

Guest-Editorial

IT Service Management and Engineering: An Intelligent Decision-Making Support Systems Approach

Manuel Mora^{a,*}, Jorge Marx-Gómez^b, Fen Wang^c and Ovsei Gelman^d

^a*Autonomous University of Aguascalientes, Aguascalientes, Mexico*

^b*University of Oldenburg, Oldenburg, Germany*

^c*Central Washington University, Ellensburg, WA, USA*

^d*CCADET, Universidad Nacional Autónoma de México, Mexico City, Mexico*

Services, which have been defined as “... *the application of competences for the benefit of another, meaning that service is a kind of action, performance, or promise that’s exchanged for value between provider and client*” [12], are becoming a relevant concept in the modern world. The economic perspective shift from product design, product manufacturing, and product distribution to service design, service composition, and service delivering, can be explained from a market focus on delivering guaranteed functionalities of services through the concept of service systems [12].

As foresighted by Quinn [10], the main trading items are now services (financial, educational, health-care, logistic, managerial, energy, informational, entertainment, and so on) as an opposite or complementary concept to products in the modern worldwide economy [2,7]. Thus, nowadays business organizations focus on delivering “*help, utility, experience, information or other intellectual content ... account for more than 70% of total value added in the OECD*” [11].

We believe that such a service-oriented worldview and shift demands new engineering and managerial

scientific (both fundamental and applied) knowledge to cope with the planning, design, building, operation and evaluation (including the disposal of non-adequate) of service systems, particularly of IT service systems [6]. As a result, the existing knowledge on the planning, design, building, operation and evaluation of products must be complemented with a service-oriented view.

In particular, we are interested in supporting the engineering and managerial processes of IT service systems through the specialized tools called intelligent Decision-Making Support Systems (i-DMSS). These systems are specialized IT systems that support some or several phases of the individual, team, organizational or inter-organizational decision making process by deploying some or several intelligent mechanisms [4,9]. Specifically, Artificial Intelligence (AI) has been recognized as a significant enhancement tool for DMSS [3,5] since several decades ago.

However, the utilization of i-DMSS for engineering and management of IT service systems is still scarce. We believe that fostering its research and utilization is relevant and needed for advancing the progress of IT service systems.

In this special issue on “*IT Service Management and Engineering: an Intelligent Decision-making Support Systems Approach*”, we pursue the main objective

*Corresponding author: Manuel Mora, Autonomous University of Aguascalientes, Aguascalientes, Mexico. E-mail: dr.manuel.mora.uaa@gmail.com.

of supporting and advancing the development of constructs, frameworks-models, methods-processes-techniques, tools-instruments, and instantiations of systems and components, for supporting the management and engineering processes in the domain of IT Services Management (ITSM) and Engineering using an intelligent Decision-making Support Systems (i-DMSS) approach.

IT Services are currently engineered and managed using well-known process standards and models such as ITIL v2, ITIL v3, ISO 20000, CMMI-SVC, ITUP or MOF 4.0. There are also many IT tools for such tasks. However, few of them have incorporated intelligent techniques. Consequently, in this special issue, we invite experts in the ITSM and AI international research community to submit high-quality papers for advancing our theoretical and practical knowledge on such ITSM management and engineering activities. Given the novelty of this topic, exploratory and conceptual papers on the requirements for these systems as well as empirical papers providing proof of concept were appropriate to be included in this special issue.

This special issue presents six research papers. Five of them were accepted from the set of submitted papers. The sixth paper is a position paper presented by the guest editors of this special issue.

In the first paper entitled “*Service-oriented Framework for building reusable decision processes – in the domain of ITSM*”, Klaas Schmidt, Timo R. H. von der Dovenmühle at Volkswagen AG, Wolfsburg, Germany, and Jorge Marx Gómez at University of Oldenburg, Oldenburg, Germany, argue that in the service-oriented world, the reusability of processes should be an imperative. In particular, they identify that the current decision-making processes are built and used without such a characteristic. Accordingly, the authors present a service-oriented framework for designing reusable decision processes in general. Specifically, they illustrate how this framework can be used in the domain of ITSM. The authors provide innovative ITSM engineering methods for making decisions through decision processes designed and built using reusable components.

In the second paper entitled “*Consensus Model for Large-Scale Group Decision Support in IT Services Management*”, Ivan Palomares at Jaen University, Spain, reports an attitude-based consensus model for group decision-making applied to the domain of IT-based services management. This model can handle heterogeneous information and multiple criteria. According to the author, engineering and management

processes in ITSM are highly demanding in group decision-making situations. Thus, groups of ITSM engineers and managers must have adequate support for making adequate decisions under consensus. The model presented in this paper helps to address such problems. Hence, this paper contributes with such a model to the managerial group decision-making process required to be used in the ITSM domain and illustrates its application to a real-life problem regarding the selection of strategies for improvement an IT-based banking service.

In the third paper entitled “*Cloud service management decision support: an application of AHP for provider selection of a cloud-based IT service management system*”, Jonas Repschlaeger Thorsten Proehl, and Ruediger Zarnekow at Technische Universitaet Berlin, Germany, explore the applicability of the analytic hierarchy process (AHP) method to support the decisions (evaluation and selection) of cloud-based IT service suppliers. The authors report the relevance and complexity of introducing new technologies, in particular of cloud computing, in the organizations.. There are many technical, economical, and organizational factors to be considered on the available list of cloud computing suppliers, and even more from the customer’s side. Consequently, the authors elaborate an AHP model. It was realized in two steps. In the first step, the AHP model was designed through a thorough review of dimensions to be considered for this selection process in the literature with complementary discussions with cross-sectional business and IT representatives. In the second step, this model was refined with the findings from seven interviews with IT executives. Finally, the authors test the AHP model with a decision-making process realized in an international publishing company. Although this process had already occurred, similar comparative results and improvements with the AHP model were identified. Hence, this article contributes to the joint DMSS and ITSM literature and establishes further research directions to pursue enhancements through intelligent DMSS.

In the fourth paper entitled “*ITIL-Based IT Service Support Process Reengineering*”, Raul Valverde, Raafat George Saade, and Malleswara Talla, at Concordia University, Canada, report a case study of ITSM re-engineering effort conducted in a dental care company that manages 10 clinical units in UK. Based on the findings, the authors identify the need of decisional support and elaborate the case of an intelligent DMSS architecture useful for monitoring ITSM KPIs and supporting re-engineering ITSM decisions.

In the fifth paper entitled “*Intelligent IT Governance Decision-Making Support Framework for a Developing Country’s Public University*”, Yusri Arshad at Universiti Teknikal Malaysia Melaka, and A. R. Ahlan, and B. A. Ajayi at International Islamic University Malaysia, in Malaysia, explore the characteristics of IT Governance mechanisms for being adequately implemented in the context of state higher education in a developing country, and identify the opportunity of intelligent DMSS for supporting such endeavor. The authors argue that DMSS and intelligent DMSS can help to improve the IT Governance mechanisms, but there have been few investigations at present. Consequently, the authors conduct a case study in a higher education institution in Malaysia on IT Governance mechanisms (CobIT model), and based on the findings, jointly with a literature review on this topic, develop a set of recommendations for an intelligent IT Governance DMSS framework.

Finally, this special issue is completed with a position paper elaborated by the guest editors, which was also reviewed for the final acceptance. This paper is entitled “*The Role of Decision-making Support Systems in IT Service Management Processes*”, and the authors are: Manuel Mora at Autonomous University of Aguascalientes, Mexico, Gloria Phillips-Wren at Loyola University, USA, Jorge Marx-Gomez at University of Oldenburg, Germany, Fen Wang at Central Washington University, USA, and Ovsei Gelman at CCADET, Universidad Nacional Autónoma de México, Mexico. In this position paper, the guest editors report the foundations of DMSS and Intelligent DMSS as well as the foundations of ITSM, and illustrate two relevant cases of interaction between the ITSM process decisional situations and the DMSS and intelligent DMSS. In particular, the authors elaborate an exemplary list of plausible decisions found in the five ITIL process categories using the well-recognized ITIL v3 model. The authors argue that while the DMSS and intelligent DMSS technology has been massively available from the 80’s, their utilization in the ITSM domain is scarce. Thus, the guest editors call for further joint research in these two domains.

In conclusion, we believe that these six research articles fit the aims of this special issue either directly or indirectly. We also believe that all of the papers report relevant and rigorous research useful for ITSM and intelligent DMSS research streams and they are worthy to be disseminated in our research communities. Thus, we thank our colleagues who have contributed to the realization of this special issue for the Intelligent Deci-

sion Technology journal by submitting high quality papers, helping with the internal reviews, and improving their accepted papers based on the reviewers’ recommendations. These colleagues represent an adequate international landscape of both well-developed (USA, Germany, Canada) and developing countries (Spain, Mexico, and Malaysia).

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The Guest-editors

Dr. Manuel Mora,
Autonomous University of Aguascalientes, Mexico

Dr. Jorge Marx-Gómez,
University of Oldenburg, Germany

Dr. Fen Wang,
Central Washington University, USA

Dr. Ovsei Gelman,
CCADET, Universidad Nacional Autónoma de
Mexico, Mexico

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