WELCOME!

Federal Source Code Summit 2020

Hosted by Code.gov and Digital.gov

Federal Source Code Study

Joseph Castle, PhD
Product Manager & Frontend Engineer, Code.gov

Overview

- Three year study of the implementation of the FSCP

- Trying to understand why some agencies published OSS and others did not

- Provides implications for government employees working with policy and technology

- Available on GitHub

  - https://github.com/GSA/code-gov/tree/master/docs/FederalSourceCodeStudy

- Condensed version on Medium

  - @codedotgov and federal-source-code-study

Policy & Action

Federal Source Code Policy (FSCP)

- Published August 2016

- Agencies develop source code policy, update acquisition language, and inventory code

- Release 20% of code as OSS

- Created Code.gov, program and platform

Agency	Total Repos	Repos pre FSCP	Repos post FSCP
Nuclear Regulatory Commission	0	0	0
Department of Housing and Urban Development	2	0	2
Department of Education	4	4	0
Agency for International Development	8	8	0
Social Security Administration	8	0	8
Department of Homeland Security	10	4	6
Office of Personnel Management	13	6	7
National Science Foundation	16	0	16
Small Business Administration	21	1	20
Department of the Treasury	22	11	11
Department of Justice	32	14	18
Department of Transportation	37	13	24
Department of Agriculture	40	38	2
Department of Labor	72	53	19
Environmental Protection Agency	144	49	95
Department of State	265	189	76
Department of Energy	307	155	152
Department of Commerce	363	240	123
Department of Veterans Affairs	370	203	167
National Aeronautics and Space Administration	411	186	225
Department of Health and Human Services	420	183	237
Department of Defense	449	270	179
Department of the Interior	993	555	438
General Services Administration	1788	1065	723

Purpose, Framework, & Design

Study Purpose

- Examine agency implementation of FSCP using OSS publication as an indicator of policy compliance

- General research question: Why do some federal agencies publish OSS and others do not?

- Specific research questions:
    - How do unit *beliefs* affect whether it publishes OSS?
    - How does a unit's *public engagement* efforts affect whether it publishes OSS?
    - How do structural dimensions influence whether a unit publishes OSS?
    - How does *organizational location* affect whether a unit publishes OSS?

code_

GSA

Framework

Research Design

- Qualitative research

- Metadata analysis with the GitHub API

- Conducted interviews and collected artifacts

- Used grounded theory method for data analysis and theory building

Participants in Study		
Agency Publishing Frequency	Agencies	Participants
Minimally	6	7
Intermediately	6	7
Frequently	8	11
Total	20	25

code_

Publishing Frequency by Unit Function

Unit Type	Participants	% Sample
Software	12	42%
Non-Software	13	46%

Units Consuming Compared to Publishing OSS

Unit Publishing Frequency	Consuming	% Consuming	Publishing	% Publishing
Minimally	7	28%	14	56%
Intermediately	5	20%	5	20%
Frequently	13	52%	6	24%

code_

Data Collection & Analysis

Cultural Beliefs

Cultural beliefs
- Cautionary
    - Align to scope
    - Change in practices
    - Consider risk
    - Need permission
- Advantageous
    - Build community
    - Create efficiencies
    - Demonstrate competency
    - Realize benefits

Publish OSS

Public Engagement

Public engagement
- Promote participation
- Create a forum
- Leverage others
    - Team integration
    - Product integration
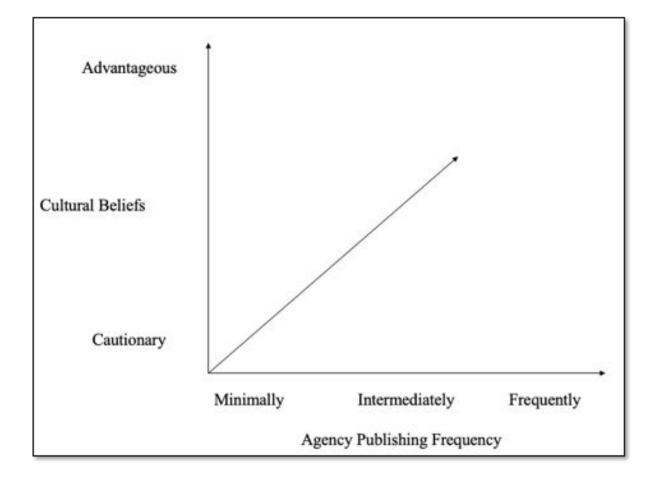
→ Publish OSS

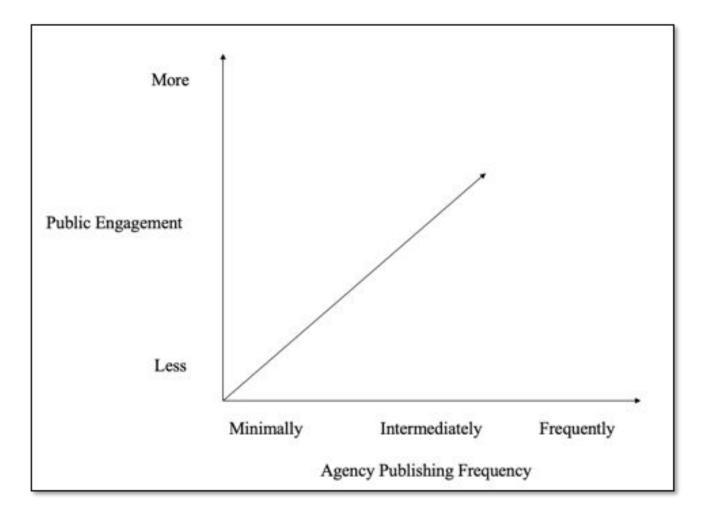# Structural Dimensions & Location

Results

Cultural Beliefs
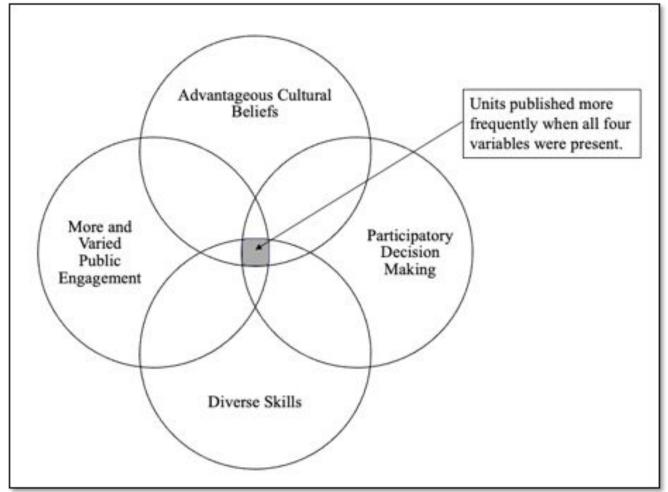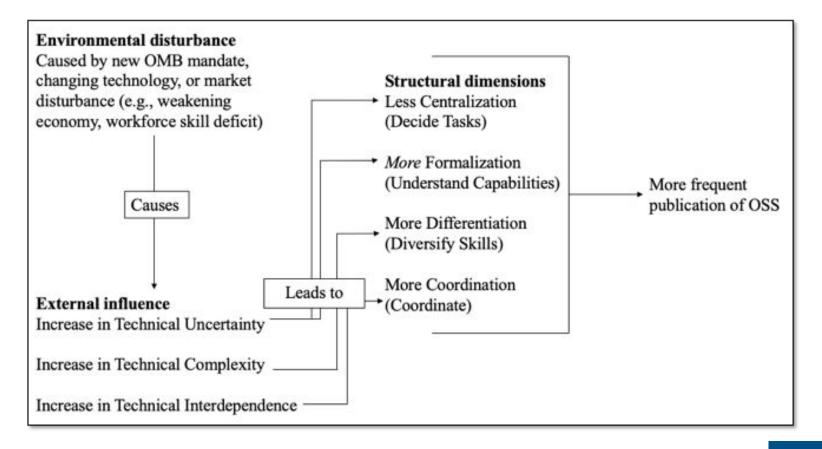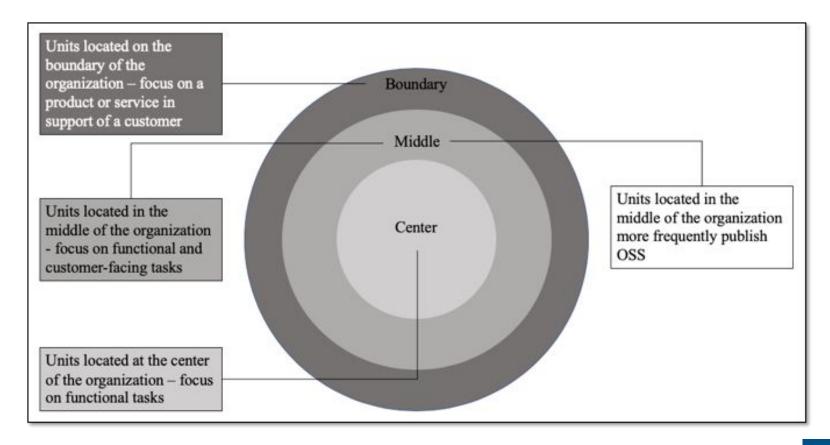
Public Engagement

Overlapping Variables

Structural Dimensions

Organizational Location

Theory and Implications

Theory of Policy Implementation for OSS Publication

Cultural beliefs – Non-monolithic, advantageous attributes

Public engagement – More and varied engagement through bi-directional communication, events, and electronic tools

Structural dimensions - Less centralization, more formalization, more differentiation, more coordination

Organizational location – Metaphorically located in the middle of the organization, unit has less hierarchical layers

→ **Publish OSS**

Implications

- Policy
  - Units require policy to implement technology
  - Even with policy, it is often unclear what units are operationally required and allowed to do
  - Policy contributes to competing interests among units

- Public administration
  - Public administrators should nurture advantageous cultures
  - Public administrators should encourage more and varied public engagement

- Organizational Theory
  - Organizations should consider how they structure their software development units
  - Organizations should consider where their unit resides in the larger organization

Thank You!!