

Introduction to the Special Issue on Model-Driven Organisations

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Modern organisations are faced with the very challenging problem of rapidly responding to continual external business pressures in order to sustain their competitiveness or to effectively perform mission-critical services. Difficulties arise because the continual evolution of systems and operational procedures that are performed in response to external pressures eventually lead to suboptimal configurations of systems and processes that drive the organisation.

Organisations can be viewed as being structured in three layers: The *strategic* layer defines what an organisation must achieve in terms of its high-level goals, the *tactical* layer defines how an organisation plans to behave and thereby achieve its goals, and the *operational* layer defines the day-to-day running of the organisation in a manner that is consistent with its plans. The operational layer is implemented using an inter-connected IT *platform*. An organisation seeks to align its high-level goals with its platform so that its strategy is properly supported by the IT infrastructure. Expressing and achieving alignment remains a key challenge: from a modelling perspective, alignment can be viewed as a refinement or realisation relationship between models of strategic goals and the IT platform.

The management of continuous business change is complicated by the current lack of effective mechanisms for rapidly responding to multiple change drivers. The use of inadequate change

management methods and technologies introduces accidental complexities that significantly drive up the cost, risk, and effort of making changes.

The change-management use-cases include: development of *directives* that express how a business operates; *business intelligence* that supports a CEO by reporting on the state of the organisation at any level; *resource planning* that allocates business resources to processes; *impact analysis* that measures the effect a proposed change; *as-is* and *to-be* analysis and the calculation of the return on investment (ROI) for any proposed change; *regulatory compliance* that establishes that an organisation meets some externally imposed constraints on its operating procedures; *risk analysis* that identifies dangers, both internal and external, that can affect the successful operation of the organisation; *acquisition and merger* that compares two organisations to identify their similarities and differences with respect to achieving a goal; *outsourcing* that moves part of an organisation to an external agent, possibly with a service-level agreement.

These problems provide opportunities for developing and applying organisation modelling approaches that seek to improve an organisation's ability to effectively evolve in response to changes in its business environment. Modelling an organisation to better support organisational operation and evolution has been characterised as a *Model-Driven Organisation* (Clark et al. 2014), where an Model-Driven Organisation is an organisation in

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which models are the primary means for interacting with, analysing and evolving the systems that drive it.

Definition: A Model-Driven Organisation *uses* models in the analysis, design, simulation, delivery, operation, and maintenance of systems to address its strategic, tactical and operational needs and its relation to the wider environment.

An organisation's Enterprise Systems (ES) support a wide-range of business activities including planning, business intelligence, operationalisation, and reporting. ES are thus pivotal to a company's competitiveness. Modelling technologies and approaches that address the development, analysis, deployment and maintenance of ES have started to emerge. Such technologies and approaches must support a much broader collection of use-cases than traditional technologies for systems design modelling. Current ES architectures do not adequately address the growing demands for inter-organisational collaboration, flexibility and advanced decision support.

Realising the Model-Driven Organisation vision will require research that cross-cuts many areas, including research on enterprise architectures, business process and workflow modelling, system requirements and design modelling, meta-modelling, and run-time models. This special issue of Enterprise Modelling and Information Systems Architectures (EMISAJ) contains papers that arose from invited talks at the AMINO Workshop at the 8th IFIP WG 8.1 Working Conference on the Practice of Enterprise Modelling (PoEM 2015). Each of the invited talks were asked to respond to the challenge of the Model-Driven Organisation and subsequently invited to submit an article to this EMISA special issue. The articles have been fully peer reviewed and address different aspects of the Model-Driven Organisation as follows:

Business Change: As noted above, many organisational use-cases involve some form of change. An important challenge for the Model-Driven Organisation is to use models to facilitate achieving the goal of the change or ensuring that business

alignment is maintained. The article *Capability-based Communication Analysis for Enterprise Modelling* by Oscar Pastor, Marcela Ruiz, Hasan Koç and Francisco Valverde shows how organisational capabilities can be used to link to business processes and to use this information to analyse the effect of changes in the business context. The article *Semantic Annotations of Enterprise Models for Supporting the Evolution of Model-Driven Organizations* by Hans-Georg Fill uses semantic annotations that are added to existing models to help evolve the models when the organisations goals or requirements change.

Decision-Making: Organisational decision-making is typically a human-centric activity that involves tacit knowledge and that can be costly in terms of time and resources. An important challenge for the Model-Driven Organisation is to use models in order to reduce the burden on humans. The article *Towards Improved Organisational Decision Making – A Method and Tool Chain* by Souvik Barat, Vinay Kulkarni and Balbir Barn provides a method based on existing model-based technologies that supports decision-making based on organisational goals.

Integration: Complexity and scale are two characteristic features of organisations therefore realising an Model-Driven Organisation will need to satisfy the needs of many different stakeholders who expect tailor-made views of information. The article *Supporting the Model-Driven Organization Vision through Deep, Orthographic Modeling* by Christian Tunjic, Colin Atkinson and Dirk Draheim shows how a single multi-level model can support integration through the use of projections.

The *Model-Driven Organisation* is an ambitious and challenging vision that has the potential to make significant improvements to enterprises in terms of efficiency, quality and the way in which they interact with all stakeholders. The articles in this special issue make a contribution towards achieving that vision.

References

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