
Editorial

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Biographical notes: Joseph Barjjs is an Associate Professor of Systems and Simulation at Delft University of Technology. His research interests are focused on: business process modelling and simulation, enterprise modelling and simulation, information systems analysis and design, systems engineering, collaborative, participative and interactive modelling. He is the Founder of the Special Interest Group on Modelling and Simulation (SIGMAS) of the Association for Information Systems (<http://www.AIS-SIGMAS.org/>) and the International Workshop on Enterprise and Organisational Modelling and Simulation (<http://www.EOMAS.org/>).

Alexander Verbraeck is a Full Professor of Systems and Simulation and Head of the Department of Systems Engineering at Delft University of Technology. He also serves as a part-time Full Professor of Supply Chain Management at the R.H. Smith School of Business of the University of Maryland. He is a specialist in discrete event simulation for real-time control of complex transportation systems and for modelling business systems. His current research focus is on generic libraries of object-oriented simulation building blocks, on tools for web-based simulation, and on the use of simulation models and virtual reality for serious gaming.

1 Introduction

An enterprise is an artefact, which like any artificial system is designed and engineered for specific purpose and goal. Enterprises are functioning within a business environment in which the enterprise is delivering services and, thus, fulfilling its societal function. These two notions of system and business environment, however, pose quite some challenges. These challenges are especially prevalent in the 21st century enterprise that functions in a complex socio-technical setting and a very dynamic business environment.

As a system, an enterprise should be properly designed, engineered, and systemic principles need to be applied. The enterprise design process should involve both the functional and the constructional perspectives, where the first is concerned with how an enterprise is functioning without regards for its inner construction; the latter refers to the construction of an enterprise – what are the components (artefacts) of an enterprise, their relationships, and how they can be reengineered.

The ever-evolving and changing business environment in which enterprises operate poses a different set of challenges. The business environment changes because of many

factors such as outsourcing, distributed operations, market liberalisation, competition for marginal benefits, mergers and splits. In short, a 21st century enterprise is required to be agile and swift in reacting to changes, competition and demands.

All these lead to the conclusion that the 21st century enterprise and its study need a systemic approach based on profound theories, which gives birth to the emerging discipline of Enterprise Engineering. This emerging discipline develops and expands theories and modelling methods for the analysis, design, engineering, reengineering, modelling, simulation, implementation and operation of all elements, components, and artefacts associated with an enterprise. This myriad of knowledge required for enterprise engineering makes it an interdisciplinary field, where information science, organisational science and systems science are combined into a whole. The interdisciplinary nature makes enterprise engineering a holistic discipline looking at enterprises from all angles such as business, operation, process, people, underlying ICT, architecture and governance.

In attempting to address some of the aspects and topics related to enterprise engineering, this special issue was launched to solicit the most recent research results in the field. The contributions made to this special issue address a variety of complimentary topics, ranging from theoretical contributions to the application of known methods and principles in enterprise engineering.

2 Synopsis of the contributions

The following synopsis should help the readers of this special issue to see the different contributions in relation to the overall scope of enterprise engineering and organisational design. The synopsis provided here is mainly based on the claims made by the authors of the corresponding papers. The synopsis starts from more theoretical and conceptual papers towards more applied ones.

In the paper ‘A framework for enterprise engineering’, by Jan Hoogervorst, the author argues that the design focus is crucial for mastering the complexity of enterprises and successfully addressing enterprise strategic initiatives. For operationalising the design focus, a formal design theory and methodology is required within the emerging discipline of Enterprise Engineering. The introduced Enterprise Engineering Framework provides various aspects of the design approach such that an enterprise design is established and enterprise goals and concerns are addressed. In this paper, three concepts are central: first, Enterprise Ontology, which addresses the implementation-independent essence of an enterprise; second, Enterprise Architecture (EA), which provides the required normative design guidance for defining the actual design that can be implemented; third, Operational Rules or business rules that guide the enterprise operation. The paper argues that the enterprise design focus is inherently broad and should transcend a mere process focus, hence it must encompass all enterprise facets. The concepts introduced are illustrated using a case example.

In the paper ‘Enterprise ontology based development of information systems’, by Antonia Albani and Jan L.G. Dietz, the authors discuss the necessity of applying methodologies for the design and engineering of enterprise information systems relying on profound theory. According to the authors, for most of the current approaches

to model enterprises and their supporting information systems this is not the case, therefore modelling results in unnecessarily complex, unstable and unwieldy models, which are unsuitable for business process (re)design and (re)engineering. A new methodology is, therefore, presented based on the notions of enterprise ontology and business components, which covers only the essential features of both enterprises and their supporting information systems. The combination of enterprise ontology and business components into a new information system development methodology is explained within the conceptual framework called the generic system development process. The methodology is intended for the reduction of the complexity of the domain models and for the identification of stable business components.

In the paper 'Towards a G.O.D. theory for Organisational Engineering: modelling the (re)Generation, Operation and Discontinuation of the enterprise', by David Aveiro, A. Rito Silva and José Tribolet, the authors discuss an extended notion of the functional perspective of an organisation and a set of extensions to an organisational engineering approach for modelling this functional perspective. With these extensions, the authors specify the following three aspects of the functional perspective of an organisation: viability – operational norms that ensure the viability of the organisation; change – organisational engineering processes responsible for generation, operation and discontinuation of organisational artefacts; architecture – design rules that guide the engineering processes, restricting the 'shape' of the organisational artefacts.

In the paper 'Understanding processes for model-based enterprise transformation planning', by Stephan Aier and Jan Saat, the authors discuss enterprise transformation planning using EA models. The study is based on a number of case studies. They use analytically developed approaches to model-based enterprise transformation planning. To understand the planning processes, they cluster the observed processes and link them to an empirically derived EA. The authors argue that the resulting process induced from empirical research can be tailored to fit specific needs of an organisation depending on its EA. The process extends the existing approaches with a feasibility check by industry professionals. The authors observe a gap between the desired and the realised degree in sophistication of EA planning. In this regard, companies seeking to formalise and institutionalise their EA planning process can use the proposed planning process and customise it according to the EA.

In the paper 'Analysing organisational structures using social network analysis: a case study', by C. Zhang, W.B. Hurst, R.B. Lenin and S. Ramaswamy, the authors focus on e-mail corpuses in an enterprise. It is discussed that a great deal of information can be discerned about organisational structure from the enterprise e-mail logs. They hypothesise that a broad based analysis of information exchanges (e-mails) among employees of a company could give deep information about employees' roles within the organisation, thereby revealing hidden organisational structures that hold immense intrinsic value. For demonstration, the Enron email corpus is used as a case study to identify homogeneous groups of employees and a hierarchy using classification and clustering. The authors, as a first step, extract 9 unweighted features and use them for analysis. Then, they carry the same analysis using 11 weighted features after a temporal analysis and show the significant improvements in both classification and clustering analyses.

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