Preface

Engineering projects are critical undertakings requiring serious commitment, clear vision, and robust long-term strategies to be successful. As a result, planning, monitoring, and evaluation activities are of utmost importance for successful execution. The projects may be carried out in technically sound ways, but failure can still be experienced due to weakness in management, such as improper budget and planning schedule. This book is aimed at highlighting this particular area and intended to give practical as well as conceptual knowledge of the latest methodologies, principles, practices, tools, and technologies used for engineering project management. This book is targeted for designers of Engineering Management (EM) processes, academicians, students, practitioners, professionals, and researchers working in the field of engineering management. The book is divided in three sections, which are Process Management, Project Management, and Technology Management.

The first section of the book is comprised of seven chapters and tries to discover new paradigms in various aspects of process management. The second section of the book focuses on issues, methods, theories, and research in the area of project management with specific reference to engineering projects. The latest practices, concepts, and theories of project management in various sectors are discussed in different chapters. Finally, the last section is comprised of five chapters and explores new paradigms in the area of technology management. Latest concepts, issues, methodologies, theories, and practices are delivered and discussed by considering various cases. This book attempts to establish new principles and suggestions or refine those existing in order for the maximum and safe use of technology for the best benefits of human kind. Transfer of technology, strategy, innovation, competitiveness, foresight, outsourcing, off-shoring, entrepreneurship in technology, etc. are the key areas of focus.

In the first chapter, Paolo Renna discusses two strategies to solve the customer order-scheduling problem. In order to understand the effectiveness, he has presented simulation results showing the performance of these approaches. Based on these results, he has also discussed some future work directions.

The second chapter by Martin Bariff focuses on organizational change as a project management agenda to achieve successful project outcomes. It discusses various models of organizational change management. The main objective of the study is to justify organizational change management as an important skill set for project management. The author reviews the strengths and limitations of existing organizational change management models and proposes a composite model of organizational change. An example case study is taken for the study of organizational change management to propose a composite model. At the end of the chapter, future areas for further research are recommended.

The third chapter focuses on six sigma, which provides a framework for real problem solving in almost any organizational context. It has the power to enable leaders and practitioners to employ new ways of understanding and solving sustainability problems. However, there is a dearth of practices and ability of translating good intentions into concrete profitability and customer satisfaction. Seifedine Kadry discusses the importance of applying six sigma methodologies to multidisciplinary sustainability programs and highlights ways to implement six-sigma in such projects.
In the next chapter, Hassanali Rassouli discusses challenges confronted by new product development. Lean thinking has been a widely accepted paradigm in order to cope with the intensive global competition of the 21st century. This chapter attempts to define challenges and implications faced by corporate management in an attempt to adapt to New Product Development approaches in line with lean thinking perspectives.

The next chapter focuses on supply chain strategies that help organizations to meet the global challenges and to achieve business success. The chapter supports understanding of functional coordination in supply chain management, importance of supply chain partnership, bullwhip cause-effect, and an approach to synchronize the operation schedule to improve supply chain operations. The bullwhip effect is often seen as a challenge to improve supply chain performances. It also discusses the strategies to reduce the bullwhip effect, various well-known contract agreements that are currently practiced by many supply chain organizations, its impact and benefits on supply chain success.

The sixth chapter highlights the Indian perspective of fundamental intellectual property rights. The focus of the chapter is to analyze the trends of patenting and patented technologies with specific reference to the Indian semi-conductor industry. In addition to discussing various aspects of patents and patentability, some year wise statistics on the importance and growth of patenting are depicted.

The last chapter of the Process Management section provides an analysis of defect trends in MI-172 Helicopters, which are a variant of the MI-17/171 helicopter series. The helicopters were brought to use in an organization, which was originally set up and tuned for the MI-17/171 series. This induction of the variant resulted in diverse problems. The chapter focuses to analyze trends in problems/defects accumulated over a period of 3 years to find the root cause. Real time data from technical and flying divisions is collected for the analysis. The chapter is expected to help eradicate the existing problems and suggest pragmatic solutions for an overall uplift of the maintenance system.

Muhammad Asim Qazi and his colleagues provide a valuable insight into the component failure analysis associated with J69-T25A engines in terms of frequency and fault isolation in the next chapter. The top ten components are selected for analysis based on failure rates, and their fault/defect history is studied to establish a relationship between defects and failed components. The comparison results are used to suggest remedial measures to reduce future problems and increase engine reliability.

The next chapter provides a view of the role of lean development approaches and its principles in fostering knowledge management initiatives in the software development process. A discussion on important principles of lean manufacturing is followed by an explanation of how these principles can help setting up a knowledge management culture in the software development process. This chapter will help practitioners and students better understand the knowledge management perspective of lean approach.

In the next chapter, Kashif Saeed and his colleagues discuss management practices in the exploration and production industry in three different sections; project management, health, safety, and environment management; and quality management. A focused description of the different elements of exploration and production industry including asset/portfolio, resources, time, planning and scheduling, risk management, etc. are discussed in these three sections.

Emad Abu-Shanab and Ashraf Al-Saggar discuss the reasons for IT project failures in the next chapter. This chapter focuses on the root causes of project failures as well as success factors. This literature review-based chapter highlights seventeen factors contributing to project failures and ten factors causing escalation of project cost, scope, and schedules. A ranking of these factors in the Jordanian business environment is explored based on an empirical study. Future areas for further research are suggested at the end of the chapter.
In the next chapter, Edward Chen focuses on critical issues and the role of technology in the energy sector with special emphasis on security, mobile dispatch solutions, and the so-called “Smart Grid.” The utility business has traditionally lagged behind in the use of latest technologies to cope with the growth of other industries both in size and complexity. However, the mounting socio-economic and environmental pressures are now extensively demanding that the energy sector must look into innovative technology solutions. This chapter also discusses the various prospects of undertaking this initiative regarding meaningful educational and employment opportunities.

Hisham Abdelsalam and his colleagues draw conclusions on decision-making styles of Egyptian managers in the next chapter. They collected empirical data from 138 individuals working on management positions in various Egyptian organizations. Success of an organization is strongly linked with the personal attributes of managers working in that organization. One such attribute is the decision-making style of managers. Based on the findings of this survey, this chapter provides a baseline to select and design a decision support system in Egypt.

The next chapter focuses on identification of major Foreign Object Damage (FOD) contributors in aviation by studying the case of a particular aviation setup. FOD is one of the major challenges in aviation safety not only in terms of direct costs but also due to potential loss of human lives associated with such occurrences. This chapter provides a statistical analysis of aircraft accidents attributed to various types of FOD. Data for the last 10 years has been considered for analysis, which helped in identification of eight major factors. The chapter proposes a prevention and control plan to address the most critical cause factors and improve organizational response.

This chapter investigates the role of NHK (Japan’s national broadcaster) in covering the earthquake and then the nuclear crisis in March 2011 in Japan. It explains how this Japanese public television played a double role during these crises and tries to establish a case to provide a concrete example of the potential television role in disaster mitigation.

In the next chapter, Irene Samanta studies the role of the new digital era in creating diversity in the real society and the influence of social media in it. It reveals the effects of social media on economic, political, and real society affairs. This is an attempt to promote innovation to the changes that take place in communities of particular participants in the global society.

Izzat Alsmadi describes various product and process metrics for evaluating websites in the next chapter. The description is based on two major classifications of metrics into product and process-related metrics. Empirical data in this chapter takes various values of measurements in combination to provide useful information for project management and planning.

In the next chapter, Kamaljeet Sandhu discusses the E-Service acceptance model. This is a case study-based research chapter that examines the Web Electronic Service framework for an Australian university. The case study examines the process of development and implementation of a Web-based e-service system in a department of the university. The user experience to use e-services requires insight into the attributes that shape the experience variable. The chapter includes descriptive data about the attributes that form the experience variable.

In the last chapter, the author investigates the acceptability and usability factors of e-Service systems. Factors like user experience, user motivation, perceived usefulness, and perceived ease of use are discussed in this research. The chapter makes an attempt to integrate the two core variables of the Technology Acceptance Model, i.e. perceived ease of use and perceived usefulness.

Saqib Saeed
Bahria University Islamabad, Pakistan