

Transforming Health Care Management

Integrating Technology Strategies

Ivan J. Barrick, PhD, FACHE, CPHIMS

*Assistant Professor
Adjunct Faculty
University of Southern Indiana
Pennsylvania State University
University of Scranton*



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Dedication

This book is dedicated to my family; without their support throughout my career, this book would not be a reality.

Additionally, I owe considerable gratitude to those dedicated leaders and pioneers throughout the healthcare industry and medical military community who educated, mentored, and counseled me during the last forty years. Their contributions of shared experience, insight, and expertise enabled me to achieve success and rebound from failure during my career.

Contents

<i>About the Author</i>	<i>xi</i>
<i>Preface</i>	<i>xiii</i>
Chapter 1 Digitally Transforming Health Care: An Introduction	1
Introduction	1
Historical Perspectives	3
Modern Developments	7
Chapter 2 Multi-disciplinary Concepts: A Fundamental Foundation	11
Flowchart	12
Pareto Charting and Analysis	15
Ishikawa (Cause and Effect) Diagramming	17
Run Charts	19
Control Charts	20
Process Capability Analysis	27
Scatter Diagrams	28
Histograms	29
Team Dynamics Facilitation Techniques	30
Brainstorming	32
Contingency Diagramming	33
Why Technique	35

Nominal Group Technique	35
Force Field Analysis	36
Summary	38
Chapter Questions	38
Additional Resources	39
Chapter 3 Information Technology: Components, Functions, and Features	41
Computer Use and User Requirements	42
Patients Deserve More, Not Just More Technology	43
System Fundamentals and Computer Applications	46
Fundamental System Terminology and Operations	51
HEPIS (Healthcare E-Patient Information System)	55
Summary	70
Chapter Questions	70
Additional Resources	70
Chapter 4 Networking to Digitally Transform Healthcare Communication	72
Networks	72
Common Topologies	73
Network Categories and Configurations	74
HIPAA	77
HIPAA Severity Mandates	78
Summary	79
Chapter Questions	79
Additional Resources	79
Chapter 5 Quality Management	81
Choosing Total Quality	81
Leaders and Legends	82
Deming's Strategy and Process Variation	85

Cost of Quality	87
Quality Is Free	87
Cause and Effect	89
Be the Best	89
Summary	91
Chapter Questions	91
Additional Resources	91
Chapter 6 Process Redesign Strategies	93
Summary	96
Chapter Questions	97
Additional Resources	97
Chapter 7 Transformational Strategies for Tactical Project Management	98
The Project Management Process	101
Summary	110
Chapter Questions	110
Additional Resources	110
Chapter 8 Tactical Work Breakdown and Workload Analysis	111
Work Simplification	111
Why Technique	114
Work Distribution Analysis	117
Flow Process Analysis	119
Horizontal Flow Process Analysis	121
Time Flow Analysis	122
Job Sequencing	122
Summary	126
Chapter Questions	126
Additional Resources	126

Chapter 9 Tactical Performance Management and Metrics: Productivity Benchmarking for Operations Improvement	127
Productivity Metrics	129
Labor Costs and Benchmarks	130
Productivity Indexing	134
Benchmarking	134
Workforce Planning and Resource Allocation	134
Resource Scheduling	135
Control of Labor Expenses and Budgeting	135
Outcomes	137
Summary	138
Chapter Questions	138
Additional Resources	138
Chapter 10 Queuing Theory and Waiting Line Analysis	140
Waiting Line Balancing	141
Single Channel, Single Server	144
Probability Distributions	145
Exponential Probability Distributions	147
Summary	148
Chapter Questions	148
Additional Resources	149
Chapter 11 Process Simulation and Predictive Modeling	150
Credibility and Acceptance	152
Model Types	154
Degree of Difficulty: Model Design and Analysis	156
Summary	157
Chapter Questions	157
Additional Resources	158

Chapter 12 Strategic Application of Six Sigma Concepts	159
Summary	172
Chapter Questions	172
Additional Resources	172
Chapter 13 Lean Enterprise Theory and Facilitation	173
Visual Management	175
Pull, Push, and Takt Time	177
Lean Implementations and Implications	177
Lean Opportunities and Principled Application	180
Summary	182
Chapter Questions	183
Additional Resources	183
Chapter 14 Telemedicine and Clinical Informatics	184
Evolving Perspectives	187
Informatics Applications	189
Summary	196
Chapter Questions	197
Additional Resources	197
Chapter 15 Emerging Technologies	198
NHII Status and Current Strategy	200
Picture Archiving and Communication Systems (PACs)	203
Clinical Terminology Challenges	204
CPOE	208
RFID	209
Summary	212
Chapter Questions	212
Additional Resources	213

Chapter 16 Visionary Perspectives: Healthcare's Future . . . 2014 and Beyond	215
Fast Forward to 2014	227
<i>Bibliography</i>	229
<i>Index</i>	231

About the Author

IVAN BARRICK, PHD, FACHE, CPHIMS

As an assistant professor and an adjunct faculty member at the University of Southern Indiana, Pennsylvania State University, and the University of Scranton, Dr. Barrick taught health services administration, information management, and operations research graduate and undergraduate courses.

As Director of Parente Randolph's Healthcare Operations Improvement Practice, Dr. Barrick was responsible for process reengineering, operations research and his process improvement engagements, productivity management, staffing and related due diligence assessments, quality management audits, benchmarking, organization development, information systems, strategic planning engagements, HIPAA administration simplification compliance assessments, and remediation projects.

Dr. Barrick consulted with and was employed by academic medical centers, community hospitals, integrated healthcare systems, post-acute systems, medical groups, health management organizations, psychiatric hospitals, Veterans Administration, and military facilities.

He has served on boards of directors of regional healthcare, human service organizations, and as vice president of a Regional WEDI-SNIP affiliate, the e-Pennsylvania Alliance. Throughout a thirty-five year career in health care, Dr. Barrick held a number of positions. These positions include president of an independent healthcare operations improvement consultancy, Chief Information Officer, director of corporate, line, and staff functions in large academic medical centers, hospitals, and health systems. Extensive administrative, management consulting, clinical, and technical experience brings unique healthcare delivery perspectives. In addition, he served as CIO for Navy Bureau of Medicine and Surgery in a Combat Zone Fleet Hospital, retiring as a Commander, Medical Service Corps, United States Naval Reserve.

Dr. Barrick earned a Doctorate in Healthcare Administration, a Masters degree in Public Administration, and a Bachelor of Science degree in Medical Technology.

He has published extensively in professional journals, co-authored several books, and contributed to several healthcare textbook chapters.

He is credentialed as a Fellow in the College of Healthcare Executives, a Certified Healthcare Information Management Professional, and the American Society of Clinical Pathology as a medical technologist.

Preface

Health care is a very troubled industry!

Peter Drucker and other operations management experts have characterized healthcare organizations and hospitals as the “most complex, barely manageable places [. . .] maybe the most complex organizations in human history.” Health care is not a “seamless system” or even one in which a designer, operator, user, manager, or customer view a process or a system from a common perspective. As an active participant in designing, implementing, managing, changing, and training in healthcare operations and systems for more than three decades, I agree with management experts and conclude that the problems in our healthcare industry are no real surprise. For more than a quarter century, my responsibilities have included those of an educator, a chief information officer (CIO), a management engineer, an operations consultant and analyst, a civilian executive and military officer, a division director and clinician, and, most importantly, a patient.

Recognizing that healthcare organizations are so complex, should we really expect that any process or system in these confounding environments could be perceived any differently? As educators we are challenged to prepare our students, our nation’s next generation of healthcare leaders. Today’s students will be rapidly tasked to design, implement, manage, operate, monitor, and improve technology, processes, and programs. They will assess systems and process effectiveness using these key tools and techniques typically embedded in programs such as quality leadership, continuous process improvement, process redesign through reengineering, clinical process and system protocol redesign, or, most contemporarily, Six Sigma, lean enterprise, and organizational transformation. We cannot fulfill our educational obligation unless our aspiring professionals speak the same language.

Those of us directly involved in this industry-wide digital transformation process must encourage the use of standardized knowledge with a common vocabulary that incorporates essential elements of all technology-driven clinical disciplines. As an industry we have just begun to understand that digitized medical records can only be effectively used when built and maintained with a nationally standardized infrastructure.

Until now, a fundamental problem for both educators and students was that this book had yet to be written. Recognizing this unmet need, this primer is offered as fundamental tool for key healthcare process, systems, or technology stakeholders. This textbook takes initial steps in this clearly focused direction.

As both clinicians and administrators, we practice in an industry that represents more than 20% of America's economy. We are all simultaneously challenged to deliver safe, cost-effective, consumer-friendly care and to do so while being digitally transformed. As educators, as students, and as those producing educational materials we must promote a multidisciplinary understanding of essential concepts relevant to all information technology (IT) disciplines, such as management engineering, systems analysis, networks, communications, and information systems.

Although frequently critical of "bureaucratic hospital silos" of the independent nursing, laboratory, pharmacy, and other departments, we naively fail to acknowledge or clearly understand that we have our own "silos" embedded within and among our IT disciplines.

Technology and process transformational concepts are presented in a language so that students at all levels can understand, articulate, and demonstrate fundamental competence, knowledge, language, and vocabulary in these essential subject areas:

- Information Systems
- Information Systems Design
- Information Systems Analysis
- Management Engineering
- Operations Research
- Operations Analysis
- Clinical Informatics
- Networking and Communications
- Business Process Engineering
- Six Sigma
- Lean Enterprise
- Quality Management
- Quality Leadership
- Project Management and Work Breakdown Structure
- Productivity Management and Performance Improvement

Anyone planning a career in these areas can relate to health care's administrative and clinical processes and can understand them from a patient's perspective, having experienced these error-prone processes in healthcare encounters. As each student explores these processes, systems, and IT concepts from this integrated perspective, value analysis is enhanced when viewed from circumstances that have

impacted his or her own life. This approach offers increased potential for more understanding and greater retention of key concepts.

This textbook is designed for study in management engineering, computer systems, and healthcare IT programs and maintains an increased level of rigor common in Association of University Programs in Hospital Administration (AUPHA) accredited undergraduate programs and Commission on Accreditation of Healthcare Management Education (CAHME) accredited graduate programs. Operations research and IT topics are, by definition, technical subjects, and they are presented to complement each individual discipline's curriculum goals.

The language, tone, and graphics are presented like those of an introductory textbook, but they are rigorous enough to meet stringent academic accreditation standards. The key concepts and applications presented here both prepare students to credibly discuss healthcare systems and to enlighten process and IT professionals desiring to learn more technical aspects of these subjects. Our subject matter is laden with fundamentally essential clinical, engineering, and systems technical terms that can be quite intimidating when first encountered, but throughout this text we introduce and explain these terms.

This book is a primer for healthcare IT, operations research, systems analysis, process improvement, and informatics students. Additionally, this text will interest instructors teaching discipline-specific audiences in clinical specialty undergraduate programs (e.g., digital imaging nursing, medical technology, etc.). Medical students intending to pursue a career in the rapidly evolving field of medical informatics may be interested as well.

Chapters are structured and sequenced within five major sections. The first section introduces a focused rationale and common approach within four chapters:

- Digitally Transforming Health Care: An Introduction
- Multidisciplinary Concepts: A Fundamental Foundation
- Information Technology: Components, Functions, and Features
- Networking to Digitally Transform Healthcare Communications

The second section builds on this foundation and expands content scope and topic depth initially introduced, while preparing for more advanced topics:

- Quality Management
- Process Redesign Strategies
- Transformational Strategies for Tactical Project Management

The third section further develops these topics from a more comprehensive multidisciplinary approach to traditional operations research, process and performance improvement concepts, and quantitative analytical tools and techniques:

- Tactical Work Breakdown and Workload Analysis
- Productivity Measurement and Performance Management
- Queuing Theory and Waiting Line Analysis

Techniques used to achieve effective digital transformation of critical care delivery processes are highlighted in the fourth section:

- Process Simulation and Predictive Modeling
- Strategic Application of Six Sigma Concepts
- Tactical Application of Lean Enterprise Theory

The last section incorporates the fundamental techniques presented earlier and more advanced concepts and essential strategies to lead digital transformation initiatives. This section highlights pioneering experiences and futurists' expectations for patient-centric healthcare delivery capabilities and challenges of foreseeable applications:

- Telemedicine and Clinical Informatics
- Emerging Technologies
- Visionary Perspectives: Healthcare's Future, 2014 and Beyond

With a primary focus on a relatively junior audience, this text encourages students to develop an accelerating recognition of IT, process reengineering, and digital redesign strategies to drive the digital transformation of the industry in virtually every healthcare profession's programs. It is an excellent supplement to existing management-related course texts in clinical programs to incorporate process analysis, quality management (QM), process improvement, and Six Sigma and Lean Enterprise concepts in healthcare organizations that are expanding continuing education programs. Content specifically addresses fundamental, discipline-specific, and integrated subject areas essential to aspiring professionals faced with a rapidly accelerating demand for digitized healthcare organizations of all types and venues.

Of necessity, this text focuses on key hospital processes and IT applications; however, parallel concepts in other healthcare venues, such as long-term care and home health care, and both large and small medical group practices, are incorporated, typically as additional examples or case studies.

This book explains how improved quality of patient-centric care ultimately increases productivity and key relationships between quality and productivity. This critical relationship is reiterated by describing how quality drivers increase competitiveness, lower costs, and enhance long-term organizational viability. Although unique in both content and approach, this textbook links quality and productivity

by illustrating how these essential objectives of patient-centric care delivery are achieved.

Examples and illustrations of tools and techniques and how they are commonly used by multidisciplinary cross-functional teams to improve quality and productivity are included. Quality concepts incorporate philosophies from experts like Deming, Juran, Ishikawa, Crosby, Labowitz, and Caldwell.

This book presents a transformation strategy in the context of three critical and interconnected components: quality, productivity, and technology management. Links among these components are preserved throughout the book. Healthcare executives, managers, supervisors, management engineers, clinicians, and others will benefit as traditional IT needs of students in health administration are addressed. Never before has there been such intense emphasis and open debate in the healthcare industry about improving quality and patient focus and critical safety issues throughout healthcare delivery processes.

This primer provides the necessary context, tools, and techniques to prepare aspiring transformationalists to lead technology-driven “order of magnitude” improvement.

