
Editorial

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Biographical notes: Lorna Uden is Professor Emeritus of IT Systems in the Faculty of Computing, Engineering and Technology at Staffordshire University. Her research interests include technology learning, HCI, big data, mobile learning, activity theory, knowledge management, web engineering, multimedia, e-business, service science and innovation, semantic web, software as a service (SaaS), internet of things and problem-based learning.

This issue consists of five papers. The first paper is, 'Impact of traffic distribution on web cache performance', by Manuel Gómez Zotano, Jorge Gómez-Sanz and Juan Pavón. These authors argued that understanding the expected behaviour of cache policies is especially important for achieving good quality of service. According to these authors, existing works have suggested that the behaviour of the web demand can be modelled as a Zipf distribution with $\alpha \leq 1$. Their work suggested that today websites are following Zipf distributions with $\alpha > 1$.

This paper analyses real logs obtained from the client layer of high traffic websites. The main result of this article is that under these conditions, the cache hit ratio can be extremely high with a very small cache size. This means that a very expensive and high resource demanding cache is not needed for effective implementation: a cache size equal to 0.6% of the working set is enough to reach more than 80% of hit ratio, once the right replacement policy has been chosen. Understanding the behaviour of this kind of content would be interesting for future usage in coherence and consistency policies.

The second paper is, 'Combining MDE and Scrum on the rapid prototyping of web information systems', by Fábio Paulo Basso, Raquel Mainardi Pillat, Fabricia Roos-Frantz and Rafael Z. Frantz. This paper presents a rapid application prototyping (RAP) methodology based on MDE especially designed for use in agile software projects. These authors argue that their proposal enables the use of MDE techniques in Scrum-based software projects. By using their tool, a software designer can quickly design and validate application prototypes. This paper also reports a case study using their proposal.

Fábio Paulo Basso, Raquel Mainardi Pillat, Fabricia Roos-Frantz and Rafael Z. Frantz further argue that: the RAP methodology and the MockupToME tool can be used in a Scrum-based software project with short iterations; rapid prototyping helps to speed-up the design of models (annotated mockups), allowing quick feedback from clients in iterations of one week; the proposed approach can be used by non-experts in MDE and MVC and that a MDE promise is to increase the productivity in the future reuse of

designed models. Further research is needed in order to better comprehend benefits and drawbacks of the combined use of MDE and Scrum.

The third paper is, ‘A linear logic approach to the composition of RESTful web services’, by Xia Zhao, Enjie Liu, Hong Qing Yu and Gordon J. Clapworthy. These authors argue that the rising number of services being implemented and made available on the web is creating a demand for modelling techniques that can abstract REST design from the implementation in order to better specify, analyse and implement large-scale RESTful web systems. This paper introduces a formal model of RESTful web services in linear logic and proposes a formal method approach for RESTful web service composition based on planning using linear logic via theorem proving. This is a two-stage planning method that finds resources for the composition at both the abstract resource and the service operation levels. It greatly improves the searching efficiency and guarantees the correctness and completeness of the service composition process. The paper demonstrates a further validation of the planning method through its implementation in the interactive Coq logic proof assistant.

The authors argue that the approach has demonstrated that planning based on linear logic theorem proving is a sound and efficient approach for achieving RESTful web service composition. They further argue that although the method is focused on modelling and planning RESTful web service composition, it can be adapted to general RESTful web systems (i.e., those with human users as clients). Further research will need to verify this.

The fourth paper is, ‘Improved strategies and adaptive capability allocation algorithm for query result caching’, by Libing Qian, Zhenzhou Ji and Jun Bai. According to these authors, Query result caching has attracted overwhelming attention in recent years to enhance the performance of search engines. In their paper, the authors present approaches to improve cost-aware strategies for static and dynamic caching, and further propose an adaptive capability allocation algorithm for hybrid caching. More precisely, they introduce a query repeated distance factor to improve the classical static result caching. This paper describes caching based on the query popularity. The authors have designed a novel mechanism to further improve the dynamic policies. By designing a Queue-Hash cache internal structure, the adaptive capability allocation algorithm is employed to adjust the cache capability to further improve the efficiency in a hybrid cache combining static and dynamic caching policies. The experimental results demonstrate that the improved approaches can increase the overall system performance, particularly in terms of the average processing time.

However, the approach has several limitations. First, the authors only compared several classic caching policies and did not investigate caching requirements, which may differ for various types of queries. Second, the users’ request is driven by a software program, which is somewhat different from the actual online user access. Third, the improved policies have not been evaluated with various cache architectures that include several other mechanisms, e.g., list cache, interaction cache and document cache. Further research has to be carried out to address these issues.

The last paper is, ‘An approach to trading valuable points in a virtual wealth exchange model for closed virtual communities’, by Wei-Chih Hsu, Pao-Yao Wang and Chuan-Wen Chiang. These authors argue that for community operators, one major problem is increasing users’ economic activity in virtual worlds. In their paper, they propose a virtual wallet concept to resolve the model’s quantity deficit.

The paper provides two implementations as reference designs; one is a regular virtual community and another is a lean virtual community. Not only did they develop the software design and implement the three processes of wallet operations on both types of virtual community, but also extended trade service from the web to be a RESTful API for wallet-selling automation. Along with proving the usability of the approach proposed by the article, these authors argue that these implementations would be good examples for designing new virtual communities or migrating from old ones. However, there is no evaluation of the use of the approach. This must be carried out to verify its effectiveness.