As stated in the foreword of this book, software industry can be seen as the heart of the service industry transformation. Not in vain, in the current competitive scenario, IT structures are increasingly asked to “participate” in business development and innovation, rather than merely being a “support” for value chain activities (Popoli & Popoli, 2009). And in the IT field, software poses as a critical element. Due to increasing globalization tendencies in the organizations environment, software development is evolving from a single site development to a multiple location team environment (Hernández-López et al., 2010). Thus, software development evolved in order to adopt some globalization characteristics; as a result, a new field called Global Software Development (GSD) emerged to cover specific aspects of global distributed software development (Oshri et al., 2007). Today, more software projects are run in geographically distributed environments, and global software development is becoming a norm in the software industry (Damian & Moitra, 2006).

In this new scenario, Ramchandran and Atem de Carvalho give us a glimpse of applied software in the IT industry of nowadays. This industry is facing a set of attributes that need to be analyzed and addressed: service-orientation, globalization, open source, agile methods, among others. In this book, editors provide a set of chapters that covers some of the main challenges that software practitioners face in their work. In the paragraphs below, reviewers...
describe the sections and chapters of the book and conclude with an overall evaluation of it.

This handbook is a collection of papers from different authors. It is divided into three sections. The first section (Chapters 1 to 11) is organized around eleven chapters. It provides aspects about requirements engineering and software engineering. The second section (Chapters 12 to 23) is devoted mainly to different technologies and their applications for the improvement of software development. Finally, the third section (Chapters 24 to 29) introduces aspects related to enterprise systems in global contexts.

Patel and Ramachandran are the authors of both Chapter 1 and 6. Given that Section 1 deals with Requirements, Chapter 1 proposes best knowledge based guidelines for agile requirements engineering to enhance the quality of requirements (story cards). Chapter 6 proposes the story card maturity model (SMM) whose structure is based on the CMMI model. SMM has four levels: Initial, Explored, Defined and Improved. For each level, requirements practices are analyzed by means of a continuous improvement of the story cards realized by stakeholders and customers.

Chapter 2, “Requirements Engineering in a Model-Based Methodology for Embedded Automotive Software”, presents a methodology for embedded automotive software. This methodology is based on the Electronic Architecture and Software Tools-Architecture Description Language (EAST-ADL) and the System Modeling Language (SysML).

“Agile Software Engineering” by Mnkandla presents a literature review about agile techniques and their impact in the measurement of software production process. According to this author, such techniques reduce time-to-market in software developments.

In Chapter 4, authors present an approach developed by Japanese Software Traceability and Accountability for Global software Engineering (STAGE). In this chapter, authors introduce some challenges and concepts behind the use of software tags to support a purchaser-centered approach to empirical software engineering. The authors conclude that such software tagging is possible, helpful and can be seen as a quality label that tackles the lack of information provided in software products.

Chapter 5 outlines the challenges that global software development add to the already-complex quality assurance process. In order to do so, Khan and Memon present two case studies of GSD projects that demonstrate the importance of continuous integration testing. The authors conclude that GSD requires the enhancement of testing techniques and a new testing process: The key idea of this process is to create concentric testing loops, each one with specific software testing goals, requirements, tools/techniques, and resource usage.

Chapter 7 presents a platform that facilitates the semantic interoperability management of software artifacts. This platform provides the reliable infrastructure for the reuse and sharing of heterogeneous software component resources. Given the importance of semantic technologies, which can be seen as a new paradigm for knowledge management, the authors exploit a novel methodology named Theory of Ontology & Meta-modeling, which is a concrete application of the ISO/IEC 19763-3 standard in the semantic interoperability management and service.

Chapter 8 presents a state of the art about this crucial sub-discipline of requirements management. Apart from this review, the authors propose an adaptation of the Model for link generalization and suggest that these links could be improved with the use of richer semantics.

Chapter 9 is the first of the three chapters devoted to software product lines and is co-authored by Ganeshan and Ramachandran. In this case, the chapter presents a state of the art of software product lines and assets. This chapter concludes that a well developed asset mining and maintenance schemes are crucial for a successful software product line approach.

In Chapter 10 the Comprehensive Software Industry Analysis Model is presented. According to its authors, this model complements...
CMMi by providing a set of rational metrics on active resources and processes operating over the model developed by SEI. The acceptance of this model is still uncertain, but authors believe that their model can enable a sweeping change in a highly manpower dependent industry, morphing it into a machine dependent industry, and having better metrics to measure it in a comprehensive and unified manner.

Chapter 11 proposes a Model based on Shannon’s entropy equation to evaluate object oriented class metrics and to predict object oriented software quality.

Section 2, Productivity Technologies, starts with Chapter 12. It presents a model-driven exception management framework via a case study. According to the authors, and reinforced by good results of the model application in the case study, their approach is a key enabler to support global distributed solution delivery teams.

Chapter 13 proposes a methodology for deploying patterns in mobile applications. Subsequently, Chapter 14 provides a discussion of empirical studies that reveals the effectiveness of combinatorial testing for detecting software faults in a manageable number of tests.

Jiménez, Piattini and Vizcaíno present in Chapter 15 a systematic review of the literature related to the problems of distributed software development. This is a type of software development in which team members are distributed in remote sites. The authors analyze the problems and solutions identified about distributed software development. From the experimental studies analyzed, the authors suggest several success factors of distributed software development.

In Chapter 16 authors offer a comprehensive summary of a considerable number of research works on model based testing along with a complete list of model based testing tools.

Chapter 17 also deals with the use of models in software engineering. In this case, the authors introduce Matilda, a generic and customizable framework for direct model execution in model-driven software development. Matilda is a framework to build virtual machines for software models that, according to several tests presented in this chapter, work efficiently with small memory consumption in small to medium scale applications.

Chapters 18 (Section 2) and 26 (Section 3), authored by Hababeh and Ramachandran, describe and analyze a Distributed Database Management System (DDBMS) tool architecture for evaluating efficiency and effectiveness of service performance quality.

Chapter 19 proposes to combine formal methods (B and FSP) and UML to model key aspects of railway critical systems. The novelty of this approach is the use of a metamodeling architecture and model-transformations to get a certified design of safety-critical systems.

Ganeshan and Ramachandran propose in Chapter 20 a way to conduct commonality analysis in software product lines. This chapter, far from being empirical, can be seen as a set of thoughts, views and experiences of the authors about commonality analysis in software product lines. In Chapter 21, the same authors dig deeper into software product lines to provide success histories and cutting edge developments in this new and promising field of study.

Chapter 22 deals with software components and their implications in software engineering. Component-based software engineering can be seen as a key enabler for GSD and a chapter devoted to this area is more than pertinent in a book of this nature. However the chapter does not fulfill the expectations of a reader willing to learn about component caveats in GSD, although authors present definitions, impact, risks and other crucial issues of software components, GSD implications are not covered in detail.

The last chapter of Section 2 is Chapter 23. In this chapter, Al-Marri and Ramachandran study the role of the Information Technology manager in case of any disaster events. The main contribution of this chapter is a model for disaster recovery management which consists in a set of hierarchical roles and activities to be performed in case of natural disasters. This work is followed later in Section 3 by Chapter 29. In this case, the focus is the design of a
model for classification of natural disasters and catastrophic failures.

Section 3, Enterprise System and Globalisation, starts with Chapter 24 that focuses on ERP for SMEs. This market has been the scenario of several deep transformations. From the buyer perspective, SMEs are also adopting ERPs, but the demand is becoming harder to fulfill. On the seller side, the free and open source movement and the SaaS philosophy is changing also the way these products appear into markets. In this challenging scenario, the aim of the chapter is to provide guidance for prospective adopters.

“Directed Basic Research in Enterprise Resource Planning (ERP) Systems” presents the main problems and challenges in ERP projects from the viewpoint of software engineering and proposes a set of clues to tackle some of the problems encountered in the study.

Chapter 27 presents a development process and supportive tools for the open source enterprise system ERP5. The ERP5 project is a FOS-ERP that aims at offering an integrated management solution based on the open source Zope platform, written in the Python scripting language. The main goal of the chapter is to supply ERP5 adopters with a model-driven development method that, according to authors, reduces programming efforts and modeling tasks.

Chapter 28 presents two models. Firstly, a model for predicting software bugs in open source software repositories. Open source software bug repositories have been recognized as reliable data assets that can provide useful information to assist in software development and software project management. However, according to the authors, in spite of tool support, OSS development still remains a craft, vastly dependent on the experience and expertise of individual software developers. The second model is aimed to understand the dynamics of distributed OSS developer groups. Given that software development is a human capital intensive task, this model presents a good approach for managing issues related to personnel in distributed environments.

In general, the style of writing could have been more shaped. The book results a little uneven in quality and some good contributions are mixed with other less relevant. Apart from this, many chapters present a useful list of key terms and definitions, but many others does not, and there is little consistency in the use of terminology across the book and an uneven coverage. However, in sum, the book is timely and relevant, although some aspects could be improved.

In conclusion, this book is a very instructive and pertinent book. In the publication predominates limited and in some cases very specific samples studies that narrow the book’s appeal to experienced professionals in software engineering positions. Nevertheless, it may serve well to researchers seeking to further study any of the topics depicted or any other reader, including students, in pursuit of an awareness increase of the matter.

REFERENCES


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