

## ABSTRACT

**Introduction:** The digitisation of the health sector in Sri Lanka has been progressing at a steady rate for the last couple of years. The introduction of graduates in MSc in Biomedical Informatics as Medical Officers of Health Informatics to the Sri Lankan health sector resulted in the expedition of this process, with them being pioneers in new implementations. Considering the resource-constrained environment, most of these implementations were based on Free and Open Source Software (FOSS). However, some of these projects had to struggle to expand beyond their successful initial phases with time. Many factors were considered to be responsible for this. This study aimed to identify these barriers and develop a governance framework for acquiring Free and Open Source Software for the health information system development in Sri Lanka.

**Methods:** Considering the reality is ambiguous, and the knowledge is derived through facts in this study, the research followed the “pragmatist research philosophy”, where the mixed methodology was used for data gathering. The research was carried out in five phases. A quantitative study was done using self-administered questionnaires among stakeholders for health information system implementation in the state health sector to access the personal factors influencing FOSS acquisition. In the second phase, the organisational readiness for FOSS acquisition was accessed by conducting four focus group discussions and three semi-structured in-depth interviews covering both preventive and curative sectors. The third phase was to develop a governance framework using the phase one and two research findings and the literature findings. In phase four, a real-life case scenario was used to refine the governance framework. In phase five, in-depth interviews were carried out among identified key informant interviewees to refine the governance framework.

**Results:** The quantitative study done in phase one identified the significant contribution of graduates in MSc Biomedical Informatics to the decision making on health information system implementation. However, their knowledge of 2<sup>nd</sup> generation FOSS and FOSS licensing and legal aspects were unsatisfactory. The thematic analysis of the qualitative study in phase two identified 143 secondary codes, which were categorised into 31 organising themes and nine major themes. The inadequacy of technical staff, limited financial support for FOSS acquisition, procurement process difficulties, lack of government policy decisions

for FOSS acquisition and negative stakeholder perceptions of FOSS acquisition were highlighted. Together with literature findings, these findings were used for the governance framework development. The governance framework identified five principal components that need to be strengthened to facilitate a FOSS acquisition for health information system development, including financial governance, security governance, technology governance, organisational governance, and policy governance. The governance framework also consisted of a governance mechanism to ensure the source code level governance of the FOSS product. Applying the framework to a real-life case scenario brought out the advantages of using the framework. The in-depth interviews conducted to refine the framework identified seven secondary codes leading to one major theme, resulting in minor modifications to the framework.

**Discussion and Conclusions:** The research found that the knowledge among the technical experts on FOSS products is not satisfactory, especially concerning its latest advancements and legal aspect, and the organisational factors do not accommodate a FOSS product to function in its full capacity and to sustain for longer. The government policies, including procurement procedures, do not cater to FOSS products, leading to FOSS implementations that do not follow a proper acquisition pathway. This can lead an organisation to be liable for licensing term violations unintentionally. The government framework will ensure the procurement process for commercial FOSS products and will address the issues related to all FOSS acquisitions, provided multi-sectoral support is obtained for its proper implementation.

**Keywords:** Free and Open Source Software (FOSS), Governance framework, Health Information System acquisition