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# How to achieve digitally sovereign and interoperable software solutions

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# Software

- Conditions for the development and provision of software has changed during the history of computing
- Until the late 1960s “software was just a companion to hardware: as long as you paid for maintenance, you had access to the software catalog of the manufacturer” (Gonzalez-Barahona, 2021)
- The importance of software to individuals, organisations and society at large is significant for the ability to address a range of contemporary challenges
  - For example, in its 2013 annual report the General Electric Company expressed the importance of software when articulating the view that “every industrial company will become a software company” (GE, 2013)

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# Software as a Service (SaaS)…

- Software as a Service (SaaS). ‘The capability provided to the consumer is to use the provider’s applications running on a cloud infrastructure’ (NIST, 2011)
- Microsoft 365 and Google Workspace are examples of globally provided SaaS solutions

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# Open Source Software (OSS)

- Open Source Software (OSS) is software which is provided under terms that comply with the Open Source Definition (OSD, https://opensource.org/osd) and made available under a software licence that has been approved by the Open Source Initiative (OSI, https://opensource.org)
- The Open Source Definition “is a specification of what is permissible in a software licence for that software to be referred to as Open Source” (Perens, 1999)
- OSS is typically provided by OSS projects on one (or several) open collaborative platform(s) under one (or a few) widely used OSS licence(s) (AGPL-3.0, GPL-2.0, GPL-3.0, LGPL-2.1, LGPL-3.0, MIT, BSD 2/3-Clause, Apache-2.0, EPL-2.0 & MPL 2.0)

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# Free Software & Open Source Software (FOSS)

- Free Software (FS) is software which is provided under terms that comply with the Free Software Definition[1] (FSD)
- Open Source Software (OSS) is software which is provided under terms that comply with the Open Source Definition[2] (OSD)
- Free and Open Source Software (FOSS) is software that complies with the FSD and the OSD
- Individuals, organisations and other types of stakeholders (e.g. governments) that engage with, and contribute to, FOSS projects generally presuppose they have all the rights necessary to use, study, redistribute, and modify FOSS that is being developed and maintained by such projects

1: The Free Software Definition, https://www.gnu.org/philosophy/free-sw.html#fs-definition

2: The Open Source Definition, https://opensource.org/osd/

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# Open Source Software – *significant impact ...*

- An immediate economic effect through code reuse and effort reduction: at least 114 Billion Euro (31% of the software and services market) per year through direct savings, reduction in project failure and improvements in code maintenance cost (Daffara, 2012)
- ‘It is estimated that companies located in the EU invested around €1 billion in Open Source Software in 2018, which brought about a positive impact on the European economy of between €65 and €95 billion. The study predicts that an increase of 10 per cent in contributions to Open Source Software code would annually generate an additional 0.4 per cent to 0.6 per cent GDP, as well as more than 600 additional ICT start-ups in the EU.’ (Tynan, 2021)

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# OSS licences

- “A copyleft license is one that requires, as a condition of distribution (or making available) of software binaries, that the distributor make the corresponding source code available under the same licensing terms.” (Meeker, 2020)
- A study of 200 OSS projects providing widely-used software finds that 60% of widely used OSS projects “are provided under the GPL-family of licences” (Gamalielsson & Lundell, 2017)
- The GPL copyleft licences ‘promote “full symmetric” rights among contributors (the most prominent of which being the Linux kernel)’ (Lundell et al., 2022a)

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# Standards in the ICT domain

- Conditions for the development and provision of standards have changed during the history of computing
- Many stakeholders have contributed to development and use of ICT (Information and Communication Technology) standards that are provided by different Standards Setting Organisations (SSOs)
- In the ICT domain there has long been significant tension and disputes concerning what different stakeholders consider to be appropriate conditions for the development, provision, and implementation of ICT standards  (Contreras, 2017)

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# Standards provided under FRAND- vs. RF-terms ...

- Many SSOs have adopted policies that allow for the development and provision of ICT standards under FRAND (Fair, Reasonable, And Non-Discriminatory) terms
- The ‘IETF and W3C, have evolved strong policies and norms favouring RF [Royalty-Free] standards’ (Contreras, 2016)
- Provision of an ICT standard under FRAND terms allow for standard-essential patents (SEPs) to impinge on the standard

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# Open standards & open formats ...

- A standard which complies with the definition presented in the European Interoperability Framework (EIF) version 1.0 (EIF 1.0) constitutes an open standard
- A format which complies with the definition of open standard (as defined in EIF 1.0) constitutes an open format
- Open standards (as defined in EIF 1.0 & SOU 2009:86) can be lawfully implemented by software projects which provide software under different licences for proprietary software and under all licences for FOSS (Free and Open Source Software)
- An open standard must not prohibit conforming implementations in Open Source Software (OSI, 2006)

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# Open standards & FOSS ...

- Open standards constitute a subset of all standards
- Open standards are irrevocably provided under royalty-free terms and can be used and implemented by FOSS projects without restriction  (Lundell et al., 2018)
- There is limited research that address how software projects deal with patents that impinge on standards (i.e. standard-essential patents, SEPs) (Contreras, 2025)
- A study that investigated 24 software projects implementing ICT standards provided by eight different SSOs (ETSI, IEC, IEEE, IETF, ISO, ITU-T, OASIS, W3C) shows that the majority (15 of 24) of the investigated OSS projects are provided under copyleft conditions (Gamalielsson et al., 2024)

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# FRAND & OSS projects ...

- “There is a long-running debate regarding the compatibility of FRAND licensing structures for SEPs and the distribution of software embodying standards on an open source basis. To date, only a few studies by Lundell and co-authors have rigorously analyzed the use of standards subject to FRAND licensing commitments in open source projects. Given the continuing growth of open source software and the increasing implementation of hardware functions in software, further research is needed on actual instances in which patented standards are, or are not, used in OSS implementations and with what results” (Contreras, 2025)
- ‘FRAND licenses create barriers for Open Source projects to implement the technical specification’ (EC, SWD(2013) 224 final)
- ‘We find that it is impossible to obtain licences from patent holders that would allow for implementation and use of the standard in open source software.’ (Lundell et al., 2023a)

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# Lock-in …

- ‘The concept of ‘lock-in’ is a complex one that has received attention amongst researchers, practitioners, and policy makers for a long time’ (Lundell et al., 2023b)
- Lock-in effects impose many different types of technical, legal, economic and societal challenges for organisations
- ‘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 ”IT-standarder, inlåsning och konkurrens” (commissioned by the Swedish Competition Authority, our translation)*

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# On lock-in ...

- ‘Lock-in is said to occur whenever a switching to a potential competitor product is made more difficult by external factors. These may be human factors such as familiarity with the system’s operation or user interface, development of internal work-arounds to tailor the system to a particular organisation’s needs, or the natural desire to remain with the existing system since its shortcomings are at least known and understood: the devil you know. Other forms of lock-in may be technical, such as the file formats and APIs that a particular system uses not being compatible with a potential future replacement system. Lock-in is not unlawful per se, but it may in some circumstances have legal consequences. For example, lock-in imposed by a supplier may result in breaches of competition law, such as abuse of a dominant position.’ (Lundell et al., 2023b)

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# Lock-in & cloud-based SaaS solutions ...

- Findings show that each public sector organisation (PSO) that ‘uses the Microsoft 365 (M365) solution do so under unknown and unclear conditions which imposes significant risks for different types of lock-in effects that may prevent sustainable and lawful maintenance of digital assets. Further, we find that no PSO has identified all relevant contract terms for the M365 solution before use.’ (Lundell et al., 2022b)
- ‘Global providers of cloud-based SaaS solutions may have strong incentives for causing dependencies and different types of lock-in effects in order to retain customers (Opara-Martins et al., 2016; Xiao et al., 2020)’ (Lundell et al., 2022b)

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# *Selected* strategies for how to avoid lock-in ...

- ‘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)
- ‘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)

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# Proprietary cloud solutions cause lock-in …

- ‘A major lock-in concern is risk of dependence (or over- dependence) on one provider’s, often proprietary, service.’ (Hon et al., 2012)
- Research shows that 97% (29 of 30) of the municipalities that were randomly selected for a study (amongst all 290 Swedish municipalities) used a specific SaaS solution (Microsoft 365) (Lundell et al., 2021)
- Market concentration involving extensive use of cloud-based SaaS (Software-as-a-Service) solutions amongst public sector organisations (PSOs) has caused concern amongst nations and PSOs for different types of lock-in effects

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# Implementations of specifications of standards … … may cause standard & file format lock-in …

- ‘there are several problematic issues related to clarity and detail in the specification of the PDF format.’
- ‘Implementations may cover a subset of the features in the specification, and also features beyond the specification.’
- ‘there are different kinds of influences, both between different implementations of a specification, and also between a specification and its implementations. … implementations of a specification are primarily influenced by the market leading implementation instead of the specification of a standard’
- ‘patent issues are perceived as a concern by contributors to open source projects implementing a specification of a standard’

(Gamalielsson & Lundell, 2013)

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# SaaS solutions that require FRAND standards … … cause format lock-in & licensing issues …

- The ‘HEVC standard constitutes an inherent part (as a normatively referenced standard via other standards) of the widely referenced file format ISO/IEC 29500 standard.’ (Lundell et al., 2023a)
- Contract ‘documents expresses that a customer which uses Microsoft 365 must obtain its own licences for HEVC:
  - “Customer must obtain its own patent license(s) from any third party H.265/HEVC patent pools or rights holders before using Azure Media Services to encode or decode H.265/HEVC media.”’ (Lundell et al., 2023a)
- Findings ‘from the investigation of legal and licensing conditions for implementation and use of the HEVC standard show that it is impossible to obtain licences from apparent SEP holders that would allow for lawful use of the standard.’ (Lundell et al., 2023a)

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# Use of a SaaS-solution under unknown … … terms and conditions is always inappropriate …

- ‘The fact that public bodies have actually no control over the engagement of processors and subprocessors makes it difficult for them to ensure that the processing is compliant with the provisions of the GDPR, especially regarding transfers to third countries. However, it must be emphasised that this difficulty does not, in itself, exonerate the controller from its responsibilities in the processing.’ (EDPB, 2023)
- For an organisation that uses a SaaS-solution under unknown terms and conditions for data processing and maintenance of digital assets it is impossible to show that use of the solution is not inappropriate

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# On lock-in – challenges concerning how to …
# … establish and maintain digital & data sovereignty

- ‘In many industry domains, data are highly sensitive or needs to be protected. The current market structure risks dependency on international providers. Technical, economic and contractual obstacles in the path of a data migration to another infrastructure provider (so-called ‘lock-in effects’) constrain companies’ freedom in their operations – both in running their firms and in the event of political conflicts. In order that platforms and whole industries can continue to secure and expand their value creation, data infrastructure that strengthens the users’ digital sovereignty is necessary.’ (BMWi, 2019)

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# Interoperability

- ‘interoperability is the intentional design of a technology product or system, which allows it to cooperate with other products or systems without restriction or difficulty, thus producing a reliable outcome and resource optimization. The main goal of an interoperable system is to facilitate interaction between different software applications and to enable sharing and re-use of information among non-homogenous systems.’ (Aliprandi, 2011)
- ‘Based on this definition and given the current evolution and state of the mass computer market, it is clear that interoperability plays a pivotal role in ensuring competition between all of the actors involved. Major computer companies with large market shares can easily control and limit the competitive power of their rivals with intentional product design, a conduct defined by the competition law as “abuse of dominant position”’ (Aliprandi, 2011)

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# Interoperability - The robustness principle …

- ‘In 1981, Jon Postel formulated the Robustness Principle, also known as Postel’s Law, as a fundamental implementation guideline for the then-new TCP. The intent of the Robustness Principle was to maximize interoperability between network service implementations, particularly in the face of ambiguous or incomplete specifications.’ (Allman, 2011)
- ‘the specification may be ambiguous: two engineers build implementations that meet the spec, but those implementations still won’t talk to each other. The spec may in fact be unambiguous but worded in a way that some people misinterpret it. Arguably some of the most important specs fall into this class because they are written in a form of legalese that is unnatural to most engineers. The specification may not have taken certain situations (for example, hardware failures) into account, which can result in cases where making an implementation work in the real world requires violating the spec.’ (Allman, 2011)

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# ICT Standards & interoperability...

- ‘Also, standards can be used as a lockout mechanism for new entrants; this is especially true if the standards are costly enough to implement, or are badly enough specified, that small new entrants cannot afford to implement them, or cannot figure out how to implement them interoperably.’ (Alvestrand, 2004)
- ‘The Internet Engineering Task Force (IETF) is an organization that grew up with the Internet and remains intimately connected to it. Thus, the idea of widely available global connectivity and interoperability is close to its heart and is a driving ideology behind its structure.’ (Alvestrand, 2004)

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# Interoperability & lock-in …

- ‘This interoperability is also important to ensure consumers have the ability to migrate workloads between different providers, to prevent customers from being “locked-in” to any one provider because of inaccessibly high costs and risks in migrating data to a new provider’s system.’ (Benzina, 2019)
- ‘Without any standards for interoperability, customers can find themselves locked into one of the dominant IaaS providers, making it difficult to switch if needed. Given the vibrant and dynamic state of the burgeoning SaaS market, this kind of market distortion could prevent new companies and technologies in downstream industries from reaching consumers. This is especially risky when the companies with market power in the IaaS market are global conglomerates that compete in a wide range of downstream industries.’ (Benzina, 2019)
- ‘Interoperability and data (and application) portability are critical to ensuring customers are not “locked-in” to a single IaaS provider or forced to purchase the IaaS provider’s other cloud offerings. Without recognized standards, IaaS providers with market power can dictate which interfaces, and therefore which providers, can operate atop their cloud infrastructure.’ (Benzina, 2019)

# Internet standards & interoperability…

- ‘At every layer of the protocols, there is a general rule whose application can lead to enormous benefits in robustness and interoperability [IP:1]: “Be liberal in what you accept, and conservative in what you send”’ (Braden, 1989)
- ‘Software should be written to deal with every conceivable error, no matter how unlikely; sooner or later a packet will come in with that particular combination of errors and attributes, and unless the software is prepared, chaos can ensue. In general, it is best to assume that the network is filled with malevolent entities that will send in packets designed to have the worst possible effect. This assumption will lead to suitable protective design, although the most serious problems in the Internet have been caused by unenvisaged mechanisms triggered by low-probability events; mere human malice would never have taken so devious a course!’ (Braden, 1989)
- ‘If the Internet is to converge successfully to complete interoperability, the default values built into implementations must implement the official protocol, not “mis-configurations” to accommodate faulty implementations. Although marketing considerations have led some vendors to choose mis-configuration defaults, we urge vendors to choose defaults that will conform to the standard.’ (Braden, 1989)

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# Standards & SEPs…

- ‘In recent years, high-profile lawsuits involving standards-essential patents (SEPs) have made headlines in the United States, Europe and Asia, leading to a heated public debate regarding the role and impact of patents covering key interoperability standards. Enforcement agencies around the world have investigated and prosecuted alleged violations of competition law and private licensing commitments in connection with SEPs. Yet, while the debate has focused broadly on standardization and patents in the information and communications technology (ICT) sector, commentators have paid little attention to differences among technology layers within ICT.’ (Contreras, 2016)
- ‘A review of case statistics shows that patent filing and assertion activity is substantially lower for Internet-related standards than for standards relating to telecommunications and other computing technologies.’ (Contreras, 2016)
- ‘A patent is a form of governmental grant that gives its owner the exclusive right to practise (i.e., make, use and sell) a claimed invention throughout the issuing country. Patent protection in most countries lasts for a period of 20 years from the date a patent application is filed. Patents may cover any system, device, product feature, process or improvement, so long as it is useful, novel and not obvious in view of existing technologies.’ (Contreras, 2016)

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# Open standards & FOSS…

- ‘open standards for software markets should be defined in order to be compatible with FLOSS licenses, to achieve this economic effect’ (Ghosh, 2005)
- ‘As West writes, “attempts to create advantage and lock-in are far from limited to the sponsors of de facto standards. Sponsors of de jure and consortia standards also gain advantage from attracting adopters and creating lock-in, if such standards are encumbered by private patent claims, as are standards such as W-CDMA, MPEG-4 and DVD” (West 2004).’ (Ghosh, 2005)

# Interoperability & portability…

- ‘Interoperability, data portability and application portability are essential to the use of cloud services. The goal of interoperability is to enable the interaction between non-cloud and cloud services, as well as between cloud services, in addition to enabling composition of new services from multiple services. The goal of portability is to enable cloud service customers (CSCs) to move their data or applications between non-cloud and one or more cloud services and between cloud services.’ (ISO, 2017)
- ‘Interoperability is the ability of two or more systems or applications to exchange information and to mutually use the information that has been exchanged. In the context of cloud computing, interoperability should be viewed as the capability of public cloud services, private cloud services and other cloud service customer systems to understand each other’s interfaces, configuration, forms of authentication and authorization, etc. in order to cooperate and work with each other.’ (ISO, 2017)

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# Open standards & Innovation…

- ‘Another important development to increase efficiency, promote interoperability and improve the performance in public sector delivery is the move towards the use of open standards and open source alternatives in new procurements. It is my belief that we need a clear definition of openness in the European Interoperability Framework and that the definition of open standards and open source software as defined by the European Interoperability Framework version one has served us well so far. The use of open standards and open source solutions decreases the public sector’s reliance on specific vendors and platforms and it increases European competiveness as well as the transparency and ability to interact with third party developers of services built on public data.’ (Odell, 2009)

# Standardisation & interoperability standards & FRAND terms…

- ‘For both participants in standards development and implementers of interoperability standards, the interface between patents and standards development necessarily involves uncertainty. What innovations will be selected for inclusion in a standards, and will those innovations be protected by valid patents?” If the standard is developed in a standards development organization (SDO) that permits licensing on fair, reasonable, and nondiscriminatory (FRAND) terms, on what terms will patents essential to the standard be available to implementers of standards in products?’ (Ohana & Biddle, 2019)

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# Open Standards Requirement for Software…

- ‘An “open standard” must not prohibit conforming implementations in open source software.’ (OSI, 2006)
- ‘To comply with the Open Standards Requirement, an "open standard" must satisfy the following criteria. If an "open standard" does not meet these criteria, it will be discriminating against open source developers.
- 1. No Intentional Secrets: The standard MUST NOT withhold any detail necessary for interoperable implementation. As flaws are inevitable, the standard MUST define a process for fixing flaws identified during implementation and interoperability testing and to incorporate said changes into a revised version or superseding version of the standard to be released under terms that do not violate the OSR.
- 2. Availability: The standard MUST be freely and publicly available (e.g., from a stable web site) under royalty-free terms at reasonable and non-discriminatory cost.
- 3. Patents: All patents essential to implementation of the standard MUST:
  - be licensed under royalty-free terms for unrestricted use, or Membership
  - be covered by a promise of non-assertion when practiced by open source software
- 4. No Agreements: There MUST NOT be any requirement for execution of a license agreement, NDA, grant, click-through, or any other form of paperwork to deploy conforming implementations of the standard.
- 5. No OSR-Incompatible Dependencies: Implementation of the standard MUST NOT require any other technology that fails to meet the criteria of this Requirement.’ (OSI, 2006)

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# Standards & Patents…

- ‘Today’s computer industry standards increasingly include technology that may be covered by a software patent. The owner of that patent has the right to demand a royalty from all parties that implement the patented principle, or may discriminate regarding who will and will not be allowed to license the patent. It is often the case that there is no way to implement a standard without making use of a particular patented principle. This effectively gives the patent holder absolute control regarding who will implement a standard containing his patented principle.’ (Perens, 2005)
- ‘Such patents arise in two ways: they are knowingly embedded in the standard as it is being created, or they are submarine patents, unknowingly part of the standard until they “surface” after the standard is already in wide use.’ (Perens, 2005)
- ‘Patent royalties tend to create discrimination against small-to-medium-sized businesses developing any form of software, and especially against Open Source developers.’ (Perens, 2005)
- ‘The patent situation is bad enough when applied to the general field of software. When applied to standards, it specifically restricts the interoperability of programs and communication between them, because those are the subject of computer industry standards. Thus, software patents can be used to prohibit interoperability.’ (Perens, 2005)

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# Procurement & Competition...

- ‘public procurement aims to achieve procurement practices that stimulate a fair and competitive market based on the important principles of transparency, non-discrimination and equal treatment (Directives 2004/17/EC and 2004/18/EC).’ (Lundell, 2011)

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# Sovereignty…

- ‘Sovereignty is a troublesome politico-legal concept. It is both the cornerstone of the international (legal) order and fatally under-defined. It is both a divisive and a unifying concept.’ (Broeders et al., 2023)
- ‘Worries about the power and state-like role of big tech companies have spread wide and underpin some of the European concerns when it comes to digital sovereignty. In recent years, the EU, whilst resisting the ‘authoritarian model’, has started to relate sovereignty to information flows and technology in cyberspace, seeking to increase control under the flag of digital or technological sovereignty.’ (Broeders et al., 2023)

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# Digital sovereignty…

- ‘Digital sovereignty refers to the ability of a nation to control its own digital infrastructure, data, and technology, independent of foreign influence or control. In an increasingly interconnected world, digital sovereignty is vital for protecting national security, economic stability, and individual privacy. Digital sovereignty should be understood in terms of both protective mechanisms and offensive tools to foster digital innovation. This understanding underpins the intrinsic relationship between digital sovereignty and cybersecurity. Digital sovereignty relates to cybersecurity as the latter is critical for national security, in protecting government systems, military infrastructure, and critical sectors from cyberattacks or espionage by foreign actors. Additionally, effective cybersecurity ensures that citizens’ personal data and sensitive national data remain within national borders, reducing the risk of external surveillance or exploitation. Last, cybersecurity builds trust in national infrastructure, both for government entities and private citizens, ensuring resilience against cyber threats that could undermine sovereignty.’ (Katsikas, 2025)

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# Digital sovereignty… cont.

- ‘For individuals and institutions alike, digital sovereignty means having capabilities and opportunities of performing their roles in the digital world independently, self-reliantly and safely.’ (SH, 2024)
- ‘we must be self-critical enough to admit that it will not be possible to achieve digital sovereignty with the products currently in use at the standard IT workplace. The reason is that suppliers of proprietary IT solutions are increasingly shifting their applications to the Internet in the form of cloud services, which involves an outflow of data that is undesirable or inevitable as a result of use. In the IT environment of public administration, this is alarming for reasons of information security (availability, confidentiality, integrity of IT systems and data) and inadmissible under the data protection laws.’ (SH, 2024)
- ‘Although the concept of digital sovereignty can be illustrated concisely using public administration as an example, there is a need to think this issue beyond the limits of purely administrative action. It raises questions of a sovereign digital Ecosystem and a digitally sovereign society as a whole, comprising the economy, education and the sciences, administration, societies and associations, foundations, and the public as a community of citizens.’ (SH, 2024)

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# Digital sovereigns vs. Digital subjects…

- ‘individuals, communities, corporations, states, and supranational organizations can become digital sovereigns by understanding, developing, and regulating the use of digital technologies, according to their needs, aspirations, and values. Conversely, aspiring digital sovereigns can be turned into digital subjects when there is insufficient understanding, development, or command of such technologies even when “digital sovereignty” policies and plans are formally adopted.’ (Belli & Jiang, 2023)
- ‘To understand why the digital sovereignty sentiments have been growing globally, motivated by mistrust toward dominant US technologies, it is instructive to consider the normative analysis of the ECJ. Section 702 of the Foreign Intelligence Surveillance Act (FISA) authorizes the collection, use, and dissemination of electronic communications content stored by US platforms (such as Facebook, Google, and Microsoft) or transported across the internet’s “backbone” infrastructure, thus compelling US connectivity providers (such as AT&T and Verizon) to cooperate with national intelligence agencies (Data Protection Commissioner v Facebook Ireland Ltd, 2020, para 184).’ (Belli & Jiang, 2023)
- ‘It is also necessary to stress that digital sovereignty policies may also be primarily driven by economic protectionism. Indeed, a further element of complexity in digital sovereignty discussions is the potential protectionist dimension. Digital sovereignty narratives lend themselves well to the inclusion – and to some extent confusion – of a variety of goals, including resistance to data colonialism (Ávila, 2018), the implementation of digital development agendas, the establishment of protectionist measures, the tightening of social control, and political exploitation of post-colonial resentments.’ (Belli & Jiang, 2023)

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# Data sovereignty vs. Digital sovereignty…

- ‘It is possible to draw a distinction between “data sovereignty” and “digital sovereignty,” where “data sovereignty” refers to control over data, including through data protection law, competition law, and national security law. This definition would make data sovereignty a subset of digital sovereignty.’ (Chander & Sun, 2022)

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# Digital sovereignty & Sovereignty-as-a-Service…

- ‘Over the past few years, major technology companies, particularly Microsoft, Amazon, and Alphabet/Google, have rebranded themselves as stewards of digital sovereignty. In response to mounting regulatory pressures […] these firms have launched programs that promise governments and organizations greater “control” over their data, infrastructures, and cloud operations. These initiatives, which we call “sovereignty-as-a-service,” means a strategic shift: sovereignty is no longer a matter of collective self-determination but a modular product delivered via cloud compliance, infrastructure management, and corporate-led governance frameworks. In other words, sovereignty becomes an empty signifier, one that Big Tech companies fill with infra structural services, serving as a form of social responsibility whitewashing.’ (Grohmann & Costa Barbosa, 2025)

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