

## Preface

Knowledge is distilled from large volumes of data and information to serve users' needs. Knowledge management tools have helped different domains to improve the operations. Software development is human intensive activity, and knowledge accumulated through experience from past projects can help in resource optimization for new projects. Software products vary widely by their nature, complexity, size, requirements, etc., and this makes it hard to generalize one specific approach that can successfully be used in developing different software products.

In the first chapter, Rawan Khasawneh and Emad Abu Shanab discuss how to use knowledge management systems to help in improving decision-making. The chapter discusses frameworks that can be used in Knowledge Management (KM) decision-making. The chapter concludes with a section of KM practices related to software development processes and approaches.

Next, Dr. Sameer Abu Fardeh presents a chapter on KM and global software engineering. The chapter elaborates on challenges related to the global software development process. The chapter then discusses KM practices in global software engineering and the different terms and usages of knowledge in such development paradigms. The chapter also discusses how KM helps in solving some of the challenges presented in global software development, especially issues related to cultural and language barriers. The author proposes recommendations on how to improve KM in global software development and future research directions.

In chapter three, Izzat Alsmadi and Sascha Alda discuss KM in Semantic Web services. Semantic Web services are expanded to allow users to make high-level queries with Web services. This is an important component in the Semantic Web in general that aims at making information through the Web more structured and utilizable. While Web services provide important information to a wide range of different users who may use those services in different contexts, it is necessary for users to interact with Web services or make complex queries. The authors also present different KM components developed to help in achieving Semantic Web services.

Chapter 4 by Anupama Surendran and Philip Samuel is focused on the development of embedded systems and major challenges that may arise in the development phase. The authors also discuss how different testing methodologies can be uniquely applied in testing embedded systems.

In the fifth chapter, Emilia Mendes and Simon Baker discussed KM in Web effort estimation. Software projects' effort estimation techniques are traditionally proposed for the development of traditional software products. For development of Websites, the authors present several unique aspects on Web efforts' estimation that may make traditional software effort estimation techniques deficient. The authors discuss how KM can be used to develop Web effort estimation models that can be generalized and used as a dictionary for Website development in general.

In the sixth chapter, Ligu Yu focuses on project management aspects related to open source projects. The author discusses management aspects such as: effort, scheduling, and staffing, and how the agility and flexibility of open source projects pose challenges in handling those projects and their resources. Linux kernel open source is used as a case study in this chapter. The author describes some of the differences in those aspects between closed and open source projects. The author also discusses prediction models that can be used to predict effort and resources in such open source projects.

In the next chapter, Saqib Saeed and his colleagues present a case study where they discuss requirement engineering practices employed by different small- and medium-scale enterprises in Pakistan. They conclude that Pakistani software industry is in its nascent stage and still a lot of effort is needed to improve the work practices.

The eighth chapter by Izzat Alsmadi and Sascha Alda focuses on different testing activities in software development processes of Web services. Unlike Websites or software products, Web services are developed to be generic and can easily be called and used by different clients/users in different environments. Dynamic/real time execution will be far more important in comparison with traditional software products, especially as services are called more often and used by a large number of users' in possibly different contexts. The authors visit all testing activities describing how each testing activity can be different in Web services development.

In the ninth chapter, Tamer Abdou, Peter Grongono, and Pankaj Kamthan discuss KM in testing open source software products. The chapter tries to evaluate testing and quality aspects, especially where open source projects may not go through aggressive testing activities in comparison to typical company type or closed projects. A conceptual model for knowledge in software testing is presented. The authors elaborate on the knowledge management testing model and how to draw traceability between KM components and testing activities.

In chapter 10, Lavika Goel and V. K. Panchal provide a mathematical formulation of the concept of information sharing in each of the swarm intelligence techniques of Biogeography-Based Optimization (BBO), Ant Colony Optimization (ACO), Particle Swarm Optimization (PSO), and Bee Colony Optimization (BCO). The feature extraction results based on the concepts of information sharing are demonstrated on two different datasets for each of the above techniques.

In the next chapter, Usman Akram and Shehzad Khalid present a software solution based on novel algorithms for early detection of diabetic retinopathy. It detects dark and bright lesions from retinal image. The proposed system is evaluated using publicly available retinal image databases and results demonstrate the validity of proposed system. The authors also discuss information related to preprocessing and retinal component extraction.

In chapter 12, Fairouz Tchier and Huda Alrashidi categorize methods that are used to formally specify and verify software requirements. The authors discuss several formal method-related subjects such as calculus fuzzy and relational calculus.

In the last chapter, Rene Robin and his colleagues discuss how knowledge from engineering subjects can be processed, stored, retrieved, and communicated between educators and students.

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