PROJECT MANAGEMENT FUNDAMENTALS

FIRST EDITION

YOGARAJAH NANTHAGOPAN

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Yogarajah Nanthagopan

Senior Academic in Project Management

Faculty of Business Studies

University of Vavuniya

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Author's Preface

In today's highly competitive and fast-paced business environment, which has no space for errors, ineffectiveness, and inefficiencies, project management has become one of the most valued skills in all types of organizations. To meet their strategic goals and objectives, it is essential for organizations to deliver their projects on time and within budget, meeting the agreed requirements and quality constraints. In order to achieve this, they rely heavily on the expertise of skilled project managers, rather than the partial methods traditionally used by organizations. It is essential for everyone to have at least a basic understanding of project management for an organization to thrive in the market. Project management is introduced to plan, co-ordinate, and control the complex and diverse activities of modern industrial, commercial, and community projects.

Project management is not unique to any specific organization and in today's complex and dynamic business environment, project-based works can be increasingly found in all organizations, across all disciplines. Best practices in project management are crucial to ensure a sustainable competitive advantage for an organization. Therefore, the aim of this book is to impart to you, the readers, the basic structure of project management and to inspire you to learn project management and apply the knowledge, skills, tools, and techniques of project management in your workplace at all levels.

The book consists of seven chapters. The first chapter covers the basic concepts of 'project' and 'project management', describes the evolution of project management, and shows the importance of project management in today's business environment. The second chapter explains the role of the project manager, team, and stakeholders and the stages of the stakeholder engagement process in a project. The third chapter explains the project life cycle and its initiation, planning, implementation, monitoring and control, and completion phases. The fourth chapter explains the ten knowledge areas of integration management, scope management, schedule management, cost management, quality management, resource management, communications management, risk management, procurement management, and stakeholder management. The fifth chapter examines the advantages and disadvantages of various types of organizational structures. The sixth chapter explains the project management resources of project organizations at three levels: team, organizational, and collaborative social. The seventh chapter explains the results framework of a project, logical framework approach, the different levels of success of a project, and the evaluation criteria. At the end of each chapter, discussion questions and cases from Sri Lankan community, business and national development projects are provided for readers to understand project contexts and practices. Finally, the glossary guides especially beginners and intermediaries to understand the vocabulary of the PM discipline.

Competence in project management is not only important for managers in organizations, it is also essential for all types of people at all levels in all organizations. Moreover,

knowledge of project management can be applied not only in organizations but also in everyone's personal careers. Therefore, this book is suitable for everyone, especially high school leavers, undergraduates, postgraduates, all staff employee and manager levels in organizations, and beginners who are interested in learning project management. The book is written in simple language so that the reader can easily understand and get the most out of it.

I believe this book will stimulate people's interest in learning about project management and that it will help anyone's work to at least apply project management approaches to improve their work effectiveness and efficiency.

Dr Y.Nanthagopan

28th of February 2022

Forward

A famous saying is, "If you fail to plan, you are planning to fail". Project Management never ceased to recognize the importance of planning for the successful delivery of a Project. "Project Management Fundamentals" by Dr. Yogarajah Nanthagopan beautifully sums up the complex content of plan-driven Project Management as a simple and easy-to-read book that can be used as a reliable handbook from beginner to advanced level learners in the field.

This book provides the readers with an opportunity to acquire new knowledge and upskill themselves with the global standards and practices in Project Management. It starts with the basic project management concepts, process group-based project management approach from Initiation, Planning, Executing, Monitoring and Controlling and Closing. At the end of each chapter, case studies and discussion questions demonstrate how to apply what is discussed into practice and keep them engaged throughout.

The book discusses the role of the Project Manager, Teams, Stakeholders, Organization, and the Knowledge Areas that every project manager must know. With the comprehensive knowledge shared, it is evident that "Fundamentals in project Management" is a unique result of Dr Nanthagopan's 15+ years of experience as a senior academic and researcher of Project Management. In this journey, Dr Nanthagopan's effort to align the content with the global standards in project management is highly commendable.

This book is an excellent introductory guide for the students studying for the Project Management certification exams offered by professional organizations in Project Management, universities, and other educational institutes. The practitioner in Project Management is a well-structured 'step-by-step' guide for a beginner to learn project management. For experienced Project Managers, this book will be a simplified 'all-in-one read' to refresh their prior learnings in the subject.

While I thank Dr Nanthagopan for his excellent effort in putting this book together to contribute to our nation and the advancement of the Project Management Profession, I would be happy to see more books by Dr Nanthagopan in the future. As Project Management is continuously evolving, books on new Project Management Tools, Agile and Hybrid Project Management methodologies will be helpful to the readers who enjoy this book, "Project Management Fundamentals."

Dr. Madhu Fernando
Director/CEO Innova Strategies
Founder Director/CEO – PMI Colombo Chapter 2004/5

Abbreviations

AAPM	American Academy of Project Management
APM	Association for Project Management
CPM	Critical Path Method
IPMA	International Project Management Association
ISO	International Organization for Standardization
M & E	Monitoring and Evaluation
NGO	Non-Governmental Organization
PERT	Program Evaluation Review Technique
PLC	Project Life Cycle
PM	Project Management
PMBOK	Project Management Body of Knowledge
PMI	Project Management Institute
PMIS	Project Management Information System
PMO	Project Management Office
SWOT	Strengths, Weaknesses, Opportunities and Threats
WBS	Work Breakdown Structure

CHAPTER ONE

Introduction to Projects and Project Management

Chapter Objective and Learning Outcomes

The objective of this chapter is to provide the readers with a basic understanding of projects and project management. After studying this chapter, the readers should be able to:

1.1. Define the term 'project'.
1.2. Describe the key features of a project.
1.3. Define the term 'project management'.
1.4. Explain the evolution of project management.
1.5. Interpret the parameters of the project management triangle.
1.6. Differentiate projects and programmes.
1.7. Recognize the principles for project management success.
1.8. Identify when organizations need a project.
1.9. Discuss the benefits of project management to organizations.

1.1. Project Definition

The Project Management Institute (PMI, 2017) defines a project as a temporary endeavour undertaken to create a unique product or service or result. That is, a project has a fixed duration: a project is not just business routine operation as usual. Projects are particular undertakings: each one will differ from every other in some respect, creating unique tangibles, intangibles or results. They usually involve a series of interrelated tasks that are intended and planned to be implemented during a specific period of time and within specific constraints, such as scope, cost, time, and quality.

Projects are a great opportunity for organizations and individuals to more effectively achieve their business and non-business goals by implementing changes. Projects enable us to make the required changes in an organized manner and reduce the likelihood of failure. Projects are different from other types of routine processes in an organization. Projects attempt to implement required changes to an organization or environment in a controlled manner. By using projects, we can plan activities, such as developing or acquiring a new or modified information system, developing a new product or service, running a campaign for political office, constructing a building or facility, running a marketing campaign, organizing a party, graduating from university with honours, or whatever else we may wish to do.

The Association for Project Management (APM, 2019) defines a project as a unique and transitional effort, undertaken to achieve planned objectives, which could be defined in terms of outputs, outcomes or benefits. A project is generally considered a success if it achieves its objectives according to its acceptance criteria, in an agreed timeframe and budget. Therefore, a project is a specific, finite activity that produces a unique, observable

result under certain predetermined requirements. A project is unique in that it is not a routine operation, thus routine activities that are undertaken in an organization cannot be considered as projects.

1.2. Key Features of a Project

Key features of a project are.

- **Projects create unique deliverable(s).**

  The purpose of any project is to create one or more deliverables, which can be products, services or other end results.

- **Projects are unique undertakings.**

  You do something you have never done before. A project is one-time, one-off activity and can never be executed in the same way. Therefore, a project differs from what was previously done, and it also involves unfamiliarity.

- **Projects have specific goals to achieve.**

  A project is the process of working to achieve goals. The goal is the overall result the project should achieve and should be consistent with business goals. The purpose is to describe specific tangibles, intangibles or results, and their subsequent descriptions.

- **Projects are temporary.**

  This key feature is that each project has a defined beginning and end. The project begins with the identification of the project idea. Then the project idea will be planned and executed. Once all the project objectives have been met, the project will be closed.

- **Projects require resources.**

  Resources are essential assets whose primary function is to help complete a specific task or project. Resources are a person, a team, a tool, finances, and time. Most projects require different resources to complete. Before the project begins, resources must be evaluated and allocated.

- **Projects have schedules.**

  A schedule is a list of the project's activities, milestones, and deliverables, and generally contains the expected start and end dates.

- **In projects, measures of quality apply.**

  You should plan what activities to use to measure the quality of the project's deliverables. Figure out the quality plan for each activity, and how you will measure project quality to ensure success.

- **Projects usually involve several stakeholders.**

  In projects, several stakeholders may be involved directly or indirectly. They are typically the members of a project team, project managers, executives, project sponsors and contractors, and the clients, customers or end users the products, services or results are intended for.

1.3. Project Management

Project management can be defined as the application of knowledge, skills, tools, and techniques to project activities in order to meet stakeholders' needs and expectations from a project. It is the collection of knowledge, skills, tool, techniques to direct the use of diverse resources towards the accomplishment of project objectives. Meeting stakeholder needs and expectations involves balancing competing demands among:

- ⇨ Scope, time, cost, and quality
- ⇨ Stakeholders with differing needs and expectations
- ⇨ Needs (specified requirements) and expectations (implied requirements).

APM (2006) defines project management as planning, organizing, monitoring and controlling all aspects of a project and motivating everyone involved to achieve project objectives and within agreed time, cost and performance criteria. It manages all the aspects of a project from inception to closure using a logical, scientific and structured methodology.

Project management is the art of using modern management techniques to guide and coordinate human and material resources throughout the life cycle of a project, aiming to achieve the predetermined objectives of scope, cost, time, quality, and customer satisfaction. Projects are managed by project management techniques and processes and the practices of initiating, planning, executing, controlling, and closing the work of a team to achieve specific goals and meet specific success criteria.

1.4. Evolution of Project Management

Project management has thousands of years of history, but little in the way of widely applicable, formalized theory. Informal tools and technologies were often used to manage projects as they arose. The modern era of project management began in the 1950s in the USA. The evolution of project management is explained below.

The mid 1800s: Project management grows

In the mid 19th century, the need for additional structures in the fields of construction, manufacturing and transportation led to the modern project management strategies that we use today. For example, transcontinental railroads, corduroy roads and the reconstruction of the American South after the Civil War are important achievements in the history of project management. Transcontinental railroads are an important factor in American

industrial development, and the First Transcontinental Railroad is considered the first major project management plan.

1900 to 1950: Birth of modern project management and Henry Gantt

With the development of the 20th century, US business leaders began to face challenges from the federal government on labour laws and regulations. Henry Gantt played a vital role in the history of project management and is considered the founder of modern project management. He developed planning and control technologies to help business leaders succeed and comply with these new regulations. An example is the popular Gantt Chart to ensure that project progress is tracked and controlled. This basic bar graph shows the phases of a project from start to finish.

1911: Frederic Taylor

In 1911, Frederick Taylor published the book Principles of Scientific Management based on his experience in the steel industry. The purpose of this book was to give unskilled workers the opportunity to work on complex new projects by learning skills quickly through simplicity. He created incentive-based compensation systems and took advantage of time-saving techniques.

1950 to 1980s: PERT and CPM

After World War II, project managers started to use two mathematical approaches to executing and managing projects.

The Programme Evaluation Review Technique, or PERT, analyses individual tasks, asserting the minimum time to complete them. PERT is used to control the time of project activities.

The Critical Path Method, or CPM, calculates how long activities take to complete and the relationship between activities and their endpoints. CPM takes into account both time and cost and evaluates the trade-off between project cost and project time. With additional resources, CPM enables reduction of the project duration at an optimal cost.

The Project Management Institute was established in 1969. The PMI's premise is that project management tools and techniques can be employed in similar ways across the multitude of projects from the software industry to the construction industry to the service sector.

1980 to 2000: Computers and project management

In 1981, PMI's board of directors authorized the development of what has become the PMBOK Guide: A Guide to Project Management Body of Knowledge, which contains industry-wide standards and practice guidelines.