



RISE

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Software Reuse through Open Source Software in the Public Sector

A qualitative survey on Policy and Practice. RISE Report 2024:7

Photo by Don Kaveen | <https://unsplash.com/photos/a-room-filled-with-lots-of-blue-and-purple-lights-D6RyctKZ-dk>

Background

- Open Source Software (OSS) is an instrument, not a means in itself
- Software reuse is a use case among many
- Rationale and potential benefits typically include the improvement of interoperability, digital sovereignty, innovation, and cost efficiency in the public sector.
- Study scope: .
 - Commissioned by the Danish Agency for Digital Government (**Digitaliseringsstyrelsen**) and Local Government Denmark (**KL**),
 - Investigate how PSOs and the public sector at large enable and facilitate software reuse, specifically through OSS as an instrument
 - Provide input on how Danish PSOs can specifically become better at reaping benefits by reusing existing software and creating value by developing software in a way so that it can be reused.



Background

- We specifically examine a sample of 16 countries considered mature in their digital practices, as indicated through a set of digital maturity indicators. These countries are surveyed in terms of:
 - *Government policies for software reuse and OSS, and the actors involved.*
 - *Rationale (e.g., security and transparency) for promoting and enabling software reuse and OSS, including transparency and security considerations.*
 - *Support for software reuse and OSS.*
 - *Means for promotion, exhibiting, and sharing of software for reuse.*
 - *Success stories of reused software, and lessons learned.*
- Findings from the country case studies are synthesized in this report, and a set of recommendations are presented to allow for PSOs (both Danish and those in other countries) to consider what steps to take to best leverage the opportunities software reuse and OSS may bring.



Policy and stakeholder

Government policies for software reuse through OSS and the actors involved.

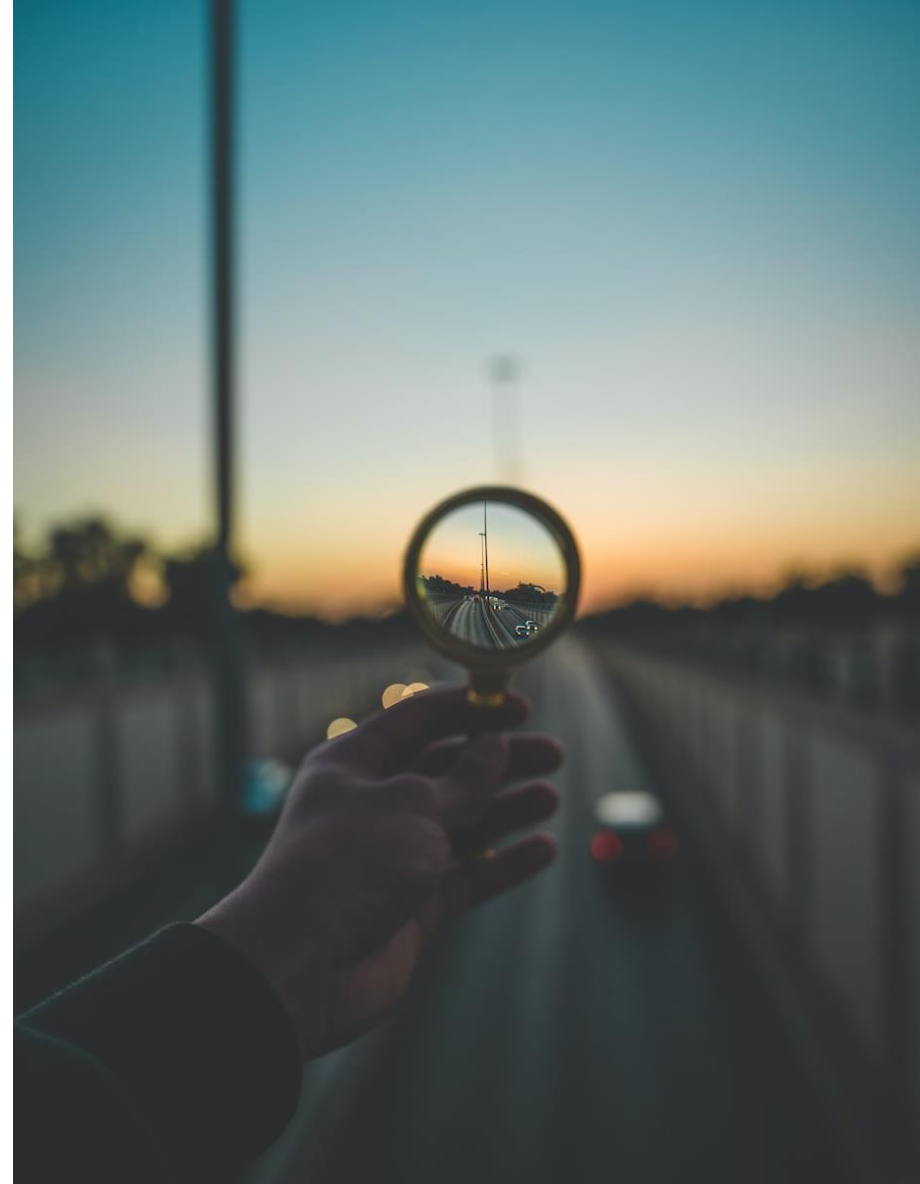
- Policy focus:
 - Internal vs. External
- Policy direction:
 - Inbound vs. Outbound
- Type of intervention:
 - High-level endorsement vs. Advisory vs. Prescriptive
- Form for definition
 - Legislative vs. Government instruction vs. Strategy documents
- Scope of policy
 - National gov. vs. Regional/Local gov. vs. Institution-specific



Policy goals

Rationale (e.g., security and transparency) for promoting and enabling software reuse through OSS, including transparency and security considerations

- Policy documents typically draw on several such factors to make the case for encouraging OSS.
 - Economic factors – OSS to avoid double spend, lock-in, and promote a competitive market
 - Interoperability – OSS as a mechanism for interoperable infrastructure and public services
 - Digital sovereignty – OSS as a means empower sovereign decisions on use of technology
 - Security – OSS as a (potentially) robust building block in need maintenance
 - Transparency – OSS as an enabler for trust, control, and innovation



Implementation and support

Support for software reuse through OSS

- Open Source Program Offices (OSPOs), support functions and centers of competency for OSS and software reuse, emerging on different levels
 - National government OSPOs
 - Regional/Local government OSPOs
 - Association-based OSPOs
 - Institution-centric OSPOs
- Guidelines and support documents
 - Inbound vs. Outbound focus
- Communities of practice
 - Public sector-specific <> External/general



Promotion for reuse

Means for promotion, exhibiting and sharing of software for reuse.

- Several countries maintain software catalogues to showcase and enable software reuse. Varies in several ways
 - Prescriptiveness:
 - Legally mandated vs. voluntary
 - Software scope
 - Public sector software in general vs. OSS
 - Maintenance
 - OSPO vs. crowdsourcing
 - Level of accessibility
 - Open to the public or for PSOs only
 - Meta data
 - Brief descriptions vs. Meta data files (Public-code.yml)
 - Code repository
 - Code hosting service vs. external referrals



Success stories

Success stories of reused software, and lessons learned.

- Several success stories of public sector OSS projects identified demonstrating the potential and opportunities for (re)use and collaborative development of OSS
 - E.g., X-Road, Signalen, and gvSIG.
- Public Sector or independent Open Source stewards commonly used for hosting projects
 - Help pool resources and collaborate on planning, procurement, development, and maintenance of the project(s)
 - In some cases, also comparable to Association-based OSPOs
- More capable PSOs, such as larger cities and municipalities, typically play a leading role in the development and ensuring the long-term sustainability of the projects.



Recommendations

Policy for software reuse through OSS

For policy- and decisionmakers in a country's national, regional, and local levels of government, it is recommended to:

- **Investigate** and consider how software reuse, specifically through OSS as an instrument, can be used for improving:
 - **interoperability** among public services and digital infrastructure, and towards third party actors, both on a national and international level.
 - **digital sovereignty** by empowering PSOs to make technical design and sourcing decisions based on national, regional, and local law, norms, and values.
 - **transparency** in public services, e.g., in terms of collecting and managing data, making algorithm-based decisions, or define interfaces that third-party actors may interact with.
 - **cost efficiency** by facilitating shared development and maintenance costs, lower license fees, and increased competition in tenders



Recommendations

Policy for software reuse through OSS

For policy- and decisionmakers in a country's national, regional, and local levels of government, it is recommended to:

- **Establish** an inbound policy detailing how software reuse through OSS is to be considered in the acquisition process of a new software solution.
- **Establish** an outbound policy detailing how software reuse may be enabled through the sharing of acquired software solutions, either internally within government or publicly as OSS.
- **Establish** an external-focused policy detailing how software reuse and collaborative development through OSS may be promoted or enabled within national industry.



Recommendations

Implementation and support

To enable the implementation and support of any policy on software reuse through OSS,

- **Establish** national government OSPOs to ensure effective implementation of any policy on software reuse and OSS per the defined policy goals.
- **PSOs should identify**, set up, and leverage administrative and legal bodies as neutral arenas and stewards to pool resources, host, and collaborate on joint OSS projects and enable software reuse.
- **Municipalities, cities, and regions with the capabilities and resources** should take on a **leading role and drive** the development and other PSOs on the local level in leveraging OSS in their digital transformation.
- **PSOs across the public sector should be provided** support in defining how software reuse and OSS may be leveraged in their own policies for digital transformation, in line with the national policies, and establish OSPOs to execute on these.
- **Initiate and facilitate** common networks across the public sector to promote knowledge-sharing and new collaborations.



Recommendations

Implementation and support

To enable the implementation and support of any policy on software reuse through OSS,

- **Establish** guidelines related to inbound policies, detailing when and how OSS should be considered in the acquisition and development of new software solutions.
- **Establish** guidelines related to outbound policies, detailing when and how software developed through public funds can be released as OSS.
- **Invest** in specialised training and education programs focused on OSS to enhance workforce capabilities nationally across the public sector and vendor ecosystems.
- **Create** a catalogue of public sector software to promote and enable reuse within the public sector.
- **Create** a national software repository for hosting and collaborative development of public sector OSS projects.
- **Engage** in the national and international OSS ecosystem through key organizations, networks, and communities.



Conclusions and future outlook

- What we have not observed is a forward-looking approach to planning, steering, and following up on goals and practices for enabling software reuse through OSS, and its impact, short and long term.
- Current indicators for digital maturity, of which some were used for the sampling in this report, to various degrees touch on the topic of OSS in relation to digital transformation, but none go into detail looking at actual steps take to enable software reuse, or potential policy goals attached.
- We thoroughly recommend that such metrics are developed, both among countries aiming to leverage OSS as an instrument in their digital transformation, and among the organizations maintaining the indicators for digital maturity as they act as a guiding light for countries looking to mature and evolve. The recommendations of this report may serve as part of the foundation for such indicators



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