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Open Source Technologies: A Strategic Imperative for Jordan's Digital Future

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1. Introduction

The global economy is in the midst of a profound transformation, driven by the relentless pace of digital innovation. At the heart of this revolution lies a powerful and often underestimated force: open source technology. From the operating systems that power the majority of the world's servers to the frameworks that underpin the most advanced artificial intelligence, open source has become the invisible backbone of the digital age. It is a testament to the power of collaboration, a catalyst for innovation, and a critical enabler of economic growth and digital sovereignty.

This position paper, published by Information and Communications Technology Association Jordan (intaj) in partnership with the Jordan Open Source Association (JOSA), advocates for the strategic and wholehearted adoption of open source technologies across Jordan's public and private sectors. It argues that embracing open source is not merely a technical choice, but a strategic imperative that will be instrumental in achieving the ambitious goals of Jordan's Economic Modernization Vision and its National Digital Transformation Strategy. By leveraging the global momentum of the open source movement, Jordan has a unique opportunity to accelerate its digital development, foster a vibrant local technology ecosystem, and secure its position as a regional leader in the digital economy.

This paper will provide a comprehensive analysis of the global open source landscape, including detailed market data, economic impact assessments, and international case studies. It will then delve into the specific context of Jordan, examining the existing policy landscape, identifying key opportunities and challenges, and offering a set of detailed, actionable recommendations. The aim is to provide a clear roadmap for how Jordan can harness the transformative power of open source to build a more prosperous, innovative, and digitally sovereign future for all its citizens.

2. The Global Open Source Landscape: A Market in Ascendancy

The adoption of open source software is no longer a niche phenomenon confined to startups and tech enthusiasts. It is a global megatrend, a multi-billion dollar market, and a fundamental pillar of the modern digital economy. Understanding the scale and trajectory of this landscape is essential for any nation seeking to formulate a forward-looking digital strategy.

Market Size and Growth Projections

The global open source software market is experiencing explosive growth, with its value projected to more than double in the coming years. According to a 2025 report by The Business Research Company, the market is expected to grow from $41.83 billion in 2024 to $48.54 billion in 2025 at a compound annual growth rate (CAGR) of 16.0%. This impressive growth is forecasted to continue, with the market expected to reach $85.6 billion by 2029 at a CAGR of 15.2% noting that that these are commercial open-source software & services market figures (a small slice of total OSS value) [1].

This growth is fueled by a confluence of factors, including the increasing demand for collaborative and flexible software solutions, the rising cost pressures on businesses, and the growing number of government initiatives promoting the use of open source. The increasing shift towards cloud-based infrastructure and the rising availability of open APIs are also significant drivers of this trend.

Economic Impact: The Multi-Trillion Dollar Value of Collaboration

The economic impact of open source extends far beyond the market value of open source software and services. A groundbreaking 2024 study from Harvard Business School, titled "The Value of Open Source Software," estimates the demand-side value of open source software to be a staggering $8.8 trillion [2]. This figure represents the cost that firms would incur if they had to recreate all the open source software they use from scratch. The study also found that firms would pay an estimated 3.5 times more to build the software and platforms that run their businesses without open source.

The European Union has also recognized the immense economic value of open source. A 2021 study commissioned by the European Commission found that the €1 billion invested in open source software in 2018 generated a positive impact of €65-95 billion on the European economy [3]. The study also concluded that a 10% increase in open source contributions could generate an additional 0.4-0.6% of GDP annually and create over 600 new ICT startups in the EU.
These figures underscore a fundamental truth: open source is a public good that creates enormous economic value. It lowers the barriers to entry for new businesses, accelerates the pace of innovation, and enables a more competitive and dynamic digital economy.

Dominant Trends Shaping the Future

Several key trends are shaping the future of the open source landscape:

- **Cloud-Native Open Source:** The rise of cloud computing has been inextricably linked with the growth of open source. Technologies like Kubernetes and Docker, which are essential for building and managing modern cloud-native applications, are both open source projects. The future of the cloud is being built on open source. These technologies are also converging with open IaaS platforms (e.g., OpenStack) and open networking stacks to enable sovereign, standards-based clouds. This allows governments to meet data residency, portability, and auditability requirements while avoiding commercial lock-in.

- **AI and Machine Learning on Open Platforms:** The field of artificial intelligence is being democratized by open source, as Openness in AI accelerates innovation, enables independent auditing, and reduces concentration risk. Leading AI and machine learning frameworks like TensorFlow and PyTorch are open source, enabling researchers, developers, and businesses around the world to build and deploy sophisticated AI applications.
- **Security and the Open Software Supply Chain**: Governments are moving from ad-hoc security to codified practices: Software Bills of Materials (SBOMs), provenance (SLSA), reproducible builds, and continuous vulnerability disclosure in the open. Transparency, broad peer review, and rapid patching make open source a cornerstone of cyber-resilience. This shift is now being formalized in law: the EU's Cyber Resilience Act (CRA), which entered into force in December 2024, introduces mandatory security and vulnerability reporting requirements for commercial products that incorporate open source components, while preserving exemptions for non-commercial community projects. For Jordan, this has two direct implications: Jordanian exporters of connected software products targeting the EU market will need to comply, and the CRA offers a legislative model for Jordan's own open source security and procurement policy framework.
- **The Strategic Importance of Open Source Program Offices (OSPOs):** As organizations increasingly rely on open source software, they are also recognizing the need for a strategic approach to managing their open source consumption and contribution. Open Source Program Offices (OSPOs) are becoming increasingly common in large enterprises and government agencies, providing a centralized function for managing open source licenses, security, and community engagement. According to a 2024 study by the Linux Foundation's TODO Group, 77% of large organizations now have an OSPO [4].

These trends highlight the dynamism and vitality of the open source ecosystem. For Jordan, understanding and embracing these trends will be critical to harnessing the full potential of open source for its digital transformation.

3. International Benchmarking: Case Studies in Open Source Adoption

Nations around the world are increasingly recognizing the strategic importance of open source software for achieving their digital ambitions. From promoting digital sovereignty to fostering local innovation and achieving significant cost savings, the benefits of a strategic approach to open source are clear. This section examines the experiences of four leading nations – Germany, France, India, and Brazil – to provide a set of international benchmarks for Jordan.

Germany: A Model of Digital Sovereignty

Germany has made digital sovereignty a cornerstone of its national technology strategy, with open source playing a central role. The German government has launched several ambitious initiatives to promote the use of open source in the public sector and to support the development of a vibrant open source ecosystem.

- **ZenDiS and the openDesk Initiative:** The German government's Ministry of the Interior and Community has established the Center for Digital Sovereignty (ZenDiS) to develop and promote open source solutions for public administration. A key initiative of ZenDiS is openDesk, an integrated suite of open source enterprise tools that includes groupware, project management, file sharing, and communication tools. The goal of openDesk is to provide a viable and competitive open source alternative to proprietary software suites, thereby reducing vendor lock-in and enhancing the digital sovereignty of the German public sector [5].
- **The Sovereign Tech Fund:** Germany’s Sovereign Tech Fund, launched in 2022, received €11.5M (2023) and €17M (2024), and had invested ~€23.5M by late 2024 in critical open source projects that form the backbone of the digital economy. The fund's mission is to strengthen the open source ecosystem and to ensure the long-term sustainability of key open source projects. The Sovereign Tech Fund is a powerful example of how governments can play a proactive role in supporting the open source commons [6].
- **Legal and Policy Framework:** The German federal government has passed a legal amendment that favors the use of open source software in public procurement. This, combined with a multi-year strategy for digital transformation, provides a strong policy framework for the adoption of open source across the German public sector.

France: A Commitment to Digital Commons

France has a long and proud history of supporting open source software, which it views as a key component of its commitment to building a "digital commons." The French government has established a comprehensive policy and institutional framework to promote the use of open source in the public sector.

- **DINUM and Etalab:** The Interministerial Directorate for Digital Services (DINUM) is the main coordinator of open source efforts in the French public administration. Within DINUM, the Etalab unit is responsible for leading the implementation of the government's open source strategy. This centralized approach ensures a coordinated and coherent approach to open source adoption across all government ministries [7].
- **The "Open by Default" Principle:** The 2016 Digital Republic Bill established the principle of "open by default" for public data, which has been a major driver of open source adoption in the French public sector. This principle has evolved toward the publishing of all publicly funded software as open source, with ministries encouraged to release the source code of custom-developed software unless there is a national security exception. The bill also enshrined the principles of net neutrality and data portability into French law.
- **The SILL Repository:** The French government maintains the SILL (Socle Interministériel de Logiciels Libres), a repository of recommended open source software for the public sector. The SILL provides a curated list of high-quality open source solutions that have been vetted for use in government, making it easier for public sector organizations to adopt open source with confidence.

India: A Story of Large-Scale Savings and Adoption

India has emerged as a global leader in the adoption of open source software, particularly in the public sector. The Indian government has recognized the immense potential of open source to reduce costs, promote local innovation, and bridge the digital divide.

- **Kerala State Government:** The state of Kerala has achieved remarkable success in its migration to open source software in the education sector. By replacing proprietary software with open source alternatives across 16k+ schools in public schools, the state government has saved an estimated $360-430 million [8].
- **Public Sector Undertakings:** Major public sector undertakings like the Life Insurance Corporation (LIC) and New India Assurance have also achieved significant cost savings by migrating their IT infrastructure to open source. LIC, for example, saved an estimated $8.75 million by replacing its proprietary software with open source alternatives [8].
- **National Potential:** A study by the Indian Institute of Management Bangalore estimated that India could save Rs. 10,000 crore ($1.8 billion) by replacing just 50% of its proprietary software with open source alternatives [8]. This highlights the enormous economic potential of open source for a country of India's scale.

Brazil: A Pioneer in Public Sector Open Source

Brazil has been a pioneer in the adoption of open source software in the public sector, with a long history of government support for open source initiatives. The Brazilian government has recognized the potential of open source to promote digital inclusion, foster a local IT market, and reduce its dependence on foreign technology vendors.

- **High Adoption Rates:** A recent 2024 study by the Brazilian Internet Steering Committee found that 93% of federal government organizations and 78% of state-level government bodies use open source software [9]. This makes Brazil one of the leading adopters of open source in the public sector globally.
- **Legal Framework in Rio de Janeiro:** The state of Rio de Janeiro has passed a law that mandates the use of open document formats (ODF) in all public entities. This has helped to promote the use of open source office suites and to reduce the state's reliance on proprietary document formats [10].
- **Economic Benefits:** The adoption of open source has helped to foster the growth of a local IT market in Brazil, with a growing number of companies providing open source support and services. It has also helped to reduce the country's trade deficit in software and to enhance its digital sovereignty.

These case studies demonstrate the diverse and compelling benefits of a strategic approach to open source adoption. For Jordan, they provide a set of valuable lessons and a source of inspiration as it embarks on its own open source journey.

4. The Jordanian Context: A Nation on the Brink of Digital Transformation

Jordan is at a pivotal moment in its history. With a young, tech-savvy population, a dynamic startup ecosystem, and a government that is committed to digital transformation, the kingdom is well-positioned to become a regional leader in the digital economy. The strategic adoption of open source technologies will be a critical enabler of this transformation, providing a powerful set of tools to accelerate innovation, foster local talent, and build a more digitally sovereign future.

The National Digital Transformation Strategy

The Jordanian government has already taken the first crucial steps towards embracing open source. Jordan's Digital Transformation Strategy encourages use of open-source solutions and open standards (e.g., JAAP Open APIs Policy) [11]. This is a landmark policy, eventhough not embraced, provides a strong foundation for the widespread adoption of open source across the public sector.

The strategy also highlights the success of the SANAD portal, a digital government services platform that is built entirely on open-source components [12]. SANAD is a powerful testament to the viability and cost-effectiveness of open source for building modern, citizen-centric government services. The "Jordan as a Platform" (JAAP) initiative, with its Open APIs policy, further reinforces the government's commitment to open standards and interoperability, which are core principles of the open source movement [11].

The Role of the Jordan Open Source Association (JOSA)

Jordan is fortunate to have a vibrant and active open source community, led by the Jordan Open Source Association (JOSA). JOSA is a non-profit organization dedicated to promoting openness in technology and defending the rights of technology users in Jordan. With its focus on open source software, hardware, open internet, and open government, JOSA is a key partner for the government in its efforts to promote the adoption of open source [13].

JOSA's work in advocating for open source, supporting the local developer community, and providing policy advice to the government is invaluable. The organization's endorsement of the National Digital Transformation Strategy and its recognition of open source as a key digital transformation technology is a strong signal of the alignment between the government's vision and the aspirations of the local open source community.

Opportunities and Challenges

Jordan has a unique set of opportunities and challenges as it embarks on its open source journey.

Opportunities:

- **A Youthful, Tech-Savvy Population:** Jordan has one of the youngest populations in the world, with a high level of digital literacy. This provides a large and eager talent pool for the development of a vibrant open source ecosystem.
- **A Clear Government Mandate:** The National Digital Transformation Strategy provides a clear and unambiguous mandate for the adoption of open source in the public sector. This provides a strong policy foundation for driving change.
- **A Vibrant Startup Ecosystem:** Jordan has a thriving startup scene, with a growing number of innovative companies that are already leveraging open source to build their products and services. This provides a strong base for the development of a local open source economy.

Challenges:

- **Skills Gaps:** While Jordan has a large pool of young talent, there is a need to develop more specialized skills in open source development, administration, and security. A concerted effort will be needed to upskill the local workforce to meet the demands of a growing open source economy.
- **Bureaucratic Hurdles:** As with any major transformation, there will be bureaucratic hurdles to overcome. A streamlined and efficient procurement process, with clear guidelines for evaluating and preferring open source solutions, will be needed to facilitate the adoption in the public sector and reduce delays.
- **Budget Limitations:** While open source can deliver significant cost savings in the long run, there may be upfront costs associated with migration, training, and support. A clear and sustainable funding model will be needed to support the transition to open source.
- **Security Concerns:** As with any software, there are security considerations to be taken into account when using open source. A robust security framework will be needed to ensure that open source software is deployed securely in the public sector.

By addressing these challenges head-on and by capitalizing on its unique set of opportunities, Jordan can unlock the full potential of open source to drive its digital transformation.

5. Detailed Recommendations for Jordan

To fully harness the transformative power of open source, Jordan needs to move beyond ad-hoc adoption and implement a comprehensive and strategic national open source program. This section outlines a set of detailed recommendations, covering policy and governance, economic and private sector development, and education and skills development. It also proposes a phased implementation roadmap to guide the process.

Policy and Governance

1. **Establish a National Open Source Program Office (OSPO):** The single most important step that Jordan can take to accelerate its open source journey is to establish a national OSPO within the Ministry of Digital Economy and Entrepreneurship. This office would serve as the central coordinating body for all open source activities in the public sector, providing policy guidance, technical expertise, and community engagement. The OSPO would be responsible for:
    - Developing and maintaining a national open source policy.
    - Managing a national repository of recommended open source software (a Jordanian SILL) and ensuring that code and components are reused and shared between entities
    - Providing training and support to government agencies on adopting and developing open source solutions .
    - Collecting and publishing metrics on adoption and cost savings to track progress.
    - Engaging with the local and international open source communities.
    - Maintain a list of vetted OSS developers and providers

2. **Develop a Comprehensive National Open Source Policy:** Building on the existing mandate in the National Digital Transformation Strategy, Jordan should develop a comprehensive national open source policy that provides clear and detailed guidance on the procurement, use, and development of open source software in the public sector. The policy should:
    - Mandate the use of open source software wherever feasible and consider and prefer open source in government procurements.
    - Require that all new software developed by or for the government be released under an open source license.
    - Establish a clear framework for managing open source licenses and security, and for contributing back to open source projects.

3. **Mandate the Use of Open Standards and Open Document Formats:** To ensure interoperability and to avoid vendor lock-in, the Jordanian government should mandate the use of open standards and open document formats (ODF) across all government entities. This would ensure that citizens and businesses can access government services and information without being forced to use a particular proprietary software.

4. **Implement Open Cloud and Cloud-Native Infrastructure**: Actively deploy open cloud and cloud-native open source technologies across government systems to ensure data residency, reduce vendor lock-in, and build sovereign digital infrastructure that supports both public services and private-sector innovation.

Economic and Private Sector Development

1. **Create a "Jordanian Sovereign Tech Fund":** Following the successful model of Germany, Jordan should create its own sovereign tech fund to invest in local open source projects and startups. This fund would provide a vital source of early-stage funding for innovative open source companies and support for locally developed open source projects and widely used components, helping to build a vibrant and self-sustaining open source economy in Jordan.

2. **Launch a National Program to Support Private Sector Migration to Open Source:** The government should launch a national program to support private sector companies, particularly small and medium-sized enterprises (SMEs), in their migration to open source solutions. This program could include financial incentives, technical assistance, and training programs.

3. **Foster Public-Private Partnerships:** The government should actively foster public-private partnerships to ensure a domestic supply of open source solutions. This could include partnerships with local IT companies to provide support for open source software in the public sector, or partnerships with international open source foundations to share their expertise and to co-invest and build capacity in Jordan.

Education and Skills Development

1. **Integrate Open Source into the National Education Curriculum:** To build a sustainable open source ecosystem, Jordan needs to cultivate a new generation of open source developers and contributors. The government should work with the Ministry of Education to integrate open source software and principles into the national education curriculum at all levels, from primary school to university.

2. **Launch a National Upskilling Program:** The government should launch a national upskilling program to train the existing workforce in open source development, administration, and security. This program could be delivered in partnership with universities, vocational training centers, and private sector training providers.

3. **Partner with Universities and Vocational Training Centers:** The government should partner with universities and vocational training centers to create specialized open source programs and certificates. This would help to create a pipeline of highly skilled open source professionals to meet the demands of a growing open source economy.

Implementation Roadmap

A phased approach to implementation will be critical to the success of Jordan's national open source program.

- **Phase 1 (1-2 years): Foundational Setup:** The focus of the first phase should be on establishing the foundational elements of the program. This includes establishing the national OSPO, drafting the national open source policy and its legal enablement framework, and launching a set of pilot projects to demonstrate the benefits of open source in the public sector.
- **Phase 2 (3-5 years): Scaling and Expansion:** In the second phase, the focus should be on scaling up the program and expanding its reach. This includes launching the Jordanian Sovereign Tech Fund, rolling out the national program to support private sector migration, and expanding the integration of open source into the education system, and mainstreaming open standards and infrastructure practices across government.
- **Phase 3 (5+ years): Maturity and Leadership:** In the third phase, the focus should be on achieving maturity and establishing Jordan as a regional leader in open source innovation. This includes fostering a self-sustaining open source ecosystem, exporting open source products and services, and playing a leading role in the global open source community.

6. Conclusion

The adoption of open source technology is not a matter of if, but when and how. For Jordan, the time to act is now. By embracing open source with a clear and strategic vision, Jordan can unlock a new wave of innovation, economic growth, and digital sovereignty. The recommendations outlined in this paper provide a comprehensive roadmap for this journey. From establishing a national OSPO to investing in local talent and fostering a vibrant open source ecosystem, the path forward is clear.

The journey will require a concerted effort from all stakeholders – from government and industry to academia and civil society. But the rewards will be immense. A Jordan that is powered by open source will be a more innovative, more competitive, and more prosperous Jordan. It will be a Jordan that is not just a consumer of technology, but a creator and a contributor to the global digital commons. It will be a Jordan that is truly in control of its digital destiny.

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8. Biography

Founded in 2000, intaj is a membership-based ICT & Digital industry advocacy, support and networking association. intaj serves as the collective voice of the industry, advocating on behalf of stakeholders and seeking to maximize the contribution of the ICT sector towards the national economy..

Our Vision

Inspire innovation, collaboration, and digital excellence transforming and shaping Jordan's sustainable digital future

Our Mission

Drive the growth of Jordan's digital economy through policy advocacy, ecosystem connectivity, a strong pipeline of highly skilled and innovative talent, and empowering businesses of all sizes to compete locally, regionally, and globally.

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The Jordan Open Source Association (JOSA), founded in 2011, is a non-profit organization that advocates for openness in technology and defends the rights of technology users in Jordan. JOSA works to maximize the impact of local open technologies, leverage innovative open source tools for social impact, and support a safe and open tech ecosystem through research, advocacy, capacity building, and policy engagement.

Our Vision

A technologically open and capable Jordan.

Our Mission

To promote openness in technology and defend the rights of technology users in Jordan.

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