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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 Administration for Digital (DINUM)
- IO-app, PagoPA in Italy



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



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 the pooled resource, using external service providers



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.



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 bug-reports and feature requests.
- Funding, subject-matter expertise, requirements engineering and promotion most frequent and important contributions.



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



Sustainability

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



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



