HEALTH CARE INFORMATION SYSTEMS

A Practical Approach for Health Care Management

FOURTH EDITION

Karen A. Wager | Frances W. Lee | John P. Glaser

WILEY

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Fourth Edition

Karen A. Wager

Frances Wickham Lee

John P. Glaser

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In memory of our colleague Andy Pasternack

Preface

Health care delivery is in the early stages of a profound shift in its core strategies, organization, financing, and operational and care processes.

Reactive sick care is being replaced by proactive efforts to keep people well and out of the hospital. Fragmented care delivery capabilities are being supplanted by initiatives to create and manage cross-continuum systems of care. Providers that were rewarded for volume are increasingly being rewarded for quality and efficiency.

New forms of reimbursement, such as bundles and various types of capitation, are causing this shift. To thrive in the new era of health care delivery, providers are creating health systems, such as accountable care organizations, that include venues along the care spectrum.

In addition providers are introducing new processes to support the need to manage care between encounters, keep people healthy, and ensure that utilization is appropriate. Moreover, as reimbursement shifts to incent-improved provider performance these organizations will have a common need to optimize operational efficiency, improve financial management, and effectively engage consumers in managing their health and care.

These changes in business models and processes follow on the heels of the extraordinary increase in electronic health record adoption spurred by the Meaningful Use program of the US federal government.

On top of a foundation of electronic health records, the industry will add population health management applications, systems that support extensive patient engagement, broader interoperability, and more significant use of analytics. Providers involved in patient care will need immediate access to electronic decision-support tools, the latest relevant research findings on a given topic, and patient-specific reminders and alerts. Health care executives will need to be able to devise strategic initiatives that take advantage of access to real-time, relevant administrative and clinical information.

In parallel with the changes in health care, information technology (IT) innovation continues at a remarkable pace. The Internet of Things is creating a reality of intelligent homes, cars, and equipment, such as environmental sensors and devices attached to patients. Social media use continues to grow

and become more sophisticated and capable. Mobile personal devices have become the device of choice for personal and professional activities. Big data has exceptional potential to help identify new diagnostic and therapeutic algorithms, conduct most market surveillance, and assess the comparative effectiveness of treatments.

For providers to prosper in this new era they must be very effective in developing IT strategies, implementing the technology, and leveraging the technology to improve organizational performance. They must understand the nature of health care data and the challenges of privacy and security. Clinicians and managers must appreciate the breadth of health care IT and emerging health care IT trends.

The transformation of the health care industry means that IT is no longer a necessary back-office evil—it is an essential foundation if an organization is to survive. That has not been true in the past; provider organizations could do quite well in a fee-for-service world without computerized physician order entry and other advanced IT applications.

Having ready access to timely, complete, accurate, legible, and relevant information is critical to health care organizations, providers, and the patients they serve. Whether it is a nurse administering medication to a comatose patient, a physician advising a patient on the latest research findings for a specific cancer treatment, a billing clerk filing an electronic claim, a chief executive officer justifying to the board the need for building a new emergency department, or a health policy analyst reporting on the cost-effectiveness of a new prevention program to the state's Medicaid program, each individual needs access to high-quality information with which to effectively perform his or her job.

The need for quality information in health care, already strong, has never been greater, particularly as this sector of our society strives to provide quality care, contain costs, and ensure adequate access.

PURPOSE OF THIS BOOK

The purpose of this book is to prepare future health care executives with the knowledge and skills they need to manage information and information systems technology effectively in this new environment. We wrote this book with the graduate student (or upper-level undergraduate student) enrolled in a health care management program in mind.

Our definition of health care management is fairly broad and includes a range of academic programs from health administration, health information management, and public health programs to master of business

administration (MBA) programs with an emphasis in health to nursing administration and physician executive educational programs. This book may also serve as an introductory text in health informatics programs.

The first (2005), second (2009), and third (2013) editions have been widely used by a variety of health care management and health information systems programs throughout the United States and abroad. Although we have maintained the majority of the chapters from the third edition, this edition has gone through significant changes in composition and structure reflecting feedback from educators and students and the need to discuss topics such as population health and recent changes in payment reform initiatives. We have removed the section on the international perspective on health care information technology and updated the case studies of organizations experiencing management-related information system challenges. We also added a new chapter on the role of information systems in managing population health.

ORGANIZATION OF THIS BOOK

The chapters in this book are organized into four major parts:

- Part One: "Major Environmental Forces That Shape the National Health Information System Landscape" (Chapters One through Four)
- Part Two: "Selection, Implementation, Evaluation, and Management of Health Care Information Systems" (Chapters Five through Eight)
- Part Three: "Laws, Regulations, and Standards That Affect Health Care Information Systems" (Chapters Nine through Eleven)
- Part Four: "Senior-Level Management Issues Related to Health Care Information Systems Management" (Chapters Twelve through Fourteen)

In addition Appendix A provides an overview of the health care IT industry. Appendix B provides a compendium of a sample project charter, sample job descriptions, and a sample user satisfaction survey.

The purpose of Part One ("Major Environmental Forces That Shape the National Health Information System Landscape") is to provide the reader with the foundation needed for the rest of the book. This foundation includes an overview of the major environmental forces that are shaping the national health IT landscape, such as Medicare's alternative payment programs. The reader will gain insight into the different types of clinical, administrative, and external data used by health care provider

organizations. Additionally, the reader will gain an understanding of the adoption, use, and functionality of health care information systems with focus on electronic health records (EHRs), personal health records (PHRs), and systems need to support population health management (e.g., data analytics, telehealth).

Specifically Part One has four chapters:

- *Chapter One: National Health Information Technology Landscape.* This chapter discusses the various forces and activities that are shaping health information systems nationally. The chapter reviews the HITECH Act, the Affordable Care Act, HIPAA, and national efforts to advance interoperability.
- *Chapter Two: Health Care Data.* This chapter examines the range of health care data and issues with data quality and capture. This examination is conducted from a cross-continuum, health system perspective.
- *Chapter Three: Health Care Information Systems.* This chapter provides an overview of clinical and administrative information systems. The chapter focuses on the electronic health record and personal health record and describes in greater detail the major initiatives that have led to current adoption and use of EHRs by hospitals and physician practices (e.g., Meaningful Use and health information exchanges). The chapter also includes discussion on the state of EHRs in settings across the care continuum (e.g., behavioral health, community care, long-term care). It concludes with a discussion on important health care information system issues including interoperability, usability, and health IT safety.
- *Chapter Four: Information Systems to Support Population Health Management.* This is a new chapter. Its purpose is to focus on the key data and information needs of health systems to effectively manage population health. Key topics include population health, telehealth, patient engagement (including social media), data analytics, and health information exchange (HIE).

The purpose of Part Two ("Selection, Implementation, Evaluation, and Management of Health Care Information Systems") is to provide the reader with an overview of what is needed to effectively select, implement, evaluate, and manage health care information systems. This section discusses issues mid- and senior-level managers are likely to encounter related to managing

change and managing projects. The reader will also gain insight into the role and functions of the IT organization or department.

Specifically Part Two has four chapters:

- *Chapter Five: System Acquisition.* This chapter discusses the processes that organizations use to select information systems. We have included a discussion on the importance of system architecture.
- *Chapter Six: System Implementation and Support.* This chapter reviews the processes and activities need to implement and support health care information systems. We have included an examination of change management and project management.
- *Chapter Seven: Assessing and Achieving Value in Health Care Information Systems.* This chapter discusses the nature of the value that can be obtained from health care information systems and the approaches to achieving that value.
- *Chapter Eight: Organizing Information Technology Services.* This chapter reviews the structure and responsibilities of the IT organization. This chapter discusses IT senior management roles such as the chief information officer and the chief medical information officer.

The purpose of Part Three ("Laws, Regulations, and Standards That Affect Health Care Information Systems") is to provide the reader with an overview of the laws, regulations, and standards that affect health care information systems. Emphasis is given to system security.

Specifically Part Three has three chapters:

- *Chapter Nine: Privacy and Security.* This chapter examines privacy and security regulations and practices.
- *Chapter Ten: Performance Standards and Measures.* This chapter discusses the wide range of regulations that affect health care information systems, with an emphasis on new regulations related to the focus on the continuum of care.
- *Chapter Eleven: Health Care Information Systems Standards.* This chapter reviews the new and emerging standards that govern health care data, transactions, and quality measures.

The purpose of Part Four ("Senior-Level Management Issues Related to Health Care Information Systems Management") is to provide the reader with

an understanding of senior-level management responsibilities and activities related to IT management.

Specifically Part Four has three chapters:

- *Chapter Twelve: IT Alignment and Strategic Planning.* This chapter discusses the processes used by organizations to develop an IT strategic plan. The chapter reviews the challenges faced in developing these plans.
- *Chapter Thirteen: IT Governance and Management.* This chapter discusses several topics that must be addressed by senior leadership if IT is to be leveraged effectively: establishing IT governance, developing the IT budget, and ensuring that projects are successful.
- *Chapter Fourteen: Health IT Leadership Case Studies.* This chapter comprises case studies that provide real-world situations that touch on the content of this textbook.

Each chapter in the book (except Chapter Fourteen) begins with a set of chapter learning objectives and an overview and concludes with a summary of the material presented and a set of learning activities. These activities are designed to give students an opportunity to explore more fully the concepts introduced in the chapter and to gain hands-on experience by visiting and talking with IT and management professionals in a variety of health care settings.

Two appendixes offer supplemental information. Appendix A presents an overview of the health care IT industry: the companies that provide IT hardware, software, and a wide range of services to health care organizations. Appendix B contains a sample project charter, sample job descriptions, and a sample user satisfaction survey: documents referenced throughout the book.

Depending on the nature and interests of the students, various chapters are worth emphasizing. Students and courses that are targeted for current or aspiring senior executive positions may want to emphasize Chapter One (National Health Care IT Landscape), Chapter Four (Population Health), Chapter Seven (IT Value), Chapter Twelve (IT Strategy), and Chapter Thirteen (IT Governance and Management). For classes focused on mid-level management, Chapter One (National Health Care IT Landscape), Chapter Five (System Selection), Chapter Six (System Implementation), and Chapter Seven (IT Value) will merit attention.

Regardless of role, Chapter Two (Health Care Data), Chapter Three (Health Care Information Systems), Chapter Eight (IT Organization), and Part Three (Laws, Regulations, and Standards) provide important foundational knowledge.

One final comment. Two terms, *health information technology (HIT)* and *health care information systems (HCIS),* are frequently used throughout the text. Although it may seem that these terms are interchangeable, they are, in fact, related but different. As used in this text, HIT encompasses the technologies (hardware, software, networks, etc.) used in the management of health information. HCIS describes a broader concept that not only encompasses HIT but also the processes and people that the HIT must support. HCIS delivers value to individual health care organizations, patients, and providers, as well as across the continuum of care and for entire communities of individuals. HIT delivers little value on its own. Both HCIS and HIT must be managed, but the management of HCIS is significantly more difficult and diverse.

Health care and health care information technology are in the early stages of a profound transformation. We hope you find this textbook helpful as we prepare our students for the challenges that lie ahead.

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Finally, we wish to extend a very special thanks to Molly Shane Grasso for her many contributions to Chapter Four, "Information Systems to Support Population Health Management."

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Glaser was the founding chair of the College of Healthcare Information Management Executives (CHIME) and the past president of the Healthcare Information and Management Systems Society (HIMSS). He has served on numerous boards including eHealth Initiative, the American Telemedicine Association (ATA), and the American Medical Informatics Association (AMIA). He is a fellow of CHIME, HIMSS, and the American College of Health Informatics. He is a former senior advisor to the Office of the National Coordinator for Health Information Technology (ONC).

Glaser has published more than two hundred articles, three books on the strategic application of information technology in health care. Glaser holds a PhD in health care information systems from the University of Minnesota.

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