DIGITAL SERVICE AT CMS

Establishing the First US Federal Open Source Program Office (OSPO) at CMS.gov

Remy DeCausemaker, Open Source Program Office Lead

Centers for Medicare & Medicaid Services // Federal Committee on Statistical Methodology Conference // FCSMConf.org // October 2024

https://github.com/DSACMS/decks/blob/main/fcsmconf2024.pdf

opensource@cms.hhs.gov

Open Source and The Digital Service at CMS

What's Coming Next

1. **The Digital Service at CMS**
2. **The First Federal OSPO**
3. **What are the Risks? What are the Benefits?**

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What does the Digital Service at CMS do?

We work to transform the U.S. healthcare system by:

Improving the design of healthcare experiences

Delivering value to the government, healthcare providers, and patients

Modernizing systems

Participating in policy development

 https://github.com/DSACMS/decks/blob/main/fcsmconf2024.pdf

How do we do it?

We deploy **small groups** of designers, engineers, and product managers on a "tour of duty" to work alongside **dedicated civil servants**.

These **multidisciplinary teams** bring best practices and new approaches to support government **modernization** efforts.

Who we serve: The American People (180M+)

65M

Medicare Beneficiaries

(2022)

88M

Medicaid Beneficiaries

(2022)

31M

Healthcare.gov

(2021)

https://data.cms.gov/fact-sheet/cms-fast-facts
https://www.cms.gov/files/document/2022-medicare-trustees-report.pdf

Who we serve: Taxpayers

$ 1.7 T

CMS Budget - 12% of the federal budget

(FY 2022)

$ 829 B

Total Medicare Payments

(FY 2021)

$ 646 B

Total Medicaid Payments

(FY 2019)

https://data.cms.gov/fact-sheet/cms-fast-facts
https://www.cms.gov/files/document/2022-medicare-trustees-report.pdf

Who we serve: The Health Care System

6,244

CMS Employees

(FY 2022)

1.4M

Health Care Providers

(2022)

20%

National Health Care Spending is Medicare

(2022)

https://data.cms.gov/fact-sheet/cms-fast-facts
https://www.cms.gov/files/document/2022-medicare-trustees-report.pdf

The First US Federal OSPO

go.cms.gov/ospo

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Biden-Harris Administration Releases Summary Report of 2023 RFI by Open-Source Software Security Initiative (OS3I)

THE WHITE HOUSE

Administration Priorities The Record Briefing Room Español MENU

AUGUST 09, 2024

Fact Sheet: Biden-Harris Administration Releases Summary Report of 2023 RFI on Open Source-Software Security Initiative

ONCD › BRIEFING ROOM › PRESS RELEASE

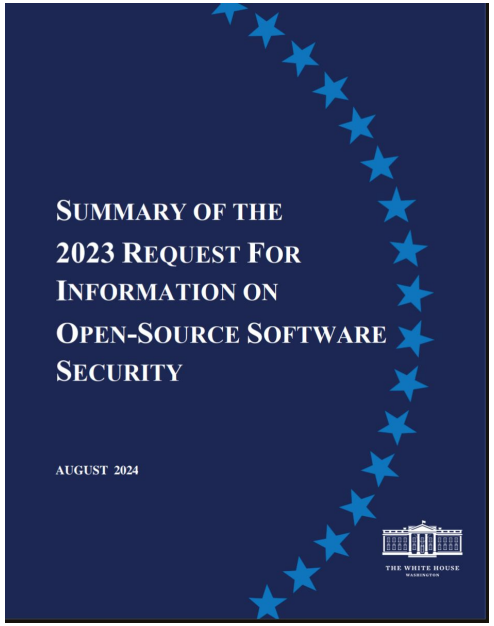
August 9, 2024

Read the full report here

Today, the White House Office of the National Cyber Director, in partnership with members of the Open-Source Software Security Initiative (OS3I), is publishing a summary report on the *Request for Information (RFI)* ↗: *Open-Source Software Security: Areas of Long-Term Focus and Prioritization*. This builds on the commitment the Administration made in the National Cybersecurity Strategy, "to invest in the development of secure software, including memory-safe languages and software development techniques, frameworks, and testing tools."

whitehouse.gov/wp-content/uploads/2024/08/Summary-of-the-2023-Request-for-Information-on-Open-Source-Software-Security.pdf

Establish the First U.S. Government OSPO: The Department of Health and Human Services (HHS) Center for Medicaid and Medicare Services (CMS) recently established the first Open-Source Program Office at a United States Federal Agency.[xl] The function of the OSPO is to establish and maintain guidance, policies, practices, and talent pipelines that advance equity, build trust, and amplify impact across CMS, HHS, and Federal Government's open-source ecosystem by working and sharing openly.



SUMMARY OF THE 2023 REQUEST FOR INFORMATION ON OPEN-SOURCE SOFTWARE SECURITY

AUGUST 2024

THE WHITE HOUSE

CISA DARPA NSF CMS.gov Science and Technology U.S. DEPARTMENT OF ENERGY

OPEN-SOURCE SOFTWARE SECURITY RFI SUMMARY

What is an Open Source Program Office? (OSPO)

*An open source program office (OSPO) serves as the center of competency for an organization's open source operations and structure. It is responsible for defining and implementing **strategies**, **programs**, and **policies** to guide these efforts.*

CMS OSPO Functional Statement:

*"Establishes and maintains guidance, policies, practices, and talent pipelines that **advance equity**, **build trust**, and **amplify impact** across CMS, HHS, and Federal Open Source Ecosystems by working and sharing openly."*

What are the Risks?
What are the Benefits?

cms.gov/digital-service/open-source-program-office

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“Risks” (aka Myths) of Open Source

Open source is ~~less~~ more secure.

"**Many eyes make any bug shallow**." The more people looking at a project, the faster we'll be able to identify problems and create solutions.

Open source is ~~bad~~ good for for-profit businesses.

By **lowering barriers to entry and costs of acquisition**, developers are given access to world-class industry leading tools and infrastructure used at the largest enterprises today.

~~Open Source means all data must be public.~~ Open Source means SOME data CAN be public.

Open source is not a binary, it is a spectrum, and there are layers to the stack. Being intentional about what we cannot share for privacy and security purposes, helps us determine what we can share more effectively.

Open by Default is something we ~~do not~~ already do in Federal Government.

According to **Title 17 U.S. Code § 101 and § 105**, "Copyright protection under this title is not available for any work of the United States Government" meaning, "work prepared by an officer or employee of the United States Government as part of that persons official duties.”[1][2]

https://www.law.cornell.edu/uscode/text/17
https://www.law.cornell.edu/uscode/text/17/105

What are the *actual* Risks in Open Source?

Overdifferentiation

- Unnecessarily duplicating work
- Unnecessarily dividing your resources

Examples

- “Not Invented Here Syndrome”

Proliferation

- Unnecessarily duplicating communities and projects
- Unnecessarily dividing your addressable market

Examples

- License Proliferation
- Event/Conference Proliferation

Fragmentation

- Unnecessarily dividing your community of contributors

Examples

- Hostile Forks
- Internal Forks

How does our OSPO benefit the Agency?

Save us Money

Save us Time

Accountability for Contract Performance

Engine for Talent

Reduce Duplicate Work

Reduce Duplicate Costs

Reduce Security Risk

Reduce Continuity Risk

 https://github.com/DSACMS/decks/blob/main/fcsmconf2024.pdf

BIGGEST RISK: *For every* **1** *Federal Employee under the age of* **30**, *there are* **7** *over the age of* **50** ...

"The Federal Retirement Cliff"

https://www.opm.gov/policy-data-oversight/data-analysis-documentation/federal-employment-reports/reports-publications/full-time-permanent-age-distributions/

September 2017

Age	Count	Percent
< 20	375	0.02
20-24	22,390	1.18
25-29	93,543	4.94
30-34	193,540	10.22
35-39	238,520	12.60
40-44	219,386	11.59
45-49	268,623	14.19
50-54	310,728	16.41
55-59	286,921	15.15
60-64	176,255	9.31
65 or more	83,166	4.39
Total	1,893,447	100.00

Average Age 47.5

OPM U.S. Office of Personnel Management

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BENEFIT: Early Career Talent Pipeline in Open Source

Digital Service at CMS.gov 	**Up to 4 year tour of duty** for established professionals in **Engineering, Product management, Design, and Data science**. GS-13+	https://cms.gov/digital-service-cms
DigitalCorps at GSA.gov 	**2 year tour of duty** for **early-career** technologists, eligible to convert to full-time, career positions in the competitive service at their agency. GS-9 to 12, + **50% recruitment Incentive**.	https://digitalcorps.gsa.gov
Summer Fellowship at CodingItForward.com coding it forward >	**Paid 10 week summer internship** program for **currently enrolled** undergrad, grad, bootcamp students **or recent graduates**.	https://www.codingitforward.com
Internships at CodeInTheSchools.org 	**Paid 5-10 week summer experience** for **Baltimore City residents** between the ages of **14 and 21**, with YouthWorks Summer Jobs Program, managed by Mayor's Office of Employment Development.	https://codeintheschools.org

How we measure Risks and Benefits?

Establishing a Baseline: Maturity Models, Repo Templates, and Lotsa Metrics

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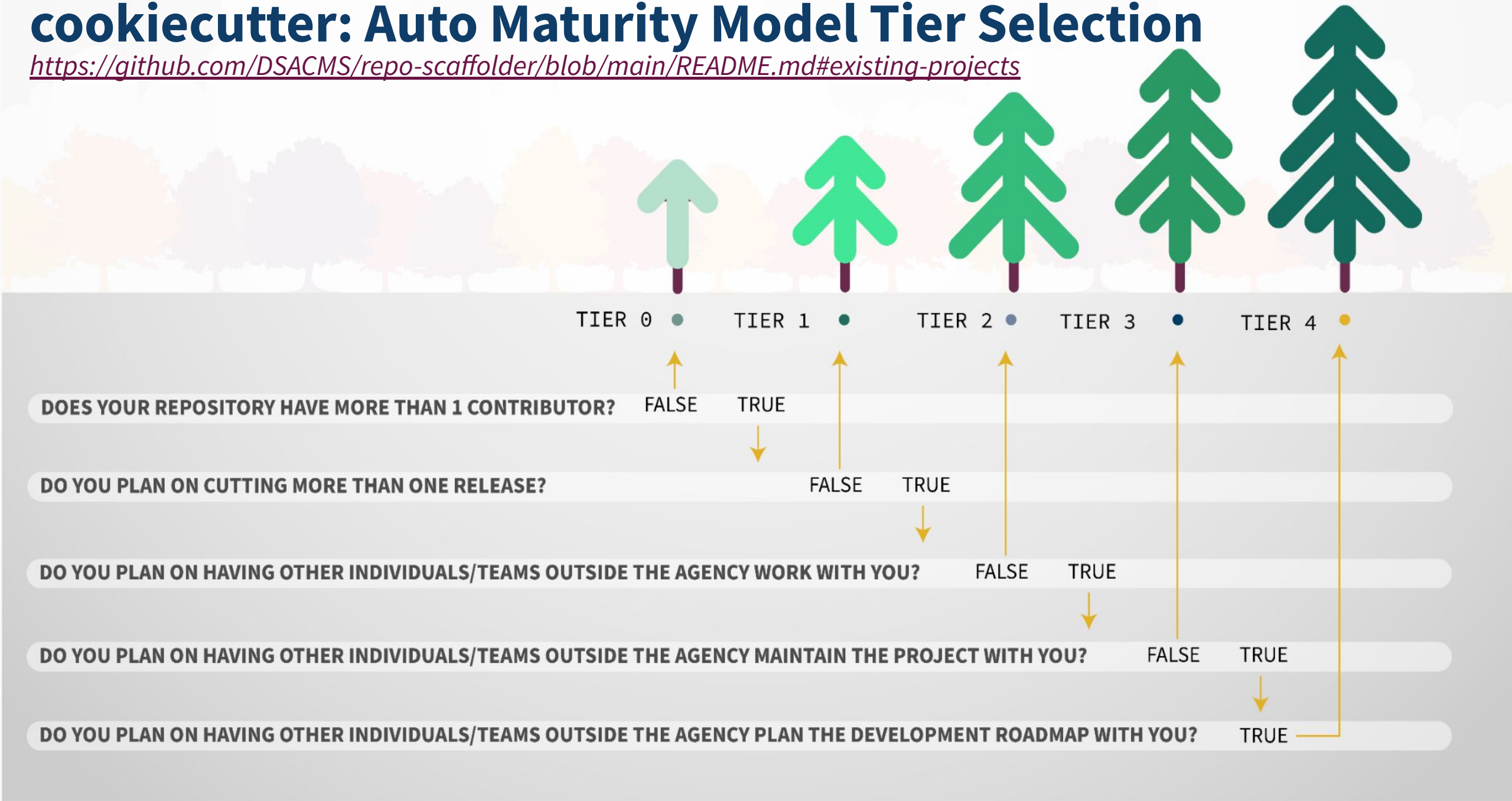
CMS Open Source Repository Maturity Model Framework

github.com/DSACMS/repo-scaffolder/blob/main/maturity-model-tiers.md

Level	Name	Purpose	Description
Tier 0	**Private Repository**	Experimental, Historical	Project is private, usually with a single developer. Typically **working projects**, **example code**, and **early prototypes**.
Tier 1	**One-Time Release**	Publication for Informational, Accountability, or Transparency Purposes	Project released publicly, but **without planned future activity or maintenance** from original author(s).
Tier 2	**Close Collaboration**	Collaboration with smaller, mostly internal teams	Project within a team or operational division, internal repo for **innersource-style work**.
Tier 3	**Working in Public**	Collaboration in the open with smaller, semi-open source teams	Project developed Open Source by CMS or CMS contractor. Limited external contributions, **CMS-led** (by choice or by statute).
Tier 4	**Community Governance**	Collaboration broadly in public	Project donated to or **stewarded by an external community** that welcomes public input and purposefully develops an open governance structure.

cookiecutter: Auto Maturity Model Tier Selection

https://github.com/DSACMS/repo-scaffolder/blob/main/README.md#existing-projects



Repository Hygiene: File Ordinality

File	Tier 0	Tier 1	Tier 2	Tier 3	Tier 4
LICENSE	M	M	M	M	M
SECURITY.md	N	M	M	M	M
README.md	M	M	M	M	M
CONTRIBUTING.md	R	R	M	M	M
MAINTAINERS.md	N	N	R	M	M
GOVERNANCE.md	N	N	N	R	M
CODEOWNERS.md	N	N	R	M	M
COMMUNITY_GUIDELINES.md	N	N	M	M	M
CODE_OF_CONDUCT.md	N	N	M	M	M

Ordinality

Level	Description
M	Mandatory
R	Recommended
N	Not Recommended

 https://github.com/DSACMS/decks/blob/main/fcsmconf2024.pdf

After repo hygiene established, what metrics are helpful?

dsacms.github.io/metrics

Maturity Metrics

- Tiering of public repositories quantify **security and continuity risk**

Cost Metrics

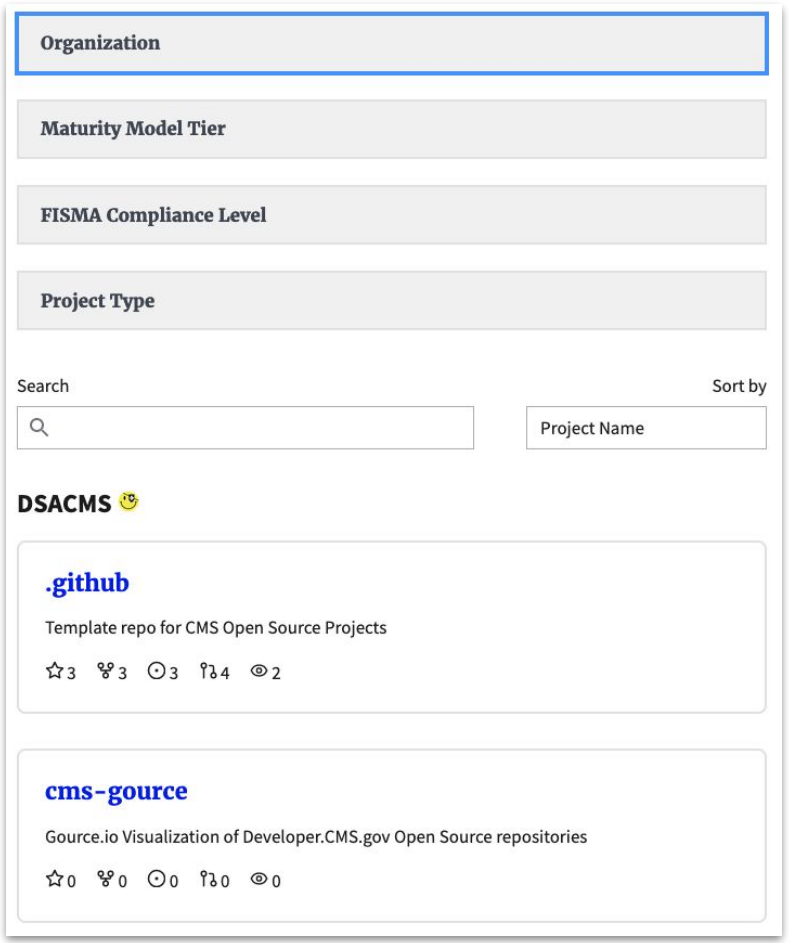
- Quantify **time and effort invested** into repositories

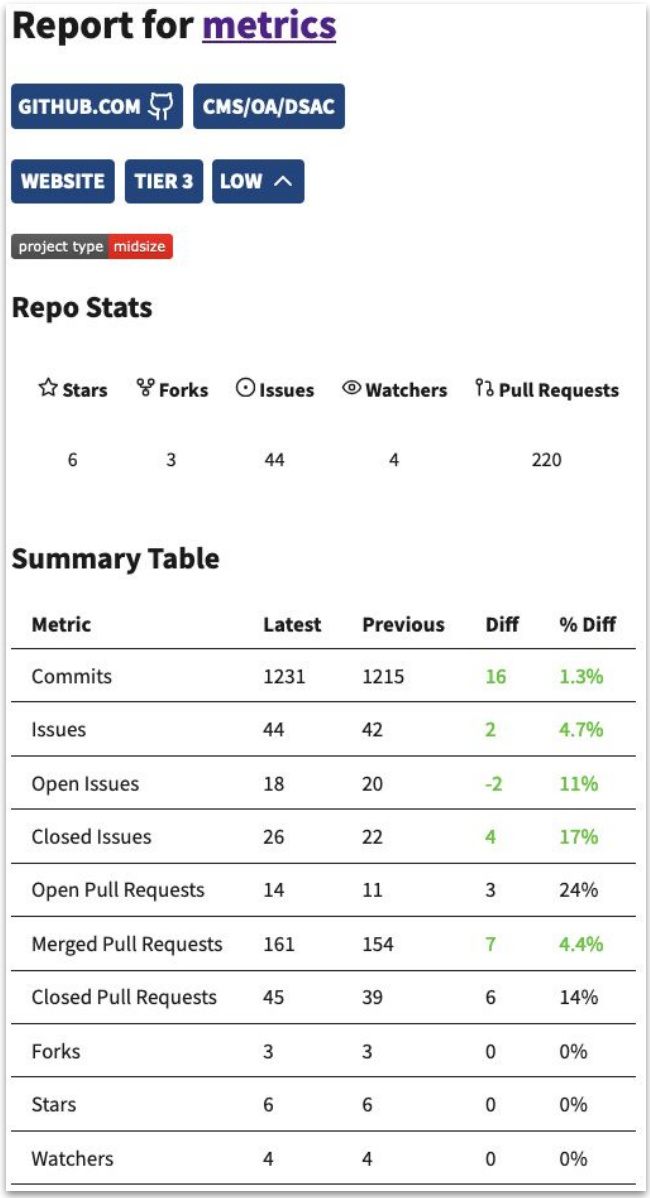
Burden Metrics

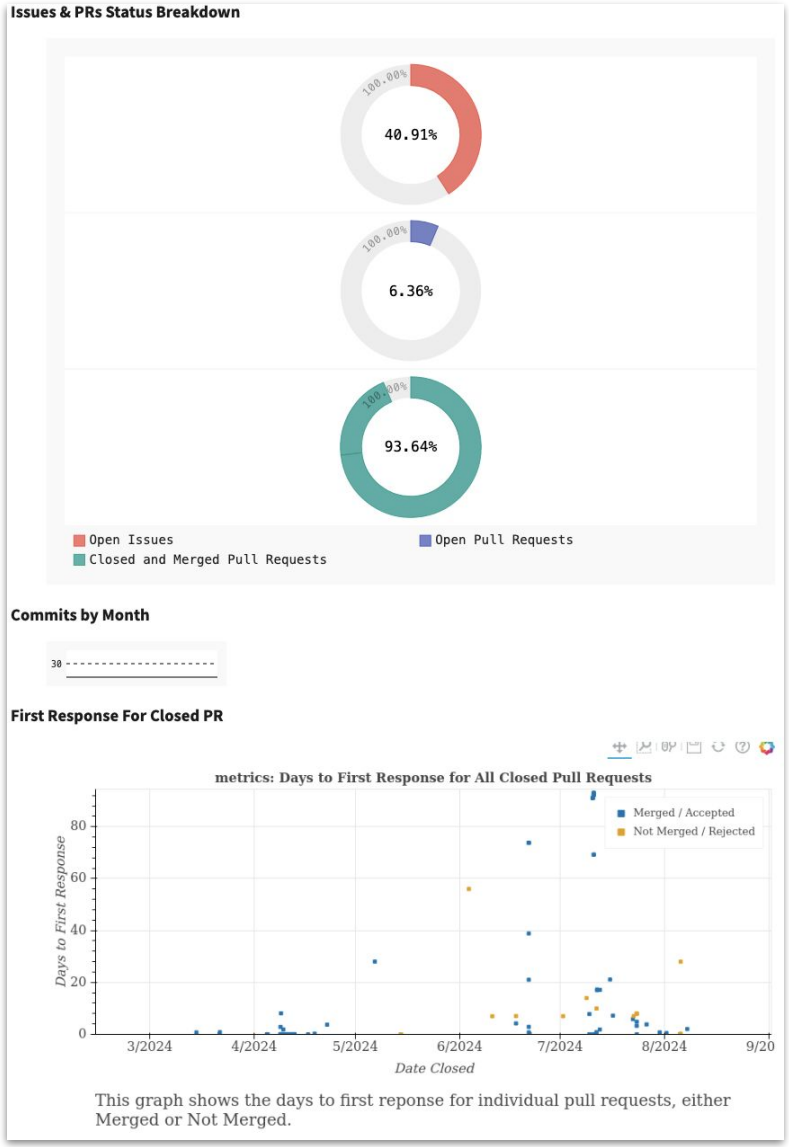
- Quantifies **time and effort needed to contribute & improve** repositories

OSPO Repo Metrics Website

dsacms.github.io/metrics







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New (old) Cost Metrics: COCOMO Reports

github.com/DSACMS/repodive-CMSgov

What is COCOMO?

- COnstructive COst MOdeling
- Oversimplified:
  Source Lines of Code * average salary

How do we calculate it per project?

- Sloc, Cloc and Code: **scc** is a very fast accurate code counter with complexity calculations and COCOMO estimates

What's next?

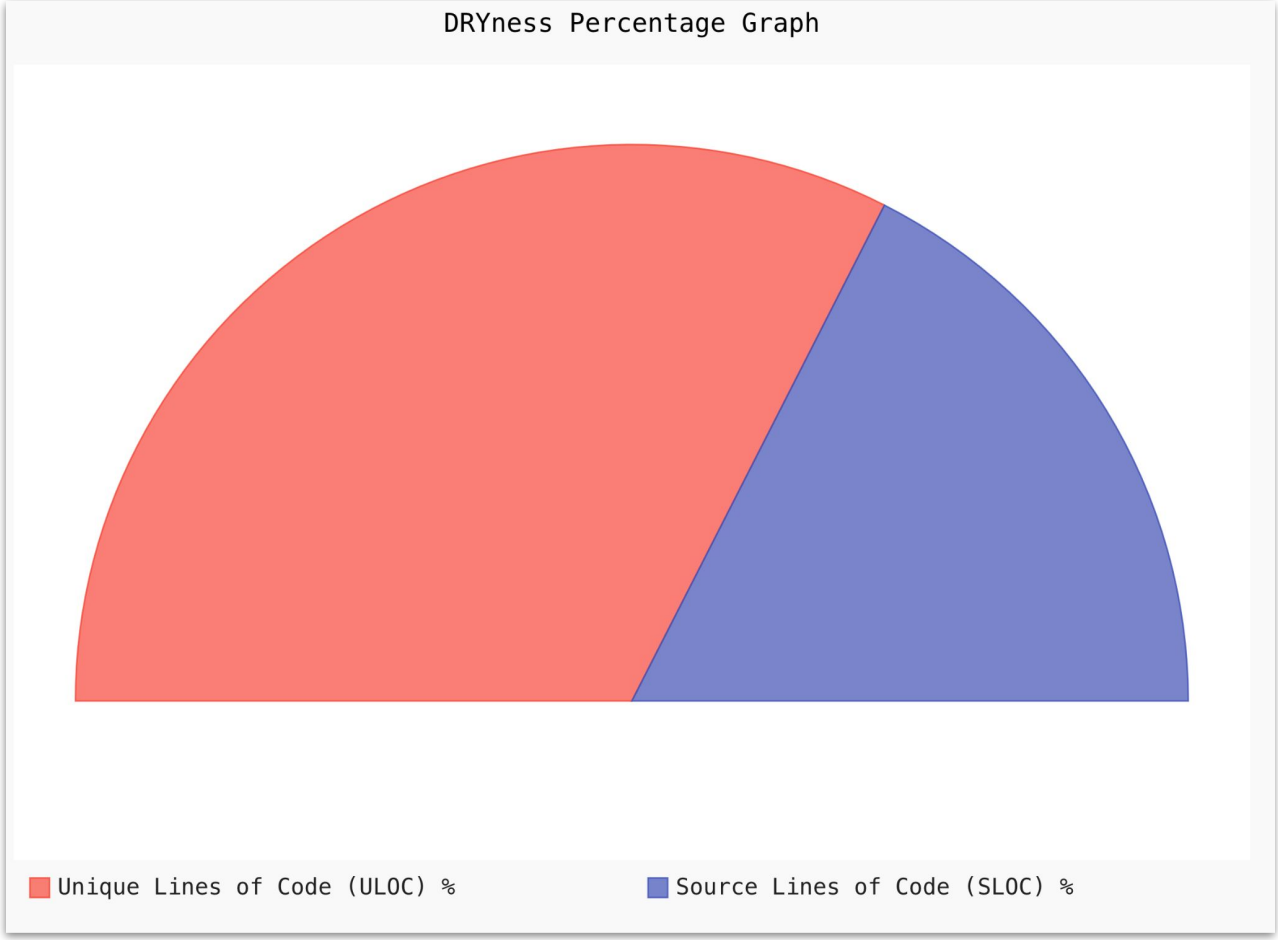
- automation in CI/CD
- front-end visualizations

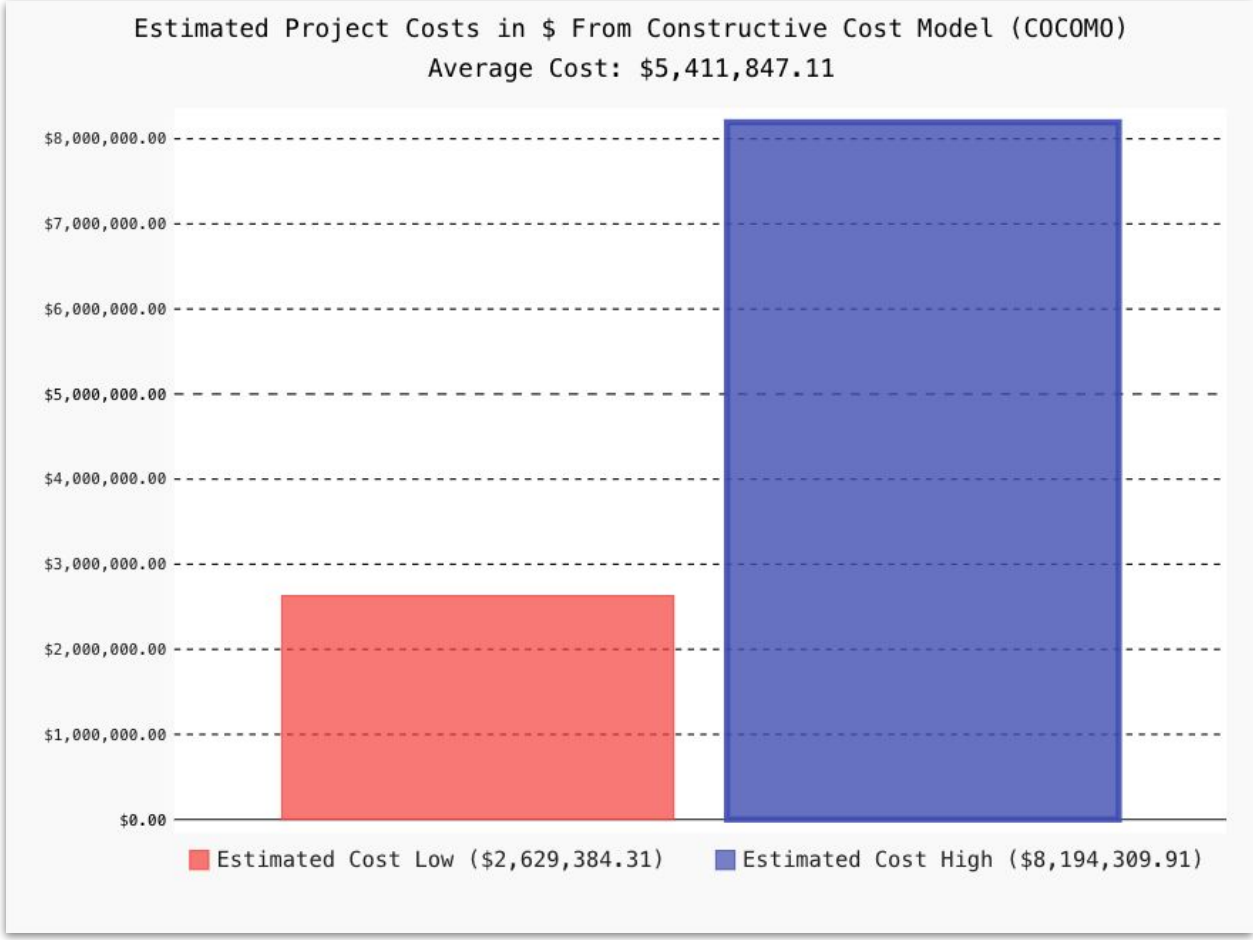
Language	Files	Lines	Blanks	Comments	Code	Complexity
SVG	845	3399	0	0	3399	1676
Markdown	186	20262	453	0	19809	0
JSON	173	61329	1	0	61328	0
Python	14	2079	162	341	1576	70
JavaScript	10	653	92	69	492	38
YAML	9	662	65	111	486	0
Shell	5	134	32	23	79	15
CSS	1	152	24	4	124	0
Plain Text	1	5	0	0	5	0
Total	1244	88675	829	548	87298	1799

```
Total Physical Source Lines of Code (SLOC)                      = 87,298.
Development Effort Estimate, Person-Years (Person-Months)     = 21.83 (261.98)
 (Basic COCOMO model, Person-Months = 2.40*(KSLOC**1.05)*1.00).
Schedule Estimate, Years (Months)                             = 1.73   (20.74)
 (Basic COCOMO model, Months = 2.50*(person-months**0.38))
Estimated Average Number of Developers (Effort/Schedule)            = 12.63.
Total Estimated Cost to Develop                               = $5,239,362.
 (average salary = $100,000/year, overhead = 2.40)
```

```
Processed 20026599 bytes, 20.027 megabytes (SI)
```

New COCOMO Report Visualizations





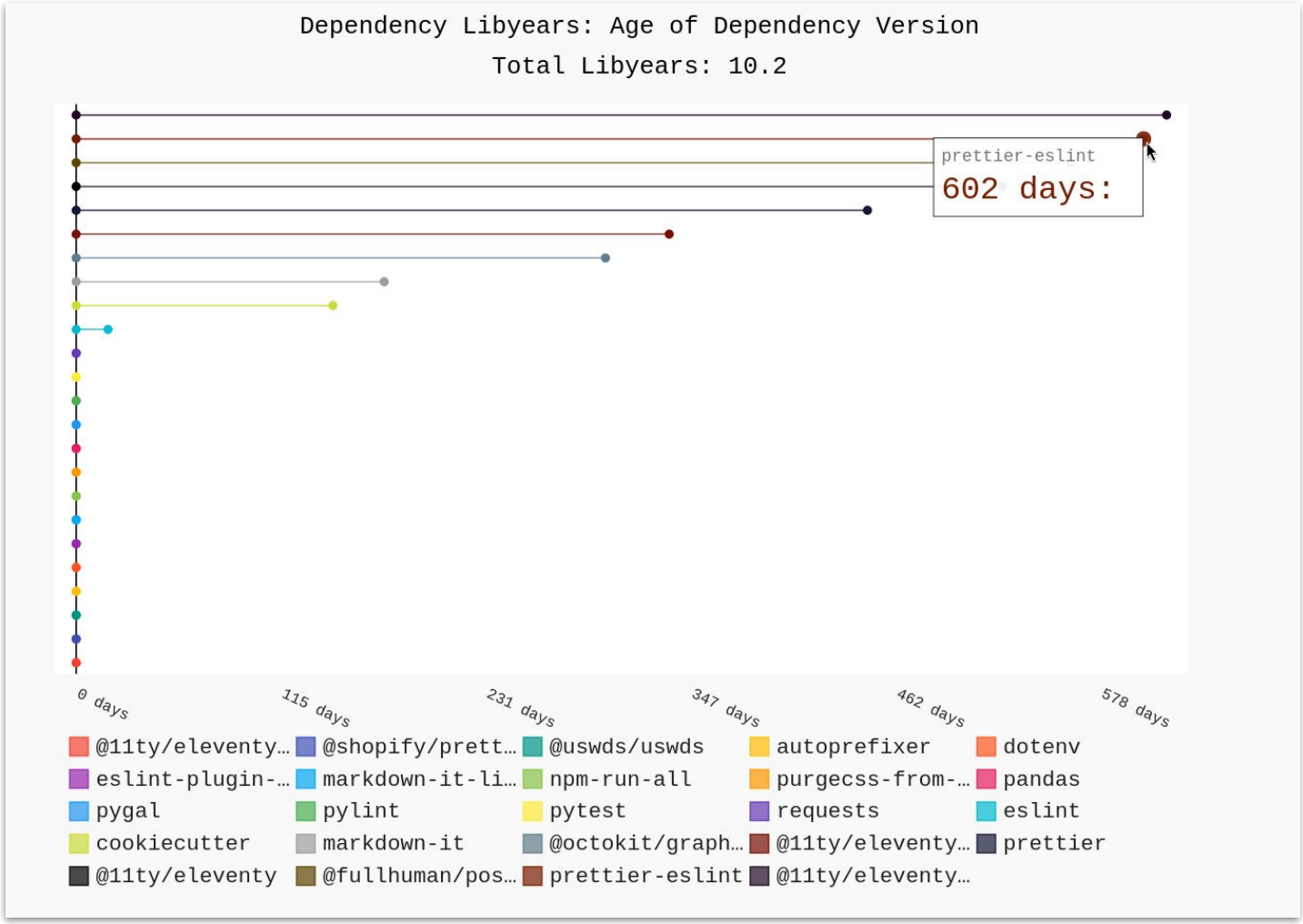
New Risk Metric: Libyears

What are libyears?

- Library Years of Technical Debt
- Total number of years all dependencies are out of date from their latest published versions

How do we Calculate it per project?

- We use the Augur API to scan project dependencies and give us the libyears data



Thank You FCSMConf!

Questions or Comments?

https://go.cms.gov/ospo

https://github.com/DSACMS/decks/blob/main/fcsmconf2024.pdf

Open Source Questions?
opensource@cms.hhs.gov

Digital Service Questions?
DigitalService@cms.hhs.gov

Help Answer The Call!

Digital Service at CMS.gov
https://cms.gov/digital-service

DigitalCorps Fellowships
https://digitalcorps.gsa.gov

CodingItForward Summer Internships
https://codingitforward.com