Editors' Introduction to the Special Issue on "Grid, Cloud and Sky Applications for Knowledge-based Industries and Businesses"

In the past decade, we have witnessed spurt of activity in the area of distributed computing. Several new distributed computing paradigms have emerged that promise to facilitate the delivery of software-based services at unprecedented scale. This includes the emergence of Grid, Cloud, Sky and Fog computing technologies.

These middleware technologies are increasingly used for the development of data and computationally intensive, Web-based applications, involving the use of geographically dispersed resources and potentially huge number of users. With our current experience, it may be forseen that in the future applications will be completely detached from the underlying infrastructures and will be able to elastically scale based on dynamically changing requirements. Middleware solutions facilitating such applications are currently of interest to many knowledge based industries and businesses, active in the areas of engineering, finance, medicine, biology, pharmacy, telecommunications and so on, since they are facing challenging scientific and engineering problems.

Important research and technology development areas at the moment include the investigation of industrial and scientific requirements for distributed computing applications, architectural considerations, the use of the Model Driven Architecture in the software services area, the integration of software services and the Internet of Things, development of new business models for software services, investigation of the possibilities for migration of legacy codes across Cloud and Grid environments, the evolution of standards related to software services and so on.

This Special Issue is based on an open Call for Papers, but, it also includes exended version of selected papers, which were presented at the 4th Workshop on Software Services (WoSS 4) and at the 1st International Conference on CLoud Assisted ServiceS (CLASS 2012) that took place from October 22-25, 2012 in Bled, Slovenia.

The Special Issue contains six papers presenting both application and technology oriented approaches.

The paper of Peter Peer *et al.* presents a Cloud-based fingerprint service which is integrated with the e-learning framework Moodle. The paper discusses the various issues that need to be considered when designing Cloud-based biometric services.

Pawel Czarnul's paper focuses on creation of an effective dynamic ranking service for Infrastructure as a Service, Platform as a Service and Software as a Service providers.

The paper of the authors Ivan Tomašić *et al.* describes the application of Hadoop modules for processing and analyzing large amounts of tabular data acquired from a computer simulation of heat transfer in bio tissues.

The paper of the authors Chengying Mao and Jifu Chen focuses on prediction of the Quality of Service of various software services available over the Internet.

The paper of Ravi Singh Pippal *et al.* deals with the possibility to improve the security aspects when using Cloud services.

The work of the authors Zahra Pooranian *et al.* focusses on optimisation and improvements of a grid scheduling algorithm.

At this point, we would like to thank professor Matjaž Gams for the opportunity to publish this Special Issue, the authors for sharing the results of their research and the members of the WoSS 4 Program Committee: Pawel Czarnul, Janis Grabis, Matjaž B. Jurič, Andras Micsik, Enn Õunapuu, Tomas Pitner for their contribution to the Workshop and for reviewing the papers submitted to this Special Issue.

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