Preface

Technology project management, planning, and operational strategies are critical resources for organizations. In the past, manual procedures provided the only means for manipulating information. Today, technology represents powerful tools for maximizing the value of information. As a major resource and asset, technology requires effective planning, management, and operations. In this respect, technology project management has much in common with other types of assets, such as human resources, capital facilities, and financial resources. All require some degree of formal structure to promote effective use and management.

Looking back at recent innovations within technology, we can trace these innovations back to a project: the behind the scenes work that, when managed correctly, results in a new system, a new technology, or a new product in the marketplace. Technology project management refers to the field of study and practice utilizing management and administrative principles as a means to controlling the bounds of a technology-based project to solve business and organizational challenges and human performance issues. Within the field of technology project management, there are many specific areas of focus. While technology project management can apply to the military and corporate settings, it is also applied to the school setting including charter schools, public schools, online, higher education or anywhere a technology project or initiative can be initiated.

With the rapid progress in technologies, systems planning and management have become increasingly important in this digital economy. New technologies that can have significant implications for corporate strategies are developed constantly. The incredible growth of technology and the demand for a new generation of technology stakeholders have facilitated the introduction of technology project management programs in many higher education institutions in the United States and around the world. *The Handbook of Research on Technology Project Management, Planning and Operations* provides a broad scope of technology project strategies for researchers, educators, students, and industry practitioners to share and exchange their research ideas, practical experiences, challenges, and opportunities concerning technology project management.

Successful technology project management, planning, and operations are increasingly vital to all organizations, driven by the demands of global competition, rapid technological growth, and faster time to market. For those in technology fields, project management skills are a major core competency needed for serious competition. Those who have mastered these skills will continue to be in high demand worldwide, commanding higher salaries than those around them. However, how does one extend those skills or acquire them in the first place? *The Handbook of Research on Technology Project Management, Planning, and Operation* is a great place to start.

Technology Project Management is the discipline of planning, organizing, and managing resources to bring about the successful completion of specific project goals and objectives within a technology driven organization. A technology project is a finite endeavor (having specific start and completion

dates) undertaken to create a unique product or service which brings about beneficial change or added value. This finite characteristic of projects stands in sharp contrast to processes, or operations, which are permanent or semi-permanent functional work to repetitively produce the same product or service. In practice, the management of these two systems is often found to be quite different, and as such requires the development of distinct technical skills and the adoption of separate management philosophy.

The primary challenge of project management is to achieve all project goals and objectives while adhering to classic project constraints, including scope, quality, time and budget. The secondary and more ambitious challenge is to optimize the allocation and integration of inputs necessary to meet pre-defined objectives.

Technology project management is quite often the province and responsibility of an individual project manager combined with technological expertise. This individual seldom participates directly in the activities that produce the end result, but rather strives to maintain the progress and productive mutual interaction of various parties in such a way that overall risk of failure is reduced.

Further, a technology project manager can be a client representative. This representative has to determine and implement the exact needs of the client, based on knowledge of the firm they are representing.

An organizations vision for technology project management should speaks "to achieve the objectives of the project on time and within budget." This vision, goals, and priorities of an organization provides context for the technology project management planning and operations process. In addition, good technology project management planning and operations should help to achieve certain principles for technology-based projects. These include:

- Technology must serve and respond to the mission, goals, and priorities of the sponsoring entity.
- Assessing and possibly redesigning the business process must precede decisions about applying a specific information technology solution.
- The planning, operations and management process should treat projects as a strategic resource that has value and should explore ways to maximize this value.
- Technology projects belong to the enterprise, and sponsoring entities should incorporate data sharing and the needs of other users in their plans, subject to privacy and confidentiality requirements.
- Technology projects should be scalable, reliable, and efficient.

Like any human undertaking a technology-based projects, projects needs to be performed and delivered under certain constraints. Traditionally, these constraints have been listed as "scope," "time," and "cost". A further refinement of the constraints separates product "quality" or "performance" from scope, and turns quality into a fourth constraint.

The time constraint refers to the amount of time available to complete a project. The cost constraint refers to the budgeted amount available for the project. The scope constraint refers to what must be done to produce the project's end result. These three constraints are often competing constraints: increased scope typically means increased time and increased cost, a tight time constraint could mean increased costs and reduced scope, and a tight budget could mean increased time and reduced scope.

The discipline of technology project management is about providing the tools and techniques that enable the project team (not just the project manager) to organize their work to meet these constraints.

Of the hundreds of project management books on the market, few address the unique needs of the technology project manager or projects undertaken in a technology driven organization. Unlike most other project management books, *The Handbook of Research of Technology Project Management, Planning, and Operations* tackles the specific issues that technology professionals must face, such as understanding

technology resources, managing project scope and feature creep, quality, risk management, assessment, project evaluation, meeting client expectations, leadership, outsourcing, among many others.

Whether you're a college student, a software engineer, an IT professional, or a scholar in the field, *The Handbook of Technology Project Management, Planning, and Operations* will help you gain a comprehensive understanding of the technology project management life cycle and learn how to manage it – from first steps on through to intermediate topics (as well as some advanced ones).

With *The Handbook of Research on Technology Project Management, Planning, and Operations* you will:

- Discover the reasons projects fail
- Understand keys features to project success
- Explore the components of the technology project lifecycle
- Review the documents necessary for technology project management and learn how to complete a post project evaluation
- Understand the warning signs of a project in trouble and learn how to get it back on track
- Learn quality and risk management practices in easy-to-understand terms
- Acquire practical ways to develop effective leadership and team-building skills

The *Handbook of Research on Technology, Project Management, Planning and Operations* provides a compendium of terms, definitions and explanations of concepts, processes and acronyms. Additionally, this volume feature chapters authored by leading experts offering an in-depth description of key terms and concepts related to different areas, issues and trends in technology project management, technology management, technology planning, and technology operations in modern organizations worldwide.

Technology project management, planning, and operational strategies ensure a higher chance for organizations to reach their technology based goals. Technology project management streamlines processes, coordinate projects and enable more efficiency in day-to-day operations and planning of technology project management. As more companies see the relevance of technology project management, these trends will become increasingly important to overall technology project management, planning, and operations design.

In order to provide the best balanced coverage of concepts and issues related to the topics of this handbook, current researchers from around the world were asked to submit their chapter describing their unique coverage of technology project management planning and operations. Each chapter submission began with the proposal phase. Following the submission phase, each proposal was submitted for blind reviewed by a team of reviewers who indicated the accepted or rejection of the chapter proposal. Following the proposal review phase, each author was then given permission to complete their own chapters for the handbook. After completing their respective chapter, the chapter was then submitted once again for blind peer review once more. After a two round rigorous referred processed of two reviewers, the chapters that were strong and favorable from the reviewers were chosen as entries for this handbook. The idea here was to assemble the best minds in the field from all over the world to contribute entries to the handbook. As a result of the double blind submission process, this handbook includes more than 30 entries highlighting current concepts, issues and emerging trends relating to technology project management planning, and operations. All entries are written by knowledgeable, distinguished scholars from many prominent research institutions around the world.

This book can provide valuable information to wide-range audience. This audience includes members from higher education, K-12 education, business and industry, as well as federal, state, and local governments and the military. Whether one is planning, managing, implementing or evaluating a technology-based project, researchers and practitioners alike will need to be informed concerning technology project management, planning activities, and operational strategies.

In particular, this handbook will be valuable to corporate executives, information technology professionals, project managers, and scholars in the field who are seeking sound theoretically and practically informed strategies of how to effectively manage technology-based projects. Managers may take advantage of examples from this book to help justify project management tools, offices, initiatives and strategic plans. This book also appeals to higher education IT professionals and administrators struggling with issues on where to place value and resources as it relates to technology projects. Clarification of the range of technology project management models can help administrators and staff members. Whether one is planning, managing, implementing or evaluating a technology-based project researchers and practitioners alike will need information concerning technology project management, planning, and operations. Those in the field conducting research will benefit from reading chapters on the current research and applications both from the corporate perspective. Finally, policy makers reading or accessing this book will discover the value and power in technology project management to promote excellence in technology project management. Hence governmental funding for these types of initiatives and projects needs to reflect this fact.

The chapters authored in this collection were selected because of their expertise and leadership roles within the field as well as the unique perspective they had to tell. With the mix of corporate and military training, non profit organizations, K-12 school, higher education institution, and industry, a wide range of perspectives are covered in this book. This book highlights technology project management as a growing field of study which uses technological interventions as a means to solve project related challenges challenges. The chapters are not organized by industry. Instead, they are divided into six major themes. Section I provides both an introduction and an overview of technology project management, planning and operations beginning with a foundational knowledge to understanding technical projects through an analytical framework. Chapters in this section present to the author project management, competencies, IT project complexities, and then a brief look at project management from 2027. Section II lays a thorough foundation of project leadership, decision making, and management for the overall success of a technology based project. Leadership is essential to the success or failure of a project. Section III provides an overview of quality and risk management for technology projects. This section first reviews the basic principles, techniques, and their application to the development of quality. The reader is then provided with a review of basic risk management concepts, including the Integrated Project Risk Model. The balance of the section discusses how quality techniques are both a contributor to, as well as a mitigator of risk. Project planning is a most critical and complex part of entire IT project process. Section IV provides the reader with critical information on how to plan planning a project, how to assess the project and then how to determine when to outsource a project. Section V presents the unique opportunity for the reader to learn of technology project management, planning and operations through a variety of case studies that span business, industry, and education. Gaining knowledge from the successes and failures of others is an effective way to learn and this section presents innovation case studies to facilitate such learning. Section VI, presents future trends within the field of Technology Project Management, Planning, and Operations As more companies see the relevance of technology project management, these trends will become increasingly important to overall technology project management, planning, and operations design.

For all practical purposes this handbook discusses various methods and tools for assessment, testing and evaluation of technology project management strategies, case studies, opportunities and challenges. For future development of technology project management, this book gives information about the trends and issues facing the field. At the end of this book, there is a wide range of ideas, examples, guidelines, stories, models, and solution all with the basic premise of technology project management.

   With the diverse and comprehensive coverage of multiple perspectives in the field, this authoritative handbook will contribute to a better understanding all topics, research, and discoveries in this evolving, significant field of study. Furthermore, the contributions included in this handbook will be instrumental in expanding of the body of knowledge in this vast field. The coverage of this handbook provides strength to this reference resource for technology project management, planning, and operations research and also decision makers in obtaining a greater understanding of the concepts, issues, problems, trends, challenges and opportunities. It is my sincere hope that this publication and the amount of information and research presented will assist colleagues, faculty, students, teachers, and organizational decision makers in enhancing their understanding of this discipline and to effectively integrate technology planning and operations and technology project management to meet the needs of our diverse organizations. Perhaps this publication will inspire its readers to contribute to the current body of research in this immense field, tapping into possibilities to assist organizations in making technology project management opportunities open to success.

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