THE SYMBIOTIC RELATIONSHIP BETWEEN HEALTH INFORMATION MANAGEMENT AND HEALTH INFORMATICS: OPPORTUNITIES FOR GROWTH AND COLLABORATION

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Abstract

Health information management (HIM) and health informatics (HI) are two similar but distinct disciplines. They share a common goal in terms of using information technologies and information power to improve the quality and efficiency of patient care; contribute to disease prevention and treatment; and improve overall population health. HIM professionals are primarily focused on managing health information, and HI professionals are primarily focused on the technologies and systems that make health information management possible. The right combination of the breadth of knowledge HIM professionals possess and the depth of knowledge HI professionals bring into the various areas constituting the scopes of the two disciplines can strengthen an organization's potential and growth in a complex, fast-changing healthcare environment.

Keywords: health information management, health informatics, information technology, HIM competencies, health informatics education

Introduction

Health information management, health informatics, health information technology, and health information professionals are terms that are commonly used interchangeably. For the purpose of this paper, we are considering health information management (HIM), health information technicians (HIT—the associate degree level of HIM, different from strictly technology services or health IT), and health information professionals as one discipline, and health informatics (HI) as the other discipline. The reason for this distinction will be made clear in this paper through an examination of brief historical aspects of both disciplines, the similarities and differences between HIM and HI education, the significance of the academic foundation underpinning them both, and recommendations for their growth and collaboration.

What Is Health Information Management?

Health information management has a long history that dates back to the ancient world. The earliest known medical records go back to ancient Mesopotamia.[1] Archaeologists have discovered thousands of records in the form of clay tablets that documented the patient's history, just as we would record a history and physical exam in today's world. There are also more than 30,000 surviving cuneiform tablets that are known to be about medicine and medical practices of the Sumerians.[2] In 4000 BC, Egyptian scribes were the forerunners to our modern-day transcription. They transcribed medical information on scrolls of papyrus, a material that was made from a water plant.[3] Greek and Roman records had descriptions of a patient's mental and physical history; however, the gods are still mentioned as the cause of sickness. Greek and Roman medical records

were transcribed on parchment, which is prone to disintegrating.[4] It is remarkable that even at such a distant time from where we are now, ancient civilizations understood the importance of medical records.

HIM is about managing and protecting a patient's health information, which is important to providing quality healthcare. The modern HIM profession began with Grace Whiting Myers' work organizing themedical records stored at Treadwell Library at MassachusettsGeneral Hospital in Boston. Myers was focused on the centrality and integrity of the patient record, which led to the president of the American College of Surgeons proposing the Association of Records Librarians of North America (ARLNA) in 1928.[5] As the profession became more involved in the administration of federal programs such as Medicare and increased their presence in acute care facilities and other healthcare settings, there was a need to redefine the association. Since being formed, the American Health Information Management Association (AHIMA) has undergone several name changes, from the American Association of Medical Record Librarians (AAMRL) in 1938 and the American Medical Record Association in 1970 to its present name in 1991.

AHIMA defines health information management as the practice of acquiring, analyzing, and protecting digital and traditional medical information.[6]It is a combination of business, science, and information technology.

Patient care has become increasingly driven by data and the great need for quality healthcare data for continuity of care, therefore enhancing the need for healthcare professionals to be highly trained to understand the workflow within healthcare organizations. They are responsible for the integrity and protection of patients' health information. According to the Health Insurance Portability and Accountability Act, electronic health record (EHR) adoption has also placed health information professionals at the forefront of daily operations of healthcare organizations, as they are well versed in understanding the need for accurate and complete patient records. Great opportunities exist for HIM to incorporate data science methods in the use and management of healthcare data.[7]

HIM is also fundamental in addressing the changes in secondary use of patient information. HIM professionals bring their knowledge and skills in EHRs, clinical documentation, coding, and legal and compliance issues,[8] hence making them marketable in different settings, including acute care, physicians' offices, outpatient, and private healthcare organizations. There have also been several opportunities in other non-patient care related areas such that the report for Health Data Management Report from the US Bureau of Labor Statistics predicted an 18 percent increase in health information management jobs by 2028.[9]

The quality of healthcare data continues to be of importance as we focus on healthcare outcomes and value-based care, and HIM continues to be at the center stage in facilitating accurate data

capture both manually and electronically. At the highest levels, HIM professionals manage people, manage health data that is produced within a healthcare organization, and contribute to important financial and compliance aspects.

What Is Health Informatics?

Health informatics (HI) is a subset of informatics, just like construction informatics, visual informatics, intelligence and security informatics, or organizational informatics.[10] The University of Edinburgh considers informatics as the study of the structure, behavior, and interactions of natural and engineered computational systems.[11] For a more thorough understanding of health informatics, it is important to highlight a few historical aspects related to its root: information technology.

Archeologists have found recordings of royal assets and taxes as early as 4000 BC in the form of Sumerian cuneiscript in stone tablets.[12] During circa 1200-1475 AD, in the Andes of South America, a wealthy society called Inca had created a system to measure and account for the products that were delivered in different geographical areas.[13] This system included: 1) a method for recording of data by tying ropes of different lengths, materials, and colors in different distances and frequencies (called quipu); 2) a large and efficient transportation network; and 3) trained information specialists (called chasquis) that remembered what was shared verbally and ran to various distances to deliver the quipu.[14] Identical copies of quipu were kept in order to compare recordings with other parties and assure the integrity of the information as well as fair practices.

Fast-forwarding to the 20th century, Morse code was invented for electric telegraphy in the 1830s, and punch cards and tabulating machines were used for the purpose of US census recordings in the 1890s.[15] In 1930s, right before World War II, the first programmable computer was created in Germany and used for the purpose of military operations.[16] Ten years after, radio detection and ranging (RADAR) technology appeared. These brief historical findings show that our predecessors coded select information by using consistent systems of symbols as needed at the time. The emergence of computers marked the beginning of modern information technology. Efforts to improve information technology led to the study of information technology in academic settings and to the creation of various supporting associations. It was not until the late 1960s and early 1970s that computers were being considered for use in healthcare.[17]

To support that movement, the International Medical Informatics Association and American Medical Informatics Association (AMIA) were established respectively in 1967 and 1988.[18] It was during those years that the framework for education in medical informatics started taking shape. Today, health informatics plays an important role in healthcare. AMIA defines health informatics as the science of how to use data, information and knowledge to improve human health and the delivery of health

care services.[19] The Health Information Management Systems Society states that "Health Informatics is the integration of healthcare sciences, computer science, information science, and cognitive science to assist in the management of healthcare information,"[20] a definition adapted by Saba and McCormick.[21,22] Coiera describes health informatics as the logic of healthcare.[23] Furthermore, he states that "health informatics … is the rational study of how we think about patients and how treatments are defined, selected, and evolved. The tools of informatics are likely to be clinical guidelines, formal medical languages, information systems, or communication systems like the Internet."[24]

Health informatics has also been recognized and referred to as medical informatics, clinical informatics, or biomedical informatics. It includes a number of areas, such as telehealth, telephone triage and telecare, telenursing and remote guidance, teleradiology, teledermatology, medical monitoring, Holter monitoring, automated ECG interpretation, patient registration, digital radiology, PACS, clinical decision support systems (CDSS), computer-aided diagnosis, concept processing (artificial intelligence, machine learning), robotic surgery, cyber knife, or clinical trials.[25] Health informatics delves even deeper into the establishment of an infrastructure that can accommodate use of various technologies in healthcare.[26] The basic distinction among the various types of health informatics is the scope of healthcare technology or information that is being worked with. For example, telenursing is focused on the information systems and technologies used in nursing practice. The scope of informatics specialties tends to be narrow and deep, but from a distant perspective, health informatics is a field that deals with the use of technology to solve complex problems, monitor large-scale data, and improve decision-making processes.

Academic Aspects

Over the years, both HIM and HI have identified a number of domains and competencies that a professional with a degree in each area should possess at the entry level in the workforce. Upon examination of the existing domains and competencies published by AHIMA and AMIA, multiple similarities and some differences are observed between HIM and HI academic education. As seen in **Figure 1**, both HIM and HI professionals need to have a good grasp on domains such as data structure and content, information technology, data analytics, information security, leadership, management, and project management. HIM professionals are also expected to have a strong background in medical coding, healthcare reimbursement and finance, revenue cycle management, health law, risk management, and compliance with various healthcare policies and regulations. HI professionals are expected to have a much stronger technology background and be specialists when it comes to computer science and information technology aspects.

Under the assumption that both HIM and HI professionals are masters of data structure and content, the first observation of those domains indicates that HIM professionals bring to the table their

expertise in clinical coding, business, finance, and compliance, and HI professionals contribute their technical expertise in terms of computer systems and information technology. However, when considering the educational background and work experience, the depth and scope pertaining to each domain reveal more varied scenarios.

Typically, HIM professionals complete bachelor or associate degrees in health information management or technology from programs accredited by the Commission on Accreditation for Health Informatics and Information Management Education (CAHIIM). They are expected to pass respectively, the Registered Health Information Administrator (RHIA) or Registered Health Information Technician (RHIT) certification exams. Graduate programs are being developed for both, building on the undergraduate HIM education and as an entry into practice degree. HIM professionals are expected to master the health data content from the point of inception, including patient registration, insurance, legal consents, and clinical data documented by nurses, physicians, and other care providers. They also are expected to analyze and classify the patient encounter from a medical coding, reporting, compliance, treatment, or clinical protocol perspective. Furthermore, their well-rounded knowledge makes them a valuable party that can bring in perspectives from various aspect of the healthcare organization, and lead or facilitate routine operational activities and special projects that require use of health information.

On the other side, HI programs are currently offered at the graduate level. At the time of this article, degree program accreditation exists for HI, although program accreditation is not associated with a specific HI credential. AMIA is in the process of evaluating Health Informatics Certification, yet, to date, employers do not require a specific certification as essential for entry into the profession. Typically, the HI degree programs require a bachelor's degree in computer science, biology, mathematics, or clinical education such as medicine, nursing, or radiology for admission. Varied backgrounds lead to varied types and levels of specializations among HI professionals, such as computer science specialists better equipped to build health information systems or applications, health data analysts, or clinicians who can understand the information technology aspect better and provide meaningful feedback pertaining to information technologies and systems in their area of expertise (clinical decision support, nursing, etc.).

Significance

Deeper understanding of the educational foundation and background is helpful in better understanding the potential and positioning of both HIM and HI professionals. Academic details discussed above are significant, as they demonstrate that, by academic design, HIM professionals completing accredited programs have a consistent, holistic approach to health information. The multipronged education on the origin and purpose of the health data and the preparation to interpret and work with clinical, administrative, and financial data creates an opportunity for HIM professionals to serve as managers, liaisons, or consultants in any healthcare organization activities that require use of health information. Similarly, HI education leads to diverse, varied, specialized

knowledge of health information, although with a potential for inconsistency based on the differing content of degrees without required accreditation. Such specialized knowledge is valuable when it comes to designing specific types of health information systems and technologies, working with specific health data sets, or other types of health data analysis.

The external healthcare environment in the United States is changing at a much faster rate than before given the new medical treatments and technologies, personalized medicine, information technologies, compliance with changing regulations, and business model changes due to mergers and acquisitions. Investments in health-related technologies and the data derived from them is increasing as well. An industry trends report published by Global Market Insights in April 2019 estimated that the digital health market for US, Canada, Germany, UK, Spain, Italy, Russia, Poland, Japan, China, India, Australia, Brazil, Mexico, and South Africa will reach $504.4 billion in the near future.[27] Further, a Market Watch report in February 2020 stated that the value of the digital health market in North America is projected to reach $219.7 billion by the year 2025.[28] Similar trends are being observed in Europe, Canada, and other countries. Investments of such size demand management by highly skilled professionals that work with health information and health technologies; HIM and HI professionals are very well positioned in that regard.

According to the 2019 data shared by the Bureau of Labor Statistics (BLS), medical records and health information technicians (which represent health information management) occupied 341,600 positions in the US. BLS does not have health informatics listed as one of the occupations;[29] however, there are multiple entries under the category of computer and information technology, and most of those occupations (such as systems analysts, database administrator, network and computer systems administrators) are present in hospitals and large healthcare organizations. In addition, job search engines such as Monster or Indeed show demand for thousands of jobs with a title "health informatics," "data analysts," and other alike terms. While there may be some overlap in the projected job growth between health information management and health informatics, the potential for growth is still relatively high.

The contributions from physician informaticists, nurse informaticists, and other clinician informaticists are very important, necessary, and welcomed. However, given that their primary education, background, credential, and job responsibility is focused on patient care (such as medicine, nursing, pharmacy, etc.), from an economic and financial standpoint, using them primarily for tasks related to health information management and health informatics may not be feasible. In addition, as explained above, the majority of students pursuing a graduate degree in health informatics already have jobs and are using the higher degree and specialization to secure their jobs or seek career growth opportunities. On the HIM side, the number of new HIM professionals depends on the capacity of HIM programs across the country. According to the 2017-2018 reports from the Integrated Postsecondary Education Data System (IPEDS), over 1,200 students graduated with a bachelor's

degree in HIM from CAHIIM accredited programs across the US.[30] With the addition of new programs, this number may go up a little; however, it is still low considering the demand for over 300,000 professionals.

Outlook and Recommendations

Today's healthcare industry relies more heavily than ever on technology and health information. We are faced with large scale health data arising from experiments, clinics, population health centers, pharmaceuticals, community health information systems, portable health devices, wearable technology, and so on. Despite increased automation in health data collection and processing, the complexity of our healthcare system and health issues require human capital.

In the future, wide implementation of health information systems, expectations for greater optimization, growth of digital data, and complexity of working with big data will require both the breadth of knowledge offered by HIM professionals and specialized knowledge offered by various HI professionals. Carroll asserts, "Hyper-growth in knowledge means that every medical profession is becoming ever more specialized and niche-oriented. Add to this the looming baby boomer retirement wave and declining numbers of medical graduates, and it's evident that the war for talent is going to drive much of the agenda of the health care industry in the next few years."[31] Health care organizations are headed to greater optimization of technologies, greater interoperability, increased use of artificial intelligence, and ability to exchange the necessary information among providers, payers, regulatory agencies, and patients.[32,33] The continuing growth of bioinformatics, personalized medicine, and frequency of health data doubling (exponential growth) will create both opportunities for HIM and HI, some of which are listed in **Table 1**.

Opportunities are accompanied with challenges. More and more HIM professionals are finding it necessary to continue their education toward a master or doctoral degree or seek continuous education opportunities in specialized areas of interest, such as data analytics, population health, or data security. Likewise, HIM programs are in an ongoing quest for finding the right balance of teaching the basic expected knowledge, incorporating new technologies, and providing opportunities for deeper learning and greater level of expertise. HI programs are challenged with providing a flexible curriculum that can provide the general concepts as well as opportunities for specialization in specific areas such as artificial intelligence, population health, or risk management.

HIM and HI professionals can play a tremendous role in not only capitalizing on the existing technologies and availability of health data but also optimizing them and growing them. This requires building a workforce that will live up to such challenges. Higher education is responding by opening new programs or updating and strengthening the existing ones, and must continue the quest for innovation in the process of preparing students with the expected skill set and instilling the drive to pursue learning and adaptation beyond the years of formal education.

In looking ahead to meet the challenges of healthcare and grow both HIM and HI professions, each discipline must continue to evolve and adapt. Both professions have some similarities that are generally found in each of the separate disciples. Together, the current skill set of HIM and HI can address a wide range of interconnected needs of a workforce required to adapt and thrive in an efficient and growth-oriented manner to a rapidly changing healthcare environment. As the technology continues to evolve and healthcare continues to adapt new technologies and new approaches to care, the skill sets for both HIM and HI will need to be re-evaluated.

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Notes

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