



# Open Source and The Digital Service at the Centers for Medicare & Medicaid Services (CMS.gov)

[events.linuxfoundation.org/lf-member-summit](https://events.linuxfoundation.org/lf-member-summit) || November, 2022

[github.com/decause-gov/decks/blob/main/lfms-2022.pdf](https://github.com/decause-gov/decks/blob/main/lfms-2022.pdf)



THE **LINUX** FOUNDATION  
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UNITED STATES  
**DIGITAL  
CORPS**



# The Digital Service at CMS (DSAC)

1. **Digital Service at CMS**
2. What is Open Source
3. Open Source at CMS today
4. The future of Open Source at CMS
5. How to get involved



# Who we are

We work with dedicated civil servants at the Centers for Medicare and Medicaid Services:



**Remy DeCausemaker**  
Open Source Lead,  
Digital Service at CMS

# What we 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

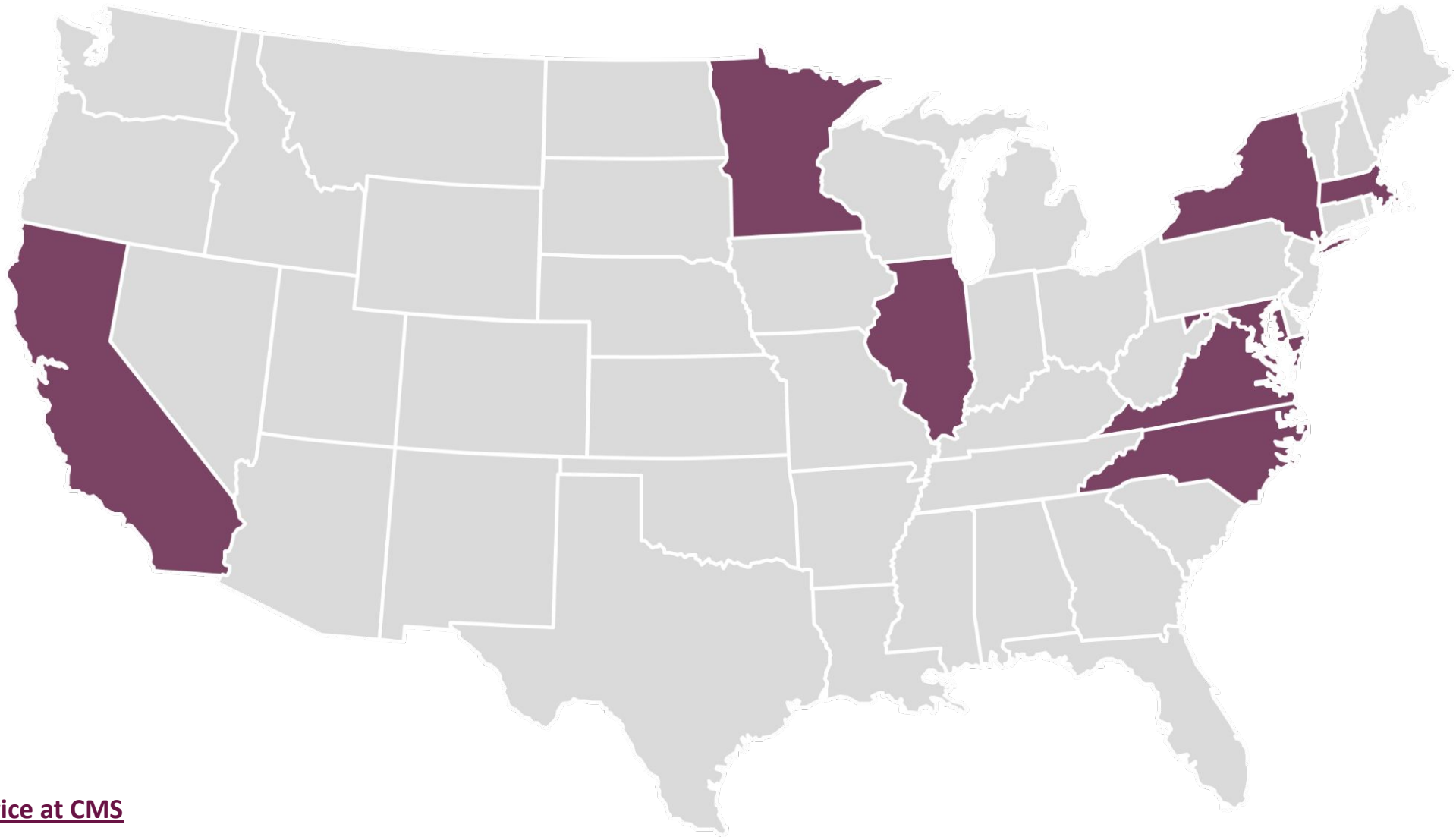
# How we work

We achieve goals through hiring great talent. We deploy **small, responsive** groups of designers, engineers, and product managers to CMS for a "tour of duty" to work alongside **dedicated civil servants** to solve some of the largest, most complex problems facing our healthcare system.

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



# Where we work (remotely!)



# Who we serve

**62 M**

**Medicare Beneficiaries**

**(As of 11/2021)**

**88 M**

**Medicaid Beneficiaries**

**(As of 4/2022)**

**31 M**

**Healthcare.gov Beneficiaries**

**(As of 6/2021)**

<https://www.cms.gov/Research-Statistics-Data-and-Systems/Statistics-Trends-and-Reports/CMS-Fast-Facts>

<https://www.hhs.gov/about/news/2021/06/05/new-hhs-data-show-more-americans-than-ever-have-health-coverage-through-affordable-care-act.html>

<https://www.medicaid.gov/medicaid/program-information/medicaid-and-chip-enrollment-data/report-highlights/index.html>



# What is Open Source?

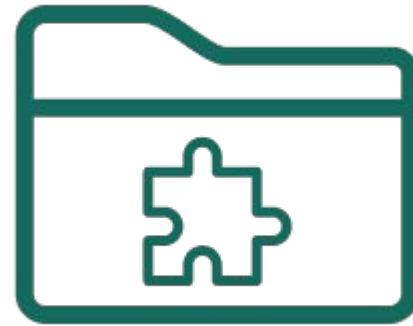
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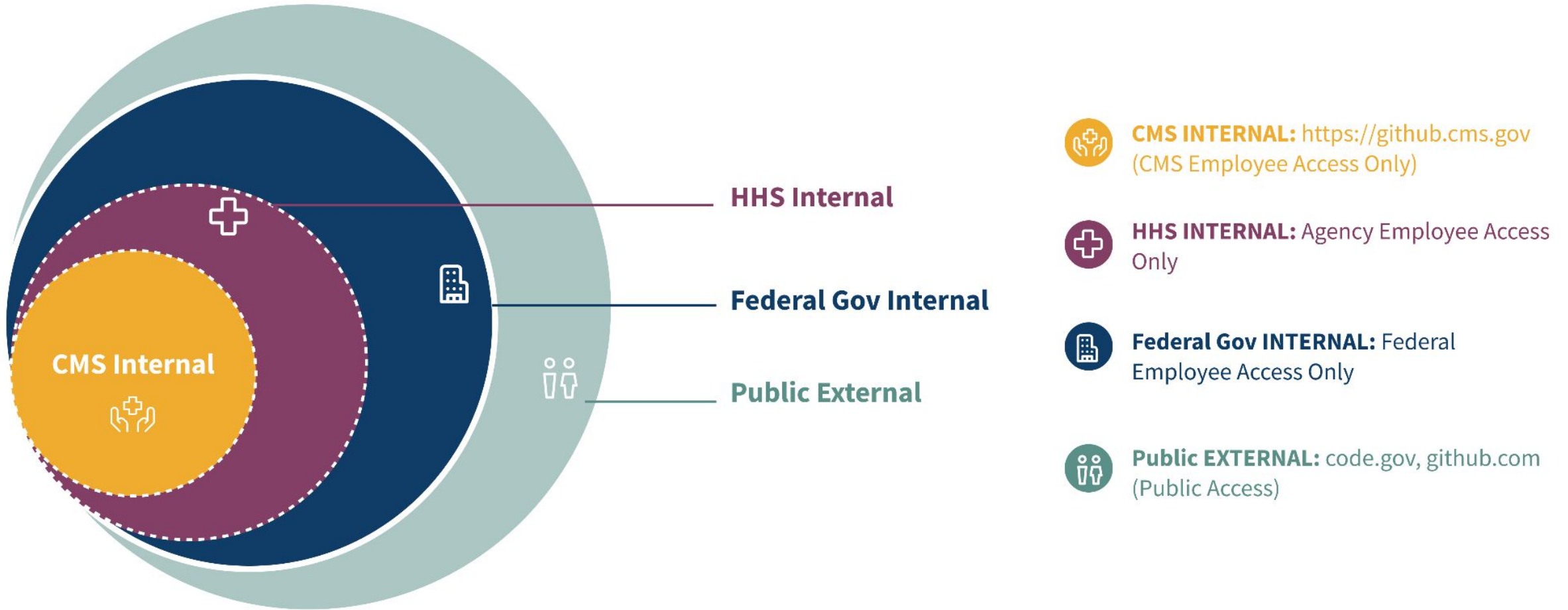


# What is Open Source Software?

Open source means source code that anyone can **inspect**, **modify**, **enhance**, and **share**.



# Open Source is a Community of Communities



# Benefits of Open Source Software (OSS) within the CMS Environment [1]

“OSS provides many advantages, as demonstrated in the commercial industry and the government sector. If used thoughtfully, **OSS offers the potential for cost reduction, timelier delivery, and improvement of the overall capabilities of a system.**”

[1]: [https://www.cms.gov/tra/Content/AD\\_0210%20Open%20Source%20Software%20Overview.htm](https://www.cms.gov/tra/Content/AD_0210%20Open%20Source%20Software%20Overview.htm)

# Specifically, Open Source Software (OSS) can:



Offer **considerable savings** in software purchasing cost and **greater efficiency** in repurposing and enhancing existing software



Increase the **productivity** of application development through open standards to help achieve **interoperability across systems**



**Minimize vendor lock-in** through open standards and **flexibility in the choice** of solutions



Support **open collaboration and innovation** with the open source **development community** through **free exchange of ideas and results** with the wider community



**Enable transparency** of software implementation to **support extension** of software (through supported plug-in mechanisms) while also ensuring robustness of design and implementation



Help **keep the enterprise abreast of technology developments** and **facilitate the early adoption of emerging technology**

# 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.



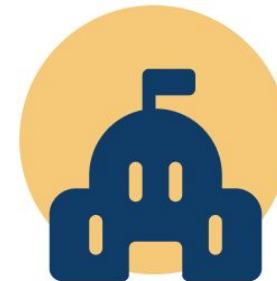
~~Open Source means all data must be public.~~  
Open Source means **SOME** data CAN be public.

**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]





# 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

License Proliferation,  
Conference Proliferation,  
Event Proliferation



## **Fragmentation**

- Unnecessarily dividing your community of contributors

Hostile Forks, Internal Forks

# Open source at CMS today

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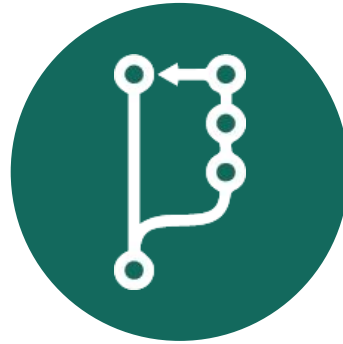


# How do we ‘do’ Open Source at CMS?



## Policies

How we inbound and outbound open source code and content



## Projects

Open Source Projects we have released publicly



## Programs

How we onboard new contributors into projects, internships, and jobs



# Who We Serve

**100's**

source code repositories

(As of 08/2022)

**1000's**

open source contributors

(As of 08/2022)

**1,000,000's**

lines of code

(As of 08/2022)

<https://github.com/orgs/CMSgov/insights?period=year>



# OSS Timeline: 20+ Years of Federal Open Source Policy

## 1999-2001: Important Publications

- Open Source Code and the Security of Federal Systems
- Developing Open Source Software To Advance High End Computing
- Making the Business Case for Open Source Software



2003: The Department of Defense (DoD) CIO, John Stenbit, releases the first agency wide guidance on OSS



2011: The White House publishes "The Open Government Partnership: National Action Plan for the United States"



2014: Consumer Financial Protection Bureau Open Source Policy

18F

2020: 18F Open Source Policy



2000: The National Security Agency (NSA) releases Security-Enhanced Linux



2009: President Obama appoints the First CIO and CTO of the U.S.  
2009: The Department of Defense releases a memo titled "Clarifying Guidance Regarding Open Source Software (OSS)"



2014: The White House announces New Open Government Initiatives as part of the Second Open Government National Action Plan.



2019: GSA.gov Open Source Policy

# Ecosystem of APIs at CMS



**CMS Blue Button 2.0**



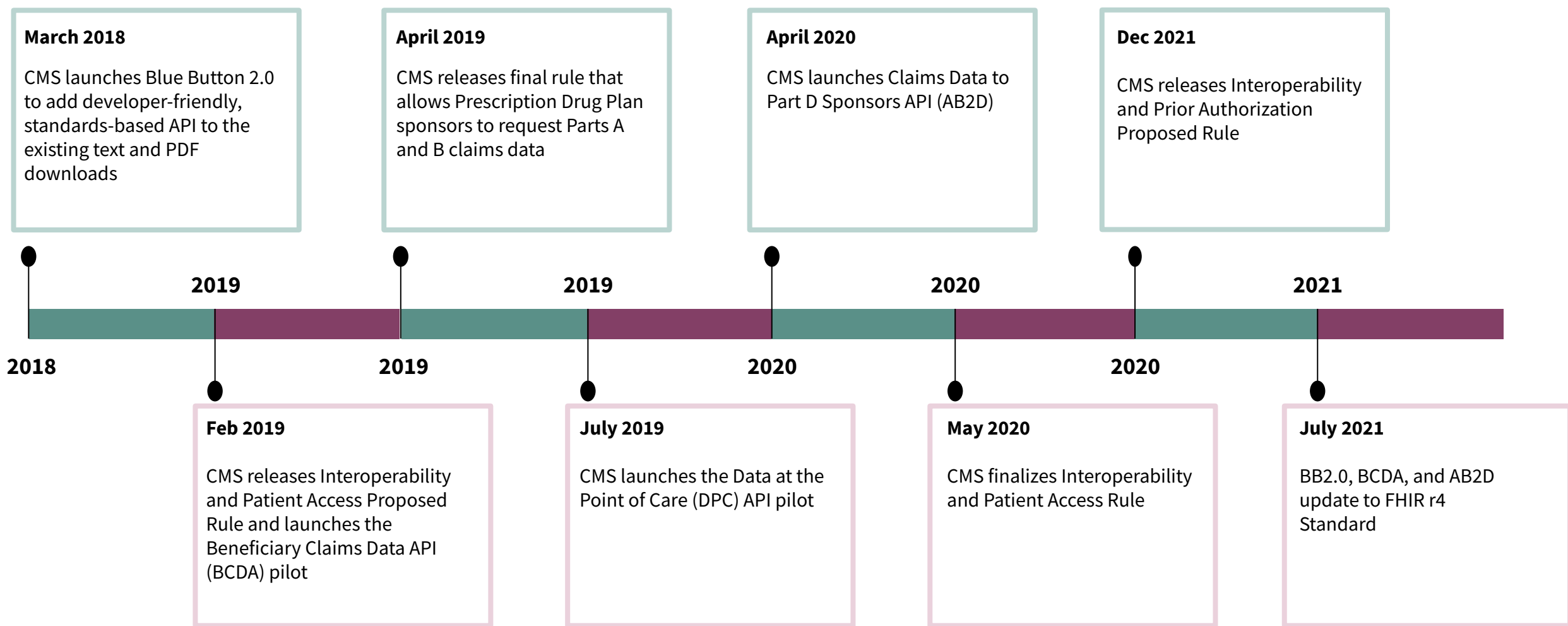
**Beneficiary  
Claims  
Data API**



**Data at the  
Point of Care**



# OSS-powered APIs at CMS



# Transforming Healthcare



**Medicare recipients**



**Providers**



**Accountable care organizations**



**Insurance plans**

# The Big Picture



# CMS Open Source Inbound Policies

## Common Criteria for OSS Evaluation

### Existing Products

- **Approved COTS:** Are there CMS-approved COTS products that can serve the same purpose as the OSS?

### Maturity

- **Market Share:** What is the OSS's market/industry rate of adoption?
- **Credibility:** What is the position of OSS's structured bodies and organizations?
- **Documentation/Books:** Are instruction manuals comprehensive and readily available?
- **Community:** Is there an active online community behind OSS? Are there any commercial conflicts? What is the composition of the community?
- **Source Code Quality:** Does the open source project routinely use source code inspection tools to assess quality and security of the source code? Is the code well documented? Does an independent body review the code?
- **Rate of Change:** What is the rate of change of the OSS? This includes the rate of code change and the rate of new releases.
- **Bug and Vulnerability Tracking:** Is there a bug/vulnerability reporting and resolution system? How quickly are patches issued to resolve them?

### Costs and Risks

- **Integration:** How well will the OSS integrate within CMS's environment? Is customization of the OSS required?
- **Talent Pool:** Does CMS have the right resources to support Development, Operations, and Maintenance for the OSS?
- **Prohibitions:** Are there CMS or federal security policies that prohibit the use of the OSS? Does the OSS product allow implementation of CMS or federal security requirements?
- **Professional Services Availability:** Is there third-party vendor support to install, configure, customize, integrate, operate, and maintain the OSS?
- **Cost Comparison:** What is the cost of using and maintaining the OSS compared to a COTS solution?

### Licensing

- **Licensing Model:** Does the copyright license associated with the OSS have restrictions limiting the redistribution of software code or restrictions on merging with proprietary code that are unreasonable for CMS?





# CMS Open Source Recommended Outbound Policies

## RP-OSS-1

### **Provide Ample Documentation with CMS-Release OSS Code**

For a CMS-managed repository, the project team should include ample documentation with the software code for increased adoption and modification by the community. The documentation should provide the information on the project's mission, philosophy, goal, design, decision-making process and product roadmap. It should also provide instructions on how to submit issues, feature requests and how to contribute towards fixes or enhancements.

## RP-OSS-2

### **Implement the Tools to Support the Community Around a CMS-Released OSS Project**

Implement some or all of the following tools to support the community around an open source project:

- Mailing lists
- Message forums
- Version control
- Wiki
- Tracking mechanisms, such as Kanban boards

GitHub now includes a Kanban board for planning each project, thereby allowing development teams to create a development roadmap. Project teams should use Github Kanban or another Kanban tool, such as Trello to publicly display development



# CMS Open Source Recommended Practices



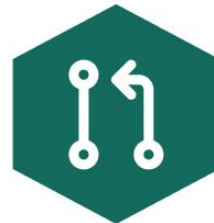
## Industry Best Practices



Follow or adopt a **decentralized governance** model.



**Define the team** constituents, their decision-making authority **and their roles** to support the project in the open source community.



Define and **staff the roles** for active user engagement, product roadmap development, and for accepting new contributions via pull-requests.



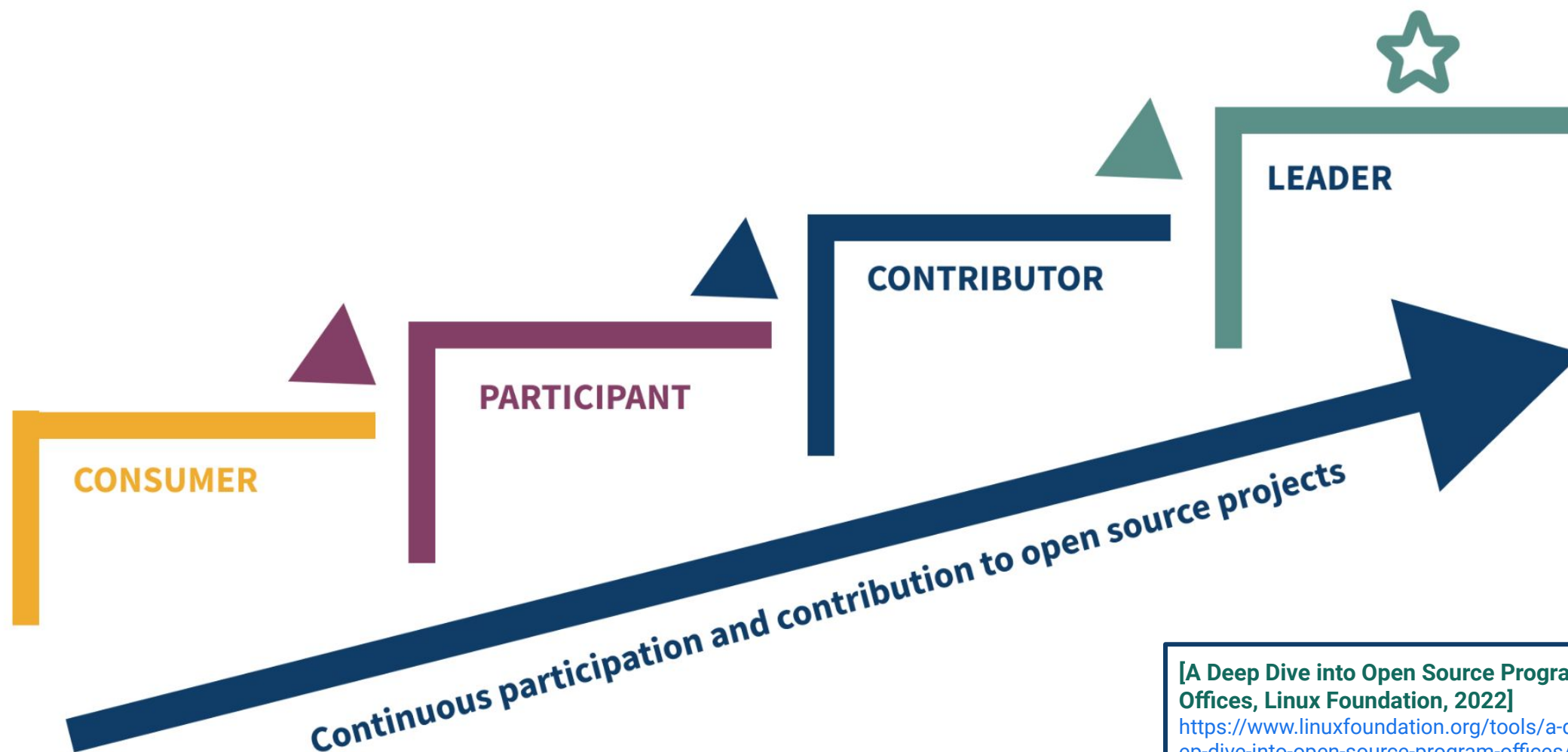
Identify and **promote active contributors to committer status** based on the quality and quantity of code contributions and involvement in day-to-day discussions.

# The Future of Open Source at CMS

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# The Four Core Stages of Open Source Strategy



[A Deep Dive into Open Source Program Offices, Linux Foundation, 2022]  
<https://www.linuxfoundation.org/tools/a-deep-dive-into-open-source-program-offices/>

# Challenges Open Source Program Offices Face

Open source programs face many challenges including **culture**, **process**, **tools**, **continuity**, and **education**.

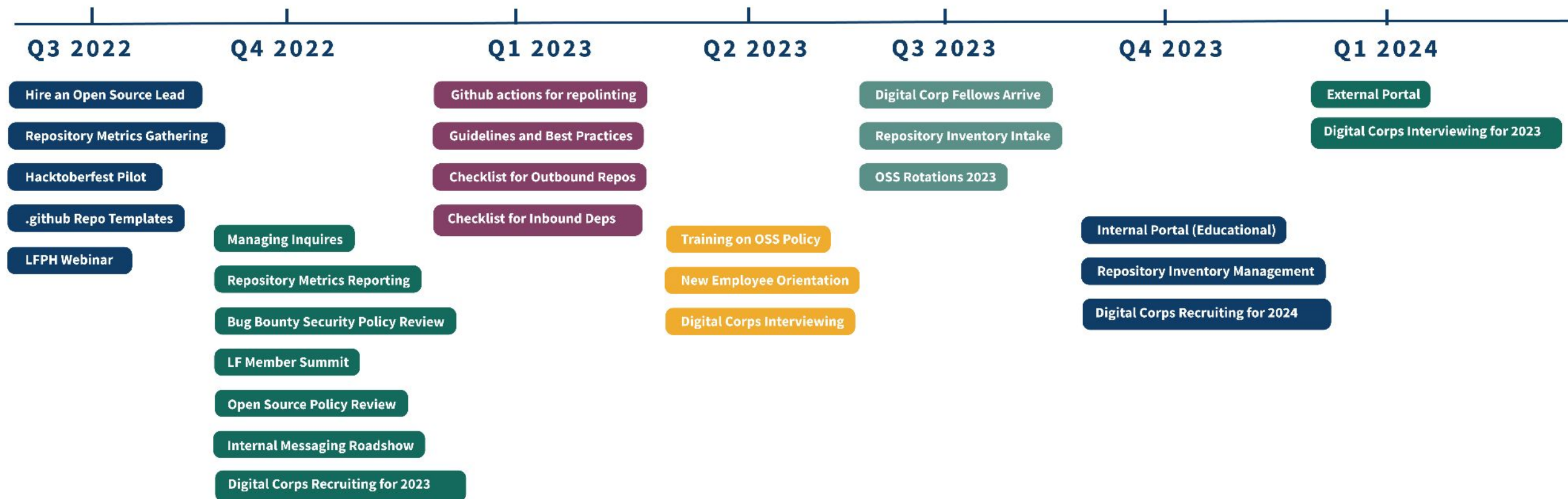


# How will CMS Open Source Programs address Challenges?

Education	Tools	Policy & Process	Communication	Continuity
Guidance on Agency policy	Source code scanning	Usage & compliance policy (distribution, auditing, notices, usage)	<b>Internal portal (educational)</b>	<b>Succession planning</b>
Guidelines & best practices	<b>CommArch analysis</b>		<b>External portal (project visibility, recruiting, developer comms)</b>	<b>Governance models</b>
<b>Guidance on open source licenses</b>	<b>Repository analysis &amp; metrics</b>	<b>Upstream contribution policy</b>		Incident reponse & protocol
<b>New employee orientation</b>	Security vulnerability analysis	<b>Bug bounty &amp; disclosure Policy</b>	Data sharing & visualization	Internal communities
Checklist for outbound repos	Software bill of materials (SBOM)	<b>Code of conduct &amp; incident policy</b>	<b>Conferences &amp; public speaking</b>	External communities
Checklist for inbound deps	<b>Repository linters &amp; templates</b>		Mailing lists (internal/External)	<b>Onboarding documentation</b>
Checklist for OSS procurement	IP evaluation tooling			<b>Automation of manual workflows</b>
<b>Coaching and mentorship guide</b>	<b>SW inventory management</b>		Hackathons & contributor events	
Professional developer training	Project management			



# Aspirational Roadmap



# How to get involved

## 1. Digital Service



DIGITAL SERVICE AT CMS

## 2. Digital Corps



## 3. CodingItForward



[coding it forward >](#)

## 4. Hacktoberfest



DIGITAL SERVICE AT CMS

# Join us at the Digital Service!

<p><b>Digital Service at CMS.gov</b></p> 	<p><b>Up to 4 year tour of duty</b> for established professionals in <b>Engineering, Product management, Design, and Data science.</b>  <u><a href="#">GS-13+</a></u></p>	<p><u><a href="https://cms.gov/digital-service-cms">https://cms.gov/digital-service-cms</a></u></p>
<p><b>DigitalCorps at GSA.gov</b></p> 	<p><b>2 year tour of duty</b> for <b>early-career</b> technologists, eligible to convert to full-time, career positions in the competitive service at their agency. <u><a href="#">GS-9 to 12</a></u>, + <b>50% recruitment Incentive.</b></p>	<p><u><a href="https://digitalcorps.gsa.gov">https://digitalcorps.gsa.gov</a></u></p>
<p><b>Civic Digital Fellowship at CodingItForward.com</b></p> 	<p><b>Paid 10 week summer internship</b> program for <b>currently enrolled</b> undergrad, grad, bootcamp students <b>or recent graduates.</b></p>	<p><u><a href="https://www.codingitforward.com">https://www.codingitforward.com</a></u></p>



# Start by Volunteering and Contributing!

Anyone can make a difference, local, state, or federal!

**CODE** *for*  
**AMERICA**

[CodeForAmerica.org](https://CodeForAmerica.org)

**US** **DIGITAL**  
**RESPONSE**

[USDigitalResponse.org](https://USDigitalResponse.org)



# Thank You



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## Questions or Comments?

Open Source Questions?

[opensource@cms.hhs.gov](mailto:opensource@cms.hhs.gov)

Digital Service Questions?

[DigitalService@cms.hhs.gov](mailto:DigitalService@cms.hhs.gov)

[github.com/decause-gov/decks/blob/main/lfms-2022.pdf](https://github.com/decause-gov/decks/blob/main/lfms-2022.pdf)

## Answer the Call!

Digital Service at CMS.gov

<https://cms.gov/digital-service-cms>

DigitalCorps Fellowships

<https://digitalcorps.gsa.gov>

CodingItForward Summer Internships

<https://codingitforward.com>



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