

# Integration of Practice-Oriented Knowledge Technology: Trends and Perspectives

Madjid Fathi (Ed.)

# Integration of Practice-Oriented Knowledge Technology: Trends and Prospectives

 Springer

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# Preface

Scientific network of Integrated Systems, Design and Technology (ISDT) is an initiative that has been established to respond industrial needs for integration of **“Knowledge Technology” (KT)** with multi- and inter-disciplinary applications. In particular the objective of ISDT is to incorporate multilateral engineering disciplines i.e. Composite-, Automotive-, Industrial- , Control- and Micro-Electronics Engineering, and derive knowledge for design and development of innovative products and services. In this context, the discourse of KT is established to address effective use of Knowledge Management, Semantic Technologies, Information Systems and Software Engineering towards evolution of adaptive and intelligent systems for industrial applications.

Naturally, the point of view on any kind of integration confronts several obstacles on managing of Human Resource (HR), technical resources and Information Technology (IT) infrastructures. There is a need to a think-tank and cooperative research on the conceptual, systematical, and technological aspects of integration as well as feasibility study on potential mediums of application. In this era, ISDT is established since 2007 based on indication of a gap between KT scientists and industrial practitioners.

Furthermore, integration should be critically seen, especially for in-house development of robust and adaptive solutions and further adaptation. Thus, reusability and adaptivity are the major challenges. In this context, the primary aspect is to investigate possibilities which enable us to integrate multi-domain intellectual capitals as organizational, technological or human capitals in distinctive research fields. Interdisciplinary research encompasses identifying the potential of each field and also the needs for improvement. Such effort facilitates the entire process for development and transfer of innovation among inter- or intra-organizational stakeholders. In ISDT, we are cooperating on detection and finding adaptive solutions for bridging industrial challenges based on integration of computerized and intelligent methods. In today’s SMEs the common required technology should be established particularly for reusing of existing values at HR and exploiting of available tools and methods raising production and industrial values. To succeed in this competition and achieve sustainable marketing strategies, selected KT components should

be taken into use, namely knowledge modeling, representation, discovery, and delivery, as well as semantic and decision-making algorithms and data analytics. The common attribute in this matter is “*Knowledge*” for reasoning (i.e. reasoning under uncertainty), and decision-making. Reasoning under uncertainty requires handling uncertain knowledge and discovering hidden relations between knowledge attributes to increase the usability of decision-making. In sum, KT concentrates on conceptual solutions that enable the usage and further development of knowledge based techniques and methods to support human behavior like decision-making, learning, planning or controlling. In our understanding, the entire goal of integration is to sustain efficient management of HR and increase on return of investment in SMEs.

In the latest ISDT meeting, we have successfully discussed the mentioned issues and agreed for constituting and concretizing the discourse of KT integration with special involvement of leading researchers and industrial experts whose contributions are presented in the book chapters. This book consists of three main chapters, namely:

- **Chapter 1: Applied Knowledge Management in Practice**
- **Chapter 2: Semantic Technologies for Industrial Management and Process Controlling**
- **Chapter 3: Knowledge Driven Approaches for Product Engineering**

In addition, each article presents a unique in-progress research with respect to the target goal of integration. All articles have been double blind reviewed with a domain-specific expert, and published as a book chapter.

I honestly hope that this edition of ISDT publication leads to improve our common understanding of KT integration and promotes further researches and cooperation in future.

Siegen, September 2012

Madjid Fathi

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