

PART 2

AI. AKTAYEWA, D.L. FUSCHI,
L.DAULETKIREEVA, N. ZAURBEKOV,
K. ASSANOVA, B. URMASHEV, R. NIYAZOVA

FUNDAMENTALS PROJECT MANAGEMENT: INFORMATION TECHNOLOGIES

textbook for High School

FUNDAMENTALS PROJECT MANAGEMENT:
INFORMATION TECHNOLOGIES



AI. AKTAYEWA D.L.FUSCHI L.DAULETKIREEVA
N. ZAURBEKOV K. ASSANOVA
B. URMASHEV R. NIYAZOVA

***FUNDAMENTALS PROJECT MANAGEMENT:
INFORMATION TECHNOLOGIES
PART 2***

Almaty, 2017

RECOMMENDATIONS:

Baikenov A.S. – prof. AUES

Ilipbayeva L.B. - prof. K.Satpayev KazNTU

Tsekhovoy A.F. – prof. K.Satpayev KazNTU

Recommended by the Academic Council of Almaty Technological University

A _____: Al.Aktayewa, D.L.Fuschi, I. Dauletkereeva,
N.Zaurbekov, K. Assanova, B. Urmashhev, R.Niyazova

FUNDAMENTALS PROJECT MANAGEMENT: INFORMATION TECHNOLOGIES: textbook for High School, 2 - Part / Editorial director
A.Aktayewa: - Almaty: Evero, 2017. - 328 pages.

ISBN

This textbook addresses the challenges posed by various levels of project complexity by introducing an approach to profiling projects and discussing the implications to project management. The textbooks provide an overview of project management and uses the industry standard definitions of the divisions of project management knowledge as described by the Project Management Institute (PMI) to provide grounding in traditional project management concepts.

Additionally, students learn an IT developed by the authors to assess the complexity level of a project. This overview and complexity profile provides a cognitive map to which the student can refer when they proceed to the second part of the book and learn more about the specific areas of project management knowledge.

Students learn more about specific topics in Charters devoted to scope, planning, budgeting, cost management, quality, risk management, procurement, and closeout. They learn about the knowledge, skills, and tools used in each of these areas. They learn that different subsets of this knowledge, skills, and tools are needed depending on the complexity of the project and how to make the appropriate selection based on a project's complexity profile. It provides a practical, case-enriched learning experience that will help students go from learners to competent project managers.

ISBN

© Al.Aktayewa, 2017, © D.Fuschi, 2017, ©, L.Dauletkireeva, 2017
© N.Zaurbekov, 2017, © K. Assanova, 2017, © B. Urmashhev, 2017, © R.Niyazova 2017

ISBN

© Almaty, 2017

TABLE OF CONTENTS	
PREFACE	8
INTRODUCTION	13
CHAPTER 1: CONFLICT MANAGEMENT IN PROJECT	
Introduction	18
Objectives of Conflicts	18
Views of Conflict	20
Conflict in Projects	22
Managing Conflict in Projects	24
Stimulating Conflict	25
The conflict environment	26
Conflict resolution	27
Formulate Conflict Management Strategies	29
Summary	33
Review Questions	34
CHAPTER 2: ORGANIZATIONAL STRUCTURES AND CULTURE	
Introduction	37
Organizing Projects within the Functional Organization	40
Organizing Projects within a Matrix Arrangement	42
Different Matrix Forms	45
What Is the Right Project Management Structure?	47
Transitional organizational management structures	49
What Is Organizational Culture?	51
Identifying Cultural Characteristics	54
Summary	57
Review Questions	61
Exercises	63
CHAPTER 3: METODOLOGIES OF RISK ANALYSIS	
Introduction	66
Qualitative methods of risk analysis	66
The objective of risk analysis	68

The Quantitative Project Management process	68
Comparative Analysis of Methods for Project Risk Assessment	70
Probabilistic and quantitative risk assessments	73
Probability and Impact Matrix	77
Analytic hierarchy process method	78
Summary	79
Review Questions	80
Exercises	81
CHAPTER 4: OVERVIEW METHODS OF RISK ANALYSIS PROJECT MANAGEMENT	
Introduction	83
Overview Methods of Quantitative Risk Analysis	83
Program Evaluation and Review Technique (PERT)	85
Monte Carlo simulations methods	88
Decision tree risk analyses methods	90
Discussion on the Comparison of Methods for Assessing Project Risk	91
Summary	92
Review Questions	94
Exercises	94
CHAPTER 5: RISK MANAGEMENT IN IT PROJECTS	
Introduction	97
Risk management in IT-projects	98
Methods of analysing the risk	100
Introduction of Monte Carlo Method	100
Definitions of Monte Carlo Method	103
Calculation of Monte Carlo Method	104
What is Monte Carlo Analysis?	106
Benefits of Using Monte Carlo Analysis	107
Monte Carlo Analysis Steps	109
Summary	111
Review Questions	112
Exercises	113
CHAPTER 6: USING INFORMATION TECHNOLOGIES IN	

PROJECT MANAGEMENT	
Introduction	115
History of Project Management Software	115
Planning tools	119
Budgeting tools	120
Monitoring tools	122
Reporting tools	123
Communication tools	126
Procurement tools	127
Financial tools	128
Summary	130
Review Questions	131
Exercises	131
CHAPTER 7: OVERVIEW OF THE PROJECT MANAGEMENT SOFTWARE	
Introduction	132
Tips for Improving Project Management Efficiency	132
Overview of the Software Microsoft Project	134
Free and Open Source Project Management Software	142
Summary	153
Review Questions	154
Exercises	155
Case study	155
CHAPTER 8. DATA ARCHIVING & NETWORKED SERVICES-SOFTWARE- DEVELOPMENT METHOD	
Introduction	157
Initiation phase	157
Definition phase	159
Design phase	160
Cyclical phase	161
Implementation of the functionalities	163
Summary	166
CHAPTER 9: SOFTWARE PROJECT MANAGEMENT IN INDUSTRY - EXPERIENCES AND CONCLUSIONS	

Introduction	169
A Project Management Assessment	169
Project Staff	170
Measuring a Software Project	171
Methods and Tools	172
Inadequate Amount of Time Invested for Project Management Activities	173
Inadequate Usage of Project Management Techniques	174
Important Quantitative Data were not Available for Project Management	175
Distributed Software Development Requires Better Project Management	176
Plan for Adequate Quality Assurance Methods	178
Initiate Policy and Organizational Changes	179
Summary	179
CHAPTER 10: PROJECT CONTRACT MANAGEMENT	
Introduction	181
Types of contracts	181
NDA, NDCA, MOU what are they and when to use them	185
Elements of a contract	186
How to read a contract	188
Clauses in a contract	190
Small print (terms and conditions)	192
Responsibilities and obligations	194
Liabilities and penalties	195
Summary	196
Review Questions	198
Exercises	198
Case study	200
CHAPTER 11: PROJECT MONITORING AND CONTROLLING MANAGEMENT	
Introduction	202
Understanding monitoring	203
Metrics, Indicators and KPI	206
What to monitoring	210

How to read and interpret KPI and metrics	211
How to report	213
How to react (contingency management)	215
Summary	215
Review Questions	216
Exercises	216
Case study	217
CHAPTER 12: PROJECT PROCUREMENT MANAGEMENT	
Introduction	218
What is Procurement Management	218
Selecting suppliers	220
Supplier register	222
Negotiations	224
Approaches to Purchasing Negotiation with Suppliers	225
Managing suppliers	227
Managing suppliers with sub-contractors	228
Controlling procurements	230
Closing procurements	231
Project procurement processes	232
IT to assist in project procurement management	233
Summary	236
Review Questions	238
Exercises	239
Case study	240
CHAPTER 13: SPECIAL TOPICS IN PROJECT MANAGEMENT	
Introduction	241
Vendor and contractor partnerships	241
Vendor and contractor affiliations	242
Manage Vendor and Contractor Information	244
Vendor or contractor business profile	245
Identify and Qualify Vendors and Contractors	247
Qualify vendors and contractors	247
Prepare Vendor and Contractor Contracts	249
Mentoring	250
Project management benchmarking	250

Outsourcing Project Work	252
Art of Negotiating	254
Summary	256
Review Questions	257
Exercises	257
CONCLUSION	
THE PROJECT MANAGEMENT INTERNATIONAL CULTURE: RUSSIAN'S EXPERIENCE	260
ADVANCED FEATURES OF RUSSIAN PROJECT MANAGEMENT SOFTWARE	265
THE PROJECT MANAGEMENT CULTURE: KAZAKHTAN'S EXPERIENCE	277
REFERENCES	290
GLOSSARY	300
APPENDIXES	
APPENDIX 1: SAMPLE IT - PROJECT PLAN	308
APPENDIX 2: ACRONYMS	316
APPENDIX 3: TOP CAUSES OF DELAYS IN IT PROJECTS	319
APPENDIX 4: ROLES WITHIN A PROJECT	321
APPENDIX 5: USEFUL RESOURCES FOR PROJECT MANAGEMENT	323
ABOUT THE AUTHORS	324

ABOUT THE AUTHORS



Prof. Dr. Ing. David Luigi Fuschi - Fellow of the Royal Society for the encouragement of Arts, Manufactures and Commerce (RSA), Chartered Manager (CMgr) as well as Chartered Engineer (CEng). As Professional: almost 30 year experience, Director & Chairman at Bridging Consulting Ltd, member of the Professional Advisory Board of HP-MOS, Senior member of IEEE and ACM, and Project Expert Evaluator/Reviewer in over 12 Research Programmes. As Project Manager: a track record of over 98 projects (for over 300 million Euro) successful completion (12 rescued), acquisition of over 21 projects (for over 62 million Euro), and over 100 projects assessed. Strong connection with industry and academia (over 140 industrial partners, 70 universities/research centres and 20 cultural institutions). As Academic: good experience in teaching and knowledge transfer both in academia and in industry; a book Charter and the market analysis adopted as the starting point of the EC Special Task Force for Multimedia & Education, several scientific articles, position papers, and very successful tutorials. Adjunct Professor at KIIT University, Invited Professor of Project Management & Problem Solving at the Catholic University of Cordoba Argentina (Faculty of Engineering and ICDA Business School), Visiting Professor at Vilnius Technical University and at Almaty Technology University, Invited Lecturer at the School of Design of the Politecnico di Milano, Senior Trainer at Fondazione Clerici Milano, Visiting Research Fellow at Brunel University and Associated Senior Research Fellow at Reading University.



Al. Aktayewa - Ph.D in Information systems from Kazakh Economic University after named T.Ryskulov in Kazakhstan. She is an associate professor who has been teaching and utilizing new technologies at Almaty Technology University for more than twenty-five years, have been educational background in applied mathematical science. She published more than 50 scientific and educational works, including 10 in foreign journals, 10 abstracts and articles in international symposia, 10 methodical and manuals, and 5 textbooks, translated from Russian and English into the Kazakh language. **She currently teaches multiple courses in BSc and MSc Programs** in Research area as a coordinator for Final Project in MSc Program beside. She supervises students in final project. **Courses taught include Project Management IT, Research and analysis of algorithms, Information security: technical supports, Languages and programming technology, Quantum informatics.** Dr. A. Aktayeva's research interests include: Applied mathematics, Neuroscience, Marketing IS, Management ISS, Quantum informatics, Adult Education.



Liliya Dauletkereeva Ph.D in Applied informatics from Nosov Magnitogorsk State Technical University in Russia. She is an associate professor who has been teaching and utilizing new technologies at Nosov Magnitogorsk State Technical University for more than 15 years, have been educational background in applied mathematical science. She published more than 130 scientific and educational works, including 10 in foreign journals, 25 abstracts and articles

in international symposia, 10 methodical and manuals, and 5 textbooks, translated from Russian and into the English language. She currently teaches multiple courses in BSc and MSc Programs in Research area as a coordinator for Final Project in MSc Program beside. She supervises students in final project. Courses taught include Project Management IT, Applied informatics, Audit IS, Languages and programming technology, Software Engineering. Dr. L. Dauletkereeva's research interests include: Applied informatics, IT teaching methodology, Education.



Dr.PhD Nurgali S.Zaurbekov -head of the Department "Information technologies" Almaty Technology University, have been building mathematical science together since 1988. He published more than 200 scientific and educational works, including 15 in foreign journals, 35 abstracts and articles in international symposia, 10 methodical and manuals, and 4 textbooks, translated from Russian into the Kazakh language, 6 copyright certificate and 3 innovative patents RK for invention. **He currently teaches multiple courses in MSc and PhD Programs. Courses taught include Project Management IT, Research and analysis of algorithms, Algorithms and Data Structures, Languages and programming technology, Software Engineering. Theory of reliability and fault tolerance software, Technology of designing software systems".** *Prof. Nurgali S. Zaurbekov* have worked in a wide range of industries, including, natural language processing, science, and academy, entertainment, R&D.



Rossamgul S.Niyazova - Ph.D in Information systems from K. Satpayev Kazakh Technical University in Kazakhstan. Dr. R.Niyazova joined at L.N. Gumilyov Eurasian National University as professor and teaches undergraduate student in Technical Information department. She also, teaches in the Doctor's Program in Research area as a coordinator for Final Project in DSc Program beside

for more than twenty-five years, have been educational background in applied technical science. She published more than 55 scientific and educational works, including 10 in foreign journals, 10 abstracts and articles in international symposia, 15 methodical and manuals, and 3 textbooks, translated from Russian and English into the Kazakh language. She currently teaches multiple courses in BSc and MSc Programs in Research area as a coordinator for Final Project in MSc Program beside. She supervises students in final project. Courses taught include Project Management IT, Research and analysis of algorithms, Theory Informatics, Languages and programming technology. Dr. R.Niyazova's research interests include: Informatics, Applied mathematics, Management ISS, Technical Information.



Dr.PhD Baidalet A. Urmashiev -Head of the Department "Computer Science" Al-Farabi Kazakh National University, have been building software together since 1994. He specializes in delivering seminars Development of methods, models and geo-information technologies of control, analysis and forecasting of the

dynamics of desertification processes on the territory of the Republic of Kazakhstan. He published more than 100 scientific and educational works, including 10 in foreign journals, 35

abstracts and articles in international symposia, 10 methodical and manuals, and 1 textbook, translated from English into the Kazakh language, 1 copyright certificate and 1 innovative patent RK for invention. He currently teaches multiple courses in Executive MSc and PhD Programs. Courses taught include Project Management SW, Operations Research, Languages and programming technology, Theory of computability Software Engineering, Technology of designing software systems, Model theory, Research and analysis of algorithms, the study of combustion processes on mathematical models, Mathematical theory of burning.



Karlygash Assanova - joined at Kazakh-American University as associate professor and teaches undergraduate student in Technical Information department. She also, teaches in the MSc Program in Research area as a coordinator for Final Project in BSc Program beside for more than twenty-five years, have been educational

background in applied technical science. She published more than 55 scientific and educational works, including 10 in foreign journals, 5 abstracts and articles in international symposia, 15 methodical and manuals, and 1 textbook, translated from Russian and English into the Kazakh language. She currently teaches multiple courses in BSc and MSc Programs in Research area as a coordinator for Final Project in MSc Program beside. She supervises students in final project. Courses taught include Project Management IT, Theory Informatics, Languages and programming technology, Informatics. K. Assanova's research interests include: Applied mathematics, Management AS, Technical Information.

**AI. AKTAYEWA, D.L. FUSCHI, L.DAULETKIREEVA,
N. ZAURBEKOV, K. ASSANOVA,
B. URMASHEV, R. NIYAZOVA**

**FUNDAMENTALS PROJECT MANAGEMENT:
INFORMATION TECHNOLOGIES**

PART 2

Format 60x100 1/16
Closeness 80g/m². Whiteness 95%. *Printing RIZO.*
Conditional guire. 20.5. Volume 328 p.



«Evero» publishing house, RK. Almaty,
street of Baitursynova, 22.
Tel.: 8 (727) 233 83 89, 233 83 43,
233 80 45, 233 80 42
e-mail: evero08@mail.ru