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Collaborative activities support techniques: from business process implementation to dynamic deployment management

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Miriam A. M. Capretz is an Associate Professor and the Associate Chair-Graduate in the Department of Electrical and Computer Engineering at the Western University, Canada. She has been working in the software engineering area for 30 years and has over 140 publications in software engineering. Her current research interests include software evolution, service oriented architecture, ontology and semantic integration, business process management, software security and cloud computing. She has been involved with the organization of several workshops and symposia, has been serving on program committees in several international conferences as well as has been member of editorial boards of international

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Ismael Bouassida Rodriguez received the B.Sc. and M.Sc. degrees in Computer Science from the National School of Computer Sciences of Manouba and his Ph.D. degree from the University of Toulouse and the University of Sfax in 2011. He joined the National School of Engineers in Sfax as an Assistant Professor of Computer Science in 2010. He joined the Higher Institute of Computer Science and Multimedia of Sfax as an Associate Professor in Computer Science in 2012. His current research areas include software engineering of distributed systems, graphs grammars, self-adaptive and pervasive systems, and autonomic middleware.

1 Introduction

This special issue presents an extended version of seven articles selected from WETICE 2012. The extended articles report on research about various topics to support collaborative activities including business process, coordination, information sharing, orchestration, ontologies, decision making and dynamic deployment. The first article, from Pankaj Goyal and Rao Mikkilineni, presents a new approach to implement π -calculus mobility using DIME network architecture; it is shown how process mobility is an inherent capability of DIMEs. The issue of inter-organizational process management in distributed collaborative activities is addressed by the second article from Jörn Franke and François Charoy. In the third article, Rodrigo Bonacin et al. propose a modeling solution for pragmatic aspects of communication acts using SemWeb technologies. The problem of service composition and particularly the automatic transformation from choreography to orchestration is addressed by the fourth article from Sirine Rebai et al. The fifth article from Ghada Gharbi et al. tackles self-configuring and self-adapting information networks using an autonomic architecture based on ontological decision models. A web-based data exploration in spatial decisional processes supported by Spatial Decision Support System (SDSS) is described in the sixth article from Michele Argiolas et al. The last article, from Mohamed Nadhmi Miladi et al., addresses the problem of pervasive systems adaptation of their deployed architecture regarding to continuous changes in everyday user's requirements.

2 Content of the issue

In the first article, *Implementing managed loosely-coupled distributed business processes: a new approach using DIME networks*, Pankaj Goyal and Rao Mikkilineni show a DIME architecture that enables the implementation of mobility; a key capability of the π -calculus. The authors propose the use of DIME FCAPS (fault, configuration, accounting, performance and security) capabilities to support business services management, including fault tolerance, performance and security. The application of this technology to loosely-coupled business process management is an approach to address the dynamicity of relationships between various tasks involved in a process execution.

In the second article, *Coordination of distributed collaborative activities for disaster management*, Jörn Franke and François Charoy introduce an approach for distributed collaboration, vertical and horizontal inter-organizational process management and improved situation awareness in disaster management. The article addresses the problem of inter-organizational process management without prior knowledge of the network structure applied to disaster management. The authors introduce an approach for inter-organizational process management which allows the exchange of information about past, progressing and planned actions. They take into account the detection and handling of conflicts which can occur through sharing of actions. The evaluation of the approach by the help of LEGO® serious play™ experiments proves the usefulness of the collaboration tool.

The third article, *An ontological model for supporting intention-based information sharing on collaborative problem solving*, Rodrigo Bonacin et al. present an ontology model based on the Pragmatics Communication Analysis. Communication acts are classified in the model according to the “illocution” classification according to three dimensions (time, invention and mode). Instances of the model from two real case studies are presented: education professionals share issues arising in daily activities to find solutions. For the case studies, the CactO model specification is given. An experimental evaluation is then presented, by exploring retrieval scenarios to observe producers and consumers of the model in order to provide richer and more precise message classifications. The results show the feasibility of the proposed approach along with new information sharing possibilities brought by the model.

The article written by Sirine Rebai et al., *Towards error-handling-aware choreography to orchestration transformation approach*, presents an approach for transformation from choreography to orchestration that can be automatically done by taking into account the capture of errors and exceptions. The authors classify the possible errors in the automatic generation of orchestrations. Based on this classification, they propose an approach to generate correct transformations.

The article entitled *AODA: an Autonomic and Ontology-Driven Architecture for service oriented and event-driven systems*, written by Ghada Gharbi et al. describes an autonomic architecture based on decision models built using ontology. The goal is self-configuring and self-adapting service oriented and event-driven distributed systems. The smart metering scenario is used as a case study. As a validation, the authors present SWRL rules (Monitor, Analyzer, and Planner and Executor rules). The article describes how semantics is useful to decouple the components of the system to allow interoperability of sensors and actuators with the autonomic engine.

The article *Web 2.0 services for collaborative spatial decision making* written by Michele Argiolas et al. presents a spatial decision support system, which provides support to Web data exploration in spatial decisional processes. The approach exploits GIS available services through the Internet. The article describes the application of the solution through a case study in the real estate domain.

The article written by Mohamed Nadhmi Miladi et al., entitled *Towards an approach for managing dynamic deployment in distributed service oriented architectures* describes the deployment modeling of pervasive services upon a service oriented architecture and their dynamic evolving management through a model driven approach and over the OSGi framework. The article presents the deployment management aspect, i.e. changing the architecture deployment within nodes. The architecture deployment description provides a suitable distributed version of the architecture structure than a traditional configuration

description. The modeling ensures more reliable adaptation to non-functional requirements. The service oriented approach has been considered for building and managing applications.

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