
Editorial

Lorna Uden*

School of Computing,
Faculty of Computing and Digital Technologies,
Staffordshire University,
Mellor Building, College Road,
Stoke-on-Trent, ST4 2DE, UK
Email: L.uden@staffs.ac.uk
*Corresponding author

Iraklis Varlamis

Department of Informatics and Telematics,
Harokopio University of Athens,
Athens, Greece
Email: varlamis@hua.gr

Biographical notes: Lorna Uden is a Professor Emeritus of IT Systems in the Faculty of Computing, Engineering and Technology at the Staffordshire University. Her research interests include technology learning, HCI, activity theory, big data, knowledge management, web engineering, multimedia, artificial intelligence, e-business, service science and innovation, mobile computing, cloud computing, neuroscience, social media, intelligent transport systems, internet of things and problem-based learning.

Iraklis Varlamis is a Professor in Data Management. He holds a PhD from the Athens University of Economics and Business, Greece, and an MSc in Information Systems Engineering from the UMIST UK. His research interests vary from data mining and the use of semantics in web mining to social network analytics and knowledge extraction from social media and the news. He is collaborating with several start-ups, companies, and government bodies as a technology mentor. He is the scientific coordinator in several H2020 projects.

Welcome to Vol. 18, No. 4, issue of *IJWET*. This issue consists of four articles that delve into the intricacies of modern cloud-based systems and web engineering. From an exploration of load balancing challenges in container microservice cloud-based systems to an insightful analysis of the value dimensions inherent in digital applications like voice assistants (VAs), these articles encapsulate the forefront of technological inquiry. Additionally, the current issue delves into the domain of temporal RDF datasets, with emphasis on enhanced SPARQL query responses alongside their temporal validity intervals and presents a bi-LSTM-AMSM model, a fusion of bidirectional long short-term memory (bi-LSTM) network, attention mechanism, and semantic mining, designed to revolutionise e-commerce web page recommendation systems.

The first article by Shamsuddeen Rabi, Chan Huah Yong and Sharifah Mashita Syed-Mohamad delves into the pivotal aspects of load balancing and

auto-scaling within cloud-based container microservices. The thorough literature review highlights the dearth of concurrent solutions addressing these interconnected functionalities, emphasising their significance in optimising system performance and addressing critical issues like server overloads and service failures during microservices' communication phases. The article proposes an integrated approach that evaluates system performance based on metrics like availability, reliability, and cost and aims to guide advancements in the field. It examines existing techniques, tools, parameters, and QoS metrics while outlining future avenues for incorporating hybrid functionalities into real-time environments. Overall, the article offers comprehensive insights and strategies to improve microservice performance and enhance quality of service for users in cloud-based containerised systems.

The second article by Uwe V. Riss, Michael Ziegler and Lindsay J. Smith offers an integrated perspective of activity theory (AT) and service-dominant logic (SDL) to explore the field of customer activity within service ecosystems, particularly in digital applications. It seeks to comprehend how user activities, as defined in AT, can blend into SDL's framework to elucidate the specific value creation by users in digital apps. By synthesising AT and SDL, the study unveils five customer value dimensions – dematerialisation, objectification, institutionalisation, modularisation, and platformisation – showcased through the lens of VAs. This work contributes to understanding customer experience in digital applications, aiming to leverage service dimensions for systematic design of smart service systems. Through a methodical approach involving theory synthesis and empirical investigation, the article aims to bridge gaps between AT and SDL, fostering a more comprehensive theoretical framework for digital applications and services.

The third article by Anastasia Analyti introduces a novel approach to handling temporal RDF datasets and temporal validity SPARQL queries (tv-SPARQL queries) within these datasets. The focus lies in extending RDF graphs with temporal validity intervals to indicate the duration of facts' validity, allowing for a deeper comprehension of temporal RDF graphs. Unlike previous works concentrating solely on expressing temporal SPARQL queries on events, this article emphasises deriving not only the answers of SPARQL 1.1 queries but also their associated temporal validity intervals. By introducing the concept of temporal validity answers for SPARQL queries on temporal RDF datasets, the article presents algorithms ensuring accurate derivation of query answers along with their temporal validity intervals. The article defines the tv-SPARQL language, its semantics rooted in SPARQL 1.1, and provides algorithms ensuring the correctness of answer derivations, displaying the combined complexity of the evaluation algorithm in PSPACE with polynomial data complexity. The comprehensive breakdown in sections elucidates the query computation process, semantic definitions, and algorithmic foundations, offering a robust framework for handling temporal validity in RDF datasets.

The fourth article by Yachao Zhang and Yuxia Yuan introduces an innovative model for e-commerce web page recommendations by combining a bi-LSTM network and an attention mechanism with semantic mining. Traditional recommendation schemes often fall short in meeting user application requirements, prompting the need for advanced methodologies. The proposed model leverages Web logs to extract five crucial features, including content and time consumption priorities, user feedback, recommendation semantics, and input bias, which serve as input for a bi-LSTM network. This network, enhanced by an attention mechanism, enhances classification effectiveness and identifies

the output priority of web pages. The resulting prioritisation facilitates quick and accurate identification of user-desired web pages, as demonstrated in the context of book sales samples. This research contributes a robust approach to improve web page recommendation systems, addressing limitations prevalent in traditional methods and elevating user experience in e-commerce settings.