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Open Source Software Adoption in the Financial Services Industry:
Exploratory Evidence From South Africa

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ABSTRACT

Although OSS has gained traction across industries worldwide, few studies have been reported on OSS adoption in the financial industry and even less in the context of developing countries. This paper presents an exploratory overview of the state of OSS adoption in the financial industry using the case of South Africa as a country with the largest and most developed financial sector in Africa. To achieve this, we conducted a qualitative study that leveraged the Technology-Organisation-Environme nt (TOE) framework, and the Diffusion of Innovation (DOI) theory as theoretical references and used thematic analysis to analyse the data collected from a focus group discussion (FGD) of eight experts from four financial services organisations based in South Africa. The study's findings reveal the state of practice of OSS and the technological, organisational, and environmental factors that affect OSS adoption, and diffusion in financial services organisations in South Africa. We also identified seven research themes that should gain the attention of researchers from now on.

KEYWORDS

Diffusion of Innovation (DOI) Theory, Financial Services Sector, Focus Group, Open Source Software, Technolog y-Organisation-Environment (TOE) Framework

INTRODUCTION

During the last 20 years, open source software (OSS) became mainstream across all sectors of the software industry (Blind et al., 2021). Many of the more recent breakthroughs (e.g., cloud computing, big data, machine learning, "internet of things," and streaming analytics) have their roots in open source. Companies renowned for building and selling proprietary software have seen the benefits of open source in the creation of their products as evidenced by IBM buying RedHat and Microsoft's purchase of GitHub, the world's largest host of open source software repositories (The Linux Foundation, 2020).

In general, the term OSS is applied to innovations that are jointly developed by different contributors and the output of OSS, like source code, can be included in products that are sold. In general, no royalty fees are paid to contributors and, again, in general there are no significant

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restrictions on how these outputs are used. Additions to the OSS may also need to be provided on an open source basis (Blind et al., 2021).

Open source has a significant impact on the economy. In 2018 the European Union (EU) invested approximately 1 billion euros, with an impact of between 65 and 95 billion euros. The cost-benefit ratio of using OSS is above 1:4, and it is expected that an increase of 10% in OSS contributions would generate an increase in EU gross domestic product of between 0.4 and 0.6% and create more than 600 additional start-ups. If the public sector procures OSS, the total cost of ownership will be reduced, vendor lock-in will be avoided, and digital autonomy within countries can be increased (Blind et al., 2021).

In much of the contemporary discussion on sustainable development, attention is given to climate change, ecological ecosystems, biodiversity, and reducing hunger and poverty. In contrast, it is also obvious that many of our activities are dependent and supported by an array of technologies, both hardware and software. If technologies are to support sustainable development goals, these technologies must be responsive to the needs of a majority of the world's population who live in developing countries. OSS can play an important role here as it is less restrictive and encourages broader public participation in decision making (United Nations, 2012).

A very nascent development that has its origin in open source development is open source theory. In this view open source is a stance, movement, process, perspective, and social phenomenon that has implications in sociocognitive theory. Open source theory has its focus more on the ways humans process, reconfigure, and use information in problem-solving activities, both individually and as a community. Open source theory emphasizes the importance of sharing information early and often and inviting contributors to be coowners in what they create. This has impacts on our being and operating in the world in general (Glassman, 2013).

OSS is important to economic growth, sustainability, and even the way we work. In the next section we present both a background on OSS in the financial services and banking globally and the motivation for our study.

OSS in Financial Services and Banking

Many industry surveys and studies note the increased prevalence, importance, and value of open source. The financial services industry has been a long-time consumer of open source software, but it has not been at the core of financial service industry business models or strategies (Ellison et al., 2021). The financial services industry has used open source for many years in infrastructure but less so in application development.

The largest quantitative survey on OSS in financial services was conducted by the Fintech Open Source Foundation (FINOS) and their research partners (Ellison et al., 2021). Subsequent sections show that, outside of FINOS, very little academic research has been done on open source and financial services with even less research on OSS and financial services in South Africa.

FINOS reports that 60% of financial respondents indicate that the economic motivation for open source is "efficiency" and "shared innovation"; 81% either agree or strongly agree that "innovation" is why their company participates in open source with "time to market" and "total cost of ownership" following closely with over 80% indicating this as a reason. These numbers show the major value that open source delivers in the competitive financial services domain (Ellison et al., 2021).

There are different ways of engaging with open source: consuming open source, contributing to open source, and publishing internal projects as open source software. Consuming open source is the most obvious way for organizations to get value from open source. Consumption in this sense means not only including open source components and libraries in bespoke applications but also using open source applications internally in infrastructure, like routers, servers, and personal computers, and deploying and migrating cloud native applications to public cloud infrastructure that are built on open source. If users can get the job done with open source software, the benefits are clear, as they can save on licensing costs and consulting fees.