

A Review of Open Source Software Implementations in the Public Sector

Ali Badrawi

Department of Management, Strategy and Entrepreneurship
School of Business Administration, AUS
Sharjah, United Arab Emirates
b00083651@alumni.aus.edu

Hameed Al Hilo

Department of International Studies
College of Arts and Sciences, AUS
Sharjah, United Arab Emirates
b00085619@alumni.aus.edu

Abstract—Issues related to digital transformation, such as concerns about digital sovereignty, have perplexed private and public sector players. Addressing these concerns requires careful consideration and a multi-disciplinary approach incorporating legal, managerial, and technical expertise. Increased interest in open-source software has raised the question of the usefulness of open software and standards in addressing these concerns. This paper explores the benefits, existing policies, implementations, and case studies of using open-source software in public sectors to uncover useful insights, practices, and worldwide trends that public policy makers should take into consideration. This paper provides a starting point for further research on the usefulness and use cases of open-source software and standards in the United Arab Emirates from a policy point of view.

Keywords—*Digital Sovereignty; Open Source; Policy; Public Sector; Software*

I. INTRODUCTION

Open-source software (OSS) can be defined as software with publicly available source code allowing anyone to view it and modify it. OSS today represents a larger portion of our digital ecosystem's critical backbone compared to previous decades [1]. In recent years, more discussions on the usefulness and benefits associated with investing in OSS have begun to surface. A study from the European Union (EU) noted that OSS contributed to significant increases in GDP [2]. OSS has the potential to present solutions to public sector entities that are lower-cost, vendor independent, and privacy-enhancing [3]. This work aims to explore use cases of OSS in the public sector and previous attempts of implementing OSS within.

II. BENEFITS OF OPEN SOURCE

OSS presents many benefits when compared to proprietary solutions. The literature discusses benefits include but are not limited to cost savings for users & developers of software, customizability, privacy & security, and reliability [3], [4].

III. FACTORS OF SUCCESS

Certain factors have been identified from previous experiments in adopting OSS for the public sector as key factors that lead to either success or failure. Curiously, the identified factors of success – which include, among others, customization, reliability, security, reductions of costs and fees,

openness and transparency, and dedicated industry growth [5], [6], [7] – were inherent benefits of the software itself, while identified factors of failure – which included lack of support, lack of familiarity, and the time and cost of training [5] – were more related to lacking technical and support infrastructures. Thus, the factors of failure could be overcome with time and development, thus reducing costs and allowing for fuller enjoyment of the benefits of OSS.

IV. OSS GOVERNMENT POLICY

In 2006, South Africa introduced policy to promote the adoption of free and open-source software. The policy however was eventually abandoned in 2015 due to cost [6]. In 2023, an amendment to the Germany's Online Access Act was introduced requiring the prioritization of open-source solutions and standards in IT solutions [7]. In the same year, Switzerland enacted a new law that mandates disclosure of source code of software developed internally or externally by/for the public sector [8]. In 2021, President Biden introduced an executive order requiring the use of a Software Bill of Materials when procuring software solutions for use in the federal government promoting transparency and OSS (indirectly) [9].

V. IMPLEMENTATION CASES OF OSS

The German state of Schleswig-Holstein has transitioned to using Linux and LibreOffice following a successful pilot project [10]. Also from Germany, Munich began, in 2003, carrying out plans to migrate towards Linux in a project titled "LiMux." By 2013, 15,000 computers had migrated over to Linux. The project was however abandoned in 2017 but restarted in 2020 by newly elected officials in the city [11].

VI. DISCUSSION

The UAE can study previous examples of adopting OSS for the public sector and develop new policy based on a calculated study of benefits and factors for success and failure. The UAE is a dynamic country which can easily begin the process of establishing technical and support infrastructure for adopting OSS, which has the potential to reduce/eliminate costs, increase efficiency, and maintain digital sovereignty and security.

VII. CONCLUSION AND RECOMMENDATIONS

Global trends towards digital sovereignty and heightened awareness of risks associated with digitalization have contributed to the adoption – full or partial – of OSS. This work presents a starting point for researchers and policy makers in the United Arab Emirates to explore where OSS and standards can be utilized to support the country’s development and utilized to reduce government bureaucracy.

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