

## Editorial Preface

# Special Issue on Prospects of Free and Open Source Software in Digital Revolution

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The World relies more on software today than before, as the World is becoming increasingly digital. There are dizzying arrays of electronic gadgets and integrated platforms for our daily life activities. For the smooth functioning of these gadgets, there are lots of device drivers, mostly free software readily available for download from the Internet. Free and Open Source Software (FOSS) differs from proprietary software as FOSS facilitates various applications as per the user's requirement. Since the practice followed by the FOSS community is different from the traditional software development, there may be some difficulty in understanding them. The results pertaining to FOSS from labs can demonstrate the benefits of research on FOSS. These studies will help to improve the knowledge regarding developing software and enable us to meet our professional obligations of delivering good quality software timely for meeting the users' requirements.

This special issue of four papers will deliberate upon some aspects of software engineering with a focus on open source software.

### INSIDE THIS ISSUE

The first article of this issue focuses on the prospects of open source software for maximizing the user expectations in heterogeneous network. The open source software tool Python is used in this research work for implementing machine learning technique for the categorization of the type of user in a Heterogeneous Network (HN).

Detection of fault prone classes helps software testers to generate effective class level test cases. A novel technique has been presented in the 2<sup>nd</sup> article of this SI for optimization of test cases. The findings of this research paper indicate that, the proposed methodology is effective and efficient as the average fault exposition potential of generated test cases is 90.16% and test cases execution time saving was found to be 45.11%.

Web based applications are mostly based on a client-server architecture. The 3<sup>rd</sup> article is an analytical study of FOSS products used in web-based client server architecture. This article provides information about the FOSS product such as FireFox (web browser), Apache (web server) and MySQL (RDBMS). This study reveals that FOSS products Apache server covers 65% of the market share while MySQL covers 58.7% market share.

Finally, the 4<sup>th</sup> article deliberates upon the minimization of energy consumption along with development and deployment of applications for smartphones. This article proposes a rule-engine driven framework for estimating the energy consumption of an Android application, using program analysis of the source code. The basis of this framework is to provide the developer with a notion of

which part of the application source code consumes considerable energy, and what alternatives could be used to replace it without changing its core functionality. It presents metrics at the overall, event, and source code level, allowing software application developers to optimize their applications early in the software development cycle.

## CONCLUSION

Ease of maintenance and cost savings are the factors for adoption of open source software. In this special issue the authors focused on free software tool Python and Weka. The free software product Apache server covers 65% of the market share, while MySQL covers 58.7% market share for web-based applications.

Software as a Service (SaaS) is a cloud-based delivery model where users access software and data through a web interface. SaaS and other computing technologies are the options for utilization of FOSS. Along with the exponential deployment of a cloud by various organizations, the adoption of open source software is also proportionally increasing. As of now, more than 270 organizations have contributed to the growth of Hyperledgers' open source distributed cloud-based ledger frameworks and tools, developed by The Linux Foundation for the implementation of Blockchain technology.

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