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Enterprise Information Systems

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This special issue includes original, pertinent and relevant contributions on the technological, organizational and social dimensions of the largely multidisciplinary field of Enterprise Information Systems.

Some of these contributions are enhanced versions of selected articles submitted and presented at *CENTERIS 2013 – Conference on ENTERprise Information Systems: Aligning Technology, Organizations and People*, held in Lisbon, Portugal, 23-25 October 2013. Three of the articles resulted from a public call for papers. All articles were peer-reviewed.

In the first article, "The Role of Absorptive Capacity in the Usage of a Complex Information System: The Case of the Enterprise Information System", Maral Mayeh, T. Ramayah and Simona Popa propose to model the relationship between absorptive capacity and intention to use in the Enterprise Resource Planning (ERP) environment in Iran. This research is a correlation study where a field survey was conducted for data collection. The unit of analysis is Iranian individuals who are users of ERP systems within their organizations. The questionnaires were sent to the selected organizations and, using a structural equation modeling analysis, the authors tested the hypothesized relationship using Analysis of MOment Structures (AMOS). The results indicate that all three absorptive capacity measures are good predictors of intention to use. The absorptive capacity for applying was the strongest predictor followed by the absorptive capacity for understanding and the absorptive capacity for assimilating. When implementing complex information systems, managers must also look at the absorptive capacity of the users in order to successfully implement the system and to ensure its continued usage. Previous researchers have not looked at the role of absorptive capacity in system usage at the same pace as those related to technology acceptance research, which only focuses on the ease of use and usefulness. Thus, this research adds on to the existing literature where future researchers may want to

expand on the factors that may influence absorptive capacity for further policy implications.

Research on variability in software artefacts is something which is already studied extensively in research. The visualisation of variability is one of the aspects of this kind of research, and results such as *feature diagrams* are well-known and well-spread. When it concerns to the origin of the variability within the phase of requirements engineering, research is much scarcer. A visualisation technique for both representing the origin and the amount of variability in requirements is not readily available. In their article "Using and Extending Formal Concept Analysis to Visualise Variability during Requirements Engineering", Tom Huysegoms, Monique Snoeck, Guido Dedene, Antoon Goderis and Frank Stumpe, provide a way to represent the origin of variability in requirements with the aid of a technique called Formal Concept Analysis (FCA). Additionally, the support that FCA can provide for variability related decisions during (early) requirements engineering is also depicted in the article. Proof of the usability of FCA for the visualization and documentation of variability is shown with the aid of a real-world case study. FCA is also applied in this case study to check the compatibility of FCA as a visualization method to support variability decision making during requirements engineering.

The purpose of the article "A Taxonomy for Virtual Enterprises", by Goran D. Putnik and Maria Manuela Cruz-Cunha, is to present a taxonomy able to contribute to building a framework within the domain of Virtual Enterprises (VE), to facilitate the sharing of knowledge and contributions to knowledge, as well as for trust building among VE stakeholders. A VE taxonomy currently does not exist, and this can be observed by the ambiguous way in which some concepts are addressed, leading to a fragmented understanding that hinders the development of the science of VE integration and management. The structure of the taxonomy developed is based on the view of the system as a 5-tuple expression consisting of Input, Control, Output, Mechanism, and Process, which is the underlying system-view of the well-known IDEF0 diagramming technique. In particular, this taxonomy addresses the VE extended lifecycle that implies the use of a meta-organization called Market of Resources, as an original contribution to the VE theory and practice. The taxonomy presented does not repeat what the literature already includes, or the commonplaces, and it is constructed in a way to be easily complemented with other VE partial taxonomies that may be found in literature. Some suggestions for extensions to other interrelated domains (as evolution leaves taxonomies in an open or incompleteness state) are given in the text.

For any Software Process Improvement (SPI) initiative to succeed, human factors such as motivation and commitment of the people involved should be kept in mind. In fact, Organizational Change Management (OCM) has been identified as an essential knowledge area for any SPI initiative. However, enough attention is still not given to the human factors and therefore, the high degree of failures in the SPI initiatives is directly linked to a lack of commitment and motivation. Gamification discipline allows us to define mechanisms that drive people's motivation and commitment towards the development of tasks in order to encourage and accelerate the acceptance of an SPI initiative. In the article "Gamification as a Disruptive Factor in Software Process Improvement Initiatives", authored by Eduardo Herranz, Ricardo Colomo-

Palacios, Antonio de Amescua Seco and Murat Yilmaz, a gamification framework oriented to both organization needs and software practitioners groups involved in an SPI initiative is defined. This framework tries to take advantage of the transverse nature of gamification in order to apply its Critical Success Factors (CSF) to the organizational change management of an SPI.

Clinical decision support systems play an important role in organizations. They have a tight relation with healthcare information systems. The authors Rui Rijo, Catarina Silva, Luís Pereira, Dulce Gonçalves and Margarida Agostinho, in their article "Decision Support System to Diagnosis and Classification of Epilepsy in Children", suggest the development of a system to support the diagnosis and the classification of epilepsy in children. Around 50 million people in the world have epilepsy. Its diagnosis can be an extremely complex process, demanding considerable time and effort from physicians and healthcare infrastructures. Exams such as electroencephalograms and magnetic resonances are often used to create a more accurate diagnosis in a short amount of time. After the diagnosis process, physicians classify epilepsy according to the International Classification of Diseases (ICD). Physicians need to classify each specific type of epilepsy based on different data, e.g., types of seizures, events and exams' results. The classification process is time consuming and, in some cases, demands for complementary exams. The article presents a text mining approach to support medical decisions relating to epilepsy diagnosis and ICD-9-based classification in children. The authors put forward a text mining approach using electronically processed medical records, and apply the K-Nearest Neighbor (KNN) technique as a white-box multiclass classifier approach to classify each instance, mapping it to the corresponding ICD-9-based standard code. Results on real medical records suggest that the proposed framework shows good performance and clear interpretations, albeit the reduced volume of available training data. To overcome this hurdle, the authors also propose and explore ways of expanding the dataset.

The goal of the article "Understanding the Growth by KILT Model and Typus Metrics", by Rinaldo C. Michelini and Roberto P. Razzoli, is investigating the odd claim of the human civilisation, which modifies the wild natural surrounds by synthetic alterations, defined improvements, bestowing ‹value added›. Indeed, the history seems sanctioning that the ‹life-quality› on earth has been expanding, with enhanced chances and increased resources, compared to the native prospects of the wilderness. Only at the millennium turnover, the ecology globalisation shows the impeding threats of over-depletion/pollution, exceeding the extant recovery and reclamation capabilities of the environment. The new imperative turns to be the ‹sustainable growth›, with caginess in defining if the trends can be positive, being conditioned by the empowered recycling, retrieval and renovation measures. In fact, sustainability requires lifecycle supply-chain visibility, resource bookkeeping and revamp planning. The lifecycle starts when the idea of a product is born and lasts until complete disposal after realisation and operation. In the musts' specification/analysis, the crucial policy (global plans, detailed design, assembly plots, etc.) are followed by manufacturing, testing, delivery, diagnostics and operation, advertising, service, maintenance, etc.; then, disassembly and firing are scheduled, requiring reclamation and recovery, via re-cycling (material reprocessing) or re-using (part refurbishing).

The article summarizes pilot cues for understanding the product-process agendas, using the typus metrics and the KILT model.

We express our gratitude to J.UCS and to Christian Gütl and Dana Kaiser for the opportunity to edit this special issue. We would also like to express our gratitude to all the authors who submitted their work and to the reviewers for their insightful visions and valuable contributions.

We hope that you find this special issue an interesting and valuable source of information for your work.

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Guest Editors