

- **Elephant Factor**

- **Organizational Influence**

- **Release Frequency**

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Project Viability Summary

Can you employ contributors
to mitigate the risk for
projects that are less viable?

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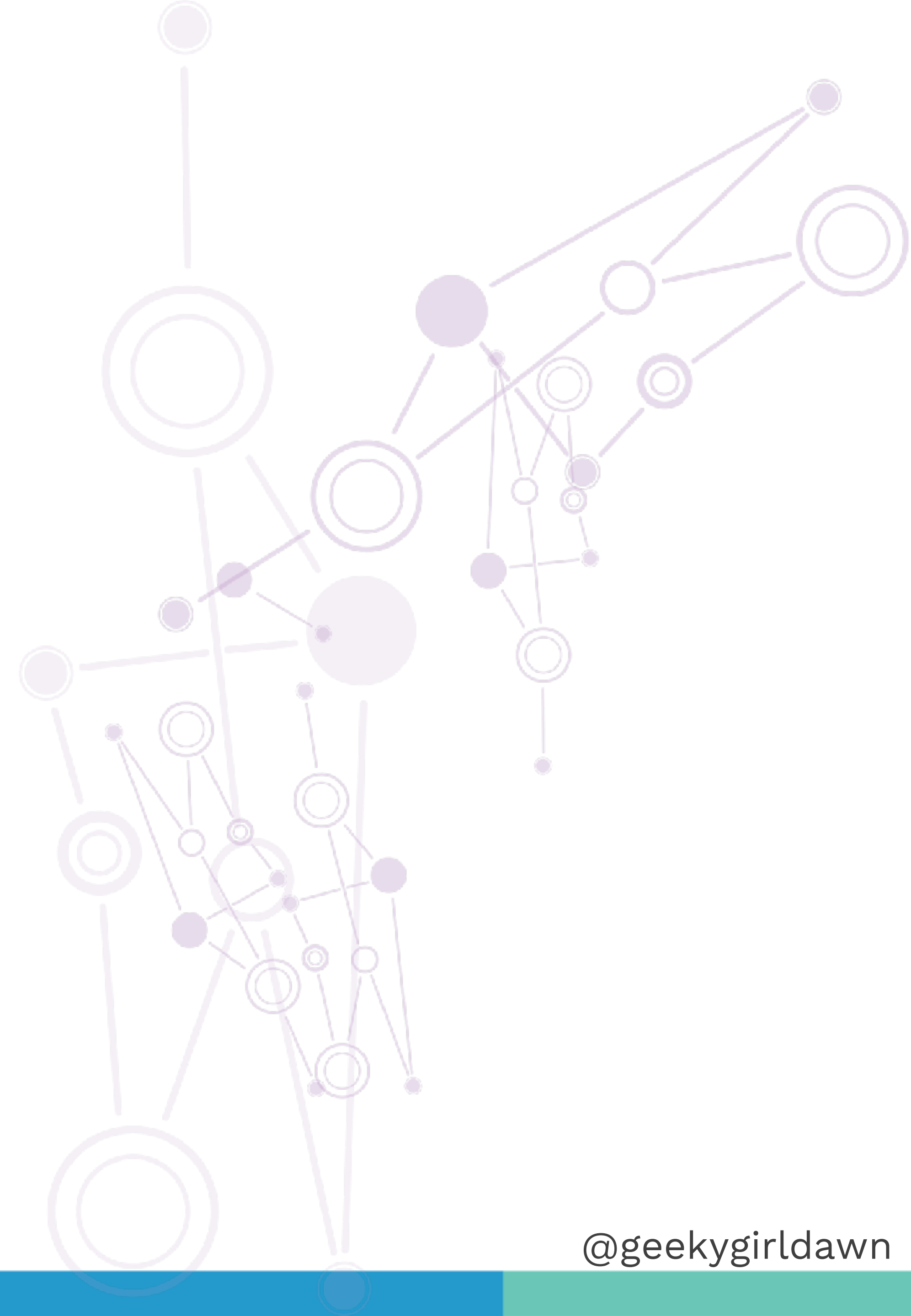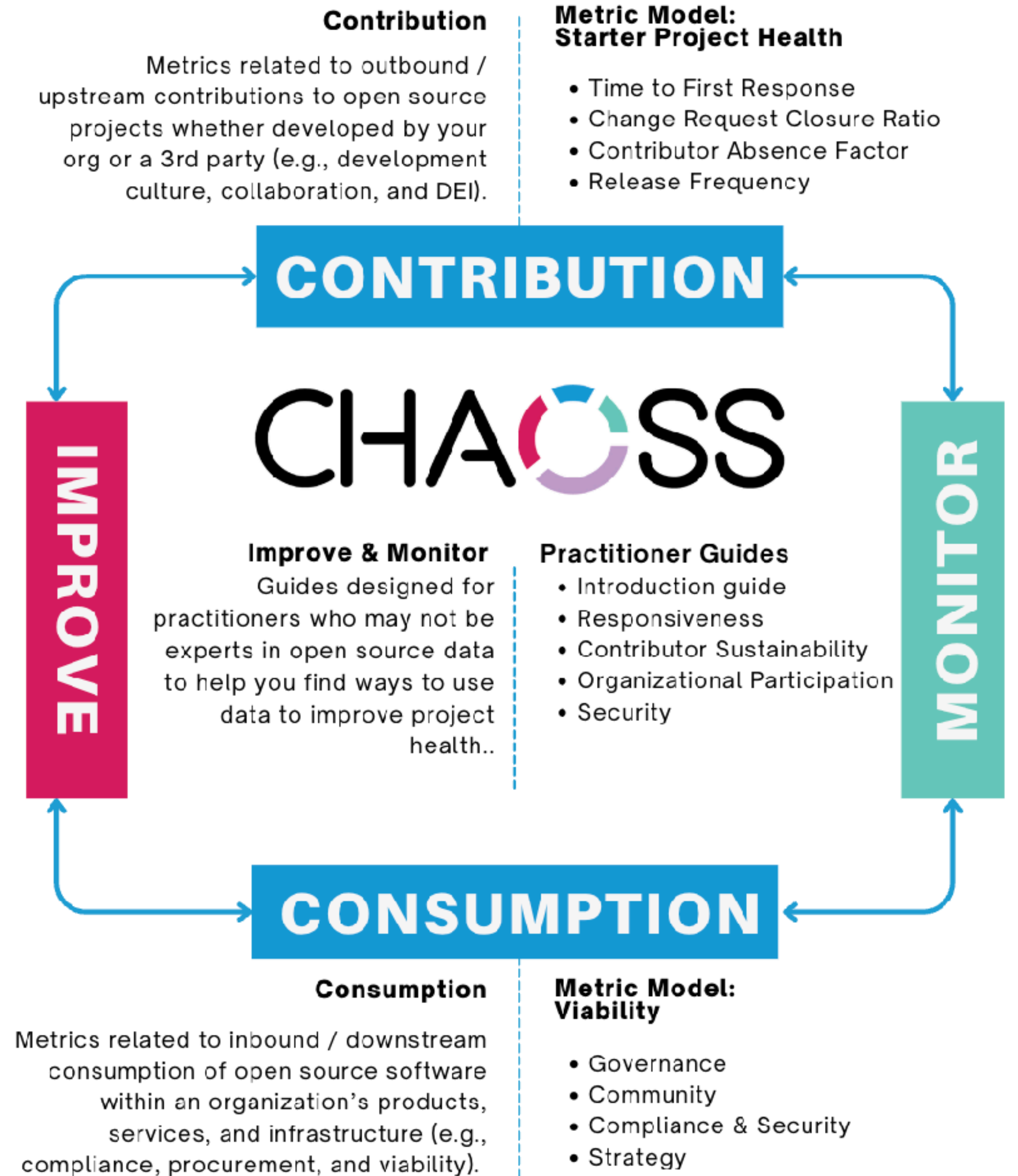# Improving projects

from within

CHAOSS Resources

Practitioner Guides

and collections of

metrics to improve the

health of your projects

Contribution

Metrics related to outbound / upstream contributions to open source projects whether developed by your org or a 3rd party (e.g., development culture, collaboration, and DEI).

Metric Model: Starter Project Health

- Time to First Response
- Change Request Closure Ratio
- Contributor Absence Factor
- Release Frequency

CONTRIBUTION

IMPROVE

MONITOR

Improve & Monitor

Guides designed for practitioners who may not be experts in open source data to help you find ways to use data to improve project health..

Practitioner Guides

- Introduction guide
- Responsiveness
- Contributor Sustainability
- Organizational Participation
- Security

CONSUMPTION

Consumption

Metrics related to inbound / downstream consumption of open source software within an organization's products, services, and infrastructure (e.g., compliance, procurement, and viability).

Metric Model: Viability

- Governance
- Community
- Compliance & Security
- Strategy

Metrics Require Interpretation

Practitioner Guides:

- **Introduction**

- **Responsiveness**

- **Contributor Sustainability**

- **Organizational Participation**

- **Security**

- **More guides coming soon**

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Collaborate with Your Community

A project's maintainers and contributors can help interpret your metrics and make the best improvements for that project.

Responsiveness

Projects that can keep up with contributions will be more sustainable

Key metrics:

- Time to First Response

- Time to Close

- Change Request Closure Ratio

Photo by Andrik Langfield on Unsplash

https://chaoss.community/practitioner-guide-responsiveness/

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Responsiveness

Improve responsiveness by setting expectations, promoting contributors into maintainers, and using templates to improve contribution quality

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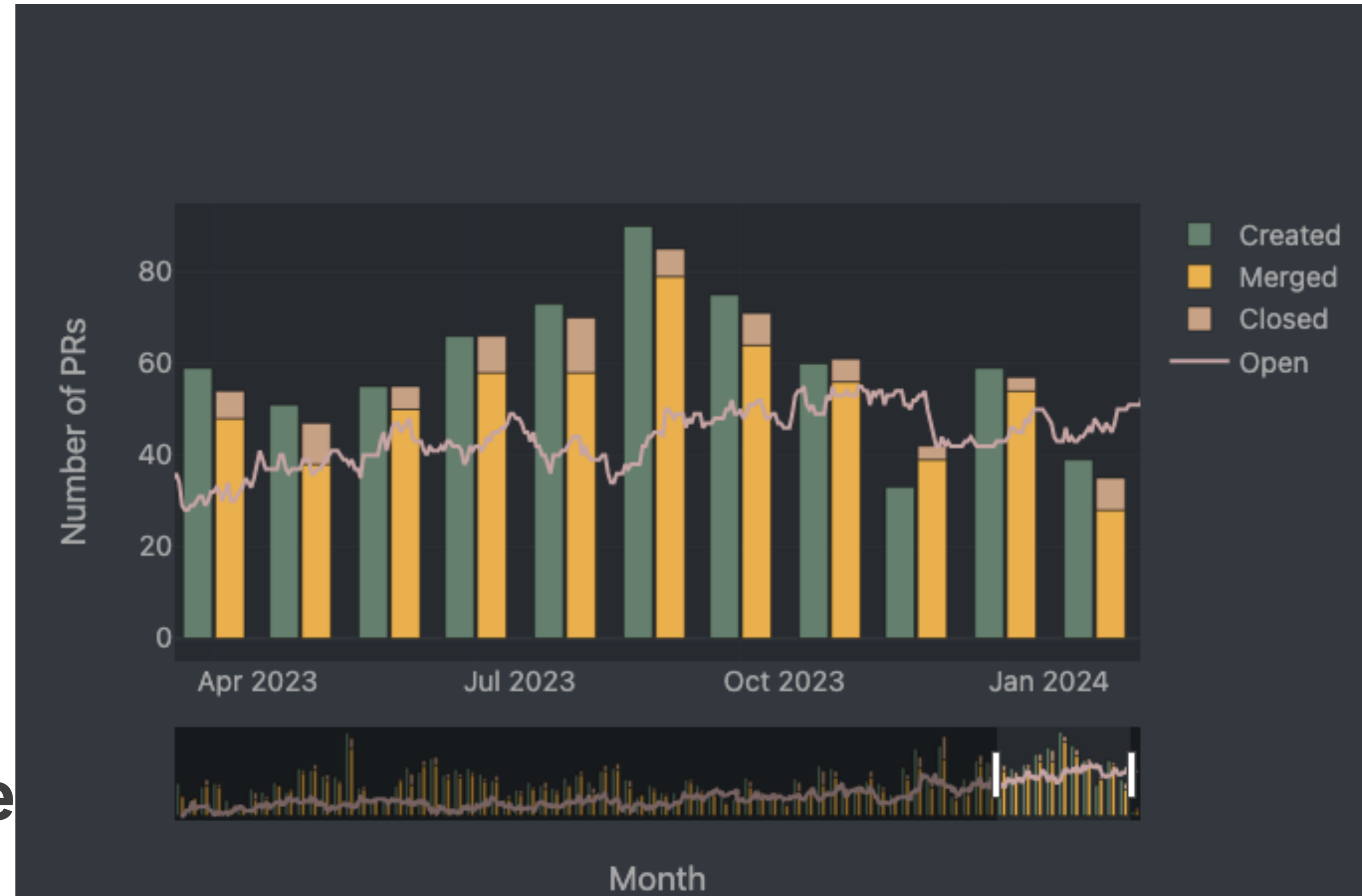
Contributor Sustainability

Projects without enough contributors to sustain them are at risk of failure.

Key metrics:

- **Contributor Absence Factor (Bus Factor)**

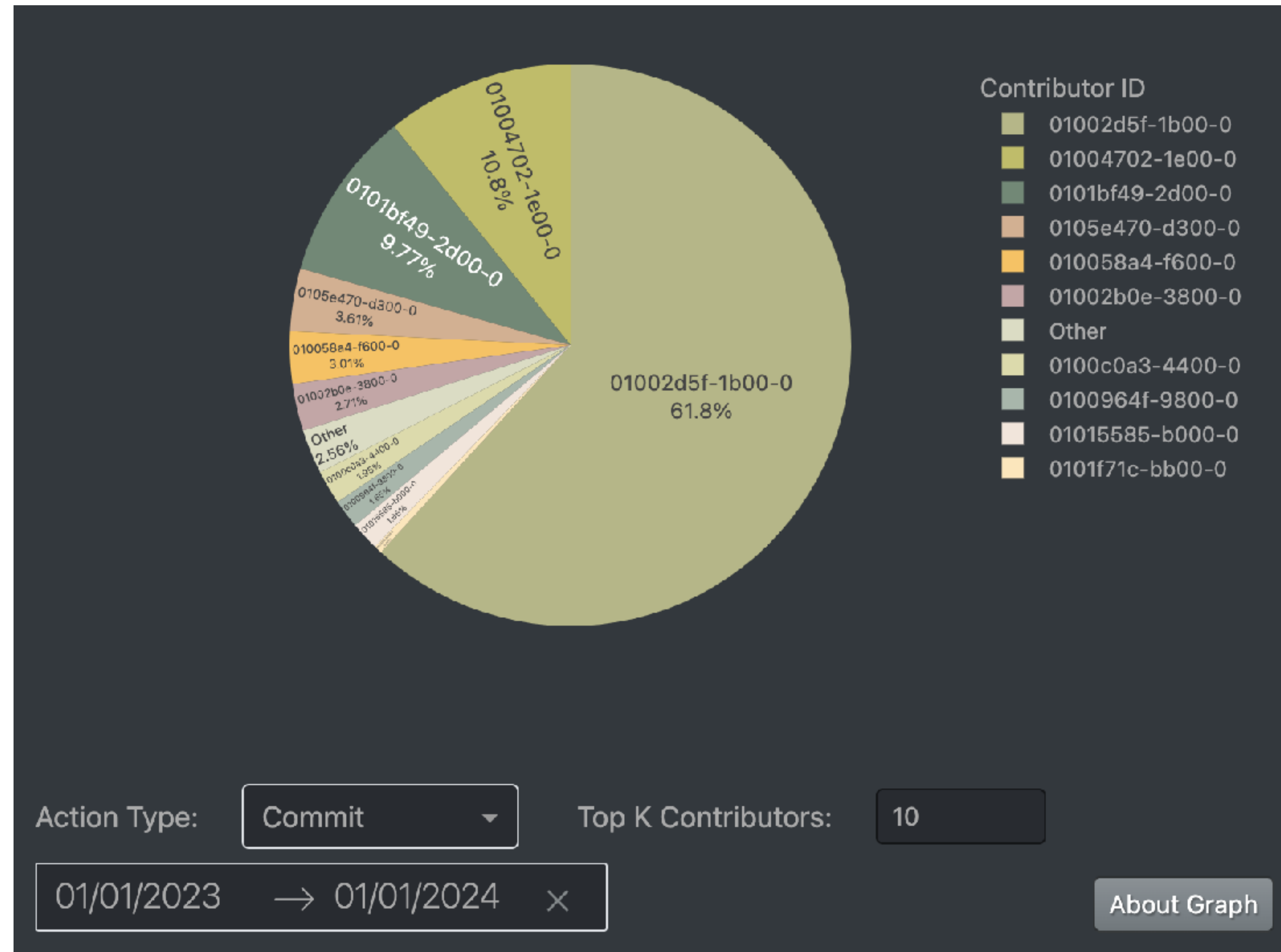- **Contributors**

- **Types of Contributions**

Image by the Linux Foundation CC BY-NC 2.0

https://chaoss.community/practitioner-guide-contributor-sustainability/

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Contributor Sustainability

Improve by recruiting new contributors & promoting maintainers including non-code roles, and improve contributing / onboarding guides

Organizational Participation

Projects dominated by a single organization might be less sustainable.

Key metrics:

- Elephant Factor

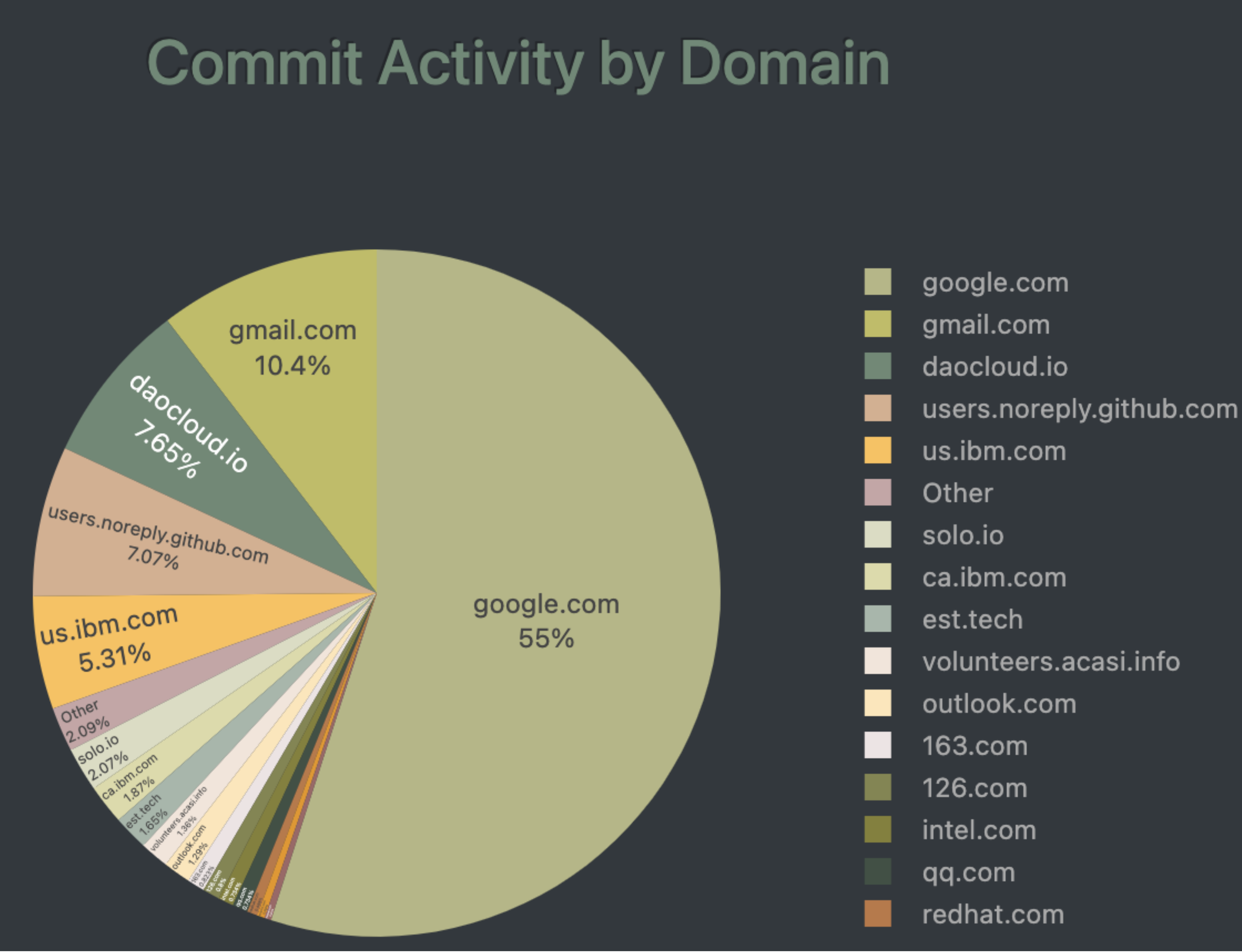- Organizational Influence

- Organizational Diversity

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Organizational Participation

Improve by recruiting contributors from other organizations, improving transparency, encouraging employees to contribute

Commit Activity by Domain

- google.com — google.com 55%
- gmail.com — 10.4%
- daocloud.io — 7.65%
- users.noreply.github.com — 7.07%
- us.ibm.com — 5.31%
- Other — 2.09%
- solo.io — 2.07%
- ca.ibm.com — 1.87%
- est.tech — 1.65%
- volunteers.acasi.info — 1.36%
- outlook.com — 1.29%
- 163.com
- 126.com
- intel.com
- qq.com
- redhat.com

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Security

A proactive approach to security increases trust and improves sustainability.

Key metrics:

- OpenSSF Best Practices
- Libyears
- Release Frequency

![CHAOSS logo] https://chaoss.community/practitioner-guide-security

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Security

Improve by securing your repo, creating a security policy, updating dependencies, and cutting releases with security fixes

OSSF Scorecard

Check Type	Score
Aggregate Score	7.3
Binary-Artifacts	10
Branch-Protection	-1
CI-Tests	10
CII-Best-Practices	5
Code-Review	7
Contributors	10
Dangerous-Workflow	10
Dependency-Update-Tool	10
Fuzzing	0
License	10
Maintained	10
Packaging	10
Pinned-Dependencies	0
SAST	10
Security-Policy	4
Signed-Releases	-1
Token-Permissions	0
Vulnerabilities	10

Repo General Info

Section	Info
License	MIT License
Code of Conduct	File found
Contributor Guidelines	File found
Security Policy	File found
Number of Releases	129
Last Release Date	2024-04-28
Avg Time Between Releases	12.0 Days
Star Count	572
Fork Count	840
Watcher Count	22
Issues Enabled	True

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Final Thoughts

Building healthy and sustainable open source projects is challenging. Identify issues using metrics and proactively improve before you have a crisis.

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THANK YOU!
Any Questions?

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