

Open Source & the public sector

Öppen programvara & offentlig sektor

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- **Introduction**
- **Open source** and its **evolution**
- Initiatives for **Open source** usage in the **public sector**
- **Strategies** for how organisations can **engage with OSS projects**
- **Conclusion** & future **outlook**

Challenges for sustainable digitalisation related to software & digital assets include ...

- Organisations **use** a variety of **different applications** and **file formats** (of which some are recognised as standards)
- Organisations often need to **preserve** and **modify** their software systems and digital assets for **more than 30 years**, sometimes longer
- **Maintenance** and support contracts for **proprietary licensed software** are provided for (up to) **10 years**
- **Digital assets** (files) **outlive proprietary software** in any maintenance scenario, and from this it follows that we need **OSS implementations of open file formats** provided by **sustainable OSS projects**
- **Software** used for the initial creation of digital assets **will not be available** during the complete life-cycle in most usage scenarios

Challenges for sustainable digitalisation related to different types of lock-in ...

- **Cloud lock-in,**
- **Standard lock-in,**
- **File format lock-in,**
- **Product lock-in,**
- **Vendor lock-in,**
- **Trademark lock-in,**
- **Competence lock-in,**
- **Contract lock-in,**
- **...**

Open Source Software (OSS) ...

- **Open Source Software (OSS)** is software that **complies with the Open Source Definition** (opensource.org/osd) and is made available under a **software licence** which has been **approved by the Open Source Initiative** (OSI, opensource.org)
- OSS is typically provided under widely used software licences, including different versions of GPL, Apache 2.0, MIT, BSD, EPL 1.0 & MPL 2.0
- An analysis of 200 widely deployed OSS projects show that **60%** of all OSS projects are provided under the **GPL-family** licences (including different versions of **AGPL, GPL** and **LGPL**), perhaps unsurprising as “GPL licensing can promote competition” (Gamalielsson & Lundell, 2017)
- Individuals and organisations have the **right** to freely **use, modify, improve, and redistribute** OSS

OSS projects & its value ...

- Many **individuals, companies, and other types of organisations** are engaged in different **collaborative OSS projects** for development and deployment of high-quality OSS
- Findings from an investigation of the Norwegian software industry show that “more than 30% of the respondents in our survey have more than 40% of their income from OSS related services or software.”
(Hauge et al., 2008)
- The overall **contribution of OSS to Europe’s economy** has been calculated to be almost **€450 billion**
(Simeonova, 2015)

Open Source & its evolution ...

... usage in general ...

- “Richard Stallman founded the free software movement in 1983 when he announced he would develop the GNU operating system, a Unix-like operating system meant to consist entirely of free software. He has been the GNU project's leader ever since. In October 1985 he started the Free Software Foundation.”

(www.fsf.org/about/staff-and-board)

- Myth #6. “If I give away my software to the open source community, thousands of developers will suddenly start working for me for nothing. ... Most open source projects have a core of a few dozen dedicated developers, a larger ring of a few hundred interested collaborators who provide problem reports, bug fixes, and occasional enhancements, and thousands or tens of thousands of users.”

– *Talk given by Tim O'Reilly to a group of Fortune 500 executives in October 1999*

Open Source & its evolution ...

... **usage** in general, mixed views at the time ...

- ‘Competitors, working with new technology, may arrive at a technology that creates a new market altogether and renders the Company’s product offerings obsolete. “Open source” software, new computing devices, new microprocessor architectures, the Internet, and Web-based computing models are current examples of the rapid pace of change and intensifying competition. ... Competing operating systems, platforms, and products may gain popularity with customers, computer manufacturers, and developers, reducing Microsoft’s future revenue.’

– *Microsoft Annual Report, 2000*

- “Founded in 2000, The Linux Foundation today provides tools, training, and events to scale any open source project, which together deliver an economic impact not achievable by any one company.”

(www.linuxfoundation.org/about)

Open Source & its evolution ...

... usage in general, different sectors ...

- The FLOSS study finds that “the usage of Open Source software differs considerably among the three countries investigated. While 43.7% of establishments in Germany are using OSS, only 31.5% of British establishments and only 17.7% of Swedish establishments do so.”
(Wichmann, 2002a)
- “Although Beaumont is satisfied with its OSS implementation overall, they have experienced problems, which other organizations contemplating OSS implementation would probably also face. There was a resistance from staff who feared being deskilled by losing experience with popular commercial software packages. Also, Beaumont is a little worried that its operations staff, who have amassed considerable experience in OSS deployment, might now be poached by other organizations.”
(Fitzgerald and Kenny, 2004)

Open Source & its evolution ...

... usage in the public sector ...

- The FLOSS study finds that “29% of the public sector establishments consider OSS to be of very low importance for their IT infrastructure”
(Wichmann, 2002a)
- ‘The survey conducted by MERIT under the FLOSSPOLs project of 955 public sector organisations in 13 EU countries in the third quarter of 2004 is the single largest information source in this context, but limited to Europe. It showed that a large share of users of FLOSS is “unaware users” – they claim not to use “open source software” but say they use Linux, Apache, MySQL etc.’

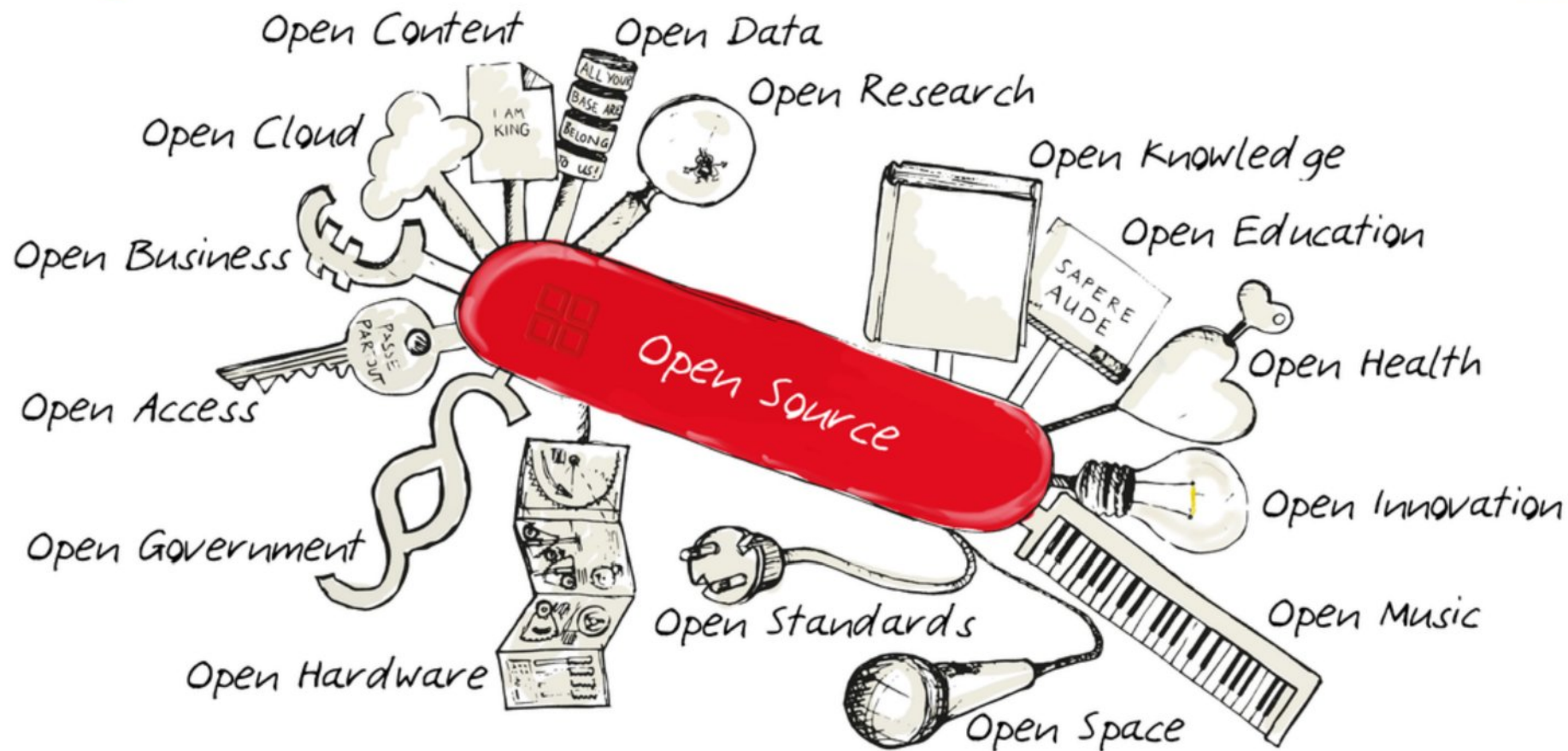
(Ghosh, 2006)

Open Source & its evolution ...

... usage in the private sector ...

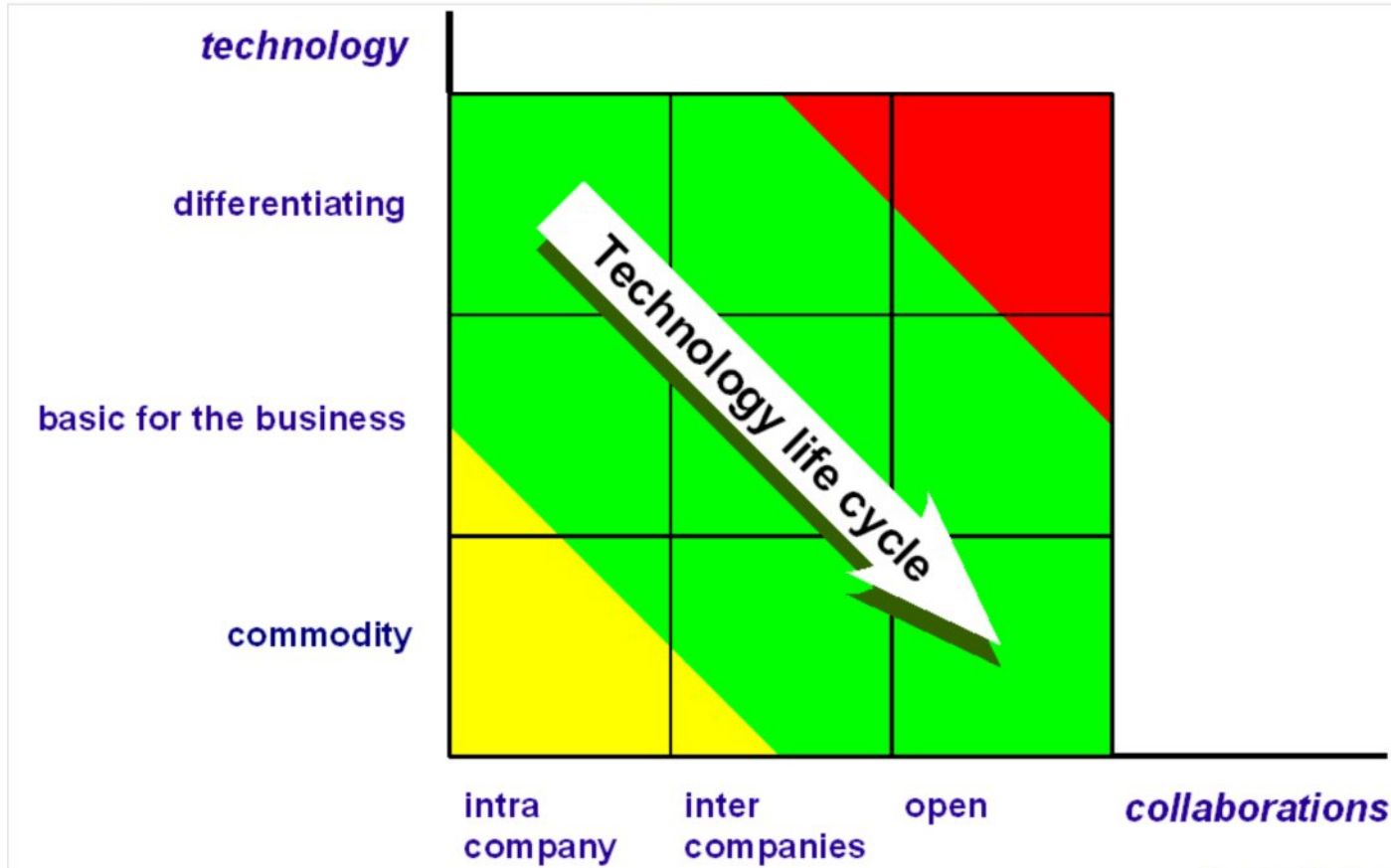
- The FLOSS study finds that “almost one third of the 25 largest software companies (32%) do engage in major OS development activities.”
(Wichmann, 2002b)
- “Close to 50% of the software industry integrate OSS components into vertical solutions serving all major business sectors.”
(Hauge et al., 2008)
- “As long ago as 2008, Gartner surveyed 274 enterprise companies globally and found that 85% had already adopted open source, with most of the remaining expecting to do so within the following year.”
(Aberdour, 2011)

Open Source & its evolution usage in related domains ...



Commodification of software & OSS projects

Knowing **what** to make open **when** ...



(Lundell and van der Linden, 2013)

Initiatives for **Open Source** usage in the **public sector** ...

... **policy initiatives** ...

- An investigation by Center for Strategic and International Studies (CSIS) shows that “in 2005 there were 265 initiatives around the world of which, most of them are preferred initiatives (i.e. FLOSS from the inception of the initiatives). Europe launched 126 Open source policy initiatives, in Asia there were 73, there were 40 in Latin America, 17 in North America and 4 each in the Middle East and Africa. Most projects were launched by the European Union (16), France (10) and Germany (9) are also heavily involved on FLOSS projects, Italy, Spain and UK comes next to these countries with 6 projects each. Small countries like Belgium (5), Denmark (5), Finland (3), Netherlands (3), Norway (4) and Sweden (3) are also involved in FLOSS projects” (Ghosh, 2006)
- CSIS found 364 “open source policy initiatives” in their April 2010 report. (<https://www.csis.org/>)

Initiatives for **Open Source** usage in the **public sector** ...

... **avoiding inhibitors** ...

- “compatibility with proprietary technologies should be explicitly excluded from public procurement criteria and replaced by interoperability with products from multiple vendors”

(Ghosh, 2005)

- “open standards should be mandatory for eGovernment services and preferred for all other public procurement of software and software services.”

(Ghosh, 2005)

An Open Standard ...

- ... is a standard which **conforms to** the **definition** presented in the European Interoperability Framework (**EIF**) **version 1.0**.
 - ...can be **implemented** and **distributed** under **different licenses** for **proprietary software** and under **all licenses for OSS**, which are approved by Open Source Initiative (OSI)
 - ...can be **referenced** as a **mandatory requirement** in **public procurement** when using the Framework agreements established by the Swedish National Procurement Services (sv. Statens inköpscentral vid Kammarkollegiet)
- (Kammarkollegiet, 2016)

Standards & (un-)equal treatment?

- “FRAND licenses create barriers for Open Source projects”
(EC COM(2013) 455 final & SWD(2013) 224 final)
- Many public sector organisations conduct projects that “include requirements with reference to specific proprietary products, specific trademarks, specific technologies (controlled by a single company) and specific closed standards.”
 - Björn Lundell, response to the Open Public Consultation concerning draft for EIFv3
- “From a competition perspective it is often problematic when public sector organisations conduct IT procurement and express requirements for closed standards.”
 - Dan Sjöblom, Director General for the Swedish Competition Authority, preface to the research study Lundell et al. (2016) commissioned by the Swedish Competition Authority

Equal treatment presupposes open standards ... *... which in turn enable competition & innovation ...*

- Open Standards and open file formats (as defined in EIFv1.0) are competition neutral and do not discriminate against any type of software licence
- **Closed standard** provided on FRAND terms are **inherently problematic** (both from a community and legal basis) for OSS and OSS projects

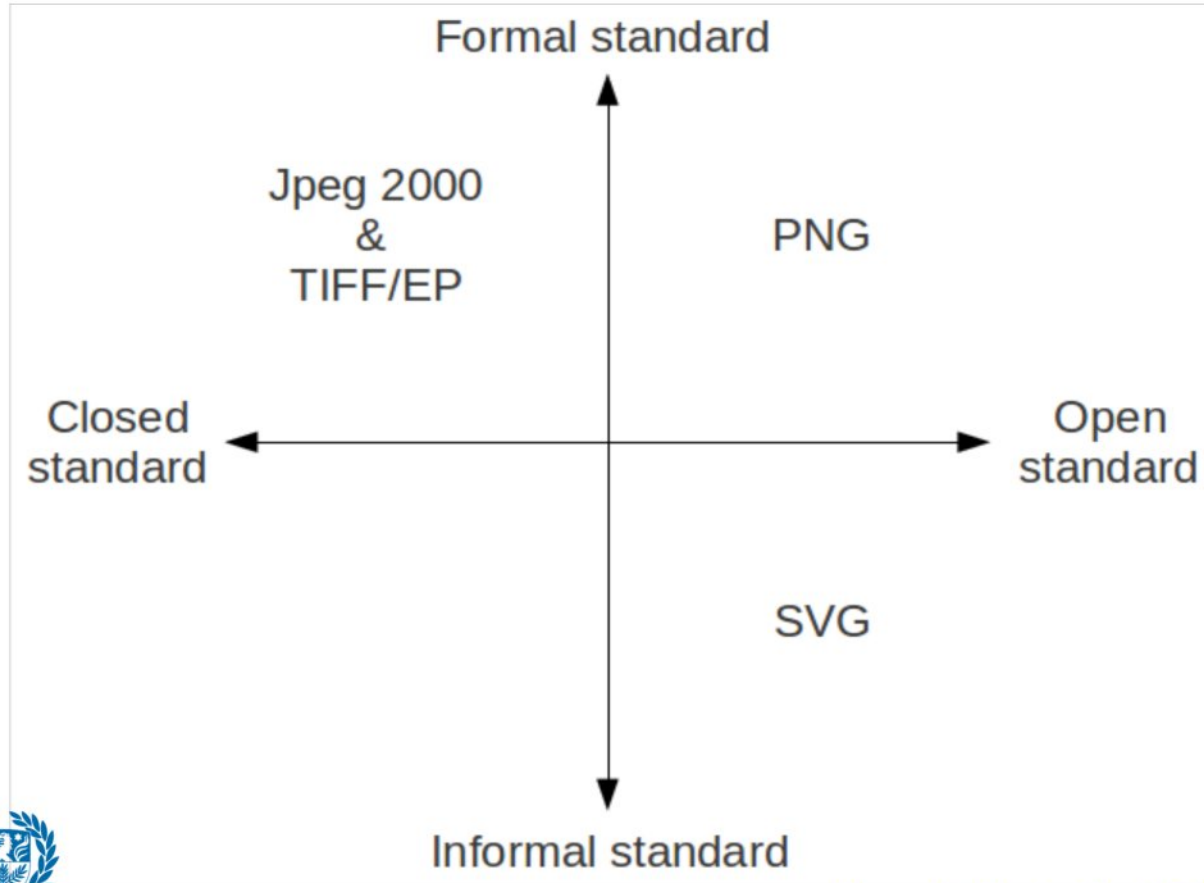
(Lundell and Gamalielsson, 2018)

- ‘An “open standard” must not prohibit conforming implementations in open source software.’

(opensource.org/osr)

Standards which inhibit *or* enable competition?

Open vs. closed standards & Formal vs. informal standards



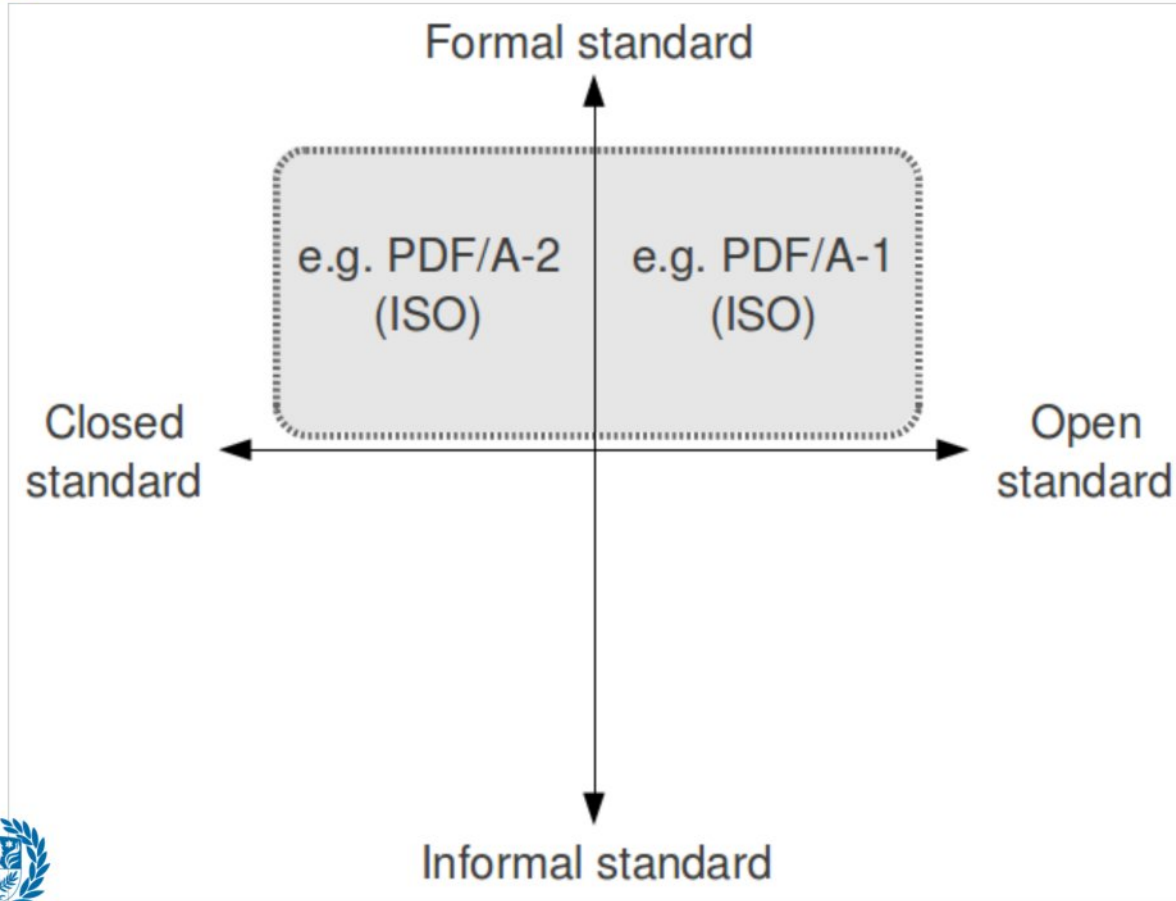
Competition neutral digitalisation
presupposes open standards (which can be implemented for provision by OSS projects) ...

... since **data** and **files** (in many usage scenarios) need to be **maintained beyond** the life cycle for the **application initially used to create the files**



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Strategies for how organisations can engage with OSS projects – adopt, contribute & use ...

- **Adopt** OSS from an established OSS project for **use** and deployment in organisational contexts
- Engage with, and **contribute to**, an OSS project in order to develop long-term healthy relationships with the project through different types of financial contributions (e.g. paying for commercial support/services) and in-kind contributions (e.g. providing bug-reports and contributions to documentation)

*Strategies for how organisations can **engage with OSS projects** – adopt, contribute, extend & use ...*

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- Engage with, and **contribute to**, an OSS project in order to develop long-term healthy relationships with the project through different types of financial contributions (e.g. paying for commercial support/services) and in-kind contributions (e.g. providing bug-reports and contributions to documentation)
- Engage with, and **extend** the source code in, an OSS project in order to provide new and customised functionality of OSS from the project in order to fulfil the needs in specific organisational contexts (avoid 'forks')

*Strategies for how organisations can **strategically engage with OSS projects** – establish healthy communities*

- **Develop** new OSS and establish a sustainable OSS project with associated healthy communities
- If appropriate, re-use pre-existing OSS from established OSS projects
- Contribute back to pre-existing OSS projects (maintenance of new code in main branch is almost always a preferred option)

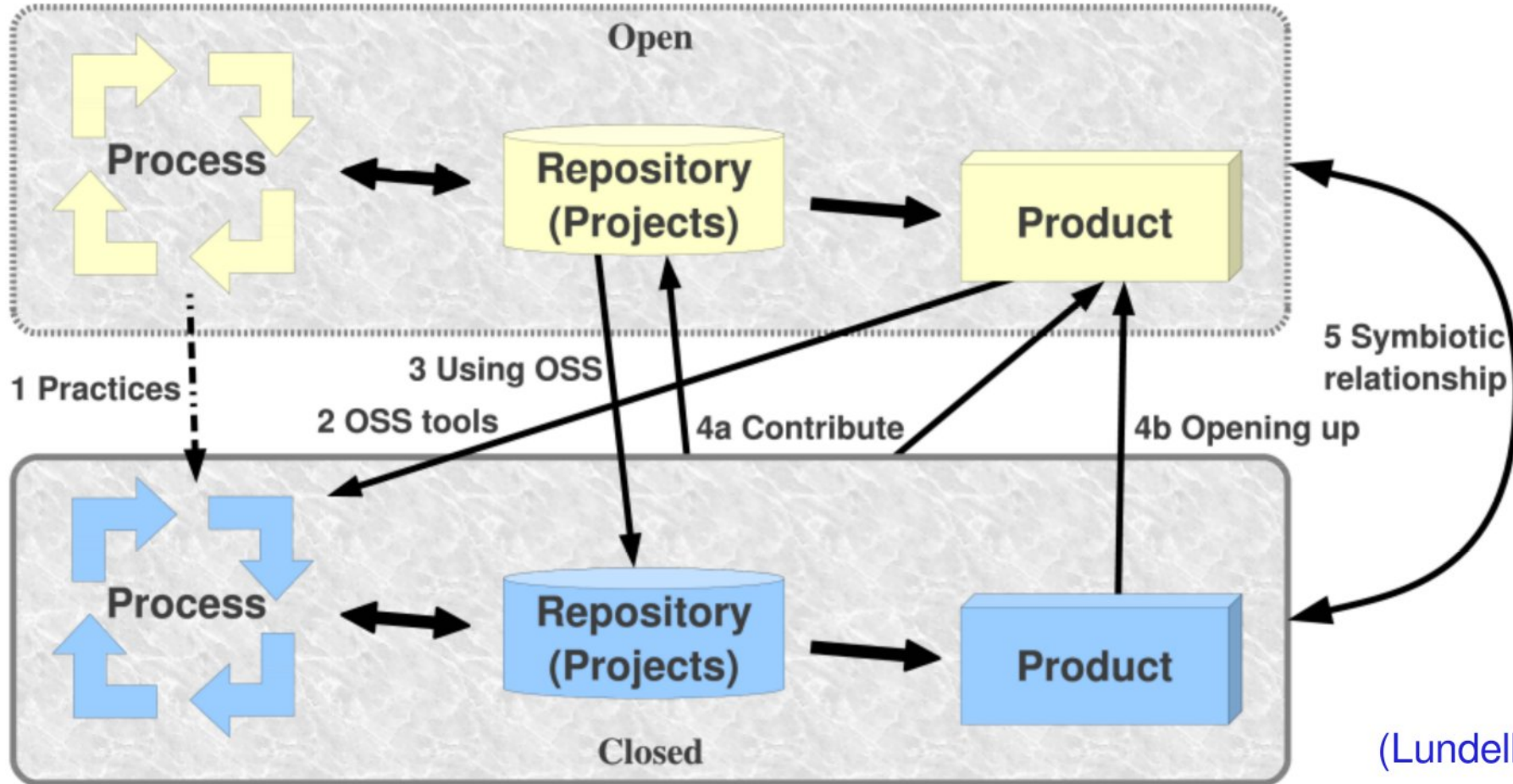
Strategies for how organisations can strategically engage with OSS projects – innovative development ...

- “Almost all participating in Open Source projects cited skills development as an important outcome of participating. Several also elaborated their experiences of being able to influence and expressed a sense of fun. Skill development happened through both detailed scrutiny of other people’s contributions and the rigours of writing and exposing their own contributions to scrutiny.”

(Lundell et al., 2010)

- “A WORLD WITHOUT OPEN SOURCE: No Amazon; No Google; No eBay; No PayPal; No Salesforce; No LinkedIn; No Twitter; No Facebook; No Netflix; No Uber”
 - *Chris Wright, Vice President and Chief Technologist, Office of Technology at Red Hat, Keynote presentation, “OPEN SOURCE MEANS UPSTREAM FIRST”*

Different **strategies** for how an organisation can **engage** with **OSS projects** ...



(Lundell et al., 2017)

*Strategies for how organisations can **strategically promote sustainable development ...***

- Organisations often utilise Open Source Software (OSS) **in combination** with proprietary software, closed standards, and closed file formats
- **Sustainable** (healthy) **OSS projects** can effectively address challenges related to **lock-in** and **long life cycles for digital assets and software**
- **Open source** and associated work-practices can be utilised **beyond the software domain** (e.g. for development and maintenance of standards)
- **Open standards** and open file formats which can be implemented and distributed under all OSS licences (recognised by the Open Source Initiative) by OSS projects (that are hosted on open platforms) **contribute to interoperability** and **to minimise risks for different types of lock-in**

Strategies for how organisations can strategically promote sustainable procurement ...

- “To allow for interoperability and long-term digital preservation, use only open standards and open file formats which have been implemented in software and thus are possible to provide and distribute under different licences (including all licences for open source software).”

(Lundell et al., 2016, p. 11)

- “To manage data and documents submitted to a public sector organisation in closed file formats, acquire before procurement all necessary rights (including all necessary patent licences) for these closed file formats so that they can be implemented in software that can be used and distributed under different licences (including all licences for open source software).”

(Lundell et al., 2016, p. 12)

Sustainable digitalisation?

A large iceberg floating in the ocean, with its massive, jagged underside exposed below the water surface. The water is a deep blue, and the sky is clear.

Long-term maintenance of software, data and files?

OpenSym 2019 – The 15th International Symposium on Open Collaboration @ Skövde, 20-22 August 2019 ...



<http://www.opensym.org/oss2019/>

<https://opensym.org/os2019/call-for-papers/>

Research paper and poster submission deadline is 31 March 2019

Practitioner poster submission deadline is 16 June 2019

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