

Principles of Sustainable Project Management

Mohamed Salama

(G) Goodfellow Publishers Ltd

(G) Published by Goodfellow Publishers Limited,
Woodeaton, Oxford, OX3 9TJ
<http://www.goodfellowpublishers.com>

British Library Cataloguing in Publication Data: a catalogue record for this title is available from the British Library.

Library of Congress Catalog Card Number: on file.

ISBN: 978-1-911396-87-1

Copyright © Mohamed Salama, 2018

All rights reserved. The text of this publication, or any part thereof, may not be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying, recording, storage in an information retrieval system, or otherwise, without prior permission of the publisher or under licence from the Copyright Licensing Agency Limited. Further details of such licences (for reprographic reproduction) may be obtained from the Copyright Licensing Agency Limited, of Saffron House, 6–10 Kirby Street, London EC1N 8TS.

All trademarks used herein are the property of their respective owners. The use of trademarks or brand names in this text does not imply any affiliation with or endorsement of this book by such owners.



Design and typesetting by P.K. McBride, www.macbride.org.uk

Cover design by Cylinder

Printed by Baker & Taylor, www.baker-taylor.com

Contents

Preface	v
About the authors	x

Part One: Sustainable Project Management: A paradigm shift

1	The Sustainable Project Management Model	1
	Mohamed Salama and Jelena Janjusevic	
2	Self-Organising and Virtual Teams	36
	Mohamed Salama and Maria Mataj	
3	Sustainable Leadership in Multi-Cultural Teams	60
	Ahmed Salih and Mohamed Salama	
4	Eco-Innovation: Lean Start up Approach	83
	Alberto Peralta, Jorge Castellote and Mohamed Salama	
5	Sustainable Change Management	103
	Ed Capaldi and Mohamed Salama	

Part Two: The Guiding Hand of Technology

6	Green ICT for Sustainable Development	135
	Hind Zantout and Norbert Seyff	
7	Blockchain: A Disruptive Technology in the Sustainable Economic System	151
	Ioannis Karamitsos, Mohamed Salama and Mohamed El Gindy	
8	New Product Development	190
	Wallace Whistance-Smith and Mohamed Salama	

Part Three: Sectoral Applications of Sustainability

9	Sustainable Construction: Green Building Strategic Model	212
	Mohamed Salama and Ashraf Hana	

10	Sustainable Logistics and the Supply Chain	236
	Shereen Nassar and Mohamed Salama	
11	Sustainable Tourism: Towards Sustainable Development	264
	Ljubomir Janjusevic and Mohamed Salama	
12	Renewable Energy for Sustainable Development	285
	Mohamed Salama, Mutasim Nour, Adel Haloub and Yara Al Jundi	
	Index	303

Case studies related to the material in Chapter 1, 11 and 12 can be downloaded from this book's page at the publisher's website:

<http://www.goodfellowpublishers.com/sustprojman>

Dedications

To my Mum & Dad, my lovely wife Zaza and our boys Omar and Ally. You are the most precious!

Preface

In the era of digital transformation, sharing economy, smart cities and disruptive innovation, change is imperative. The evolution of disruptive innovation in the context of sustainability is not limited to the emerging new products and services but extends to impact business models and the subsequent systems and processes. Project management practice has been historically guided by the relevant knowledge areas and a set of allied processes. Certainly, the existing knowledge areas and processes need a critical review in order to cope with the prevalent change. It is oblivious to believe that future projects can still be managed by implementing concepts, processes and methods from the past. And more importantly, while doing so, project managers still embrace a mindset from the past and acquire a set of skills that are at best, suboptimal, not to mention obsolete, in some aspects.

The wind of change is blowing through the project management practice and whether we like it or not, theory must embrace this change and hopefully can take the lead soon, as should be case. In the early 2000s, a similar situation, perhaps not as intensive, occurred when project management practice decided that the prevalent methodologies are suboptimal, in the case of software development projects. Agile project management evolved, set by practitioners, primarily to change the practice, and it did. This was then followed by academic research to explicate and endorse this change. This seemed like a reverse engineering approach. Ideally, it should be the other way round.

In this textbook, the authors are seeking to improvise suitable approaches to cope with the blowing wind of change, utilizing the emerging theories, frameworks and models in the allied areas within the business management discipline. The focus of its 12 chapters is to provide project managers with the knowledge and the skills they need to improve the current practice, in line with the pressing requirements of the evolving technology-driven transformation towards sustainable business environment.

It was decided to present this book in three parts. Part One covers Chapters 1- 5, and presents the new thoughts, emerging theoretical frameworks and models the authors are putting forward to project management academics and practitioners, based on the authors' research outcome, in pursuit of developing the existing theory and guiding the practice towards sustainable processes that produce sustainable products and services.

Part Two, Chapters 6-8, is titled 'The Guiding Hand of Technology' as it provides project managers with the basic, yet essential information about the emerging advanced technology and how it can be utilized in managing projects.

Part Three recognizes and further appreciates that project management is a very practical domain, led by experienced and smart practitioners who like to see that the suggested theory can work in a practical context, in their own sector.

For example, the construction project management theory is swamped with cost models that have been resting on the shelves for decades. The sophisticated black-box of advanced math and statistics used to build those models was mostly not well comprehended by practitioners. Consequently, project managers did not use such models to make investment or financial decisions. Hence, in Part Three the presented theory is endorsed by real life case studies in four selected sectors due to their impact on the economy in most countries: construction, energy, tourism and logistics and supply chain..

In Chapter 1, the editor produces the Sustainable Project Management Model (SPMM) which is the cornerstone of this book. The underpinning theory is explicated following the critical review of a wide range of literature coupled by the examination of the existing methodologies such the PMBoK, (Traditional Project Management Methodology) and the Agile methodologies. The SPMM aims to address the existing gap featured in the absence or negligence of the explicit consideration of the impact of the digital transformation which is guiding the path towards sustainable products and services, as well as redefining the associated processes, in the context of a sustainable project management practice. The dimensions and associated factors of the SPMM are discussed, illustrating the rationale and justifying the need for such a forward-looking, sustainability orientated model amid the existing models. In addition, an Appendix, by the co-author of this chapter, provide a set of case studies that can be a very useful learning tool towards understanding the application of suitability in project management context. This section reflects on the theory and concepts discussed in the previous sections of the chapter on sustainability and sustainable development and resonates well with the first dimension of the SPMM.

The following chapters will elucidate further on the key building blocks of the SPMM, explicating the relevant theory, and illustrating the application in practice through real life examples and case studies. The main emphasis is on two dimensions; 1) the soft skills for both team members and the project manager; and 2) the emergent areas of knowledge, and the allied competencies. The soft skills include teamwork as well as leadership skills. The emergent knowledge areas include: fundamentals of sustainability, sustainable development, adaptive leadership, eco-innovation management, sustainable business modelling, sustainable change management and ICT for managers. The latter opens doors for further sub-level of knowledge areas, mainly those related with the application of the relevant technologies such as Block Chain Technology (BCT) in project management; e.g. smart contracts. The following chapters in Part One will discuss the required soft skills and emerging knowledge areas in further depth.

Chapter 2 examines the essential soft skills that both team members and the project manager should acquire and relate to team work, communication, emotional intelligence, trust and dealing with different cultures. Examining two types of project teams; virtual teams in a multicultural context and self-organising team under Scrum, the chapter provides a comparative discussion that is very practical oriented, in an academic disguise.

Chapter 3 introduces the work of the authors on the area of adaptive leadership, an emerging new school of thought that claims can provide better outcomes in the context of project management. Two practical case studies are portrayed, to demonstrate how project managers can apply the presented new concepts in real life situation. Chapter 4 introduces the work of the authors in the area on eco-innovation utilizing the Lean startup (LS) approach. The chapter explicates the theory and illustrates how this knowledge can be utilized towards building a sustainable business model. Perhaps this can be perceived as a strategic level that is beyond the scope of projects and the knowledge areas that should be acquired by project managers. If you think so, then this book might not be suitable for you. In this book we advocate that modern project managers should learn how to think and act strategically and innovatively, at corporate and business level. Meanwhile, they know and certainly can manage, operate and deliver at operational level. The segregation of project managers versus programme managers is a notion from the past and should stay there.

Chapter 5 starts with an introduction to the concept and details of Agile project management with emphasis on Scrum, by the editor, to set the scene for the following ride. Then Ed Capaldi, the main author, takes the reader on a roller coaster: describing, explaining and discussing how to manage change using a case study that is fictitious yet most of the details match real-life cases that he has guided in practice with the same tools. The case is a very practical application of the presented 12 traits of sustainable change management and goes beyond the software development application of scrum to the wider business domain. This is a typical illustration of our claim at the start that by introducing a new model we do not aim to scrap the previous tools but rather build on it and utilizes it where appropriate.

Chapters 6, 7 and 8 aim to provide the reader with what can be called a short course in "*Advanced Technology for Managers*" Indeed, this is essential that every manager must know at present and more so for the future. The chapters are together as a block that should be read in sequence particularly Chapters 6 and 7 where the former provides the basic concepts about and the latter delves into realms of Artificial Intelligence (AI) with emphasis on Block chain Technology BCT. Chapter 7 provides a very comprehensive content that takes the reader from scratch (101 level – no pre-requisites) about BCT to a very reasonable stance whereby an illustration of how to use BCT in smart contracts as well as the practical applications of BCT in the built environment. Chapter 8 is about New Product Development, an integral part of the project management practice with emphasis on the use of virtual reality technology in producing new products and services. Dr. Wallace Wisthance- Smith in this chapter reflects on his own work as an entrepreneur, business developer and an academic who teaches both alongside operations and project management.

Chapters 9, 10, 11 and 12 form Part Three of this book, and aim to provide sectorial application of the new mindset that is advocated throughout this book

starting by the SPMM. Chapter 9 covers the construction with emphasis on the green buildings as an example of sustainable construction. It introduces a strategic model for implementing green buildings that was developed by the two authors of the chapter. This is an example of a strategic model that is typically interesting for project managers working for local authorities' level and the associated parties. In addition, the chapter introduces a comprehensive list of challenges and enablers for a case study of implementing green buildings in Dubai that can be useful for practitioners in general, especially as Dubai is a mix of different trends, cultures, practices. Chapter 10 introduces the basic concepts of sustainable logistics and supply chain management, with emphasis on port and maritime logistics. The importance of this chapter is due to the fact that every project, in pursuit of a sustainable project management practice, will have to embrace a sustainable logistics system. In general, logistics and supply chain management is a key area of knowledge that does not get adequate attention in the project management literature despite the imperative need to understand and even master some of the basic concepts that fall beyond the procurement context.

Chapter 11 addresses another quite a different sector, that is the tourism sector. Tourism contributes to circa 10% of the global GDP and it is a major contributor in many economies. An examining eye will realise that the emerging sustainable tourism will need to utilize project management tools and techniques since to manage the change and to develop new products and services. The relationship between tourism and the hospitality sectors, and project management has been an old one but usually disguised under "*Event Management*" yet applying the same set of tools and techniques mostly those from the traditional project management school of thought such as the PMBoK and the like.

Chapter 12 examines the Energy sector with case studies on renewable energy and on sustainable waste management. The chapter starts by comparing the different types of Renewable Energy Technologies (RETs) and discusses the importance of RETs for sustainable development. The first case study looks at the potential for biofuels in the UAE, the second related case presents the key features of a Biofuel Refinery Plant Project as an example of sustainable development projects in the Energy Sector. This is the only project of its kind in the Middle East and particularly the Gulf region and it was based on primary data collected by Adel Haloub, for a research project conducted by the authors. The third case study provides a very useful example on how to conduct a feasibility study to build a Waste-To-Energy (WTE) Incineration Plant as an example of sustainable recycling project. Similarly, the case study was based on primary data collected by Yara Al Jundy as part of a research project conducted by the authors.

Finally, the SPMM aims primarily to change the mindset, not only the tools and techniques! Once the mindset changes, the need for new set of tool and techniques (alongside some of the existing ones) as those introduced in the SPMM will be realized. As a matter of fact, the existing literature tends to agree with these statements in part; that is the impact of innovation on projects as well as the need

to lay more emphasis and give more attention to the project managers' skills (we prefer to use competences, but both will be used interchangeably in this book). However, the literature does not seem to have translated those findings into useful practical tools that can guide project managers, in practice on how to do so. When we started this book, we were tasked to address this gap. We aimed to balance the theory and practice as much as we can, so most chapters were supported with good examples and some cases to illustrate the theory. We tried to steer clear from the traditional style of providing templates, registers and the like, because we believe these hinder innovation and limits creativity. We still advocate the use of the existing tools and techniques as appropriate and when deemed useful or can serve the purpose, such as most of the core processes typically needed in project planning; those discussed in our textbook "*Project Management*" by Haniff and Salama, (2016)¹. Attention should be given though to the inputs and the context; as discussed in the sixth dimension of the SPMM.

Mohamed Salama & the Team

Acknowledgments

The editor is grateful to the wonderful team of authors who have put significant time and effort, illustrating an exemplary collaboration, despite the distance and all other commitments. We are also grateful to the very professional team at Goodfellow Publishers who were instrumental in the production of this book. It was a pleasure to work with you.

¹ Haniff, A. and Salama, M. (2016) Project Management. Goodfellow, Oxford, UK

About the authors

Dr. Mohamed Salama is academic head of Strategy, Operations and Projects, and Director of Corporate Executive relations at School of Social Sciences at Heriot Watt University, Dubai Campus. Mohamed has circa 20 years of academic experience with focus on project management and strategic management, and over 30 years of work experience as a practitioner in the areas of project management, strategic management and mergers and acquisitions. His research interests and main publications are in the area construction project management and sustainable project management. His book on Project management is the teaching textbook at Heriot Watt University, He is currently the academic chair of 'Lean and Agile Middle East Summit' an annual conference that takes place in Dubai.

Dr. Ahmad Muhamad Salih, architect by origin, GIS and IT by experience and project manager/Strategist by profession, is also a certified Project Management Professional. He has lead many cultural change programs and established the project management office within Khatib and Alami, a multi-national AEC consultancy, in UAE in 2006. His research interests are in leadership studies, culture, Douglassian Cultural Framework and Cultural Intelligence, and qualitative research methods.

Dr. Hind Zantout is the Director of the MSc Data Science Programme in the School of Mathematical & Computer Sciences at Heriot-Watt Dubai. Her academic and research interests include interdisciplinary topics that link computing and informatics with business and society. under this umbrella, big data, innovation, data mining, knowledge management and green it are all employed to support work on business analytics, smart digital communities and the knowledge economy.

Prof. Norbert Seyff is a professor at the University of Applied Sciences and Arts Northwestern Switzerland and a senior research associate at the University of Zurich. His current research focus on requirements engineering, software modeling and sustainability design. He has a particular interest in empowering and supporting end-users participation in system development.

Dr. Shereen Nassar is an Assistant Professor in Operations, Supply Chain and Logistics Management at Heriot-Watt University. Prior to her appointment at Heriot-Watt University, she taught in one of the UAE Academic institutions and a number of well-regarded Egyptian academic institutions. Dr. Nassar's main research interest is Supply Chain visibility driven by the advancement of tracking and tracing technology.

Alberto Peralta is currently a lecturer of Strategy and Business Innovation at EAE Business School (Madrid, Spain), while researching on business innovation and new business strategies. Recent publications relate Business Model Innovation to European and Spanish investors, and the impact of Business Model Innovation in the Circular Economy. He translates the work of Steve Blank, and collaborates with relevant academics and practitioners from USA, Latin-America and Europe, to build a network that helps improve the chances of success of new businesses.

Jorge Castellote is co-founding partner of Innoway. Before that he spent more than seven years in Palladium, a consulting firm specializing in Strategy Execution. Jorge is a dynamic and independent business management consultant with more than 16 years of international experience with a proven track record of delivering world-class strategy and innovation related solutions in Europe, Africa and the Middle East. He is currently focusing on providing guidance in strategy and innovation to empower companies in the Middle East and Africa region, including volunteer work with entrepreneurs in Africa.

Jelena Janjusevic is Assistant Professor at Heriot Watt University, Dubai Campus. Mrs. Janjusevic has strong managerial and research experience. Along with managing the Centre for Sustainable Development, with amission to support sustainable development policy implementation, she was engaged on many different projects dealing with macroeconomic, sustainable development, and public administration capacity building. In over 16 years of experience, she worked with many people and organisations at national and international level, including the government of Montenegro, the World Bank, IFC, EBRD, USAID, UNDP, CHF, EC, and domestic and foreign private companies). She is author and co-author of more than 30 papers and reports published in national and international publications and journals.

Ljubomir Janjusevic comes from the business sector as an experienced, senior-level professional with a strong history of driving dynamic product sales, managing client relationships, and substantially increasing revenues. He has more than 16 years of professional experience, mainly in senior management positions. He has worked in different sectors, both in retail and wholesale from FMCG, tourism, advertising. Currently he works as Marketing and External Relation Associate at Heriot Watt University, Dubai Campus. He is owner and CEO of JSM Company, with operations in wholesale and tourism sector in Montenegro and Europe.

Ashraf Raouf Hana has 29 years of experience in corporate life with emphasis on design, contracting, construction & project management, sales management and business development management. In 2011, he joined Heriot-Watt University, School of Management and Languages, Dubai Campus as adjunct faculty. His research is focused on green buildings and sustainable construction in the United Arab Emirates and he produced the UAE green building strategic model (UAE GBSM) that was published and presented to the 29th annual ARCOM conference .

Dr. Mutasim Nour is the Director of MSc Energy and Renewable Energy programs at Heriot-Watt University, Dubai Campus. He had previously worked at the University of Nottingham Malaysia Campus, where he initiated and led the Power Electronics, Control and Renewable Energy Research Group. Dr. Nour has served as a consultant in the areas of energy storage, efficiency control of AC machines and energy saving solutions. He is currently involved in research projects in the fields of PV inverter system and solar tracker, energy demand management, Energy Efficiency, renewable energy storage systems and applications of artificial intelligence in power systems.

Maria Mataj has an international background with work experience in London, San Francisco and Dubai. Maria is currently working in MedNet, a Munich Re company based in Dubai, where she is deeply involved in transformation programs with the focus on digitalization, automation and innovation. She has also conducted research in virtual teams due to her on-going experience in a virtual ecosystem.

Dr. Yannis Karamitsos has over 25 years industry and research experience as an executive manager, working in the private and public sectors and in European, Middle East and Chinese companies. Since 2010, he has been a Digital Transformation Technologist at Orange Business Services, working with clients to develop and deliver their strategies and transform their organisations into Smart and Digital Cities. Yannis is member of Dubai Silicon Oasis Authority (DSOA)- Dubai Innovation Advisory Board. In 2016, he joined the Department of Electrical Engineering as an adjunct professor at Rochester Institute of Technology Dubai.

Dr. Wallace Whistance-Smith is Professor of Business Management, Ryerson University, Toronto, Canada. Wallace is an experienced executive, entrepreneur, keynote speaker, media personality, and business owner, and has a wide-ranging career portfolio including expertise in manufacturing, purchasing, operations & supply chain management, IT, engineering, finance, economics, marketing and communications. A multi award-winning lecturer, winner of numerous awards of distinction in manufacturing, Wallace holds four innovative product patents with current research interests in the design and development of new products and operational efficiency.

Mohamed El Gindy is a Project Manager at AECOM, a multinational engineering and management services firm. Mohammed served as a consultant to several clients on prominent construction projects in the UAE. He is an enthusiast of the application of disruptive technologies such as blockchain in the urban development and infrastructure industry. This was the main drive for his research during his study of MSc in Strategic Project Management at Heriot-Watt University.

Adel Haloub, since 2016, Adel has been Business Development Manager for Florexx international investment responsible for achieving the company's vision by investing in the renewable energy projects around the world. Prior to that, he worked as a senior consultant for Price Waterhouse Coopers for three years.

Yara Al Jundy has had over 10 years of professional experience in the fields of Environment and Sustainability, with a BSc in Environmental Engineering, MSc in Energy, and multiple certifications from local and international institutes. Her skills were developed by working closely on high profile projects in different project phases, such as construction (monitoring and due diligence), design (EIA, permitting and designing waste management plans) and operation & maintenance (sustainable facility management and operations).