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HOW IS DEVELOPMENT AND COLLABORATION DONE IN PUBLIC SECTOR OPEN SOURCE SOFTWARE PROJECTS?

Insights from Six Mature Case Studies

Cases

- EnergyPlus, National Research Institutes under US Department of Energy

- OS2forms, Danish municipalities under OS2

- Oskari, National Land Survey of Finland

- Geotrek, French National Parks

- Démarches simplifies, Interdepartmental Ad-ministration for Digital (DINUM)

- IO-app, PagoPA in Italy

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Development practices

- Development often centred to a core teams of 15 or less, who produce > 80 percent of the code base

- Open development and release using GitHub

- Formal and agile processes, with structured quality assurance processes

- Aligns with fact that development is generally centred to one main organization

- Software generally reported as high in quality, usability, and functionality

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Type of sponsorship

- Centralized sponsorship

  - Development is carried out or sponsored by, and in extension dependent on, one or a few resourceful PSOs.

  - OSS typically originates main PSOs, and are of business critical character, warranting sponsorship

- Decentralized sponsorship

  - Multiple PSOs collaborate through pooled resources, using external service providers

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Development resources

- Development typically performed within the bounds of one organization, generally using procured resources, through

  - vendors and service suppliers completely (decentralized sponsorship)

  - consultants along with internal engineers (centralized sponsorship)

- PagoPA (IO-app) main exception where the ambition is to grow internal capabilities and vendor-independence

- External dependence aligns with general lack of internal capabilities among PSOs

- Suppliers highlighted as critical for sustainability. Rotation of consultants can stimulate growth.

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Planning and decision making

- Generally performed top-down from the PSOs funding the development

  - Through technical steering committees with select or full representation of sponsors

  - Through direct communication with vendor, who in turn synchronizes needs

  - Through internal in teams with differing levels of consideration from external users

- Exclusion of, or full coordination, by vendor risk causing unrealistic requests, or soft lock-in respectively

- Vendors typically from national or local context, highlighting close relationships and contacts as preferable

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Communication

- All projects use some form of public communication channel

- "Closed" communication also present
  - inside vendors or the larger PSOs driving development.
  - In direct communication between users and vendor

- Risks creating a cliques of isolated development, unsynchronized users, and potential soft lock-in

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Community engagement

- Communities typically user-focused (PSOs mainly), limited in size and contributions.

- Contributions typically in forms on
  - Funding,
  - Subject-matter expertise,
  - Requirements engineering,
  - Quality assurance

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User base

- Typically limited amounts of users, centred to PSOs in the respective countries (e.g., municipalities, national parks, research labs, ministries)

- Somewhat higher for OSS projects with decentralized sponsorship

- Number of end-users much higher as the OSS usually power public digital services and infrastructure

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Sustainability

- Centralized sponsorship
  - Dependence of main PSO(s)
- Decentralized sponsorship
  - Dependence of collective funding
  - Dependence of supplier interest and presence

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Further recommendations

- Sharing and disseminating critical knowledge for development to avoid soft lock-ins

- Facilitate development through Open Source Stewards to pool resources and knowledge, and sustain maintenance

- Grow internal institutional capabilities through Open Source Program Offices when applicable

- Grow a competitive and profitable ecosystem of service suppliers

- Grow community and collaborative culture to sustain co-funding